Monthly Labor Review Reader

U.S. Department of Labor
Bureau of Labor Statistics
1975

Bulletin 1868

Library of Congress Cataloging in Publication Data
Main entry under title:

Monthly labor review reader.

Compilation of articles on findings of the Bureau of Labor Statistics, published between Jan. 1969, and Jan. 1975, in the Monthly labor review.
Supt. of Docs. no.: L 2.2:M76/2
1. Labor supply—United States—Addresses, essays, lectures. 2. Labor economics—Addresses, essays, lectures. I. United States. Bureau of Labor Statistics. II. United States. Bureau of Labor Statistics. Monthly labor review.
HD5724.M65 331.1'1'0973 75-619070

Monthly Labor Review Reader

U.S. Department of Labor
John T. Dunlop, Secretary

Bureau of Labor Statistics
Julius Shiskin, Commissioner
1975

Bulletin 1868

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, GPO Bookstore, or
BLS Regional Offices listed on inside back cover. Price $5.50
Make checks payable to Superintendent of Documents
Stock Number 029-001-01403-1
Catalog Number L2.3:1868

CONTENTS

CONTENTS—Continued

CONTENTS—Continued

INTRODUCTION

The *Monthly Labor Review*—the principal outlet for the creative thinking, analytical skills, and statistical series of the Bureau of Labor Statistics and its professional staff—is a valuable reference source for studies of methods of collecting and compiling labor statistics and for interpretations of their meaning and significance. *The Monthly Labor Review Reader* presents some of the best of its recent articles. The selections were made by the staff of the *Monthly Labor Review* to reflect (1) current economic or social policy issues facing the Nation at the present time; (2) progress in the development of statistical concepts and methodology; and (3) the statistical practices of other countries. Since the Bureau's constant emphasis is on the quality and integrity of its output, attention—in the selection process—was also paid to the quality of the writing and analytical logic.

As the pioneer statistical agency in the Federal Government, the Bureau—over its 90 years—has developed a comprehensive core of labor statistics covering employment and unemployment, prices and living conditions, wages and industrial relations, productivity and technological change, occupational safety and health, and special economic studies. This *Reader* includes selections from each of these major areas. Although the *Monthly Labor Review* itself is a mature 60 years old, the articles selected for this new volume span roughly only the last 15 years: This restriction was necessary to keep the *Reader* to manageable size and limited to articles that are relevant to today's problems.

Nor does this *Reader* reflect the full scope of the *Monthly Labor Review's* contents. Each month, the *Review* reports on current developments in industrial relations and labor law, reviews books, and presents almost 40 pages of the Bureau's latest statistics. The MLR—and this *Reader* as well—should be of interest to labor, business, and government officials, as well as to research scholars, students and teachers of economics, industrial relations, management and public relations.

The *Reader's* nine chapters include—

Chapter I. *Measuring Employment and Unemployment:* The Bureau's two series on employment (from the household and from the establishment surveys) and the unemployment rate are major national economic indicators crucial to assessments of the state of the economy. The unemployment rate is used also to measure progress towards meeting the goals of the Full Employment Act of 1946. More recently, the administration of the Comprehensive Employment and Training Act of 1973 requires that State and local area unemployment estimates that are consistent with the national rate be used in the allocation of Federal revenue sharing funds. The properties of these Bureau measures—along with analyses of their trends, both in the U.S. and other industrialized countries—are included in this chapter, as are related series on the duration of unemployment and the rate of voluntary separations of workers in manufacturing industries—the so-called quit rate. Another article discusses the relative unemployment experiences of blacks and whites in the various phases of the business cycle. A final article includes a cyclical analysis of workers who come into and leave the labor force—job losers, leavers, and new entrants.

Chapter II. *Changes in the Labor Force,* focuses on some problems in labor force accounting—men missed in the Decennial Census of Population and discouraged workers who are not in the labor force because they think they could not find a job. It also includes the Bureau's most recent projections of the labor force and the educational attainment of workers to 1990.

Chapter III. *Special Groups in the Labor Force,* deals with some problems and employment characteristics of special groups of workers: Women, Vietnam-era veterans, urban workers, Americans of Spanish origin, and multiple jobholders.

Chapter V. *Price Measurement and Trends:* This chapter describes improvements under way in the Bureau's consumer and industrial price measures. Improvements in concept and methodology and expansions of scope are all covered. A comprehensive description of the massive program under way to overhaul the Consumer Price Index is the subject of another article. The development of a new comprehensive price measure—its objective, its construction, its assets and shortcomings, is the subject of still another article. Other subjects covered include the use of price indexes in long-term contracts to escalate wages and other income payments, the cyclical behavior of price changes during the postwar period, and price experience during a recent period of price stabilization—1972.

Chapter V. *Productivity and Technological Change,* includes descriptions of several Bureau measures of productivity; an analysis of productivity and cost performance in the private sector in 1973, a year in which long-run productivity growth slowed; productivity in construction, textiles, and the telephone industries, and in a substantial portion of the Federal Government. The Federal Government measure, still in its early stages, included more than 850 output indicators, and covered 61 percent of the employment in Federal civilian government. A comparison of productivity and unit labor costs in 12 industrial countries is the subject of the final article of this chapter.

Chapter VI. *Wages and Earnings,* examines such topics as the relationship between changes in wage rates and hourly earnings. What are a worker's "usual earnings, annual earnings of household heads? What is the effect of the Federal minimum wage on youth unemployment? How do we measure employee compensation?" One article discusses the limitations of existing wage measures and describes plans for a new index of change in total employee compensation designed to measure the full range of employment costs. Development of the new index is now under way in the Bureau. It will be published in stages: First, the measure of change in wage rates is scheduled for publication in 1976 and the measure of change in full employment costs in 1977.

Chapter VII. *Distribution of Income and Purchasing Power:* Widespread interest in welfare policies and in measures of the economic hardship of unemployment both point to the need for better information on income distribution and worker purchasing power. This chapter describes the differences in concept and scope of two widely used statistical measures of workers' purchasing power: the BLS series on real net spendable earnings and the Department of Commerce's series on per capita real disposable personal income. These series showed different trends from the mid-1960's to the early 1970's and raise questions about the actual course of purchasing power during the recent period of serious inflationary pressures. Another article reports on the increasing importance of the income of wives as a proportion of total family income—up 3 percentage points from 1958 to 1969. Another author reports on a slight but persistent trend toward greater income inequality in this country.

Chapter VIII. *Unions, Bargaining, and the Workplace,* groups several articles on collective bargaining in the public sector, for example, women in unions (although their number is increasing, their participation in union leadership positions is not) and productivity bargaining in Great Britain. A final article in the chapter describes the Bureau's new survey—one of the largest in the history of the country—to collect data on the incidence of occupational injuries and illness in U.S. industry.

Chapter IX. *Work Scheduling and Worklife:* One article in this chapter suggests that the role of work in our society will be affected greatly by changes in fertility rates: Several possibilities are presented, ranging from the assertion that work will continue to provide a central focus for personal satisfaction and status achievement to the argument that our traditional work ethic is undergoing rapid erosion, to be displaced by new criteria of personal worth and achievement unrelated to work performance. Another article reports that "little objective evidence exists to support an inference of a rising wave of discontent among workers, associated directly with the nature of their jobs." But the author goes on to point out that "most of the available statistical indicators are clearly much too aggregative to serve as reliable indexes of worker discontent. Statistical series such as productivity and labor turnover were designed for quite different purposes." One article in the chapter examines the relations between labor and leisure and another the 4-day workweek. The concluding article describes two different methods to measure the number of years, on the average, men will work. It contrasts "generation" worklife tables against "period" tables in an attempt to provide a more realistic means of estimating the length of worklife.

Authors of all the articles included in this new *Reader* were on the BLS staff at some time in their careers, though not always at the times the articles were written. Virtually all of these articles were originally published between January 1969 and January 1975, a period in which many innovations were made in editorial policies and typography of the journal. Editors who served on the *Monthly Labor Review* staff for at least part of that time included: Herbert C. Morton, Editor-in-Chief; Henry Lowenstern, Executive Editor; Georgena R. Potts and Robert W. Fisher, managing editors; Olivia G. Amiss; Elizabeth E. Barnes, Eugene H. Becker, Catherine C. Defina, Barbara V. Freund, John Gusman, Mary D. Hogya, Mervyn S. Knobloch, Constance S. McEwen, Craig E. Polhemus, Carol A. Rosen, Louise M. Schlader, and Eugene Skotzko. Their efforts and the devoted work of many other anonymous BLS employees—data collectors, field agents, clerks; statisticians, economists, programmers—made this volume possible.

I hope the users of this *Monthly Labor Review Reader* will profit from the collective wisdom contained in the selections chosen from the *Review.*

JULIUS SHISKIN
Commissioner

June 1975

Chapter I. Measuring Employment and Unemployment

Unemployment statistics and what they mean

The jobless rate in perspective: some common misconceptions about what the data represent, along with pointers on how to interpret them

JOHN E. BREGGER

"JOBLESS RATE drops to 6.0 percent," read a typical headline in newspapers throughout the country on October 8, 1971. The change—from 6.1 to 6.0 percent of the labor force between August and September 1971—was reported accurately, but the implication of an improvement in the employment situation was misleading. This is so because the unemployment rate is obtained by a sample survey. Any change of one-tenth of one percent may be attributable to sampling error and, therefore, not statistically significant.

Unemployment, of course, is more than a statistic that measures our economic well-being and the degree to which immediately available manpower is utilized. Unemployment statistics represent people—people trying to support their families or augment family income, people seeking their first jobs, people changing jobs, people losing jobs, but first and foremost, people. Whether viewed as a measure of economic well-being or as people with employment difficulties, however, the data are often misused, misunderstood, and even criticized.

Data sources and concepts

To set the stage, it is first of all desirable to review briefly the procedures by which these important statistics are collected and how the measure of unemployment itself is defined. National statistics on unemployment are derived from the Current Population Survey (CPS), a monthly sample by personal interview of approximately 50,000 households. The survey is conducted by the Bureau of the Census for the Bureau of Labor Statistics. Persons are classified through a series of questions which determine whether they were employed and, if not, whether they were looking for work or were not in the labor force. The data relate to the status of individuals in the week including the 12th day of the month (the "reference" or "survey week") and are collected in the subsequent week (the interview week).[1]

Employed persons are those who perform a minimum of an hour's work for pay or profit during the reference period; also included are those who are temporarily absent from a job or business for such reasons as illness, vacations, or strikes, as well as persons who work 15 hours or more a week without pay in a family farm or business.

To be classified as unemployed, the individual must not have worked at all during the reference week. In addition, he must have taken some specific steps to obtain a job in the previous 4 weeks, such as applying directly to an employer, or to a public employment service, or checking with friends or relatives, and being available for work at the time of the survey. Persons on layoff or waiting to begin a new job (within 30 days) need not meet these jobseeking requirements to be classified as unemployed. Those persons who are neither employed nor unemployed are "not in the labor force." Information is collected regularly on this group as well, many of whom are housewives. It is worth noting that at no time during the course of the interview is the term "unemployed" used, and, as a consequence, the respondents themselves frequently do not know how they will be classified. Furthermore, no response is elicited as to whether an individual has applied for or is receiving unemployment compensation payments.

At the present time, each household in the survey represents approximately 1,300 households throughout the United States, and, similarly, one person in the sample represents 1,300 in the population. Therefore, a total of 5 million unemployed would be represented by 3,800 individuals. On the surface, this appears to be a small sample for such an important figure. However, the survey is the largest monthly

John E. Bregger is an economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

From the *Review* of November 1971

household survey in the world, some 50 times larger than many of the national public-opinion polls, and uses a scientifically selected sample that is studied and reviewed continually. Moreover, the fact that the sample yields reasonably consistent results month after month lends credence to the procedure. Nonetheless, the fact the data are taken from a sample does mean that a degree of sampling error exists.

The statistics on employed and unemployed persons are tabulated to show a wide variety of characteristics: sex, age, color, educational attainment, marital status, household relationship, whether working full or part time or seeking full-time or part-time work, duration of unemployment, reasons for being unemployed, major activity (for young persons—in school or other), and industry and occupation for those employed and previous industry and occupation, if any, for the unemployed (industry and occupation of last full-time job lasting 2 weeks or more). Cross-classifications of a number of these characteristics are also available, such as by color, sex, and age.

Seasonal adjustment

There are a number of seasonal fluctuations in employment and unemployment that occur during the year. These include crop seasons, weather conditions, opening and closing of schools, holiday buying periods (Christmas and Easter, for example), and industry production schedules. To cite perhaps the most dramatic shift, there is a tremendous influx of young people into the labor market in June after school is out—between May and June of 1971, for example, the labor force showed a net increase of nearly 1.9 million persons, with 1.1 million initially unsuccessful in their job search.

To determine the economic meaning of a month's data relative to the previous month or months, it is essential to differentiate between the change that *usually* occurs in the month and the change, if any, that exceeded the normal, or expected, change. Therefore, all of the major labor force estimates are "seasonally adjusted" to permit an easy—and more revealing—comparison of data for 1 month with any other.

Without this separation of the seasonal component of changes, the continuing trend in the labor market situation would be more difficult to discern. Moreover, since most other economic data, such as estimates of Gross National Product and industrial production, are widely used in seasonally adjusted form, the adjusted labor force data are more comparable with them. There is a trade-off, however; seasonal adjustment tends to "depersonalize" the unemployment data.

In seasonally adjusting the unemployment estimates, as it has for many years, the Bureau of Labor Statistics uses a traditional ratio-to-moving average method.[2] The unemployment rate is derived by dividing the sum of four seasonally adjusted components (unemployed persons 16–19 and 20 and over, by sex) by the civilian labor force, which is itself the sum of 12 seasonally adjusted components.[3] Therefore, there are no direct seasonal adjustment factors for the rate itself but only for its components. However, implicit seasonal factors for the rate may be derived as the ratio of the rate, not seasonally adjusted, to the rate, seasonally adjusted.

Statistical significance

After the seasonal adjustment process has sorted out the usual, recurring, and largely noneconomic events from the more significant underlying developments, there remains an unemployment change from 1 month to the next which may or may not be "statistically significant." Because the unemployment estimates are derived from a probability sample, they may, of course, differ from the figures that would have been obtained if it were possible to take a complete census using the same questionnaire and procedures. In other words, the data are subject to some degree of sampling error, which must be taken into account in evaluating changes in the data.

The "standard error" is the measure of sampling variability, that is, the variations that might occur by chance because only a sample of the population is surveyed. The chances are about 2 out of 3 that a sample estimate would differ from the results of a census by less than the standard error; the chances are 9 out of 10 that it would differ by less than 1.6 times the standard error; the chances are 19 out of 20 that the difference would be less than twice the standard error. In its analysis of labor force data, the Bureau uses 1.6 times the standard error as a basis for determining the sampling error of an estimate or a change of an estimate from one point in time to another. For total unemployment, the standard error is approximately 3 percent, and, at 1.6 times the standard error, the error on an estimate of 5 million is on the order of plus or minus 150,000.

Thus, the term "significant," when applied to the unemployment numbers, is used whenever the change in the number from one period to another exceeds 1.6 times the sampling error of the change. When an apparent change is within this confidence interval, the likelihood that a change actually occurred is diminished. For example, a change in the present level of total unemployment should exceed 150,000 from 1 month to the next to be deemed significant statistically. Similarly, the national unemployment rate would have to change by 0.2 percentage point or more on a monthly basis to be significant.[4] Changes that are smaller than these can reasonably be attributed to sampling variations.

As a general rule, smaller numerical estimates have higher relative errors. In the case of unemployment rates, the absolute error is greater when the labor force base is comparatively smaller and also when the rates are higher. Therefore, the jobless rate for female Negro teenagers, of whom there were 350,000 in the labor force in 1970, would have an exceptionally high sampling error for a month-to-month change, whereas the error for married men (of whom there were 38.9 million) would be quite small. Sampling error, of course, is successively less when the data to be compared are averaged over successively longer time spans, such as quarterly, annually, and so on. Table 1 illustrates the standard error of change for a number of unemployment rates, representing the major labor force groups.

Table 1. Estimated error at 1.6 standard error for change in selected seasonally-adjusted unemployment rates

Category	Unemployment rate in April 1971	Percentage error on change at 1.6 standard error [1]		
		Monthly	Quarterly	Annual
Total (all civilian workers)	6.1	.21	.15	.09
Men, 20 years and over	4.4	.24	.17	.11
Women, 20 years and over	6.0	.35	.25	.16
Both sexes, 16–19 years	17.2	1.15	.83	.53
Married men	3.1	.21	.15	.09
Full-time workers	5.5	.22	.16	.10
Part-time workers	9.4	.70	.50	.32
RACE				
Negro and other races	10.0	.80	.56	.34
Men, 20 years and over	6.8	.94	.66	.40
Women, 20 years and over	9.3	1.24	.87	.53
Both sexes, 16–19 years	32.1	4.77	3.34	2.05
White	5.6	.21	.15	.08
Men, 20 years and over	4.1	.24	.17	.11
Women, 20 years and over	5.5	.37	.26	.17
Both sexes, 16–19 years	15.2	1.17	.83	.53
OCCUPATION				
White-collar workers	3.8	.24	.17	.11
Professional and technical	3.3	.43	.31	.19
Managers, officials, and proprietors	1.6	.33	.23	.15
Clerical workers	5.2	.48	.34	.22
Sales workers	4.5	.73	.52	.33
Blue-collar workers	7.4	.39	.28	.18
Craftsmen and foremen	4.5	.52	.37	.23
Operatives	8.6	.62	.44	.28
Laborers	10.2	1.18	.84	.53
Service workers	6.3	.60	.43	.27
Farm workers	1.8	.51	.39	.23
INDUSTRY				
Nonfarm wage and salary workers	6.3	.27	.19	.12
Construction	9.6	1.21	.86	.54
Manufacturing	7.0	.46	.33	.21
Durable goods	7.5	.63	.45	.28
Nondurable goods	6.3	.68	.48	.31
Transportation and public utilities	4.0	.73	.52	.33
Wholesale and retail trade	6.5	.52	.37	.23
Finance and service industries	5.3	.46	.33	.21
Government workers	2.8	.38	.27	.17
Agricultural wage and salary workers	6.1	1.71	1.21	.77

[1] For consecutive periods only; error for nonconsecutive periods slightly greater.

Although "significant" is a statistical and therefore technical term in the interpretation of labor force developments, it is often used in a more general sense, and there may be instances in which confusion arises over the use of the word. If the overall jobless rate declines by 0.2 percentage point from 1 month to the next, for example, this is a "significant" change statistically, in the sense that there is a very small probability that it would have resulted solely by chance (such as who happened to be selected in the sample). However, the decline would not be significant in the sense of being a very large movement. Similarly, a change could be interpreted as being "significant" from a policy point of view if it reflected continued improvement or represented a change in direction. It is clear, therefore, that care must be taken in recognizing the multiple meanings of the word when considering the numbers on employment and unemployment.

What the overall rate doesn't tell

Although the total unemployment rate gets the headlines, it is not always the most meaningful measure of the situation and sometimes conceals as much as it reveals. As a global estimate, it measures joblessness among *all* groups of workers—men and women, white and black, young and old, urban and rural, experienced and inexperienced. For example, it incorporates those who experience very high rates of unemployment, such as black teenagers, and those with very low rates, notably married men.

The Bureau has continually expounded on the aggregate measure of unemployment in its various studies of the economic situation and in its monthly "Employment Situation" press release. Key groups are identified—by age and sex, color, persons seeking full-time or part-time jobs, occupation and industry of last job, duration of unemployment (the

number of weeks persons are seeking work), reasons for unemployment, and so on.

To show the importance of a thorough analysis of disaggregated monthly unemployment figures, two recent examples are presented.

1. As reported on October 2, 1970, the overall jobless rate jumped from 5.1 percent in August to 5.5 percent in September 1970. Anyone who caught only the newspaper headline unfortunately got a misleading impression. However, the Bureau's analysis emphasized that the increase was wholly among 16- to 24-year-olds and adult women, many of whom were new entrants or re-entrants to the labor force; the jobless rate for males 25 and over—often thought of as primary workers and also as breadwinners—actually remained unchanged.

2. A few months earlier, the unemployment rate was reported to have risen from 4.8 percent in April to 5.0 percent in May. Following technical standards of statistical significance, the rise of 0.2 percentage point was barely more than a borderline change. As the continuation of a sharp upsurge since the first of the year, however, the increase could be viewed with greater meaning. Moreover, the components of the change were striking: the jobless rate for adult men (20 and over) rose by 0.3 percentage point and that for adult women shot up by 0.7 percentage point; these very significant increases were countered by a drop in the teenage rate from 15.7 to 14.3 percent, which, of course, held the overall rate to its small increase.

Many different interpretations could be placed on the data that emerge from these two examples. A purely surface analysis might suggest that the August-to-September increase was far worse than that from April to May, because the overall rate increased twice as much. However, a more penetrating evaluation leads to the conclusion that the May increase could well be the more meaningful one.

How is it determined which unemployment changes are of importance? Several factors must be considered. First of all, it is necessary to identify the labor force groups that have the greatest economic or social significance, both in general and in a particular period. If employment in a certain industry or occupation is changing, the jobless rate for this industry or occupation should be examined. Developments for Negroes are often compared with those of whites. Developments in other economic time series—strike reports, payroll employment, retail sales, industrial production, insured unemployment, to name a few—suggest areas for investigation. Trends among a number of worker groups should be closely watched—for example, married men, blue-collar workers, manufacturing workers, full-time workers, and those who lost their last job.

Secondly, for those categories that are analyzed, it is necessary to determine what changes are statistically significant. As was discussed earlier, developments for particular labor force groups are generally important only if deemed significant statistically. Changes can also be analyzed when their movements become statistically significant over several months —thus, representing a short-term trend—even when they may not be significant in consecutive months.

Third, the analyst studies those groups with higher than average unemployment rates. This is typically true of black workers, teenagers, women, and construction workers, among others. For example, the ratio of Negro unemployment to the total level is nearly twice the proportion of Negro workers in the labor force, and partly for this reason their job situation is closely watched.

Finally, it is important to view changes in unemployment not just for the single month being examined, but also from a longer term perspective. Charts can greatly assist in this determination. During the 1970 economic downturn, for example, the increase in joblessness among adult men greatly exceeded advances among other age-sex groups, even though their rate was comparatively low and many of the individual monthly changes were small. Moreover, current developments are frequently compared with highs or lows of previous periods.

Cross-currents in the labor force

It is important to note that monthly statistics of the labor force and unemployment conceal a vast number of movements between labor force categories. Typically, about half of the unemployed in 1 month will have found jobs or left the labor force in the next, and about an equal number will be newly unemployed. This is evidenced by the fact that more than 14.5 million persons experienced some unemployment in 1970, contrasted with an average monthly level of 4.1 million. Similarly, there are many people moving into and out of the labor force each month. These "gross flows" are illustrated in table 2, which presents March–April 1971 changes in the employment status of the population 16 years and over.

These data are not identical with published figures for April 1971, because they are based on the portion of the April sample that was also in the March sample (three-fourths of the Current Population Survey sample) and because the full estimation procedures obviously could not be applied.[5] These technical constraints notwithstanding, the gross movements into and out of unemployment are extensive; only about half of the April unemployed had been jobseekers in the previous month, whereas nearly equal proportions were employed or out of the labor force. Clearly, there is constant turnover in the ranks of the unemployed.

Changes in the labor force—both in terms of level and age-sex composition—can affect the unemployment rate even if the level of unemployment is unchanged. For example, if the employment level in April 1971 had been 300,000 higher, with no change in the level of unemployment, the unemployment rate would have rounded to 6.0 percent instead of 6.1 percent. The additional workers would have been enough to move a rate that was already on the "low side" of 6.1 percent down one-tenth of a percentage point (rounded).

Over a longer period, of course, the impact can be even more substantial if the composition of the labor force should shift, as has occurred over the last 15 years. In 1956, for example, adult men (20 years and older) accounted for 64 percent of the labor force; by 1970, the ratio had slipped to 57 precent, as greater numbers of both adult women and teenagers—groups with higher unemployment rates than men—entered the labor market. If the age-sex labor force distribution (10-year age groups) had not changed between 1956 and 1970, but allowing for unemployment rates for each age-sex group to change as they did, the 1970 overall jobless rate would have been 4.4 percent rather than the published 4.9 percent figure.[6]

Table 2. Gross flows in the employment status of persons 16 years and over between March and April 1971

[In thousands]

Employment status category	Status in April	Status in March		
		Employed	Unemployed	Not in labor force
Employed	78,409	74,240	1,508	2,660
Unemployed	4,494	1,018	2,409	1,067
Not in labor force	56,302	2,566	1,182	52,553

Labor force behavior during downturns

When business conditions begin to worsen, as during 1970, the level of unemployment increases, of course, while employment either grows more slowly or declines. The labor force, the combination of these elements, usually continues to rise, but its rate of increase may tend to decline, as people abandon or defer the search for work. This diminution tendency is recognized in labor force theory as the "discouraged worker effect."

Another concept of labor force behavior during cyclical downturns is the "additional worker effect." It holds that secondary workers are induced to enter the labor market as breadwinners lose their jobs or take a pay cut (or perhaps fear these circumstances may occur). Therefore, should a worker be laid off, his wife and perhaps a teenage son might enter the labor force. It is extremely difficult to substantiate the "additional worker effect" from available labor force data. There is more concrete evidence of the "discouraged worker effect," and it appears to be the larger factor.[7]

The above discussion suggests a very important aspect of the working population, the fact that decisions to participate or not participate in the labor force—and thus to seek work or not seek work—are often made for many personal reasons or in response to factors and events about which we have no information. In other words, people cannot be assumed to always act in a prescribed manner when it comes to their participation in the labor force. This should be borne in mind when one examines short-run labor force growth. Under short-run conditions, in fact, fits and starts in labor-force growth are more typical than a smooth trend from month to month at an annual rate of 1.5 to 2.0 million. This is also relevant to an understanding of unemployment developments, because people frequently cannot find a job as soon as they enter the labor force. And if short-run labor force behavior is not easily predictable, it is clear that short-run unemployment movements are also variable.

Problems with seasonal adjustment

Because the seasonal-adjustment process is based upon experience of past years, to the extent that seasonal patterns or short-run labor force behavior change, the current data may be difficult to evaluate.

Table 3. Seasonally adjusted unemployment rates as originally published and as revised in subsequent years, 1967–70

Month	1967					1968				1969			1970	
	Originally published	1968 revision	1969 revision	1970 revision	1971 revision	Originally published	1969 revision	1970 revision	1971 revision	Originally published	1970 revision	1971 revision	Originally published	1971 revision
January	3.7	3.7	3.7	3.8	3.8	3.5	3.6	3.6	3.7	3.3	3.4	3.4	3.9	3.9
February	3.7	3.7	3.7	3.8	3.8	3.7	3.7	3.8	3.8	3.3	3.3	3.3	4.2	4.2
March	3.6	3.7	3.7	3.8	3.7	3.6	3.7	3.7	3.7	3.4	3.4	3.4	4.4	4.4
April	3.7	3.7	3.8	3.8	3.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.8	4.7
May	3.8	3.9	3.9	3.9	3.8	3.5	3.6	3.6	3.5	3.5	3.5	3.4	5.0	4.9
June	4.0	3.9	3.9	3.9	3.9	3.8	3.7	3.7	3.7	3.4	3.4	3.4	4.7	4.8
July	3.9	3.9	3.9	3.8	3.8	3.7	3.7	3.7	3.6	3.6	3.5	3.5	5.0	5.0
August	3.8	3.8	3.8	3.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	5.1	5.1
September	4.1	4.1	4.0	3.9	3.9	3.6	3.6	3.5	3.5	4.0	3.8	3.8	5.5	5.4
October	4.3	4.3	4.2	4.1	4.1	3.6	3.6	3.5	3.4	3.9	3.8	3.7	5.6	5.5
November	3.9	3.8	3.8	3.9	3.9	3.3	3.4	3.4	3.5	3.4	3.5	3.5	5.8	5.9
December	3.7	3.7	3.7	3.7	3.8	3.3	3.3	3.3	3.4	3.4	3.5	3.6	6.0	6.2

This may come about due to transitional periods of economic activity. Other complications can arise from a shift in the timing of the survey week (whether the 12th day is early or late in the week); in months in which large labor force changes are taking place, such as in June and September; possibly from unusual events such as strikes; the timing of holidays; severe weather conditions; or changes in the survey questionnaire (these, however, are rarely made). As a consequence, the seasonally adjusted values may exhibit erratic behavior or lack of smoothness over certain months. As more experience is gained, after a year or two, the new seasonal pattern will usually emerge more clearly, and a more acceptable set of seasonally adjusted values will become available.

This "wait-until-next-year" approach to determine the more accurate seasonally adjusted monthly changes is not a satisfactory answer to the policymaker or the newsman, whose concern is necessarily with the present. However, it should be recognized that revisions of the overall jobless rate rarely exceed 0.1 percentage point in the subsequent year. Moreover, since seasonally adjusted values are subject to change, seemingly erratic movements in the current year should be viewed as approximations of what occurred rather than as exact measures.

In the past several years, there has been some evidence that the overall seasonally adjusted rate has been behaving more erratically than in prior years. This may have come about as a result of conceptual revisions and the changes in the questionnaire beginning in January 1967. Prior to 1967, an individual not working was asked, during the course of the survey interview, "Was . . . looking for work?" In 1967, the question was changed to: "Has . . . been looking for work during the past 4 weeks?" If the answer is yes, the interviewer asks, "What has . . . been doing in the last 4 weeks to find work?" A specific activity must be cited or the person will not be counted as unemployed. Finally, the question, "Is there any reason why . . . could not take a job last week?", is asked to ascertain if the jobseeker was available for work rather than seeking a job for some future period.[8]

Although the precise effect of these changes is difficult to quantify, there is evidence of their impact, particularly the addition of the availability question. The shift from an unspecified jobseeking period to a 4-week period might well have produced a lower or higher total, as previous respondents could have interpreted "looking for work" to imply either "last week" or some vague earlier period. Similarly, the introduction of the specific jobseeking method requirement (not asked, of course, of persons on layoff or those waiting to begin a new job within 30 days) may have lowered the jobless count as well, screening out those for whom jobseeking is more a state of mind rather than overt action.

And the effect of the "availability test" is clear, particularly in March, April, and May, when youngsters still in school are seeking summer jobs. All three of the questionnaire revisions appear to have seasonality implications, with teenagers in the spring being the most obvious example. One result has been a number of unaccountable movements in the overall rate, particularly in the August-through-November periods. Another result has been the fact that May is now the seasonal low of the year in terms of unemployment, instead of October. The original jobless rate and its revisions based upon seasonal adjustment for the years 1967–70 are shown in table 3. Since the 1967 alterations, the seasonal adjustment

process has had a chance to "settle down" somewhat, and it appears fewer inexplicable month-to-month jumps will be observed in 1971 and subsequent years due to this factor. However, because changes in the business cycle can affect seasonal patterns, it is also likely the seasonal adjustment process has been affected by the rise in the level of unemployment since 1969.

This would be most evident in months in which very large seasonal changes occur, such as between May and June, August and September, and December and January. The seasonal-adjustment process, which at present is essentially multiplicative in nature, may tend to overcompensate for these wide variations. This accounts for a part of the unusual drop in the jobless rate, from 6.2 percent in May to 5.6 percent in June, which was reported at the time as somewhat exaggerating the "real" change that took place between the 2 months.

It should be emphasized that seasonally-adjusted values are, at best, approximations of the underlying trend. One should therefore not expect them to be uniformly smooth on a monthly basis or that they be a precise reflection of cyclical movements.

The unemployment concepts reexamined

The question has been raised many times over the years as to whether the unemployment concepts and definitions should be revised. "We are counting too many as unemployed." "We are not counting enough." "Many of the unemployed don't really want to work and shouldn't be counted." "Many unemployed don't need a job." "Many no longer looking have just given up but are still really unemployed." So go some of the complaints about the current concepts.

This subject has been examined almost continuously since the inception of the unemployment measurement survey in 1940. The concept that has been accepted and used has changed very little over this tri-decade,[9] or else comparability would be a very real problem.

Those who feel that the number counted as unemployed is too high point to such groups as young people, particularly those who are in school, and married women as outstanding candidates for elimination from the conceptual base. The usual justifications given are that these types of workers do not really need a job and/or are only temporarily in the labor force. It would be interesting and significant for public policy development if one could make an estimate of the number of unemployed who need jobs. But the subjectivity of such a measure would be exceedingly great, since in some cases it cannot be easily determined whether an unemployed individual really needs a job. For example, in many families, the husband and wife are both active labor force participants because they believe they need the income; it cannot be arbitrarily concluded that women with employed husbands do not need jobs. Similarly, it seems unrealistic to count certain "marginal" workers as employed when they have jobs, but to exclude them from the unemployed count when they are looking for work.

On the other hand, it is also often said that the unemployment concept excludes some persons who should be counted as unemployed. Those who support this view point out that a number of persons become discouraged over job prospects and cease to look for work, even though they still desire a job. These discouraged workers are sometimes referred to as "hidden unemployed."[10] Ever since the regular collection of unemployment statistics by the Federal Government began, however, the criterion has been that to be counted as unemployed a person should be an active jobseeker, which lessens substantially the possibility of unemployment being a state of mind. The President's Committee to Appraise Employment and Unemployment Statistics recommended in its 1962 report that these workers be identified, but it was equally firm in its belief that they not be included in the jobless count.[11] At its behest, this category, as well as all other "not in the labor force" groups, has been identified in the Current Population Survey since 1967, and data are published on a quarterly basis in *Employment and Earnings* by a wide variety of characteristics. In 1970, discouraged workers as measured in the survey averaged nearly 650,000 persons,[12] mostly teenagers and adult women.

Because of the vast array of statistics regularly published on the employed, unemployed, and those not in the labor force, it is possible for one to calculate an unemployment rate based on various definitions of labor force and unemployment. For example, those who believe that labor force eligibility should begin with age 18 and end, say, with age 69 can exclude 16- and 17-year-olds and the over-70 group, and then calculate a separate unemployment rate. Similarly, estimates of discouraged workers could be added to the unemployment and labor force totals

to arrive at a rate that includes this group, or persons whose major activity is going to school might be excluded.

The major criterion that has been used over time in estimating unemployment is objectivity of measurement. Need for work, intensity of desire, and family income are all potentially subjective factors and as such are excluded from unemployment concepts, which are under constant review to make them as objective as possible.

In this context, it is appropriate to conclude with the idea that perhaps the most important aspect in the measurement of unemployment in the United States is the maintenance of consistency over time. This is another way of saying that the greater concern is necessarily focused upon the *relative*, rather than the *absolute*, position. In other words, it is imperative to know how well off the economy is each month compared with the preceding month or some earlier period. It is relevant to continue to examine who should be counted as unemployed, but such examination should not interfere with public trust in the figures, historical continuity of the data, or objectivity of measurement. If these three standards are followed, unemployment statistics will continue to provide one of the best measures of the economic status of the Nation. □

——FOOTNOTES——

[1] For a more detailed discussion of the Current Population Survey and the concepts utilized, see *Concepts and Methods Used in Manpower Statistics From the Current Population Survey* (BLS Report 313, 1967).

[2] The original data of a series "are regarded as the product of a trend-cycle component times a seasonal component times an irregular component. The trend-cycle represents the 'real' movement of the series, including cyclical movements. The seasonal component is the annual repetitive pattern which makes certain months consistently higher or lower than others. The irregular component is a residual, including sampling errors and short-term fluctuations which do not follow any consistent pattern. After a satisfactory decomposition is achieved, the seasonally adjusted series is computed by dividing each original value by the corresponding seasonal factor." The foregoing is from "The Method of Seasonal Adjustment for Labor Force Series," *Employment and Earnings*, February 1971, pp. 22–23. A more technical description of the seasonal-adjustment method may be found in "Appendix A. The BLS Seasonal Factor Method," *BLS Handbook of Methods for Surveys and Studies* (BLS Bulletin 1458, 1966), pp. 222–228.

[3] The civilian labor force, seasonally adjusted, is the aggregation of the four major age-sex components (male and female, 16–19 years, and 20 years and over) for each of three categories: agricultural employment, nonagricultural employment, and unemployment.

[4] In evaluating monthly estimates, the determination of whether a change is statistically significant is based upon the sampling error of the estimate. It is recognized that the seasonal-adjustment process itself is imperfect, especially on a current basis. However, the magnitude of any error attributable to seasonal adjustment is not quantifiable at the time the estimates first become available.

[5] See Harvey J. Hilaski, "The Status of Research on Gross Changes in the Labor Force," *Employment and Earnings and Monthly Report on the Labor Force*, October 1968.

[6] Additional amplification of structural shifts in the labor force and their effect upon the unemployment rate are contained in an article by George L. Perry, "Changing Labor Markets and Inflation," *Brookings Papers on Economic Activity 3* (Washington, Brookings Institution, 1970), pp. 411–441.

[7] For a discussion of the discouraged worker and additional worker hypotheses and some indication of their relative impacts, see William G. Bowen and T. Aldrich Finegan, *The Economics of Labor Force Participation* (Princeton, N.J., Princeton University Press, 1969).

[8] For further amplification of the 1967 changes, see Robert L. Stein, "New Definitions for Employment and Unemployment," *Employment and Earnings and Monthly Report on the Labor Force*, February 1967.

[9] For a discussion of the historical background of the conceptual framework, see President's Committee to Appraise Employment and Unemployment Statistics, *Measuring Employment and Unemployment* (Washington, 1962), Ch. I.

[10] Prominent among those who support the view that discouraged workers should be included in the jobless counts is Professor Alfred J. Tella of Georgetown University. Professor Tella has performed a considerable amount of research with labor force models which enables him to estimate the number of persons not actually counted as unemployed but who would be in the labor force under what he defines as "full employment" conditions. See "The Relation of Labor Force to Employment," *Industrial and Labor Relations Review*, April 1964, pp. 454–469, and "Labor Force Sensitivity to Employment by Age, Sex," *Industrial Relations*, February 1965, pp. 69–83.

[11] President's Committee to Appraise Employment and Unemployment Statistics, op. cit., pp. 52–56.

[12] In 1967, the number of discouraged workers averaged 732,000; this dropped consecutively in 1968 to 667,000 and to 574,000 in 1969 before rising to 638,000 in 1970 and 740,000 in the second quarter of 1971 (seasonally adjusted). For further discussion of these data, see "Discouraged Workers and Recent Changes in Labor Force Growth" (BLS Report 396, 1971).

Comparing employment estimates from household and payroll surveys

The two series generally move in similar directions, but show different levels due to absences, second jobs, the census undercount, and other factors

GLORIA P. GREEN

STATISTICS ON NONAGRICULTURAL employment are key indicators of the economic health of the Nation. Because these data serve a variety of purposes, no one source of data can adequately provide all of the information that is needed for a complete and balanced picture of the employment situation.

Each month, the Bureau of Labor Statistics analyzes and publishes two independently derived estimates of total employment in nonagricultural industries—the household series and the establishment series.[1] Each of these bodies of data makes its own unique contribution to the nonagricultural employment picture—the household series as a measure of the work status of individuals and the payroll series as a count of jobs.

These series attempt to measure different aspects of the nonagricultural employment situation—people versus jobs—but for the most part they tend to show the same underlying economic influences. At times, however, significant differences, which may be confusing to the user, are observed in the level of the estimates, in month-to-month changes, in the timing and extent of business cycles, and in certain longer run trends.

In part, these differences are inherent in the concepts and scope of the two series. Nonagricultural employment measured through a household survey cannot and should not be expected to yield magnitudes identical with those of employment measured through an employer-payroll reporting system. Conceptual differences between the series can usually be reconciled or explained in large part, and a number of the differences in coverage can be adjusted. However, there are also discrepancies caused by differences in sampling techniques and collection and estimation methods, most of which cannot be readily measured in terms of impact on differences in the levels of the two series.

It should be noted at the outset that the total nonagricultural employment series from the household survey is much more comprehensive than the establishment series. The household series includes—in addition to wage and salary workers—the self-employed, unpaid workers who worked 15 hours or more during the survey week in family-operated enterprises, and private household workers, none of whom by definition would appear on establishment payrolls. These three groups are readily identified in the household survey on the basis of major industry and class-of-worker designations; in 1968, they totaled 7.5 million workers. When these groups are subtracted from the household estimate of total nonagricultural employment, a third series, reflecting employment of wage and salary workers of generally comparable coverage to the establishment series, is obtained. In order to develop a reconciliation, it is necessary to examine the comparability of this derived household series with the payroll employment series. The three series—total nonagricultural employment (household survey), nonagricultural wage and salary employment excluding private household workers (household survey),[2] and nonagricultural wage and salary employment (establishment survey)—are compared in table 1 on an annual average basis from 1948–68.

This study first examines the conceptual and other differences between the two series. Second, it attempts to reconcile the annual levels of the two series over the 1962–68 period[3] insofar as known discrepancies can be quantified. (It should be kept in mind, however, that no attempt at reconciliation provides a complete answer accounting for all of the factors that influence the levels

Gloria P. Green is an economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

of the two series.) Finally, employment levels are examined on both an annual and a monthly basis to gain greater insight into the divergences in levels.

Measurable factors affecting comparability

Of the many factors that influence the levels of the series, only a few can be quantified to any degree. The numbers involved and their relative effect upon the levels of the series are discussed in the sections that follow.

UNPAID ABSENCES. One major source of discrepancy between the two series stems from different treatment of workers absent for a full week from their jobs. The household survey includes among the employed all persons who had jobs during the survey week but were temporarily absent because of illness, bad weather, vacation, labor-management disputes or various personal reasons, whether they were paid by their employers for the time off or whether they were seeking other jobs. By contrast, the establishment series includes only those persons on paid leave for any part of the pay period specified in the survey. Therefore, persons who are absent without pay for the entire period are not included in the payroll figures. On the average, about 3.7 million employed nonfarm wage and salary workers were picked up in the household survey as being "with a job but not at work" in 1968. Of this total, 1.6 million or 43 percent were not paid for the time off, as shown in table 2.

Table 1. Nonagricultural employment, 1948–68

[In thousands]

Year	Household series[1]		Payroll series: wage and salary employment	Difference[3]
	Total	Total wage and salary employment[2]		
1948	51,405	43,135	44,891	1,756
1949	50,684	42,308	43,778	1,470
1950	52,450	43,982	45,222	1,240
1951	53,951	45,627	47,849	2,222
1952	54,488	46,465	48,825	2,360
1953	55,651	47,449	50,232	2,782
1954	54,733	46,490	49,022	2,532
1955	56,464	47,838	50,675	2,837
1956	58,394	49,518	52,408	2,890
1957	58,789	49,745	52,894	3,149
1958	58,122	48,876	51,363	2,487
1959	59,745	50,330	53,313	2,983
1960	60,958	51,487	54,234	2,747
1961	61,333	51,690	54,042	2,352
1962	62,657	53,136	55,596	2,460
1963	63,863	54,498	56,702	2,204
1964	65,596	56,115	58,331	2,216
1965	67,594	58,217	60,815	2,598
1966	69,859	60,686	63,955	3,269
1967	70,527	62,882	65,857	2,975
1968	72,103	64,601	67,860	3,259

[1] Persons 14 years and over for 1948–66; 16 years and over for 1967–68.
[2] Excludes private household workers.
[3] Payroll series employment less household wage and salary employment.

MULTIPLE JOBHOLDING. Another major source of discrepancy relates to the treatment of persons employed in more than one job. The household survey counts each person by work status only once since each person is classified as either employed, unemployed, or not in the labor force. Employed persons holding more than one job during the survey week are counted and classified in the job at which they worked the greatest number of hours. In the establishment survey, the total number of employed persons is overstated to the extent that those who worked in more than one establishment during the reference period are counted each time their names appear on a payroll. Workers may be counted more than once, for example, because they hold down two jobs or more concurrently or because they leave one job and obtain another within a single reference period and thus appear on the payroll records of both employers. Such a situation can also arise when a worker is continued on a payroll after leaving his job because he is being compensated for earned vacation time.

While it is virtually impossible to identify persons who work at two jobs or more from payroll records, it is usually possible to obtain this information from the worker or a member of his household. To gain insight into multiple jobholding, special surveys of this phenomenon have been conducted as a part of the household survey periodically since 1943. In May 1966, the most recent month for which survey data are available, approximately 2 million workers held a secondary nonagricultural wage and salary job that would not have been reported in the usual monthly household survey.[4] As indicated in table 3, these additional jobs were concentrated in trade (28 percent), services (26 percent), and government (18 percent). Accordingly, the household estimate of 60 million persons who were employed in a nonagricultural wage or salary primary job (excluding private household workers) during the survey week in May 1966 would have to be raised by 2 million to approximate a payroll count.[5] The count for that period would be even higher, of course, if account were taken of the number of persons holding 3

Table 2. Employed nonagricultural wage and salary workers on unpaid absences, by industry, 1962–68

[In thousands]

Industry	1962	1963	1964	1965	1966	1967	1968
Total [1]	1,122	1,241	1,249	1,249	1,317	1,454	1,629
Private [1]	913	993	1,006	1,024	1,065	1,168	1,314
Construction	95	95	83	92	97	114	140
Manufacturing	339	365	377	381	394	460	488
Transportation and public utilities	68	80	78	76	81	70	95
Wholesale and retail trade	201	239	227	237	242	256	285
Finance, insurance, and real estate	35	36	46	37	41	41	46
Services [2]	163	172	188	190	194	211	240
Government	210	247	243	225	252	284	315

[1] Also includes mining, not shown separately, and excludes private household workers.
[2] Excludes private household workers.

additional paid jobs or more. These surveys have been too infrequent to determine any definite seasonal, cyclical, or secular trends, although in recent surveys the rate of multiple jobholding has remained substantially the same.

Even though several improvements in the enumeration of multiple jobholders have been made in recent years, it is probable that no survey has given what might approximate a complete count. However, the extent of this hypothetical "undercount" is uncertain. Many persons may be reluctant to report secondary jobs for various reasons, such as a distrust of the confidentiality assurances of the survey, and knowledge of such jobs might be deliberately withheld from the survey interviewer. Another possible reason for undercount is that the respondent (often the housewife) may not be aware of the second job or may not realize that the person in question is technically on two payrolls or more. Examples of this latter case are teachers paid on a 12-month basis and employed in other jobs during the summer; lawyers acting as directors of corporations, sometimes several corporations; school board and other government officials who are paid for limited services rendered; persons performing as consultants on an irregular basis, etc. It might be possible to develop techniques to improve the count in the latter cases, but it is unlikely that deliberate failures to report multiple jobholding could be uncovered.

AGE LIMITATIONS. While the household series provides data on the full- or part-time employment status of the entire U.S. civilian noninstitutional population 16 years of age and over, the establishment series has no age limitations, although child labor laws, compulsory school attendance, and general social custom prevent most children under 16 from working. In 1967 and 1968 household survey estimates of nonagricultural wage and salary workers 14–15 years of age averaged nearly 440,000 and 480,000, respectively. (Prior to January 1967, official CPS statistics on nonagricultural wage and salary employment had included 14- and 15-year-olds.) The number of young persons under 14 years of age who are employed in nonagricultural wage and salary jobs is not known.

EFFECT OF THE CENSUS UNDERCOUNT. Investigation of the accuracy and completeness of the 1960 Census of Population has indicated that an estimated total of 5.7 million persons of all ages were missed in the enumeration. Since the decennial population censuses provide the basis for projection of current estimates of the population, which, in turn, serve as monthly controls for the household survey sample, any undercount of the population in the census can have a profound effect upon the level of labor force and employment estimates derived from that survey. Advancing the ages of persons undercounted in 1960 by 7 years reveals a probable total employment undercount of about 2.8 million persons 16 years of age and over in 1967.[6] Distributing the 2.8 million on a ratio basis, about 2.4 million are estimated here to be nonagricultural wage and salary workers. The nonfarm employment estimates based on payroll surveys are not similarly affected, since these surveys cover all persons on payrolls and do not depend upon probability population controls.

AGRICULTURAL SERVICES. One minor discrepancy between the two series which has been quantified

Table 3. Distribution of secondary nonagricultural wage and salary jobs, by industry, May 1966

[In thousands]

Industry division	Total [1]	Percent
Total	1,996	100.0
Private wage and salary	1,640	82.2
Mining	9	0.5
Construction	129	6.5
Manufacturing	183	9.2
Transportation and public utilities	123	6.2
Wholesale and retail trade	551	27.6
Finance, insurance, and real estate	128	6.4
Services [2]	517	25.9
Government	356	17.8

[1] Data include only first additional job.
[2] Includes forestries and fisheries; excludes private household workers.

on the basis of data obtained from the payroll series stems from the different classification of workers employed in agricultural services. The payroll series includes them under services, while the household series classifies them in agriculture. They constitute nearly 90 percent of the payroll subclassification, agricultural services, forestries, and fisheries, and ranged from 134,000 in 1962 to 160,000 in 1968. This classification difference is of significance primarily in comparing the services industry component of the two series; its effect on overall estimates of nonagricultural wage and salary employment is of lesser importance.

Net effect of measurable differences

Taking into account all of the measurable differences between the two series, it is possible to develop reasonably comparable household and payroll estimates of nonagricultural wage and salary employment. (See table 4.) However, most of the adjustments must be made in the household data, since they contain a wide variety of data on other characteristics of workers, and it would not be appropriate statistically to adjust one series with data from another.

The adjustment technique requires the subtraction of the number employed in agricultural services from the payroll series, since this group is included in agriculture in the household series. Except for this adjustment, all others are made to the household data to achieve comparability with the adjusted payroll series. This involves a subtraction of the number of persons on unpaid absence from their jobs during the survey week, and the addition of the estimated number of secondary jobs, employment of 14- and 15-year-olds, and the estimated 1968 population undercount. The net result after allowance for these measurable differences is to reduce the original difference between the two series from 3.3 million to an estimated 340,000 in 1968.

In evaluating this difference, it should be kept in mind that estimates of the known sources of discrepancy are subject to considerable uncertainty. It should not be assumed from this isolated example that the net effect of allowing for all measurable variables would always bring the two series this close together. The net adjustment might be greater or smaller than this figure in another period. However, this attempt at reconciliation does illustrate the extent of the problem, and the nature and approximate magnitudes of many of the discrepancies.

Table 4. Measurable differences between payroll and household estimates of nonagricultural wage and salary employment, 1968

Item	Unadjusted totals	Adjustments	Additions minus reductions	Adjusted totals and difference
Payroll series	67,860,000			
Less: employment in agricultural services		160,000		
Adjusted payroll employment				67,700,000
Household series [1]	64,601,000			
Less: unpaid absences		1,629,000		
Total reductions			1,629,000	
Plus: multiple jobholders (est.) [2]		2,184,000		
14- and 15-year-olds		484,000		
1968 undercount (est.)		2,400,000		
Total additions			5,068,000	
Net adjustments			3,439,000	
Adjusted household employment				68,040,000
Difference after adjustments (payroll less household series)				−340,000

[1] Excludes private household workers (1,854,000).
[2] Estimate includes only first additional nonagricultural wage and salary job.

Other factors affecting comparability

While the foregoing factors can be quantified to some degree, there are other factors which influence the levels of the two series for which no quantitative estimates can be made.

DIFFERENCES IN SURVEY COVERAGE. In several respects, the establishment series is more inclusive in terms of population coverage than is the household series. The establishment series includes military personnel who hold civilian jobs in nongovernment establishments during their off-duty hours. It may also include some inmates of institutions who are working in or outside the institution if they are on payrolls. All military personnel and institutional inmates are explicitly excluded from the household data.

Residents of Canada or Mexico who commute to nonagricultural jobs in the United States and thus are included in the payroll count would also be outside the scope of the household survey, which covers people residing in the 50 States and the District of Columbia. Commuting to the Uuited States may be partly offset to the extent that some U.S. residents are employed by establishments in Canada or Mexico. The combined effect of these differences, however, probably does not account for much of the gap between the two series.

THE SURVEY PERIOD. The time period covered by the household survey is always one calendar week; since July 1955, it has been designated as the week containing the 12th of the month. In the payroll series, the time reference is to the payroll period including the 12th of the month, which is intended to be a single week. Despite comparability in design and intent, there are a number of differences in reality. Some establishments have 2-week or monthly payrolls (at least one-fifth of the total) and thus are likely to reflect more duplication due to multiple jobholding or turnover than would be reported for a single week. Moreover, during the longer time period a person could be counted as employed in the payroll series who, during the household survey week, was either unemployed or not in the labor force.

For the Federal Government, employment figures represent the number of persons occupying civilian positions on the last day of the calendar month plus any intermittent workers who worked at anytime during the month. This not only tends to magnify the general problem resulting from turnover but also contributes to a special problem of comparability with the household series, which is peculiar to December alone. That month the payroll series invariably rises substantially, reflecting the hiring of temporary postal workers for the Christmas rush period. The household survey, on the other hand, usually does not show a rise of similar magnitude, mainly because the survey week occurs relatively early in the month and many of the workers counted as employed in the payroll series are not working at the time the household statistics are collected.[7] Data permitting a correction for the deviation from the single-week reference period in the establishment data are not available.

PROBLEM OF SCHOOL TEACHERS. The manner in which payrolls are handled in the education system causes a special problem of comparability between the two series, which is peculiar to the summer months alone. Some teachers and other educational staff are paid on a 12-month basis; other regular faculty members are paid only during the academic school year (9 or 10 months) and would not ordinarily appear on payrolls during the summer months. As a consequence, special treatment is accorded school teachers in the establishment series. Instead of using payroll reports for the summer months, which would include only that part of the total actually employed in summer schools or on paid vacation, estimates of the number of regular school teachers in May—the last full month of the school year prior to the vacation period—are substituted in tabulations covering the vacation months.

In the household series, school teachers who have contracts (either written or verbal) to return to teaching in the fall would be reported during the summer months as "with a job but not at work" (on vacation) unless they hold other jobs and were thus classified according to the occupation and industry of that job during the survey week. The possibilities for multiple jobholding among teachers during the summer months, which would have the effect of inflating the payroll count compared with the household count, are obvious. However, the magnitude of this conceptual difference is uncertain.

SAMPLING AND ESTIMATING PROCEDURES. The household survey covers a scientifically selected probability sample of 50,000, designed to represent the entire civilian noninstitutional population. As an early step in estimating procedures, the sample data (for persons 16 years of age and over) are weighted by independently developed estimates of the population by age, sex, and color. These estimates are prepared by carrying forward the most recent census data (1960) to take account of subsequent aging of the population, deaths, immigration, and emigration.

Because the household survey is based upon a sample, the results may differ from the figures that would be obtained if a complete census using the same schedules and procedures were possible. In this series, the relative sampling error for the estimate of nonagricultural wage and salary workers is about 200,000 at present employment levels. This means that the chances are about 2 out of 3 that an estimate from the sample would differ from a complete census by less than this amount. This estimate of sampling error would be 400,000 if a confidence level of 19 out of 20 times is wanted.

As in any survey, the results are also subject to errors of response and reporting. Furthermore, as noted earlier, that part of the population missed in the census (the undercount) is also presumably missed in the sample survey and subsequent "blow-up" of the sample as well.

On the other hand, the monthly payroll em-

ployment estimates are derived from reports of a relatively large survey sample (160,000 establishments having over 30 million employees), which assures a high degree of accuracy.[8] However, since the estimating procedures employ the previous month's estimate as the base in computing the current month's level (link relative technique), sampling and response errors may accumulate over several months. To remove any accumulated error, the employment estimates are adjusted annually to new benchmarks (comprehensive counts of employment). The revision published each July also adjusts the estimates for changes in the industrial classification of individual establishments (resulting from changes in their product, which are not reflected in the levels of estimates until the data are adjusted to new benchmarks).[9] Another cause of differences, generally minor, arises from improvements in the quality of the benchmark data. For the eight most recent benchmark revisions, the estimates of total nonagricultural employment have varied from benchmarks by less than 1 percent, averaging 0.3 percent.

Within a few industries, mostly in the service sector, current monthly estimates are not obtained by direct reports from a sample of establishments (e.g., churches and other nonprofit organizations), and monthly changes in these industries are based on movements shown in the benchmark data for earlier years. Necessary adjustments are made at the time of adjustment to new benchmarks. This procedure can result in substantial error for a few individual industries, especially those in which small establishments predominate, but its effect on the much larger nonfarm total is negligible.

The accuracy of the level of the establishment series depends a great deal on the accuracy of the benchmarks. These are primarily derived from tax returns for unemployment insurance, supplemented by social security tax returns for small employers and by a variety of other sources for certain sectors. It is possible, for example, that errors of omission or duplication can occur in the reporting of social insurance tax returns for the correct period or in fitting together the benchmark data gathered from a number of sources. In addition, the benchmark occurring in March of each year can mean that the other months, particularly the summer and fall periods, are less precisely estimated. Many State unemployment insurance laws do not cover firms unless they operate 20 weeks or more during the calendar year. As a result, a number of seasonal undertakings, such as summer resorts, hotels, and amusement enterprises, may be missed by the benchmark source and thus by the payroll statistics. The net effects of these problems are unknown, and these uncertainties make comparisons of the levels of the two series even more inconclusive.

The possibility of error in the population censuses or the unemployment insurance benchmarks cannot be disregarded. There is no "true" total against which the accuracy of either can be measured. Although the benchmark data and the population totals are among the best statistical measures available, as we have seen neither is perfect.

Comparison of annual employment levels

Although measured very differently, estimates of nonagricultural wage and salary employment in the household and establishment series, have exhibited similar growth patterns over the 1962–68 period. Employment in the household series increased by 11.5 million (from 53.1 to 64.6 million);[10] in the establishment series, it gained 12.3 million (from 55.6 to 67.9 million). Both series reflected a net expansion of about 22 percent during the 7-year period. However, when related to an earlier period employment levels reveal that the two series have diverged somewhat, the difference averaging 2.7 million between 1962 and 1968 and 2.4 million over the 1948–61 period. (Household data for 1967 and 1968 are not strictly comparable with that for earlier years. Footnote 10 describes the differences.)

In an effort to examine some of the divergences in levels between 1962–68, the household and payroll estimates by major industry groups[11] have been adjusted to take into account all measurable differences between the two series that can be quantified on a year-to-year basis. (See table 5.) This involves subtraction of the number of persons on unpaid absences from their jobs during the survey week, the addition of the estimated number of nonagricultural wage and salary secondary jobs to the household series, and elimination of the number employed in agricultural services from the payroll series. In table 5, all quantifiable adjustments covered in table 4 have been made on the industry data from both series, with the exception of the undercount for every

Table 5. Comparison of payroll and household estimates of nonagricultural wage and salary employment, 1962–68

[In thousands]

Industry and year	Payroll series			Household series				Differences	
	Total [1]	Agricultural services [2]	Adjusted total (excluding agricultural)	Total [3]	Unpaid absences	Additional paid jobs [4]	Adjusted to payroll basis [5]	Payroll minus household (unadjusted)	Adjusted payroll minus adjusted household series
Total wage and salary employment:									
1962	55,596	134	55,462	53,136	1,122	1,867	53,881	2,460	1,581
1963	56,702	139	56,563	54,498	1,241	2,132	55,389	2,204	1,174
1964	58,332	143	58,189	56,115	1,249	2,005	56,871	2,217	1,318
1965	60,815	148	60,667	58,217	1,249	2,018	58,986	2,598	1,681
1966	63,955	152	63,803	60,686	1,317	1,996	61,365	3,269	2,438
1967	65,857	155	65,702	62,882	1,454	2,108	63,536	2,975	2,166
1968	67,860	160	67,700	64,601	1,629	2,184	65,156	3,259	2,544
Private wage and salary employment:									
1962	46,706	134	46,572	44,433	913	1,549	45,069	2,273	1,503
1963	47,477	139	47,338	45,405	993	1,808	46,220	2,072	1,118
1964	48,735	143	48,592	46,752	1,006	1,582	47,328	1,983	1,264
1965	50,741	148	50,593	48,594	1,024	1,626	49,196	2,147	1,397
1966	53,163	152	53,011	50,340	1,065	1,640	50,915	2,823	2,096
1967	54,459	155	54,304	51,737	1,168	1,718	52,287	2,722	2,017
1968	56,015	160	55,855	53,012	1,314	1,778	53,476	3,003	2,379
Mining:									
1962	650		650	541	12	12	541	109	109
1963	635		635	525	8	7	524	110	111
1964	634		634	512	8	8	512	122	122
1965	632		632	505	11	7	501	127	131
1966	627		627	524	15	9	518	103	109
1967	613		613	536	18	9	527	77	86
1968	610		610	508	20	9	497	102	113
Construction:									
1962	2,902		2,902	2,990	95	143	3,038	−88	−136
1963	2,963		2,963	2,980	95	181	3,066	−17	−103
1964	3,050		3,050	3,103	83	133	3,153	−53	−103
1965	3,186		3,186	3,253	92	118	3,279	−67	−93
1966	3,275		3,275	3,283	97	129	3,315	−8	−40
1967	3,208		3,208	3,238	114	126	3,250	−30	−42
1968	3,267		3,267	3,337	140	130	3,327	−70	−60
Manufacturing:									
1962	16,853		16,853	16,983	339	188	16,832	−130	21
1963	16,995		16,995	17,582	365	258	17,475	−587	−480
1964	17,274		17,274	17,986	377	192	17,801	−712	−527
1965	18,062		18,062	18,726	381	225	18,570	−664	−508
1966	19,214		19,214	19,793	394	183	19,582	−579	−368
1967	19,447		19,447	20,182	460	182	19,904	−735	−457
1968	19,768		19,768	20,362	488	184	20,058	−594	−290
Transportation:									
1962	3,906		3,906	3,866	68	101	3,899	40	7
1963	3,903		3,903	3,888	80	92	3,900	15	3
1964	3,951		3,951	3,942	78	103	3,967	9	−16
1965	4,036		4,036	3,965	76	120	4,009	71	27
1966	4,151		4,151	4,048	81	123	4,090	103	61
1967	4,261		4,261	4,150	70	129	4,209	111	52
1968	4,313		4,313	4,284	95	133	4,322	29	−9
Trade:									
1962	11,566		11,566	10,239	201	495	10,533	1,327	1,033
1963	11,778		11,778	10,484	239	598	10,843	1,294	935
1964	12,160		12,160	10,800	227	566	11,139	1,360	1,021
1965	12,716		12,716	11,280	237	530	11,573	1,436	1,143
1966	13,245		13,245	11,504	242	551	11,813	1,741	1,432
1967	13,606		13,606	11,872	256	588	12,204	1,734	1,402
1968	14,081		14,081	12,210	285	605	12,530	1,871	1,551
Finance:									
1962	2,800		2,800	2,649	35	125	2,739	151	61
1963	2,877		2,877	2,728	36	115	2,807	149	70
1964	2,957		2,957	2,849	46	107	2,910	108	47
1965	3,023		3,023	2,953	37	119	3,035	70	−12
1966	3,100		3,100	2,954	41	128	3,041	146	59
1967	3,225		3,225	3,156	41	142	3,257	69	−32
1968	3,383		3,383	3,271	46	147	3,372	112	11
Services: [6]									
1962	8,028	134	7,894	7,164	163	485	7,486	864	408
1963	8,325	139	8,186	7,219	172	557	7,604	1,106	582
1964	8,709	143	8,566	7,561	188	473	7,846	1,148	720
1965	9,087	148	8,939	7,912	190	507	8,229	1,175	710
1966	9,551	152	9,399	8,233	194	517	8,556	1,318	843
1967	10,099	155	9,944	8,603	211	542	8,934	1,496	1,010
1968	10,592	160	10,432	9,040	240	570	9,370	1,552	1,062
Government:									
1962	8,890		8,890	8,703	210	318	8,811	187	79
1963	9,225		9,225	9,093	247	324	9,170	132	55
1964	9,596		9,596	9,363	243	423	9,543	233	53
1965	10,074		10,074	9,623	225	392	9,790	451	284
1966	10,792		10,792	10,346	252	356	10,450	446	342
1967	11,398		11,398	11,146	284	390	11,252	252	146
1968	11,846		11,846	11,590	315	406	11,681	256	165

[1] Based on March 1968 benchmark data.
[2] Derived as 90 percent of agricultural services, forestries and fisheries, SIC 07–09.
[3] Excludes private household workers.
[4] Includes only secondary nonagricultural wage and salary paid jobs. Data for 1962–66 reflect actual results of multiple jobholding surveys conducted during the month of May. These surveys were not conducted in 1967 and 1968; data represent rough approximations calculated on the basis of May 1966 survey results.
[5] Equals households series (excluding private household workers), less unpaid absences plus additional paid jobs.
[6] Excludes private household workers; includes forestries and fisheries.

year and 14- and 15-year-olds for 1967 and 1968; data by industry, which would permit these two adjustments, are not available. For this reason, the adjusted household totals in tables 4 and 5 will not coincide.

Adjusting the household series to a payroll basis does not fully reconcile the overall levels of the series but does tend to reduce existing differences. For example, in 1968, total nonagricultural wage and salary employment, as measured by the household survey, was 64.6 million, compared with 67.9 million in the payroll survey, a net difference of 3.3 million. The number of unpaid absences to be subtracted from the household figures totaled 1.6 million, while the estimated secondary-job count to be added was 2.2 million. Subtracting the 160,000 wage and salary workers in agricultural services from the payroll series results in an adjusted payroll count of 67.7 million. Thus a residual difference between the two series of 2.5 million workers remains.

In light of the totally different sampling, collection, and estimating methodology used in the two series, it is perhaps more noteworthy that there is a high degree of consistency between some of the industry estimates. This is true not only for large sectors like manufacturing and government but also for some of the much smaller groups, particularly transportation and public utilities, and finance, insurance, and real estate. On the other hand, certain industries show distinct problems. Those industries with relatively extensive dual jobholding are, by and large, the industries in which the largest differences persist. Most significant in contributing to the overall disparities between the two series are the movements in trade and services.

INDIVIDUAL INDUSTRIES. Differences in estimates of employment in trade during the 1962–68 period accounted for over 50 percent of the net difference in total nonagricultural wage and salary employment. In 1968, the discrepancy amounted to 1.9 million workers, as there were an estimated 14.1 million in the payroll series compared with 12.2 million persons in the household series. After adjustment for unpaid absences (280,000) and dual jobholding (600,000), the difference totaled nearly 1.6 million.

It is quite probable that the number of dual jobholders enumerated in the household survey is somewhat understated, due to the continued expansion in trade and service activities in recent years, which has provided increased opportunities for part-time work to persons already employed. Another development in the job market that would logically increase the supply of part-time workers is the continuing downtrend in the full-time workweek in various sectors.

Payroll employment in the service industries was 1.5 million higher than the household count in both 1967 and 1968. In 1968, there were 10.6 million workers in the service industry in the payroll series compared with 9.0 million workers reported in the household series. Adjusting the household series for unpaid absences (240,000) and estimated secondary jobs (570,000), and the payroll series for workers in agricultural services (160,000), results in a residual difference of about 1.1 million. Aside from the probability of understatement of dual jobholding in the household survey, some of the residual difference can possibly be traced to benchmark problems. Since the industry tends to have smaller units and a fast rate of turnover among firms, deviations from benchmarks may be sizable. In addition, the timing of benchmarks (March) could mean that seasonal firms, which are typical in services, are inadequately accounted for both in the benchmark and throughout the year as a moving constant. The direction of this suspected deviation is not known, however.

Employees on government payrolls totaled over 11.8 million in 1968, compared with about 11.6 million in the household series, a difference of 260,000.[12] The usual adjustment technique to the household data does not significantly narrow the difference, however, as the number of secondary jobs added (about 410,000) was nearly offset by the number of unpaid absences (320,000), resulting in a remaining difference of 160,000. One source of discrepancy can be traced to the payroll series for the Federal Government, which as explained earlier, counts all civilian employees on the rolls on the last day of the calendar month and any intermittent workers who worked at any time during the month; this contrasts with the household count covering a single reference week. It is not possible to individually discuss Federal, State, and local government employment differences, however, because the two subsectors are not separately identified in the household series tabulations.

Household survey estimates of wage and salary

employees in manufacturing industries exceeded the number of workers in manufacturing in the payroll series during the entire 7-year period. The largest difference, nearly 740,000, occurred in 1967, when household estimates of nonfarm wage and salary employment in manufacturing totaled 20.2 million workers compared with 19.4 million workers in the payroll series. Of all the industry divisions, manufacturing has the largest count of persons on unpaid absences, numbering 460,000 in 1967, and more than offsetting the small number of persons holding secondary jobs (180,000). As a result, the gap between the two series was reduced to nearly 460,000. Considering the size of the industry and the magnitude of the adjustment for pay status, residual differences in 1967, as well as in the other years under discussion, are probably not significant.

Household estimates of wage and salary employees in the construction industry also exceeded the number of workers on construction payrolls each year during the 7-year span. In 1968, however, there were 3.3 million in the household series, slightly more than the number in the payroll series. While the differences are not significant either before or after adjustment, they can partly be attributed to the fact that the payroll series covers workers in contract construction, while the number reported in the household series may not accurately differentiate between contract construction, force-account, and speculative construction.[13] Aside from the problem of defining construction wage and salary workers, other problems probably stem from the number of small, short-lived firms in the industry.

Monthly comparisons

In addition to a reconciliation of the annual levels of the two series, further insights into the problem of comparability may be gained by looking at month-to-month movements in employment levels. An examination of published monthly household and payroll estimates of nonagricultural wage and salary employment levels for 1968 reveals divergences between the two series ranging from 2.3 million in both July and August to 4.0 million in September. (See table 6.) This compares to the 3.3 million differential for 1968 on an annual average basis.

As in the annual comparisons, the largest disparities in overall monthly levels took place

Table 6. Nonagricultural wage and salary employment, monthly, 1968

(In thousands)

Month	Payroll series [1]	Household series [2]	Payroll minus household series	Month-to-month change	
				Payroll series	Household series
January	65,765	62,740	3,025	[3]—1,920	[3]—1,477
February	66,115	63,313	2,802	350	573
March	66,475	63,446	3,029	360	133
April	67,170	63,752	3,418	695	306
May	67,465	64,263	3,202	295	511
June	68,470	65,104	3,366	1,005	841
July	68,036	65,734	2,302	—434	630
August	68,205	65,876	2,329	169	142
September	68,610	64,599	4,011	405	—1,277
October	68,959	65,125	3,834	349	526
November	69,247	65,358	3,889	288	233
December	69,805	65,902	3,903	558	544

[1] Based on March 1968 benchmark data.
[2] Excludes wage and salary workers in private households.
[3] Change from December 1967 to January 1968.

in the trade and service sectors. Of the 4.0 million net differential recorded in September, for example, 2.0 and 1.7 million were noted in trade and services, respectively. On the other hand, estimates for most of the other industries were surprisingly consistent.

While month-to-month changes in each series can be explained in large part, divergences between the two in any given month are more difficult to reconcile than divergences in the annual averages. The only difference between the two series that can be quantified and therefore adjusted on a monthly basis (on both a total and industry-by-industry basis) is the count of unpaid absences. Such an adjustment should theoretically eliminate one major source of disparity but, unfortunately, it also widens the gap in employment levels. Moreover, while year-to-year changes in the two series have at least been in the same direction, though not of the same magnitude, significant differences in month-to-month changes occur both in direction of movement and in size, which cancel out to a certain extent in comparisons of annual averages.

As an illustration of differences in the direction of change, payroll employment decreased by about 430,000 workers (from 68.5 to 68.0 million) in July 1968, as declines in trade, manufacturing, and government countered gains in the other industry sectors. In contrast, employment in the household series increased by 630,000 workers (from 65.1 to 65.7 million), as pickups were registered in all industry sectors except mining and manufacturing, both of which remained unchanged from June. Similarly, from August to September,

employment in the household series declined by 1.3 million workers (from 65.9 to 64.6 million), with unemployment cutbacks in all industry sectors except government. On the other hand, the payroll series showed a gain of 400,000 (from 68.2 to 68.6 million); employment pickups in manufacturing, transportation and public utilities, trade, and government offset declines in mining, construction, finance, insurance and real estate, and services.

Much of the disparity in monthly employment levels is inherent in the different seasonal patterns of the two series, although both series are subject to the same general seasonal fluctuations. The amplitude of their seasonal factor—original level divided by the seasonally adjusted level—ranges from a little over 98 percent to over 101 percent. At current employment levels, this 3-percentage point differential implies a seasonal expansion and contraction of approximately 2 million employees during the year for each series.

The two series move fairly consistently during the first half of the year, as each shows steady employment increases through June. (During the January-June 1968 period, monthly payroll employment increases averaged 540,000 compared to 470,000 in the household series.) The only real difference in the first half of the year is that the payroll series has its seasonal low in February while the household series' low occurs in January.

After June, however, certain significant differences emerge. The establishment series dips sharply between June and July, then resumes its upward movement, reaching a seasonal peak in December. The household series continues upward from June to a seasonal peak in August, drops significantly in September, then rises slightly during the remainder of the year, although December edges off marginally. In part, these differences can be attributed to different treatment in each series of unpaid absences and dual jobholding. However, other factors discussed earlier undoubtedly exert some influence on employment levels.

Seasonality caused by vacation-taking appears an important reason for monthly variations in unpaid absences, particularly in the summer months. For example, in July and August 1968, unpaid absences totaled 2.7 and 2.9 million, respectively, compared with 1.2 million in both May and September. The exclusion of workers on unpaid absences from the establishment series leads to a seasonal dip in the summertime, particularly in July, when vacations are common and many vacationing employees are not eligible for pay. Though diminishing in recent years, the number of persons on unpaid vacation is still considerable. The household count of employed nonagricultural wage and salary workers on vacation in July 1968 totaled 7 million, and more than 1.6 million of these persons did not receive pay for the time off. These absences were concentrated primarily in manufacturing, trade, services, and government.

Similarly, variations in the two series are also reflected by the relatively high incidence of absences due to bad weather and illness, particularly in the winter months and during periods of major industrial disputes.[14] The 1967 auto strike, involving over 150,000 workers, accounted for a significant swing in the two series between September and November 1967. When unpaid absences are subtracted from the household series, the month-to-month movements and consequently the seasonal pattern more nearly resemble those of the payroll series, particularly with respect to July and September. (See table 7.)

Because of the design and timing of the multiple jobholding survey—conducted in May of most years since 1962 as part of the regular household survey—the effects of multiple jobholding on employment levels from month to month cannot be quantified. It is likely, however, that changes in employment levels during certain seasons of the year can, in part, be attributed to wide seasonal swings in the extent of dual jobholding. For example, taking additional jobs at Christmas time by persons who are already employed would be reflected in the establishment series but not in the household series, since workers holding more than one job are classified according to the major activity only.[15] Multiple jobholding could largely account for the sharp rise in employment in the establishment series in December and the substantial decline in January, while changes in the household series are much smaller, although generally in the same direction. During the past 7 years, the November-to-December increase in nonagricultural wage and salary employment has averaged 490,000 in the establishment series compared with about 325,000 in the household series. By the same token, the decline in January has averaged about 1.7 million in the establishment series compared with about 1.2 million in the household series.

Similarly, there may be seasonal fluctuations in the number of workers who normally hold both agricultural and nonagricultural jobs and spend more time at one type of work or the other in any one month, depending on the demands of the harvesting season. Such workers are counted in their nonagricultural jobs each month in the establishment series, but by their major activity during the survey week in the household series.

As noted earlier, different treatment of school teachers and other educational staff creates divergences in employment levels, particularly in the summer months. In similar fashion, the entrance and exit of young persons into and out of the labor market during the summer have a significant effect on employment levels. The decline in employment in the household series in September reflects primarily the large number of youngsters leaving the labor force to return to school. Part of the explanation as to why the payroll series actually increases in September is that it may not be as responsive to changes in teenage employment as the household survey; as noted earlier, a number of summer resort, hotel, and amusement undertakings where employment of youth is prevalent may be missed by the benchmark source and thus in the current employment estimates.

Selecting the best series

In addition to explanations of the reasons for differences between the two series, many users may wish to know which is the "best series" under given circumstances. A meaningful answer to this question can be given in terms of the purpose for which the data are required. For cyclical analysis, neither series should be overlooked. Each has a long history, with data available for all of the postwar business cycles for comparative purposes. The data, however, should be used with an awareness of their coverage, concepts, methodology, and limitations.

Table 7. Current seasonal adjustment factors for nonagricultural wage and salary employment

Month	Payroll series (implicit)	Household series (implicit)	Household (excluding unpaid absences)
January	98.6	98.3	98.4
February	98.4	98.9	99.0
March	98.8	98.9	99.4
April	99.6	99.3	99.7
May	99.9	99.4	100.1
June	101.0	100.7	100.4
July	100.1	101.7	100.0
August	100.2	101.7	99.8
September	100.6	99.5	100.2
October	100.8	100.1	100.7
November	100.8	100.7	101.1
December	101.4	100.6	101.3

The household survey places its primary emphasis on the work status of individuals and relates this status to other characteristics, such as age, sex, color, educational attainment, and marital status. However, it is not well suited to providing detailed information on the industrial distribution of employment and because of this, employment levels by industry are not published. The payroll survey provides practically no information on personal characteristics of workers (except sex), but is an excellent source for detailed industrial and geographic employment data. It also provides hours and earnings data directly related to the employment figures. Moreover, the payroll series usually measures month-to-month change more precisely than the household series and therefore is more reliable for current analysis of employment changes. Therefore, the payroll and household surveys may be regarded as supplementary and complementary. Both serve a useful purpose, and neither should be discarded in favor of the other. □

FOOTNOTES

[1] Household data are collected in a national sample survey of approximately 50,000 households (called the Current Population Survey) conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics. A detailed description of this survey appears in *Concepts and Methods Used in Manpower Statistics From the Current Population Survey* (BLS Report 313, 1967).

Establishment data are based on payroll reports from a sample of 160,000 establishments employing over 30 million nonagricultural wage and salary workers, collected by State agencies in a cooperative program with BLS. For a more detailed discussion of this survey, see the technical note in *Employment and Earnings*, published monthly by BLS, and *BLS Handbook of Methods for Surveys and Studies* (BLS Bulletin 1458, 1966), chapter 2.

[2] All subsequent references to nonagricultural wage and salary employment in the household series in text, and tables, exclude private household workers.

[3] For a discussion and reconciliation of differences between the two types of employment series in 1961 and earlier years, see Chapter V and Appendix I of *Measuring Employment and Unemployment*, President's Committee to Appraise Employment and Unemployment Statistics, 1962.

[4] See Harvey R. Hamel, "Moonlighting—An Economic Phenomenon," *Monthly Labor Review*, October 1967, pp. 17–22, reprinted as Special Labor Force Report No. 90.

[5] Multiple jobholding surveys were not conducted in 1967 and 1968. For purposes of reconciliation, rough approximations of the number of workers employed in secondary nonagricultural wage and salary jobs in these years have been calculated on the basis of the May 1966 survey results. In 1967 and 1968, it was estimated that these workers totaled 2.1 and 2.2 million, respectively.

[6] This estimate was made using a "comparability assumption" by Denis F. Johnston and James R. Wetzel in their article, "Effect of the Census Undercount on Labor Force Estimates," *Monthly Labor Review*, March 1969, pp. 3–13. It is assumed here that the estimated undercount for 1968 was the same as that for 1967. This undercount is an extremely rough approximation and should not be accorded a high degree of accuracy.

[7] Because of special processing and enumeration problems of the Current Population Survey in December, primarily due to the Christmas season, it is usually conducted 1 week earlier, i.e., the week containing the 5th day instead of the week containing the 12th. This earlier survey week may also result in the missing of a considerable number of temporary sales workers in retail trade, accounting for still another source of deviation in the two series.

[8] A discussion of the sampling and estimating procedures together with estimates of sampling variability for both series are published monthly in *Employment and Earnings*.

[9] These adjustments generally mean that the employment series have been revised back to the previous complete count and forward to the current month's estimate. For a detailed discussion of the adjustment of payroll employment levels to new benchmark levels, see "BLS Establishment Employment Estimates Revised to March 1968 Benchmark Levels," July 1969 *Employment and Earnings*.

[10] For 1967 and 1968, annual average household totals are not precisely comparable to those for earlier years. Improvements in the methods of measuring labor force data initiated in January 1967 have clarified and sharpened the household statistics. (A detailed discussion of these conceptual changes can be found in "New Definitions for Employment and Unemployment," reprinted from the February 1967 *Employment and Earnings and Monthly Report on the Labor Force*.) Three particular changes affected the household count of nonagricultural wage and salary employment and consequently the differences between the two series. First, the exclusion of 14- and 15-year-olds, as discussed earlier, reduced total nonagricultural employment and at the same time widened the disparity between the two series in subsequent periods. Secondly, a shift to wage and salary employment of persons erroneously classified as self-employed had the effect of reducing the gap between the series. In essence, estimates of the self-employed, particularly in the trade, miscellaneous service, and construction industries, had been too high prior to 1967, because some persons were enumerated as self-employed, who actually operated their own incorporated enterprises and were therefore listed on the payrolls as salaried officers of the corporation. This classification problem was eliminated by asking an additional question in the household survey of all persons reported as self-employed in a nonfarm business as to whether the business was incorporated. The effect of this additional question was to reduce the average level of nonfarm self-employment by about 750,000 (in 1966) and to raise nonagricultural wage and salary employment by a corresponding amount. In a third change, which was relatively insignificant, persons absent from their jobs during the survey week and seeking other jobs were shifted from the unemployed to the employed status (with a job but not at work). The effect of this change increased total employment (in 1966) by about 80,000, most of whom were nonagricultural wage and salary workers. The net results of these changes were to reduce the differential between the two series by approximately 400,000 in 1967 and subsequent years. The fact that the 1968 differential equaled that of 1966 (table 1) suggests that a further (inexplicable) widening occurred in the latter year.

[11] The household survey has never been used to measure industry employment, and industry absolutes are not published. Such data are subject to sampling errors to a much greater extent than are the totals. In addition, industry data are also largely affected by response and classification errors to the extent that respondents may not accurately report the industry of employment. This could be expected to occur most frequently between construction and manufacturing (force-account construction, belonging in the latter industry) and wholesale trade and manufacturing (where respondents report the latter instead of the former). These data are provided here, however, because they contribute to an understanding of comparative movements in the totals.

[12] Until July 1969, when the March 1968 benchmarks were introduced, the deviation between the two series had been nearly 3 times this amount. Because the payroll employment estimate for the Federal Government is a complete count, the series is not subject to benchmark revision; the benchmark adjustment for State and local government employment (based on the Quinquennial Census of Government) is performed at 5-year intervals. As a consequence, any deviations in current employment levels from actual benchmark levels tend to accumulate.

[13] If construction activities are classified in other industries in the payroll series, this could also account for minor reconciliatory differences. However, the differences are probably concentrated in manufacturing and trade (force-account construction) and finance, insurance, and real estate (speculative construction). Force-account construction refers to construction work performed by an establishment primarily engaged in some business other than construction, for its own account and use, and by its own employees.

[14] Workers on strike for the entire reference period are counted as employed (with a job but not at work) in the household series but are not so counted in the payroll series.

[15] The CPS survey week in December is usually 1 week earlier than the payroll survey reference period, which would also have an impact upon the probable extent of multiple jobholding as well as upon divergences between the two surveys for the month.

A 25-year look at employment as measured by two surveys

Industry employment estimates based on household interviews and on payroll records move similarly but differ in levels and other specifics

CHRISTOPHER G. GELLNER

HOW HAVE TRENDS in the data developed in the payroll employment series and the household employment series of the Bureau of Labor Statistics compared over a considerable period of time? The computer has made it possible to analyze data on nonagricultural wage and salary employment in eight major industry groups and for the nonfarm economy as a whole over a 25-year period, 1948 to 1972. This study of a large number of observations shows that movements in the two series are strikingly similar despite their separate sources.

The series compared

Information on the number of jobs and rate of growth of employment by industry is developed by the Bureau of Labor Statistics from data collected by the Bureau of the Census in monthly interviews at 45,000 households (the Current Population Survey—CPS) and from payroll data collected by BLS monthly from 155,000 business establishments (the Current Employment Statistics program—CES). Data from the payroll series have generally been considered more reliable than those from the household series. There are two reasons for this. First, BLS believes that the industry of a worker can be determined more precisely from authentic payroll records of establishments whose industry classifications are periodically reviewed than from the answers of household respondents. Second, the payroll figures are derived from a much larger sample than the household data—about 40 percent of payroll employment while the household data are derived from interviews conducted at less than a tenth of a percent of the households in the universe. Movements in the monthly payroll estimates of employment have tended to show much more smoothness and stability historically than the household estimates largely because of these factors but also because of different procedures used in compiling the two series.

This does not mean, however, that the household estimates are not a useful measure of employment in major industries. The household series, in fact, has some unique virtues. It is the only source providing detailed insights into employment by industry in terms of age, color, occupation, and similar characteristics. It also extends coverage to some industries, such as agriculture and private household services, not covered by the payroll estimates. Furthermore, it provides unemployment estimates by industry and, thus, is the only source from which comparisons of both employment and unemployment can be made on an industry basis. Because both series of estimates, are important, this article contrasts their behavior during the 1948–72 period for each of the major industry groups, describing and explaining the differences exhibited.

General trends and differences

The underlying movements of the industry data from each series have been comparable over time, but the series often differ in the levels of the estimates, in month-to-month and annual changes, in the timing and extent of business cycles, and in other shortrun trends. These differences arise because the two series actually measure different phenomena—the Current Population Survey counting the number of persons employed and the Current Employment Statistics program counting the number of jobs occupied.[1] This results in different treatment in each survey of persons holding more than one job and of those on unpaid absence. For example, in the CPS, persons working during the survey week in more than one job are counted once and are classi-

Christopher G. Gellner is an economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

From the *Review* of July 1973

fied according to the job in which they worked the greatest number of hours. By contrast, in the establishment survey, workers on the payroll of more than one business establishment would be counted every time their names appeared on payrolls. Also, people who have jobs but are temporarily absent from them during the survey week because of illness, bad weather, vacation, a labor management dispute, or for various other reasons are counted nonetheless as employed—with a job but not at work—in the household survey even if they did not receive pay for this period of absence. In the payroll survey, workers on unpaid absence are not counted.

The two surveys also differ in coverage, sources of information, methods of collection, and estimation procedures. These and other differences have been comprehensively discussed and, wherever possible, quantified in two earlier analyses of the two series. For a thorough discussion of the overall differences which are only cursorily touched on in this article, these two sources should be consulted.[2] This article also differs from the earlier analyses in that it focuses on the historical trends of the two series, but does not attempt a further reconciliation of their differences. (For such reconciliations, see the two earlier studies.)

The establishment survey covers only wage and salary workers on the payrolls of nonagricultural establishments. The household survey includes all persons who worked at least 1 hour for pay or profit during the survey week—whether as wage and salary workers in establishments or private households or as self-employed workers—as well as those who worked 15 hours or more without pay in family-operated enterprises. In this article, the household survey estimates of employment by industry have been adjusted to exclude private household workers, the self-employed, and unpaid family workers. This eliminates major coverage problems and facilitates a more direct comparison with the payroll estimates. However, differences caused by the two surveys' contrasting treatment of multiple jobholding, workers on unpaid absences, and other factors such as the population undercount in the household survey and the inclusion of persons under 16 years of age in the establishment survey still affect the levels.[3]

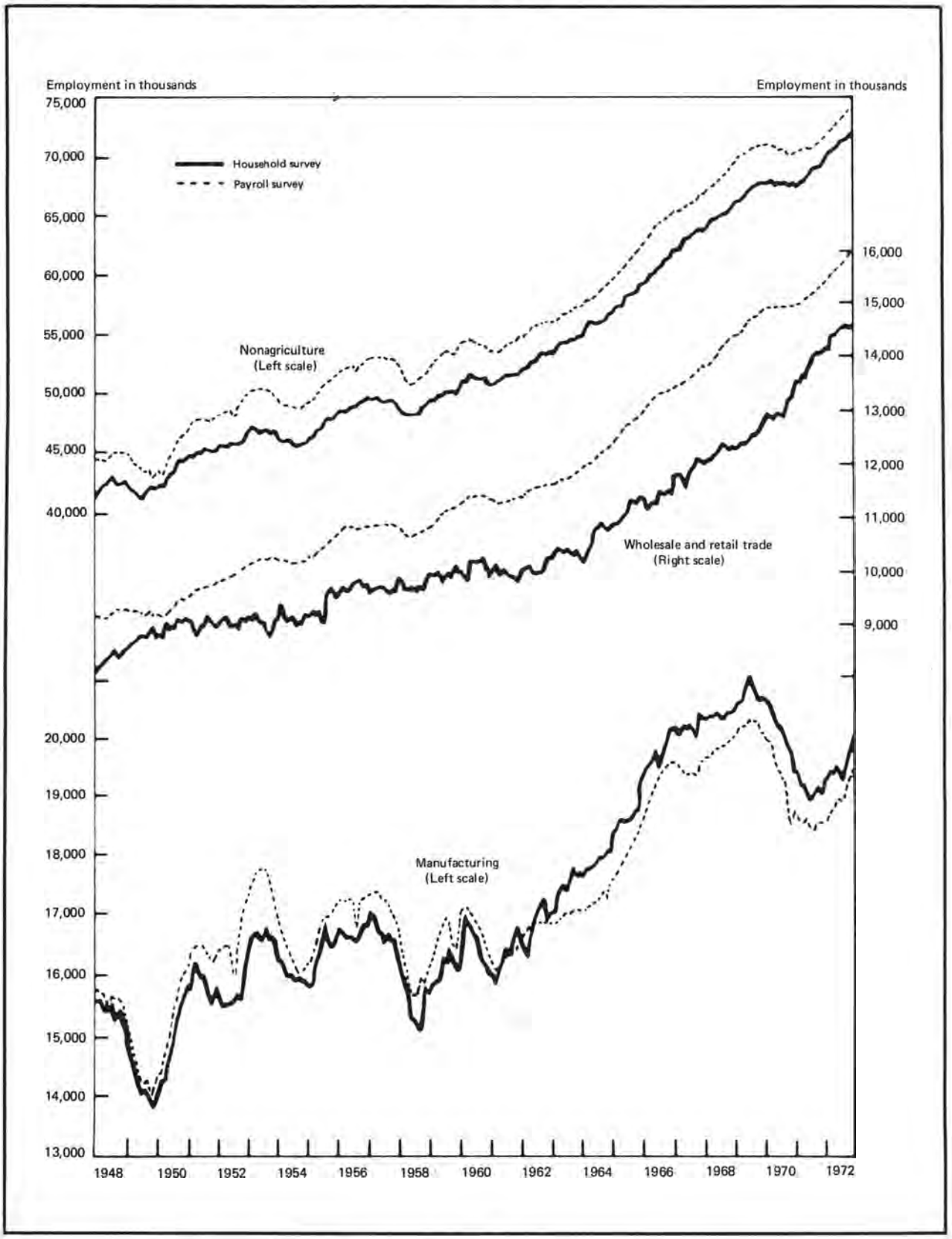
Computer-drawn charts are presented in this article, tracing the monthly movements of the household and payroll series over the 1948–72 period for total nonagricultural wage and salary employment and in eight major industry divisions. The charts clearly show (1) the two series have remarkably similar trends over time, and (2) the payroll series is significantly smoother, in terms of month-to-month fluctuations. This fact is attributable primarily to the much larger size of the establishment sample. It is also due in large part to use of a link-relative technique to estimate monthly payroll employment. This means that the previous month's estimate is used as a base in computing the current month's estimate.[4]

In addition, the payroll series are adjusted once a year to a benchmark—a complete and independent count of employment for each industry.[5] As a result of this process the series is considered relatively free of error over the long span. It is still possible, however, that the benchmark counts for certain industries, such as construction and services which abound with short-lived and seasonal firms, may be imperfect. On the other hand, the error on consecutive months change for total nonagricultural employment estimated from the household survey is on the order of plus or minus 225,000 workers based on the current size of the sample (45,000 households). Since the sample was considerably smaller during the 1950's and early 1960's, the errors on month-to-month changes were larger.

Chart 1 shows that during the entire 1948–72 period total nonagricultural wage and salary employment was consistently higher in the payroll than in the household series. One possible cause for this gap may be the so-called population undercount. The household survey findings are applied each month to a population count projected forward from the decennial Census. There is evidence that a sizable number of persons have been missed in each of the recent censuses. Consequently, household survey estimates also tend to understate the true level of employment.

Both series have shown virtually the same growth pattern over the period. Despite the short-term declines in employment during some recessions both series showed nearly the same average annual rate of growth (compounded) during the period—2.1 percent for the household estimates and 2.0 percent for the payroll. Thus, there was only a slight narrowing of the absolute gap between the series over the years (2.3 million in 1948 compared to 2.0 million in 1972). It is noteworthy, however, that this narrowing was not of a long-term nature, occurring largely during the recovery stages of the 1970–71 recession. In addition to this cyclical development, which also occurred to some extent during previous

Chart 1. Comparison of household and establishment survey employment—total nonagricultural industries, wholesale and retail trade, and manufacturing—seasonally adjusted, 1948–72



recessions, the adjustment of the household series to new population controls introduced in January 1972, based on the 1970 census, had the effect of raising the household figures for nonfarm wage and salary employment by 250,000.[6] During 1961–69, years of uninterrupted economic expansion, there had been a widening of the actual gap to about 2.7 million. In percentage terms, however, the gap between the two series has narrowed somewhat over the past 25 years. In 1948 the payroll estimate exceeded the household estimate by 5.4 percent; in 1972, it exceeded it by only 2.9 percent.

Differences in levels and movements in the two series are clarified through an examination of individual industry data. For example, the net difference between the aggregate levels from the two series has stemmed from differences in the estimation of trade and services employment.

Patterns by industry

Mining. The only industry group to show a decline in employment during the 1948–72 period was mining. Chart 2 shows that the decline in the payroll series was gradual and long term, occurring mostly between 1948 and 1962. Laborsaving technology in metal and coal mining accounted for the industry's employment shrinkage.

The household estimates of mining employment have behaved more irregularly, but most of the decline also occurred between 1948 and 1962. A phenomenally large part of the decline occurred in early 1954 and was probably related to a change in the Current Population Survey sample introduced at that time.[7]

Since 1962, the payroll series has remained rather stable. On the other hand, the household figures held steady until late 1970 and then rose enough to close the gap which had existed during most of the 25-year period. Due to the recent relative narrowing of the gap between the series, the average rate of decline of mining employment over the period was somewhat greater with respect to the payroll series than the household series (table 1).

Month-to-month and short-term disparities between the two series with respect to mining employment are partly explained by (1) the relatively high sampling variability of the household data, and (2) the two surveys' different treatment of workers on strike. Since the mining industry is comparatively small, only a small number—about 500—of mining workers are picked up in the Current Population Survey sample each month and estimates derived from the sample are subject to considerable sampling variability. Because of the small mining sample, a month-to-month change must exceed 50,000 before one can be 90-percent confident that a change in employment levels occurred. By contrast, the payroll series is subject to very little sampling error. The sharp drops in the payroll figures in October–November 1949 and January–March 1950, as well as the declines in 1966, 1968, and 1971, are attributable to strikes. Employees on strike are not included in the establishment series if they are off the payroll during the entire reference week. In the household survey, on the other hand, workers on strike are counted as employed—with a job but not at work. Consequently, the household figures did not drop during heavy strike periods.

Construction. Wage and salary employment in construction showed nearly identical trends and rates of growth in the payroll and household series between 1948 and 1972. Generally, the household estimates were slightly above the payroll estimates, with the exception of relatively short spans in 1951–52 and 1971–72. Why the two series diverged in the early 1950's and 1970's, yet were relatively close otherwise, is difficult to ascertain. Residential construction reached record levels in the early 1950's and 1970's and may have caused the divergence. Because of differences in coverage, the household survey may have been more likely to reflect employment increases during periods of rapidly expanding construction activity, particularly in the residential area. (See chart 2.)

In the household survey all persons whose major job is reported to be construction work are counted in the construction industry. By contrast, the payroll survey includes only workers employed by bona fide contractors as defined in the Standard Industrial Classification (SIC) system. It omits so-called "force-account" construction workers—those employed by an establishment, the main product or service of which is something other than contract construction. Therefore, workers performing construction in industries such as real estate development, steel, automobiles, and trade are not included in the contract construction classification but rather in the industry called for by their establishment's main product. The extent of this classification difference is probably minimal during "normal" times but

Chart 2. Comparison of household and establishment survey employment—construction, finance, insurance, and real estate, and mining—seasonally adjusted, 1948–72

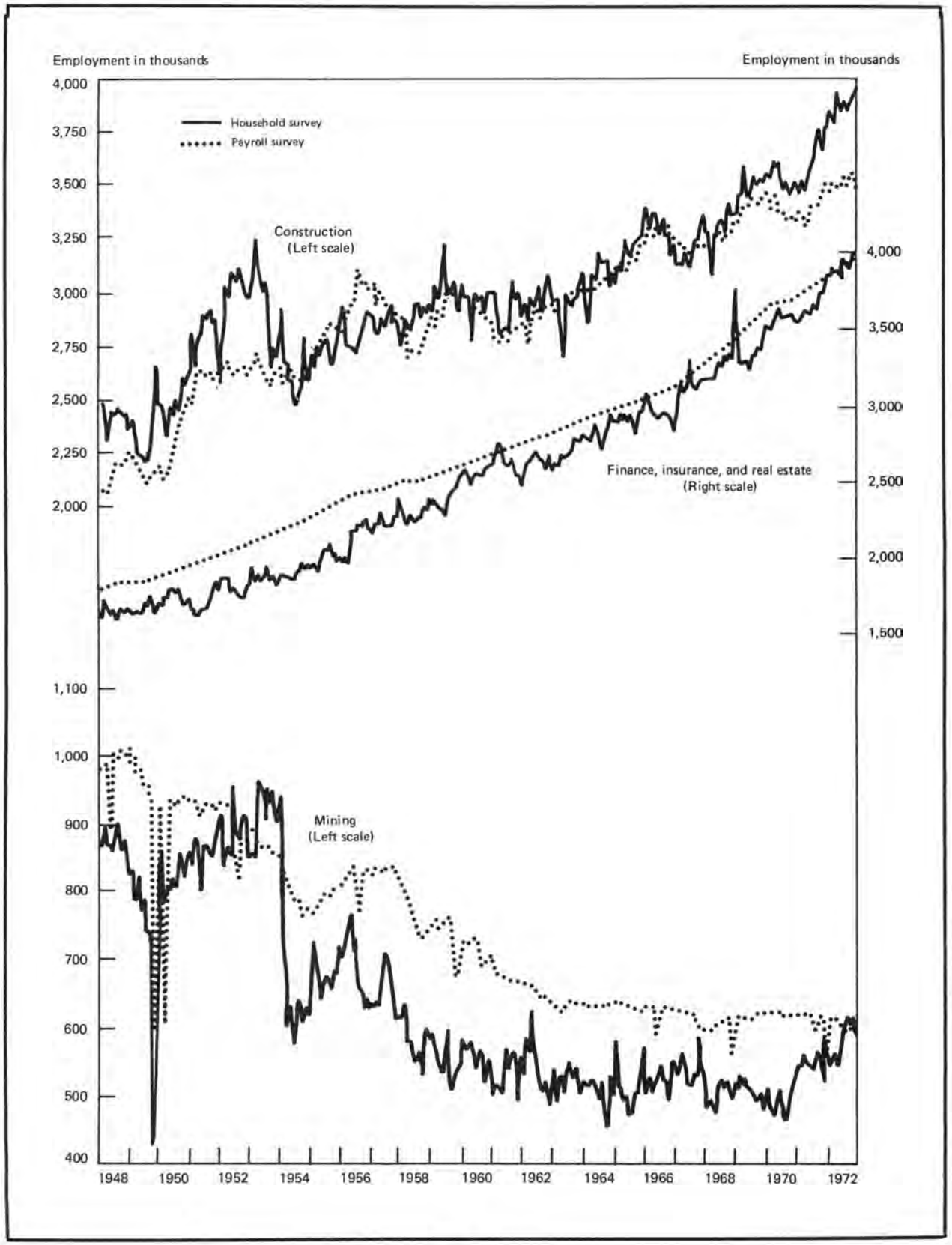


Table 1. Household and payroll estimates of nonagricultural wage and salary employment by industry groups, selected years 1948–72

Item	Total nonagricultural wage and salary	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale and retail trade	Finance, insurance and real estate	Services	Government
HOUSEHOLD SURVEY									
1948	42,603	871	2,421	15,477	4,141	8,474	1,658	4,300	5,261
1950	43,493	829	2,501	14,903	3,943	9,029	1,754	4,745	5,789
1960	51,235	552	2,962	16,552	4,033	10,092	2,567	6,542	7,935
1970	67,691	499	3,525	20,224	4,476	12,945	3,578	10,000	12,424
1971	68,209	551	3,668	19,119	4,431	13,789	3,696	10,188	12,764
1972	70,729	583	3,890	19,437	4,553	14,392	3,934	10,611	13,329
Change in level, 1948 to 1972	+28,126	−288	+1,469	+3,960	+412	+5,918	+2,276	+6,311	+8,068
Average annual rate of growth (compounded)	+2.1	−1.7	+2.0	+1.0	+0.4	+2.2	+3.7	+3.8	+4.0
PAYROLL SURVEY									
1948	44,891	994	2,169	15,582	4,189	9,272	1,829	5,206	5,650
1950	45,222	901	2,333	15,241	4,034	9,386	1,919	5,382	6,026
1960	54,234	712	2,885	16,796	4,004	11,391	2,669	7,423	8,353
1970	70,593	623	3,381	19,349	4,493	14,914	3,688	11,612	12,535
1971	70,645	602	3,411	18,529	4,442	15,142	3,796	11,669	12,856
1972	72,764	607	3,521	18,933	4,495	15,683	3,927	12,309	13,290
Change in level, 1948 to 1972	+27,873	−387	+1,352	+3,351	+306	+6,411	+2,098	7,103	+7,640
Average annual rate of growth (compounded)	+2.0	−2.0	+2.0	+.8	+.3	+2.2	+3.2	+3.7	+3.6

may increase during booms in residential construction when developers may do more of their own construction work.[8]

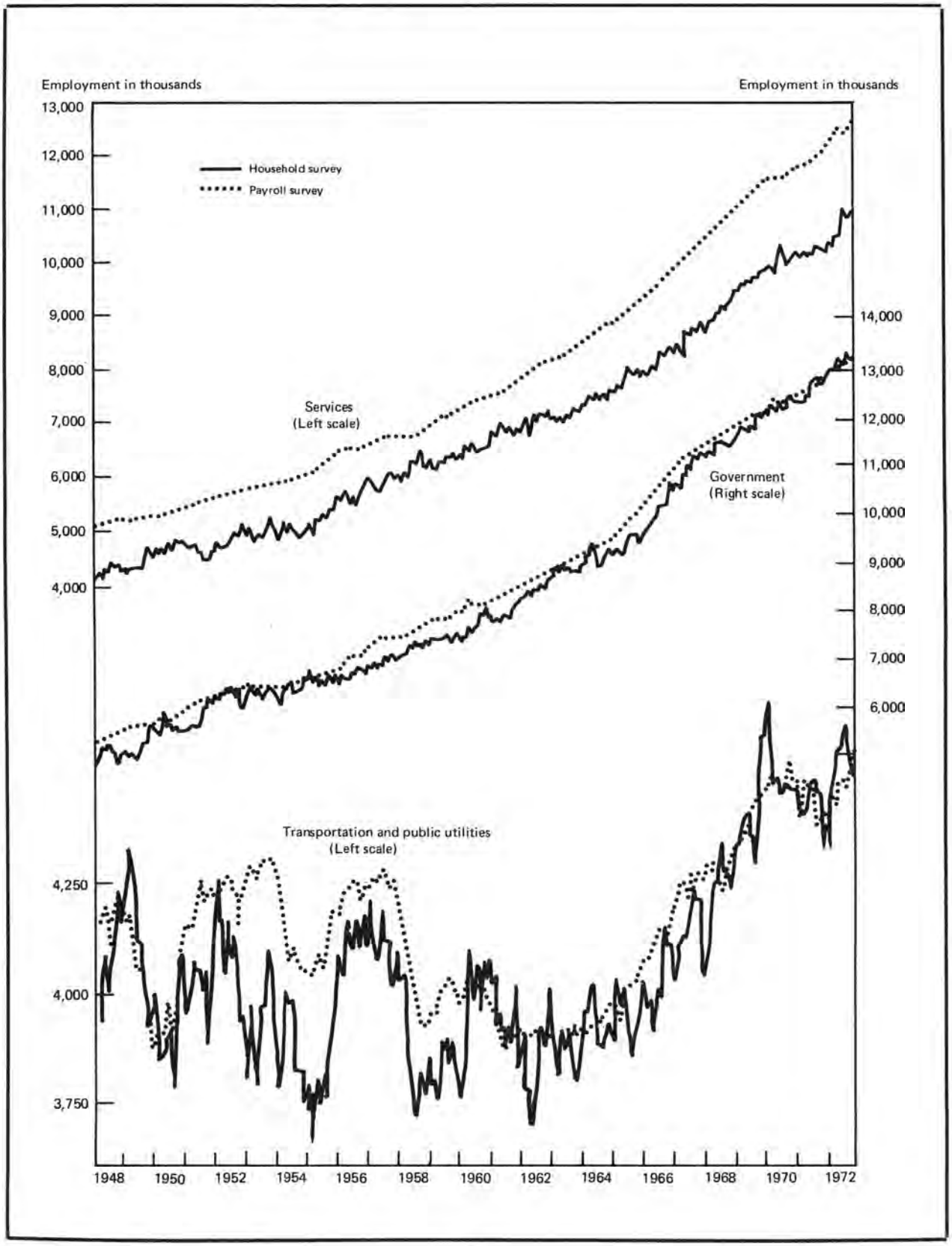
Also during boom periods in homebuilding, many small firms or associations of individuals enter the industry "to get a piece of the action." Many may not register under the unemployment compensation laws (even if required to do so by State law) because of the added expense or because in the past they were too small to qualify. The payroll survey only covers firms or establishments registered under State unemployment insurance programs. Even if registered under the unemployment insurance laws, however, firms entering the industry would not be picked up in the payroll sample until after the annual complete census of establishments—the benchmark. Thus, employment in firms which did not remain in operation until the next benchmark would never be included in the payroll count.

Thus it is possible that the divergence between the two series in 1971–72 may have been related to the surge in residential homebuilding, which pushed housing starts to record levels. The divergence in 1951–52 cannot be connected as easily to housing starts—since residential housing starts peaked in 1950, then fell somewhat in the ensuing 2 years when the gap between the series developed.

But the recent divergence between the two series may not be tied solely to increased construction activity in the residential sector. When the series began to drift apart in 1969, residential construction was not particularly strong. Furthermore, when housing starts showed strong spurts at other times between 1948 and 1972, such as in 1954–55, 1959, and 1963–64, the household series did not show an inordinate degree of increase compared with the payroll data. Compared with the booms in the early 1950's and 1970's, however, the increased residential construction activity during these other periods was relatively mild.

Manufacturing. Chart 1 shows that during most of the 1948–60 period the payroll estimates of wage and salary employees in manufacturing slightly exceeded the number of workers in manufacturing estimated in the household series. In 1961–62, the series moved together, and since 1962, there has been a reversal of the previous pattern, with the household employment levels exceeding the payroll. Nevertheless, both series showed fairly similar average annual rates of growth for the 1948–72 period —0.8 percent for the payroll estimates and 1.0 per-

Chart 3. Comparison of household and establishment survey employment—services, government, and transportation and public utilities—seasonally adjusted, 1948–72



cent for the household (table 1). The two surveys also showed about the same rates of employment growth for both the durable and nondurable goods sectors of manufacturing. For both sectors, payroll estimates of employment were generally a little above the household estimates during the 1950's but moved below them in the early 1960's. This reversal in position occurred first in nondurable goods and was followed shortly thereafter by durable goods.

In terms of cyclical developments, chart 1 also shows that both series of data on manufacturing employment have behaved similarly. Between 1962 and 1969, a period of sustained economic growth, both expanded at the average annual rate of about 3 percent, and both series plummeted at a particularly rapid pace during the 1970–71 recession.

Current differences between the two series in levels of manufacturing employment can be ascribed in large part to the contrasting ways of treating workers on unpaid absence and with more than one job. Manufacturing has a relatively large number of unpaid absences—more than any other industry group —yet a comparatively small number of secondary jobholders. Since persons on unpaid absence are counted as employed only in the household survey, theoretically the household estimates should exceed the payroll figures. However, as chart 1 shows, this has been the case only since the two series switched relative positions in the early 1960's.

In 1960, the industrial (and occupational) classification was revised in the household series. The purpose of this revision was to improve the quality of the data in terms of industry detail by making household industry groups conform to the 1957 revision of the Standard Industrial Classification (SIC) system. Following this revision, an additional question was added to the CPS questionnaire in 1960: What is the name of the employer of each worker in the household? The purpose of this question was to improve the accuracy of industry reporting. In troublesome classification cases, this question permitted matching the individual's firm with an appropriate list of industry classification codes. It is reasonable to assume that the increase in the household measurement of manufacturing employment resulting from the addition of this question and the use of the new classification system improved the reliability of the household estimates substantially, since, theoretically, the household series should have been yielding estimates above those of the establishment series because the number of unpaid absences in the industry exceeds the number of secondary jobholders.

Transportation and public utilities. Employment growth in transportation, communications, and public utilities as measured by both surveys fluctuated widely during the 1948–72 period. Apart from cyclical effects, the payroll series exhibited considerably more stability than the household series, which shows a significant degree of month-to-month variation. Trends in both series during the period were similar, although the payroll series generally was above the household series, particularly during the 1950's. As in manufacturing, industry classification revisions introduced in 1960 may have contributed significantly to the levels of the household data for transportation more closely approximating those of the payroll series (chart 3).

Chart 3 also indicates that both employment series moved downward during the 1950's. Long-term declines in employment in railroad transportation and local and interurban passenger service were the major causes of this. After the 1960–61 recession, employment expanded relatively rapidly until the 1970–71 economic slowdown. Gains in trucking and air transportation, communications, and public utilities figured importantly in the growth of the 1960's. However, because of declines in the 1950's, the 25-year growth in the industry was slight—410,000 in the household survey and 300,000 in the payroll.

Trade. Historically, the payroll estimates of employment in wholesale and retail trade have been substantially above the household estimates for the industry. In fact, the industry has generally accounted for about half the net difference between the two surveys in total nonagricultural wage and salary employment. The difference in trade employment did, however, vary during the 1948-72 period, ranging from 400,000 in 1950 to 2.2 million in 1969. By 1971, the gap had narrowed to 1.3 million. Despite occasional disparities in growth in the short term, the annual rates of expansion of both sets of estimates over the 1948–72 period were identical—2.2 percent (table 1).

A significant amount of moonlighting occurs in trade and is the major reason the payroll estimates have consistently exceeded those of the household survey. Probably, the increase in moonlighting causes the two series to diverge during business expansions and, conversely, the contraction of dual

jobholding causes them to converge during cyclical downturns. Another, relatively minor, reason for the gap between the two series is that the payroll survey, in contrast to the household survey, includes some military personnel and inmates of institutions employed in trade. Moreover, many wage and salary workers in the industry were misclassified as self-employed in the household survey before 1967.[9] This happened because some owners of small retail businesses, or salesmen with a loose relationship to their organization, may regard themselves or may be considered by the respondents in their households as self-employed, although they are listed as salaried officers or salesmen on the payroll of the business.

Services. As with trade, payroll estimates of wage and salary employment in services historically have been substantially higher than those of the household estimates. As chart 3 shows, the gap between the two series gradually widened after the late 1950's. Over the entire 25 years, it ranged between 0.5 and 1.5 million workers. When combined with that in trade, this gap has accounted for the entire net difference in household and payroll levels of nonagricultural employment since World War II.

The average annual rate of increase of the two series over 1948–72 was nearly identical—3.7 percent for the payroll series and 3.8 percent for the household, a faster rate than any other industry group except government during the 25-year period.

Differences in household and payroll estimates of employment in the service industries stem in large part from many of the factors that account for the gap in trade: The number of dual jobholders in the industry has consistently exceeded the number of workers on unpaid absence. The gradual widening of the difference between the two series is probably due to increased dual jobholding. Another minor factor is that services, like trade, is also an industry in which members of the Armed Forces are likely to hold jobs during off-duty hours.

Another source of discrepancy is that service employment in the payroll series includes workers engaged in agricultural services—about 250,000 in 1972—who are classified in agriculture in the household survey. Working in the other direction the payroll benchmark, because of its nature and timing (March), may not pick up employment in some of the short-lived or seasonal firms (mostly businesses in resort areas open only during the summer months).

Finance, insurance, and real estate. Employment in this group of industries, as measured by both the payroll and household series, expanded continuously during 1948–72. Employment shown in the payroll series rose consistently while the household series fluctuated markedly, undoubtedly due to sampling variability. (See chart 2.) There was, in addition, some disparity in the rates of growth of the series. The average annual rate of increase of the household survey was 3.7 percent, exceeding the payroll survey's 3.2 percent, the largest single industry difference during the period between the two series in terms of rates of growth. As a result, the gap between the two series, which had been substantial during the 1950's, was completely closed by 1972.

Government. Among the major industry groups, government (Federal, State, and local) posted the largest increase in employment between 1948 and 1972, both in terms of the absolute change and in average annual percent changes (table 1). The household series, however, increased at a somewhat faster rate than the payroll series, such that the small gap between the two series that prevailed throughout much of the period was completely closed by 1972.

Persistent discrepancies between the levels of the two series can be traced in part to the different times when monthly employment in the Federal Government is sampled in each survey, in addition to a different treatment of multiple jobholders and unpaid absences. The monthly household estimates reflect government employment in a single week in the month (the reference week). By contrast, the payroll series for the Federal sector counts all civilian employees on the rolls on the last day of the month plus all intermittent employees who worked during the month. Thus, some persons counted as employed in government in the payroll survey were not so classified in the household survey. There is at present no method devised which can quantify the effect of this difference in reference periods. However, since turnover among Federal employees is relatively low, it should be fairly small. A major exception would be in December when many temporary workers are hired by the U.S. Postal Service.

Another difference between the two series stems from the treatment of teachers during the summer. In the payroll survey, teachers are counted as employed regardless of whether they are paid only during the school year or on a 12-month basis. There-

fore, teachers taking jobs during their summer vacation would be counted twice. In the household series, teachers would be counted only once, either as an employed teacher (with a job but not at work) or as employed in the job obtained over the summer. The overall effect of these procedures would be to lower the household level of government employment relative to that of the payroll level.

BECAUSE OF DIFFERENCES in methodology and concepts, the payroll and household employment series by industry cannot be expected to yield the same magnitudes, even when the differences in coverage have been eliminated. In terms of total nonagricultural wage and salary employment, the household survey levels have historically been lower than the payroll levels, primarily because the payroll series counts workers more than once if they are on two or more payrolls during the reporting period. On an industry-by-industry basis, there may be other factors intrinsic to each industry which have been the major causes of the discrepancies between levels. Generally, however, the two series showed the same long-term trends and rates of increase between 1948–72, both for total nonagricultural employment and for employment in major individual industries. Moreover, the cyclical movements of the two series during the 25-year period also have been very much alike, especially with respect to turning points.

Although some inconsistencies between the series continue to prevail, each possesses unique qualities. Since the payroll series is derived from reports of industry establishments, it furnishes extremely reliable employment estimates by industry. The household survey, on the other hand, provides demographic and labor force detail not available from the employer reports. □

FOOTNOTES

[1] To be more precise, the payroll series counts the total number of persons appearing on the payrolls of business establishments at any time during the survey week. Thus, any job held by more than one person during the week would be counted more than once.

[2] President's Committee to Appraise Employment and Unemployment Statistics, *Measuring Employment and Unemployment* (Washington, 1962), chapter IV and appendix I; and Gloria P. Green, "Comparing employment estimates from household and payroll surveys," *Monthly Labor Review*, December 1969, pp. 9–20.

[3] For a comprehensive discussion of the differences between employment data from the household and establishment surveys, including the effect of the population undercount in the household survey and the inclusion of 14- and 15-year-olds in the payroll series, see the sources cited in footnote 2.

[4] For a description of the "link relative" technique used in estimating monthly payroll levels of employment, see the Technical Note in any recent issue of *Employment and Earnings*.

[5] A BLS benchmark is a comprehensive count of the number of workers on the payrolls of business establishments. It is derived from a complete census of all establishments covered by State unemployment compensation laws with supplementary information from a number of Federal and private agencies. Annually the payroll figures are updated to reflect information from the March benchmarks of the previous year. For a description of the payroll benchmarks, see "BLS Establishment Estimates Revised to March 1971 Benchmarks Level," *Employment and Earnings*, October 1972.

[6] For an explanation of the changes and an indication of the differences in the household employment estimates resulting from adjusting the CPS to population controls based on information from the 1970 Census, see "Revisions in the Current Population Survey," *Employment and Earnings*, February 1972.

[7] In February 1954, the CPS sample was expanded from 68 to 230 sample areas, although the overall sample size of 25,000 households was retained. Contemporaneously, a substantially improved estimation procedure (composite estimate) was introduced which took advantage of the large overlap in the sample from month to month. These two changes improved the reliability of most of the major statistics by an amount equivalent to that of doubling the sample size.

[8] According to a survey by the National Association of Home Builders of 450 major U. S. homebuilders, who in 1971 planned to build one-fourth of all housing units, 80 percent were involved in activities other than homebuilding. The largest group (61 percent) were in land development See "Major Homebuilders in 1971," *Economic News Notes for the Building Industry* (National Association of Homebuilders, 1971).

[9] In 1967, a clarifying question was added to the CPS questionnaire which asked all persons reported as self-employed whether or not the business was incorporated. Operators of small incorporated enterprises were classified as wage and salary workers instead of self-employed. See Robert L. Stein, "New Definitions for Employment and Unemployment," *Employment and Earnings and Monthly Report on the Labor Force*, February 1967.

Analyzing the length of spells of unemployment

New findings show average jobless spells are shorter than previously believed, but there are more of them

HYMAN B. KAITZ

How LONG does a person remain unemployed on average? A simple question, yet one that cannot be easily answered despite the wealth of data available on the unemployed.

For many years the Bureau of Labor Statistics has been reporting regularly an estimate of the average duration of unemployment for those who are unemployed in a particular month. During 1969 this figure was about 8 weeks.

Now it is possible to supplement this measure of the duration of unemployment. This article describes a method for estimating the number and the average length of all of the spells of unemployment completed during the year. During 1969, for example, this estimating procedure indicates that, on the average, a person who became unemployed remained unemployed for about 5 weeks.

The differences between these two averages will be explained below, but it is important to note here that the two averages differ primarily because they measure two essentially distinct groups.

It should also be pointed out that each measurement is an estimate since at the present time we do not have so-called longitudinal surveys that follow unemployed individuals week-by-week during their spells of unemployment. Instead, we must infer the length of the spells from a series of snapshots (surveys) at monthly intervals.

Because these estimates are derived by using analytical techniques relatively unfamiliar to labor force analysts, a detailed development of the method used is presented in the appendix.

Earlier analysis

Each month during the week including the 19th (the survey week), Census Bureau interviewers visit over 52,000 households throughout the United States and ask about the labor force status during the preceding week of all household members 16 years of age and older. (The preceding week, which includes the 12th of the month, is called the reference week.) Individuals looking for work during the reference week are asked how long they have been unemployed. On the basis of these responses, a distribution of unemployed persons by duration of unemployment to the end of the reference week is published regularly, together with the average duration of unemployment. The published material represents a cross section of the unemployed, for the most part before their unemployment spell ends.

Let us begin by examining regularly published distributions of unemployment by duration for the average reference week in each of the years from 1948 through 1969.

In table 1, we find, for example, that during an average reference week in 1969 about 133,000 people were unemployed more than 27 weeks. This number represents the long-term unemployed in 1 week, but it cannot easily be converted into an estimate of the number of long-term unemployed persons in a month or year for several reasons. Many of these people remain among the long-term unemployed from week to week and are counted repeatedly, while others find work or leave the labor force, and still others enter the long-term unemployed from among those who previously had lesser amounts of unemployment. At the other end of the scale, we know that among the 1,629,000 with less than 5 weeks of unemployment in the average reference week in 1969, many will ultimately become long-term unemployed.

The long-term and short-term unemployed can be separated if we consider only the average num-

Hyman B. Kaitz is chief of the Division of Statistical Standards, Bureau of Labor Statistics.

From the *Review* of November 1970

ber who left unemployment in the reference week. The average number who end unemployment spells of varying lengths in an average week multiplied by the number of weeks in a year yields the estimated annual number of spells by duration. Table 2 contains these data.

In table 2 we find, for example, 570,000 spells of 27 weeks or longer in 1969. Because of their length, these spells probably correspond closely to the number of people who were jobless this long in 1969, since it is unlikely that they had more than one spell in that year. Among the 24 million spells of less than 5 weeks, many were completed by individuals who had more than one spell. Consequently, the shorter spells cannot readily be converted into a corresponding number of people. Similarly, the estimated total of 32 million spells of unemployment ending in 1969 correspond to a smaller number of people with some unemployment in that year since some people experienced more than one spell.

Two views of the unemployed

It should be emphasized that the data in tables 1 and 2 constitute two distinct ways of looking at the unemployed by duration, and both are essential to an understanding of patterns of unemployment. However, while we have been accustomed to looking at the type of data presented in table 1, the estimates in table 2 are new.

Table 1. Distribution of the unemployed by duration of unemployment (up to the reference week)

[Annual averages in thousands]

Year	Total	Number of weeks					Average duration (in weeks)
		Less than 5	5–10	11–14	15–26	27 and over	
1948	2,278	1,300	505	164	193	116	8.6
1949	3,634	1,756	863	331	428	256	10.0
1950	3,287	1,450	754	301	425	357	12.1
1951	2,054	1,177	421	153	166	137	9.7
1952	1,883	1,135	390	126	148	84	8.4
1953	1,834	1,142	368	114	132	78	8.0
1954	3,533	1,605	811	305	495	317	11.8
1955	2,852	1,335	598	217	366	336	13.0
1956	2,750	1,412	594	211	301	232	11.3
1957	2,859	1,408	651	240	321	239	10.5
1958	4,601	1,753	958	438	785	667	13.9
1959	3,738	1,585	778	335	469	571	14.4
1960	3,852	1,719	823	353	503	454	12.8
1961	4,713	1,806	964	411	728	804	15.6
1962	3,913	1,659	812	323	534	585	14.7
1963	4,070	1,751	877	354	535	553	14.0
1964	3,787	1,697	798	319	491	482	13.3
1965	3,366	1,628	707	276	404	351	11.8
1966	2,878	1,573	573	206	287	239	10.4
1967	2,975	1,634	675	218	271	177	8.8
1968	2,816	1,594	613	197	256	156	8.5
1969	2,831	1,629	627	200	242	133	8.0

Table 2. Distribution of completed unemployment spells by duration

[In thousands]

Year	Total	Number of weeks					Average duration (in weeks)
		Less than 5	5–10	11–14	15–26	27 and over	
1948	25,580	18,880	4,190	900	1,140	470	4.6
1949	30,450	20,310	5,150	1,630	2,320	1,040	6.2
1950	25,510	16,870	4,150	1,270	2,050	1,170	6.7
1951	26,010	20,700	3,000	780	1,070	460	4.1
1952	24,540	19,150	3,510	680	850	350	4.0
1953	25,580	20,470	3,370	630	790	320	3.7
1954	28,600	18,720	5,300	1,320	2,020	1,240	6.4
1955	27,300	19,720	4,360	860	1,360	1,030	5.4
1956	28,680	21,010	4,480	960	1,420	810	5.0
1957	26,190	18,150	4,420	1,130	1,650	840	5.7
1958	32,350	21,890	4,160	1,470	2,650	2,180	7.4
1959	31,220	22,190	4,200	1,190	2,180	1,460	6.2
1960	33,590	24,190	4,280	1,380	2,320	1,420	6.0
1961	34,230	23,060	5,220	1,330	2,450	2,170	7.2
1962	32,900	22,980	5,230	1,150	1,930	1,610	6.2
1963	33,210	22,590	5,500	1,320	2,220	1,580	6.4
1964	33,860	24,130	5,090	1,200	2,010	1,430	5.8
1965	33,670	25,000	4,610	1,120	1,810	1,130	5.2
1966	35,900	28,410	4,420	900	1,370	800	4.2
1967	31,110	22,090	5,680	1,160	1,500	680	5.0
1968	32,340	23,980	5,390	1,020	1,320	630	4.5
1969	32,100	23,670	5,360	1,110	1,390	570	4.6

In table 3, the distribution of unemployment by duration found in the average cross section is compared with the distribution of average spells of unemployment in 1969.

The contrast between the two duration distributions shown in table 3 is a marked one. While only 2.8 million people were unemployed in an average week of 1969, 32 million spells of unemployment occurred during the year. The distribution of completed spells is more heavily skewed toward the shorter durations than is the case in the cross-section distribution. In the latter, a little more than half of the unemployed in an average week are shown with fewer than 5 weeks of unemployment, while almost three-fourths of completed spells fall in this interval. As a result, the average duration of unemployment spells of 4.6 weeks is only six-tenths of the average duration in the cross section. The greater skewness and lower average duration of completed spells is due to the probability of leaving unemployment being inversely related to the length of unemployment. (See the appendix for detailed development of this point.)

The structure of unemployment which emerges from the data on spells is quite different from previous ideas based on the characteristics of cross-section data. Unemployment duration is much shorter on the average than had previously been thought the case. By far, the bulk of those who become unemployed experience spells of only a few weeks. These spells undoubtedly reflect,

among other things, the influx of young people in the summer, intermittent looking for work by marginal workers, and seasonal activities. These spells are not necessarily terminated by finding a job. During 1969, for example, about half of those leaving unemployment found work and the remainder left the labor force. (These proportions are inferred, under equilibrium conditions, from the known fact that people who became unemployed were drawn, in approximately equal proportions, from the employed and from those out of the labor force.) Many people look for short periods because they must go back to other duties such as attending school or keeping house. Longer spells are more likely to be terminated when jobseekers become discouraged and no longer look for work. In addition, multiple short unemployment spells are experienced by some people, which add up to a substantial amount of unemployment for them during the year, with concomitant low annual earnings.

Data on completed spells offers a variety of avenues for analysis. The rest of this article considers two: (1) implications in the distribution of unemployment for one's chances of leaving the unemployed; and (2) the behavior of spells of unemployment under changing economic conditions.

To begin, we examine the distribution of unemployment by duration under relatively stable conditions with respect to one's chances of leaving the unemployed. We call this probability the "continuation rate" and it is fully explained in the appendix. It is the probability that a person unemployed n weeks remains unemployed for an additional week. Rates for 1969 are in table 4.

In this table we find, for example, that for people who have had 5 weeks of unemployment to the reference week, almost four-fifths (78 percent) will go on to experience a sixth week, and

Table 3. Comparison of distributions of unemployment by duration, 1969

Weeks of unemployment	Average cross section	Completed spells
Total: number	2,831,000	32,100,000
percent	100.0	100.0
Under 5 weeks	57.6	73.7
5–10 weeks	22.1	16.7
11–14 weeks	7.1	3.5
15–26 weeks	8.5	4.3
27 weeks and over	4.7	1.8
Average duration	8.0 weeks	4.6 weeks

Table 4. Weekly continuation rates for 1969

Weeks of unemployment experienced up to reference week	Continuation rates
n=1	.76
2	.67
3	.72
4	.75
5	.78
6	.80
7	.82
8	.84
9	.86
Average of 10 to 14	.89
Averege of 15 and over	.92

so on. We note that continuation rates generally increase with the length of unemployment already experienced. Two separate reasons for this phenomenon may be offered, although this may not exhaust the possibilities. Since these continuation rates are calculated for all of the unemployed combined, they are undoubtedly influenced by the heterogeneity present among the unemployed in their separate chances of leaving the unemployed. For example, if we had two groups among the unemployed, each with a constant but different continuation rate, the cross-section distribution for both combined would show the continuation rate increasing with the length of unemployment.

A second possible hypothesis is that of feedback effect in which the longer a person is unemployed, the less chance he has of reemployment or of otherwise leaving the ranks of the unemployed the relative importance of these two factors may be investigated by considering the duration distributions for unemployed with very specific characteristics, such as age, sex, color, occupation family role, and so on. If each of these groups is sufficiently homogeneous, increasing continuation rates will reflect only the feedback effect. More investigation of homogeneity is needed.

Spells and the business cycle

The basic data for the next analysis is given in table 5. In this table we find, for example, that 3.51 percent of the civilian labor force was unemployed in an average week of 1969, and 21.8 percent were in their first week of unemployment.

The data are given in percentages to remove the effects of population growth and cyclical labor force changes from the corresponding numbers which might otherwise have been used. The percent of unemployed with 1 week of unemployment in the average cross section for each year is the same as the percent of unemployed in the aver-

age week who are beginning new periods of unemployment. This percent (s) was regressed on the unemployment rate (u) for the 22 years with the following results:

$$s = 33.617 - 3.140u \quad \bar{r}^2 = .882, \quad D-W = 2.33$$
$$(12.6)$$

The inverse relationship is very significant, as indicated by the high correlation coefficient and the t value of 12.6 for the coefficient of u. There is no particular serial correlation as indicated by the value of the Durbin-Watson (D-W) coefficient.

One alternate form of this equation was computed with two additional independent variables: the unemployment rate lagged 1 year, and a dummy variable equal to unity for 1967, 1968, and 1969 to pick up possible effects of a change in the labor force questionnaire in 1967. These added variables proved not to be significant. Other regression forms were not considered in the present analysis. It should be noted that changes in the age-sex-color composition (heterogeneity) of the unemployed over the postwar period may well affect this aggregate relationship. Also, since the observations are annual averages, phases of the business cycle are not well articulated in it.

Nevertheless, the aggregate relationship does give some approximate results of interest to us. First of all, increases in the unemployment rate are accompanied by declines in the percent of unemployed starting new spells, as the historical data indicate. Specifically, a one-percentage-point increase in the unemployment rate is accompanied by a three-percentage-point decline in the percent of the unemployed starting new spells. As detailed development in the appendix shows, the average duration of spells is equal to the reciprocal of the proportion with new spells (100/s). The number of spells initiated in a year is given by the product of the unemployment rate (u) and the percent of unemployed with 1 week of joblessness in the reference week. As noted, this number excludes the effects of population growth and cyclical labor force changes.

Total unemployment (u) is equal to the product of the number of new spells (us) and the average duration per spell (100/s). Consequently, small percentage changes in the unemployment rate from one period to another are approximately equal to the sum of the percent changes in the number of new spells and in the length of the average spell. Table 6 presents such percent changes for increments of 0.5 in the unemployment rate. All estimates come from the equation discussed earlier.

Table 5. Data for business cycle analysis, 1948–69

Year	Unemployment rate	Percent of unemployed in first week of unemployment in average reference week
1948	3.75	21.6
1949	5.93	16.1
1950	5.29	14.9
1951	3.31	24.3
1952	3.03	25.1
1953	2.91	26.8
1954	5.55	15.6
1955	4.39	18.4
1956	4.13	20.0
1957	4.27	17.6
1958	6.80	13.5
1959	5.47	16.0
1960	5.53	16.8
1961	6.69	14.0
1962	5.54	16.2
1963	5.67	15.7
1964	5.18	17.2
1965	4.52	19.2
1966	3.79	24.0
1967	3.85	20.1
1968	3.58	22.1
1969	3.51	21.8

It must be emphasized that these results derive from the form of the relationship specified. Until a better form of the relationship is determined, these results should be considered tentative and should be evaluated against common sense considerations. We note that at low unemployment rates (between 3.0 and 3.5), the percent of newly unemployed changes more rapidly than the average spell length. This is not inconsistent with the assumption that in a tight labor market, the ranks of the unemployed contain a higher than average proportion of people only marginally connected with the labor force who swell the unemployed for relatively short periods.

As unemployment rises (up to about 5.5 percent), the rate of increase in the length of average spells rises, but the rate of increase in new unemployment spells declines. Above an unemployment rate of 5.5 percent, the length of the average spells increases faster than the unemployment rate, with accompanying declines in the number with new spells. This may reflect the conversion of a potential series of short spells for some workers into one long spell, with some workers being discouraged enough to leave the labor force, keeping them from entering the ranks of the unemployed with new spells. It undoubtedly reflects more substantially the behavior of workers with strong

attachment to the labor force. The particular sequence in which unemployment rates change through the business cycle may also have effects on the patterns of new spells and spell duration which should be explicitly considered. In general, the changing mix of workers with various degrees of marginality at different levels of the unemployment rate, and its contribution to these results, can only be investigated through a disaggregated analysis.

Both of the brief analyses presented in the latter part of this article are intended to serve mainly as examples of what can be done with data based on or related to spells of unemployment. They are not intended to present substantial analyses in their own right.

There are many avenues of research. We plan to explore current estimates of completed spells month by month. Satisfactory estimates should be possible from the available data but their development awaits further empirical work.

Table 6. Percent of unemployed with new spells and average spell length for selected values of unemployment rates

Unemployment rate		Average duration		Unemployed with new spells	
Level	Percent change	Weeks	Percent change	Proportion	Percent change
3.0		4.13		.726	
	16.7		6.9		9.1
3.5		4.42		.792	
	14.3		7.5		6.4
4.0		4.75		.842	
	12.5		8.0		4.1
4.5		5.13		.877	
	11.1		8.8		2.2
5.0		5.58		.896	
	10.0		9.6		0.4
5.5		6.12		.899	
	9.1		10.6		−1.4
6.0		6.77		.887	
	8.3		11.9		−3.2
6.5		7.57		.859	

———APPENDIX———

We first consider unemployment in a "steady state" or equilibrium condition, in which the level of unemployment remains the same from week to week. The number of people leaving the ranks of the unemployed each week is balanced by the addition of an equal number of newly unemployed, and the distribution of the unemployed by duration (in weeks) remains constant. This assumption of a steady state in unemployment would approximately represent the years 1968 and 1969, for example, apart from seasonal change.

Three groups of unemployed

Three categories of the unemployed are separately and explicitly considered in this analysis: (1) all those with some unemployment in the reference week; (2) those who have just begun spells of unemployment in the reference week; and (3) those who have just completed spells in the reference week. These categories are not mutually exclusive, since the first category includes those in the other two categories and those with 1-week spells will be in both the second and third categories.

The first category is the only one we observe directly and for which we have the distribution by weeks of unemployment. The question is sometimes asked: How long on the average will these people remain unemployed? The answer is that in a steady state condition, their average unemployment subsequent to the reference week will be the same as their average period of unemployment thus far. That is, their average completed spell of unemployment will be twice their average period of unemployment thus far. The reasoning for this may be given in nontechnical terms. All those in the first category may be classified in subgroups by the length of their completed spells. Consider, for example, the subgroup which will ultimately complete spells exactly 14 weeks in length. Under the steady-state hypothesis, within the reference week some of these people will have just begun their spells, while others are just concluding theirs, with the remaining people in between. For this group we should therefore expect to find that on the average they have already had 7 weeks of unemployment up to the reference week.

In the same way we would expect to find that on the average, each of the other subgroups is halfway through its spells of unemployment. For all of these subgroups combined we would therefore expect to find that, on the average, they are halfway through their spells. To put it another way, the average length of completed spell for all people in the reference week will be twice the average duration up through the reference week.

If the average duration up through the reference week is 8 weeks, then we can say that these people will ultimately complete their spells with an average of 16 weeks. (These computations are subject to a small adjustment as will be noted in the examples below.) This result is summarized in the following statement:

Under equilibrium conditions, within a given week, the unemployed are halfway through their spells of unemployment on the average; thus, their average duration of completed spells will be twice the average duration of the unemployment already experienced to the given week.

This method of reasoning does not, however, tell us, for example, how many people will have 14-week spells. The number in the reference week with 7 weeks include those with 7 weeks or more in their spells, but some people who will have 14-week spells will also come from those listed with fewer than 7 weeks of unemployment in the reference week. As will become evident, there is little need to further pursue the question of the duration of unemployment spells of people in the first category. We note that people in that category have begun their spells at different times and will conclude them at different times, but they all are unemployed in the reference week. The findings for this category cannot be generalized to cover a longer reference period, such as a month.

In order to extend our analysis to cover unemployment in the other two categories, it will be helpful to work with some simple duration patterns. There is only one unemployment pattern for which the average completed spell for all people in the first category is the same as that for the people in the other two categories: when all the unemployed have exactly the same length of spell, for example 8 weeks. Consider such an equilibrium pattern with two people becoming unemployed, and two people leaving unemployment each week. The unemployment distribution in the reference week is shown in table A–1.

Table A–1. First simple duration pattern

Duration of unemployment (in weeks) to—		Number of unemployed in reference week
Middle of reference week	End of reference week	
.5	1	2
1.5	2	2
2.5	3	2
3.5	4	2
4.5	5	2
5.5	6	2
6.5	7	2
7.5	8	2
Total		16

If we make our calculations to a single point of time—for example, to the middle of the reference week (the left hand column of table A–1)—we find that the average elapsed duration of unemployment up to that time for all the unemployed is 4 weeks. But we have specified that every unemployed person will go on to experience 8 weeks of unemployment. The relationship between these two averages is therefore in accord with the general rule previously stated.

More realistic pattern

We next look at a more typical pattern of unemployment by duration in a given reference week. In a steady state, in any given reference week, more people will be shown as having 1 week of elapsed unemployment than as having 2 weeks; more will have 2 weeks than 3, and so on. In general terms, we need say only that the number with n weeks of unemployment will not exceed the number with $(n-1)$ weeks, whatever the value of n. This statement allows us to include the pattern presented in table A–1.

This generalization of the longitudinal pattern of unemployment is consistent with reality as the following argument shows. Suppose there are 100 people in the reference week with 4 weeks of unemployment. In the following week, at most, 100 people will now be shown with 5 weeks of unemployment. It is more likely that some will have withdrawn from the ranks of the unemployed for some reason, so that the number with 5 weeks of unemployment will be less than 100. That the number with 5 weeks of unemployment in the week following the reference week equals the number with 5 weeks of unemployment in the reference week is an essential characteristic of the steady-state distribution, which has the same duration pattern from week to week. Table A–2 shows how this pattern keeps regenerating itself in the case of this second simple duration pattern.

Each week five new people become unemployed. Four of these will continue to remain unemployed for a second week. Three of the four will remain unemployed for a third week, and so on. Finally, one person will remain unemployed through a fifth week and then leave. No one is unemployed

for more than 5 weeks in a spell. In this pattern (which is longitudinal in nature contrasted with the cross section or latitudinal pattern in the reference week), we follow a particular group or cohort from 1 week to the next as indicated by the diagonal arrows. Any cohort followed in this way for 5 weeks will have the same duration distribution as in the cross section in a single week. As already noted, in a steady state, the cross-section and longitudinal distributions are identical.

To compute the desired average durations we can go through a simple arithmetic exercise. If we take as our reference point the middle of the week (see left hand column of table A–2), then the average elapsed duration in the cross-section distribution is 1⅝ weeks for the 15 unemployed people. If we take the first cohort of five people with 1 elapsed week to the end of the reference week, then the average subsequent unemployment for this group from the middle of the reference week to the end of their respective spells is 2½ weeks. Of these five people, one drops out after 1 week, so he has an additional duration of ½ week. Another drops out at the end of the following week with a total additional duration of 1½ weeks, and so on. In the same way we follow the second cohort of four people and find that their average additional duration of unemployment is 2 weeks. Similar calculations for the remaining three original cohorts yield average additional durations of 1½, 1, and ½ weeks, respectively. The average additional duration for all five cohorts combined is 1⅝ weeks—the same as the cross-section duration, confirming the rule stated earlier. The final average length of completed spell for all of those with unemployment in a selected reference week (the first category) is twice this number or 3⅓ weeks.

Table A–3 shows how we obtain the duration distribution of completed spells for those who are leaving unemployment in the reference week or for those who enter unemployment.

The preceding discussion shows that we can use the cross-section pattern in a single week to deduce the experience of a group of unemployed persons from the time they become unemployed to the end of their spells. By taking first differences in the cross-section distribution (second column from left) we get the number who leave unemployment by the length of their completed spells whether begun or ended in the reference week.

In a steady state condition, the pattern of completed spells for those who enter unemployment at the same time is the same as for those who leave unemployment at the same time.

Table A–2. Second simple duration pattern

Duration of unemployment (in weeks) to—		Number of unemployed in reference week				
Middle of reference week	End of reference week	Week 1	Week 2	Week 3	Week 4	Week 5
0.5	1	5	5	5	5	5
1.5	2	4	4	4	4	4
2.5	3	3	3	3	3	3
3.5	4	2	2	2	2	2
4.5	5	1	1	1	1	1
Total		15	15	15	15	15

Because our specified cross-section distribution includes individuals with different lengths of completed spells, we find in table A–3 that the cross section of unemployment by duration differs from the pattern of spells that will occur for all persons with some unemployment, and from the pattern for people entering or leaving unemployment.

Continuation rates

Before we examine actual cross-section duration distributions of the unemployed, it will be helpful to develop some additional properties of steady-state distributions. We start with a concept already familiar in actuarial and demographic analysis (the "survival rate") which is designated here as the "continuation rate." For our purposes, the continuation rate (r_n) is the proportion of people unemployed n weeks who continue to remain unemployed for the $n+1st$ week. Clearly r_n must fall somewhere between zero and unity and may change as n changes, or remain constant. In a steady-state distribution, the value of r_n for a specified value of n does not change from 1 reference week to another. Consider the continuation rates associated with the two simple distributions we have already discussed. (See table A–4).

Apart from the fact that r_n falls between zero and unity, there is no other requirement it must satisfy, other than that a value of zero ends the pattern. We reject the case in which r_n is constant and equal to unity, since this gives us a distribution with infinite average duration, and no movement out of the unemployed. However, we admit consideration of duration patterns with

Table A-3. Second simple duration pattern by cross section and completed spells of unemployment

Duration of unemployment (weeks)	Cross section (number of unemployed in reference week)	Distribution by completed spells		
		All persons with some unemployment	Persons beginning spells	Persons ending spells
1	5	1	1	1
2	4	2	1	1
3	3	3	1	1
4	2	4	1	1
5	1	5	1	1
Total	15 (people)	15 (people)	5 (spells)	5 (spells)
Average durations	1⅗ (to middle of reference week)	3⅓	3 (to end of spell)	3

infinite and reasonable averages which may be represented by mathematical functions which theoretically allow durations of infinite length. This situation is the same as in ordinary statistical practice when we assume that variables may be represented by a normal distribution, which has infinite tails to the left and to the right.

In order to understand the characteristics of actual data, we shall need some additional insights into completed spell distributions.

In a steady-state condition, with a constant continuation rate (less than unity), the cross-section distribution pattern to end of the reference week is the same as the pattern of completed spells for those either beginning or ending their spells at the same time.

The reasoning behind this statement is as follows. Let u_1 represent the number of people in the cross-section distribution with 1 week of completed unemployment; u_2, those with 2 weeks; and u_n, those with n weeks. Thus, u_2 also represents that part of the u_1 who go on to have a second week of unemployment, and so on. If r=constant continuation rate, then by definition, $u_2 \div u_1 = r = \ldots = u_{n+1} \div u_n$ whatever the value of n. Consequently, $u_2 = ru_1, \ldots, u_{n+1} = ru_n$ whatever the value of n. The number of unemployed in the reference week who complete a spell of 1 week is $u_1 - u_2 = u_1 (1-r)$. Similarly, the number who complete spells of n weeks is $u_n - u_{n+1} = u_n (1-r)$. The two distributions may be set down together as follows:

Weeks of unemployment	*Cross-section distribution*	*Completed spell distribution*
1	u_1	$u_1 (1-r)$
2	u_2	$u_2 (1-r)$
...	...	...
n	u_n	$u_n (1-r)$

It is apparent that, apart from a constant, (1−r), the two distributions are the same, and they will consequently have the same distributions and the same averages. But only in the case of a constant continuation rate will the two patterns coincide.

A critical difference between distributions by duration of unemployment for all unemployed persons and for those beginning or ending their unemployment spells must be noted. As already indicated, the results for persons in the first category cannot be aggregated or averaged over various time periods easily, but those for the other two categories can. For example, spells begun (or concluded) in 1 week do not overlap information for spells begun (or ended) in any other week. An answer to the rather imprecise question of what is the character of unemployment spells in a year can be provided by taking all those with some unemployment in the first week of the year and all those beginning unemployment in the other 51 weeks of the year, in order to develop unduplicated averages or aggregates for the year. The characteristics developed in this way would approximate the spells for those becoming unemployed in the average reference week of the year. If the question were stated in terms of all the spells begun or ended during the year, it could be answered directly in terms of the data for those beginning or ending unemployment in the reference week.

Other general characteristics

Two additional general statements which are needed for our use can be made for any duration distribution:

The number of new spells of unemployment in any period is the sum of the number of people in each week in the period identified as having completed 1 week of unemployment.

In a steady-state distribution, the average duration of completed spells is equal to the ratio of the total number of unemployed in the reference week to the number with 1 week of unemployment.

This last statement is confirmed by a simple algebraic formulation. Let u_n be the number of people in the cross-section distribution with n completed weeks of unemployment through the end of the reference week. Let u_1=the number with 1 week and u=total number of unemployed in the reference week. Then $u = \sum_{n=1} u_n$. The number

of people who complete spells n weeks in length is

$$u_n - u_{n+1} \text{ for all values of } n.$$

Consequently, the average spell duration is the sum of the number of spells weighted by the length of spell divided by the total number of spells.

$$\text{Average duration} = \sum_{n=1} \frac{n(u_n - u_{n+1})}{u_1}$$

Expand the numerator in term by term detail:

$$\sum_{n=1} n(u_n - u_{n+1}) = u_1 - u_2 + 2(u_2 - u_3) + 3(u_3 - u_4) + \ldots$$
$$= u_1 + u_2 + u_3 + \ldots = u,$$

Thus the average spell duration $= u \div u_1$.

Test this method on the two sample duration distributions we have examined in tables A–1 and A–2. For the first one, $u=16$, and $u_1=2$, so the average duration of completed spells is $16/2=8$ weeks. For the second one, $u=15$, and $u_1=5$, so the average duration of completed spells is $15/5=3$ weeks. In the special case of a distribution with a constant continuation rate (r), the average duration of completed spell is $1/(1-r)$ which is also the average duration through the end of the reference week of the cross-section distribution.

Applications to data

Before we can apply the findings developed so far to actual household survey data, we must emphasize one particular point: some of these results apply most accurately to steady state distributions. In the real world, as unemployment grows or declines or changes in distribution by duration, these properties may hold less precisely. For example, 4 weeks after there are heavy layoffs, we may find that the number of people with 4 weeks of unemployment is greater than the number with 3 weeks in a given cross-section distribution. In a steady state distribution this result is impossible. On the other hand, in the corresponding longitudinal distribution by duration after the layoffs, the number with 4 weeks of unemployment will be no greater than the number in the preceding week with 3 weeks of unemployment. The cross-section and longitudinal distributions may thus be temporarily different from each other. Similarly, the completed spell distribution for those starting new spells may well look different for a time from that for people concluding spells. Finally, the average duration of completed spell for those in the first category may be temporarily less than or more than twice the average in a given cross-section distribution. However, in the process of aggregating or averaging to annual levels, these short-term anomalies are smoothed away, so that in this article it was legitimate to consider the average cross-section distribution for the year as equivalent to a longitudinal distribution, and to derive the corresponding distributions of completed spells by duration.

The methodology for obtaining completed spell distributions may also be used for estimating these distributions month by month from the household survey data to show how they change in response to economic and other influences.

The balance of this appendix is confined to description of the procedure for estimating the distribution by duration of completed spell for 1969. Cross-section distributions by duration are ordinarily published within the class intervals shown in table 1. Unpublished data are available for a few categories of unemployed for single weeks of duration. However, this detailed frequency pattern reveals that: (1) some biases are present in the recall of the first several weeks of unemployment, and possibly elsewhere; and (2) frequencies tend to bunch up at durations which are multiples of a month; that is, quarters and half years. It was therefore deemed advisable to attempt to fit smooth mathematical functions to the data within the published class intervals to derive the estimates of the completed spell distributions. A major indication of the erratic nature of some of the frequencies lay in the variation of continuation rates above unity, and in wide fluctuations in adjacent values of the continuation rates.

No single mathematical curve appeared to fit all of the intervals simultaneously. On the other hand, reasonable results were obtained by fitting curves to two or three adjacent intervals at a time. A logarithmic normal curve was fitted to the data for the two bottom intervals and used to estimate the number with unemployment of 1, 2, 3, or 4 weeks. The top two intervals were fitted with an exponential function that was used to estimate the number of people with 27 weeks of unemployment. Treating the bottom three intervals together, we

fitted a mixed exponential (a weighted sum of two exponentials) to estimate the number of persons unemployed 5 weeks, 11 weeks, and 15 weeks, respectively.

At this point two additional general statements must be made to help us in our computations and in our understanding of the results.

In a steady state distribution, the number of spells involving from m to n weeks of unemployment is equal to the number of unemployed persons in the cross-section distribution with m weeks of unemployment minus the number with n + 1 weeks.

The reasoning here is similar to that employed before in deriving the simple estimate for the average duration of completed spells. As already indicated, the number of people in the cross-section who complete spells of exactly n weeks in length is $u_n - u_{n+1}$, where u_n is the number of people with n elapsed weeks of unemployment through the reference week. The number of persons with completed spells of from m weeks through n weeks is therefore $(u_n - u_{m+1}) + (u_{m+1} - u_{m+2}) + \ldots + (u_n - u_{n+1}) = u_m - u_{n+1}$.

In a steady state distribution, if the duration pattern has an increasing (decreasing) set of continuation rates associated with increasing weeks of duration, then the average duration of completed spell will be less than (more than) the average duration in the cross-section duration distribution.

In other words, if the likelihood of a person continuing to be unemployed increases the longer he is unemployed, then the average duration of completed spells will be less than the average duration found during the reference week. The opposite is true when he is less likely to continue to be unemployed the longer he has been unemployed.

Increasing continuation rates will yield relatively higher frequencies of spells at the lower end of the distribution than for a distribution with constant continuation rates, while a distribution with constant continuation rates will have relatively higher frequencies at the lower end than a distribution with declining continuation rates. In each of these two comparisons, the distribution with the greater weight at the lower end will clearly have a lower average duration than the other. Since the constant continuation rate distribution has the same average for completed spells as for the cross-section, the results follow.

Table 4 of the article shows that continuation rates generally increase with the length of unemployment. Possible explanations for this pattern have already been given. In accord with the general rule just stated, we expect in this situation that the completed spell distribution would have a smaller average duration than the cross-section distribution.

Table A–4. Continuation rates applicable to patterns in tables A–1 and A–2

Duration of unemployment to end of reference week (in weeks)	Continuation rates	
	Table A–1	Table A–2
1	1.00	0.80
2	1.00	0.75
3	1.00	0.67
4	1.00	0.50
5	1.00	0
6	1.00	
7	1.00	
8	0	

Since we want to derive the distribution of spells within the same intervals as for the cross-section distribution, we shall need estimates of the numbers of people in the cross section with the following specified weeks of unemployment, in accord with the estimating procedure described earlier: u_1, u_5, u_{11}, u_{15}, and u_{27}.

The derived estimates are generally satisfactory, although they are undoubtedly susceptible to improvement. Other mathematical functions might also be considered in the curve-fitting process. The estimation of the number of people with 1 week of unemployment was particularly critical and difficult. The logarithmic normal fit gave results which were closest to the actual data in the bottom interval for individual weeks and gave acceptable estimates for the continuation rates. Nevertheless, the estimated total number of spells in each of the years may be subject to an estimating error of 5 percent or more. This margin of error also will be present in the duration of average spell because of their direct connection. Estimates for the rest of the duration distributions should be reasonably good otherwise.

An excellent single reference is D. J. Bartholomew, *Stochastic Processes in the Social Sciences* (New York, John Wiley and Sons, 1967), which also has an extensive bibliography. Two other references are R. F. Fowler, *Duration of Unemployment on the Register of Wholly Unemployed* (London, H. M. Stationery Office, 1968), and B. Craig, *Development of Manpower Statistics* (Paris, Organization of Economic Cooperation and Development, 1969). □

Black and white unemployment: the dynamics of the differential

New analysis adds support to beliefs that blacks fare better in prosperity than in other phases of business cycle

CURTIS L. GILROY

THE WIDELY ACCEPTED VIEW in the economic literature is that the unemployment situation of black workers improves relative to that of whites when the demand for labor is strong and deteriorates vis-a-vis whites when the demand for labor slackens. Yet, observed changes in the ratio of black-to-white unemployment rates—roughly 2-to-1 throughout most of the post-World War II period—suggest that the unemployment situation of blacks improves compared with that of whites when the demand for labor slackens and deteriorates when the demand for labor is strong. Why is it that changes in the ratio of black-to-white unemployment rates appear to run counter to the generally accepted view? Can the apparent contradiction be reconciled?

In attempting to analyze the disproportionate share of unemployment experienced by black workers [1] and to compare changes in unemployment among blacks and whites, most analysts use the *ratio* of black-to-white unemployment rates which will be called the *relative unemployment differential,*[2] following the terminology used in the literature. Others have focused on the *difference* between the rates which is called the *absolute unemployment differential.* This article introduces another measure—ratio of the *percentage-point changes* in the unemployment rates of blacks and whites—which is termed the *incremental ratio.* Because no single statistical measure can be expected to tell the whole story, the incremental ratio can be used in concert with existing measures in describing the relative incidence of black and white unemployment. Its main contribution is to enable the analyst to describe more accurately the changing unemployment burden of the two groups during the business cycle.[3]

No attempt will be made in this paper to describe the employment situation of black workers, which is well documented; [4] nor will an attempt be made to investigate the causes of excessive black unemployment.[5] Rather, this paper, while emphasizing the usefulness of the two popular measures of black and white unemployment differences and exploring some inconsistencies between and limitations in them, seeks to demonstrate that the incremental ratio is preferable in comparisons of *changes* in the incidence of black and white joblessness over the business cycle. In particular, this study will use the incremental ratio to support the hypothesis that blacks are affected more (proportionate to their numbers) than whites by changes in the demand for labor.

The measures

In comparing unemployment of black and white workers, it is concluded that blacks experience a disproportionate share of unemployment if the relative unemployment differential (B/W) is greater than 1.00 and the absolute differential between the rates (B–W) is positive.

Neither of these popular measures is completely satisfactory by itself, however, in measuring *changes* in the incidence of unemployment. A comparison of the relative differential at two points in time can easily create a false impression if it measures changes in unemployment rates with widely divergent bases. On the other hand, a comparison of the absolute differentials in rates does not describe the *relative change* in unemployment attributable to each group. The problems in both measures may be demonstrated as follows: Consider, for example, a situation in which blacks and whites have initial unemployment rates of 8.0 and 4.0 percent, respectively. If both

Curtis L. Gilroy is a labor economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics. Roberta V. McKay, an economist in the same division, assisted in the preparation of this article.

From the *Review* of February 1974

rates decrease by the same absolute amount, say 2 percentage points, the *relative* unemployment differential would rise from 2.0 to 3.0, while the *absolute* differential in the rates would remain at 4.0 percentage points. If both the white and black rates were halved (whites from 4.0 to 2.0 and blacks from 8.0 to 4.0) the relative differential would remain unchanged at 2.0 and the absolute differential would decline from 4.0 to 2.0 percentage points. Finally, if the white rate were reduced from 4 to 1 percent and the black rate from 8 to 4 percent, the relative differential would increase from 2.0 to 4.0 while the absolute differential would fall from 4.0 to 3.0 percentage points. The policy implications emanating from this last example are somewhat unclear. Short of out-and-out equality of black and white unemployment rates, there is a question as to whether blacks are better off, in that they experienced a greater decline in their rate vis-a-vis whites, or worse off, in that their relative position deteriorated.

The question therefore remains: Which measure is the more appropriate? Many analysts, in relying on the relative differential, have pointed to a relative improvement in the black employment situation whenever the differential decreased. Other writers argue that the situation may not have improved at all and insist that what is important is not so much that blacks have higher unemployment rates but whether an increase affects them more adversely than whites, say from the peak of a business cycle to its trough.[6]

A comparison of the relative differential in rates in two distinct periods—denoted by $(B/W)_{t_1}$ and $(B/W)_{t_2}$—is useful but its usefulness is limited to a comparison of those periods when economic conditions are similar. It is informative, for example, as a measure of long-term changes between two periods with *similar* overall unemployment rates. The relative differential in rates is most appropriate in measuring relative unemployment burdens of blacks and whites at a point in time. The absolute differential between rates—$(B_{t_1} - W_{t_1})$ or $(B_{t_2} - W_{t_2})$—implies the correct unemployment relationship between time periods, but it does not go far enough. To gauge more precise relative changes in unemployment another measure is desirable—the incremental ratio.

The incremental ratio

The incremental ratio incorporates the favorable aspects of the relative and the absolute differentials. It does not show the change in *relative* unemployment rates but rather depicts the absolute change in unemployment rates and expresses it in *relative* terms; that is, $(B_{t_2} - B_{t_1}) / (W_{t_2} - W_{t_1}) = \triangle B/\triangle W$. The prime advantage of the incremental ratio is that it takes into account the widely different bases from which were measured the changes in the rates in percent terms. For example, it shows that during the 1970–71 recession, proportionate to their share of the labor force, 14 persons were added to the already high unemployment rolls of blacks for every 10 that were added to the unemployment of whites—$\triangle B / \triangle W = (6.3 - 9.2) / (3.3 - 5.4) = 1.4$. (See table 1.)

Let us translate this incremental ratio into numbers of unemployed people. Assuming that the sizes of the black and white labor forces were 1,000 and 10,000 respectively (blacks make up, in fact, about 10 percent of the labor force), the number of unemployed blacks would increase from 63 to 92, whereas the number of jobless whites would rise from 330 to 540. Thus, on a per-thousand basis, the unemployment rolls of blacks increased by 29 workers over the last recession; that for whites by only 21 workers.

By contrast, a comparison of the relative unemployment differential over that period shows an *improvement* in the black unemployment situation as the black-white ratio declined from 1.91 at the peak of the business cycle to 1.70 at its trough. This occurred because the percentage increase in the unemployment rate for whites exceeded that for blacks. The decline in the ratio is misleading, however, because it does not account for the greater increase, proportionately, in unemployment among blacks than whites. Blacks are then worse off relative to whites even though the relative differential decreased.

If, during the prosperity phase of the cycle, black unemployment fell from 9.2 to 6.3 percent and that for whites dropped from 5.4 to 3.3 percent, the relative differential would rise. Looking solely at changes in the relative differential, one could argue that the economy should be in a continuing state of recession to allow the relative differential to fall to the ideal of 1.00. On the other hand, the incremental ratio of 1.4 would indicate that blacks experienced a greater decrease in unemployment (proportionate to the size of their labor force) than their white counterparts during the cyclical upswing.

The apparent inconsistency in the measures disappears, however, *when the incremental ratio takes on a value greater than the initial value of the rela-*

tive differential. For example, during the expansionary phase of the 1960's, black unemployment fell from 12.4 to 6.3 percent while white joblessness declined from 6.1 to 3.3 percent (table 1). The incremental ratio was 2.2, and the relative differential declined from 2.03 to 1.91. In this case the value of the incremental ratio (2.2) exceeded that of the initial relative differential (2.03). To clarify its meaning, then, if the incremental ratio exceeds 1.0, the black unemployment rate is changing more than the white rate; to produce a *decline* in the relative differential over time, its value must exceed that of the initial value of the black unemployment rate divided by the white rate (B÷W typically must be greater than 2.0).

Three limitations of the incremental ratio, however, are important to consider. First, the ratio is not relevant to measuring unemployment differences at one point in time. The relative and absolute differentials in rates are most useful here. Second, the incremental ratio is inapplicable over very short periods of time when any change in a group's unemployment rate (for example, $\triangle B/\triangle W = (8\text{-}7) / (4\text{-}4) = 1/0 =$ undefined) is unlikely. Third, using the incremental ratio to measure changes in unemployment over long periods of time also may be misleading since it would tend to hide the short-run ups and downs in the economy for which it is a most useful measure.

Despite the black-white unemployment rate ratio

Table 1. Peak-to-trough and trough-to-peak changes in unemployment rates by color, by age and sex, 1954–70

Age and sex	Peak	Trough	Over-the-period change	Peak	Trough	Over-the-period change	Peak	Trough	Over-the-period change
	July 1957	April 1958		May 1960	February 1961		November 1969	November 1970	
Total, 16 years and over:									
White	3.7	6.4	2.7	4.7	6.1	1.4	3.3	5.4	2.1
Black	7.9	13.4	5.5	10.0	12.4	2.4	6.3	9.2	2.9
Incremental ratio			2.0			1.7			1.4
Both sexes, 16–19 years:									
White	10.5	14.8	4.3	12.9	15.6	2.7	10.6	15.4	4.8
Black	19.8	25.4	5.6	24.8	30.7	5.9	23.6	32.3	8.7
Incremental ratio			1.3			2.2			1.8
Men, 20 years and over:									
White	3.1	5.9	2.8	3.9	5.3	1.4	2.1	4.0	1.9
Black	7.0	13.8	6.8	9.1	11.6	2.5	3.7	6.5	2.8
Incremental ratio			2.4			1.8			1.5
Women, 20 years and over:									
White	3.7	5.9	2.2	4.3	5.7	1.4	3.4	5.1	1.7
Black	6.8	10.5	3.7	8.3	10.2	1.9	5.5	7.8	2.3
Incremental ratio			1.7			1.4			1.4
	Trough	Peak	Over-the-period change	Trough	Peak	Over-the-period change	Trough	Peak	Over-the-period change
	August 1954	July 1957		April 1958	May 1960		February 1961	February 1969	
Total, 16 years and over:									
White	5.6	3.7	−1.9	6.4	4.7	−1.7	6.1	3.3	−2.8
Black	10.3	7.9	−2.4	13.4	10.0	−3.4	12.4	6.3	−6.1
Incremental ratio			1.3			2.0			2.2
Both sexes, 16–19 years:									
White	13.2	10.5	−2.7	14.8	12.9	−1.9	15.6	10.6	−5.0
Black	16.9	19.8	−2.9	25.4	24.8	−.6	30.7	23.6	−7.1
Incremental ratio			1.1			.3			1.4
Men, 20 years and over:									
White	5.0	3.1	−1.9	5.9	3.9	−2.0	5.3	2.1	−3.2
Black	10.2	7.0	−3.2	13.8	9.1	−4.7	11.6	3.7	−7.9
Incremental ratio			1.7			2.4			2.5
Women, 20 years and over:									
White	5.2	3.7	−1.5	5.9	4.3	−1.6	5.7	3.4	−2.3
Black	9.2	6.8	−2.4	10.5	8.3	−2.2	10.2	5.5	−4.7
Incremental ratio			1.6			1.4			2.0

falling during the trough-to-peak period in the 1960's, the ratio characteristically rises in times of prosperity and falls in recessionary periods. This is evident from chart 1, which traces the ratio of the major age-sex groups over several recent business cycles. By considering only the ratio, we would be led to believe that blacks are generally better off relative to whites in cyclical downturns than they are when economic activity is strong. However, this is not the case. Blacks become worse off than their white counterparts in recessions, as the incremental ratio shows. This is supported by James Tobin, who has presented the conventional view, in his statement:

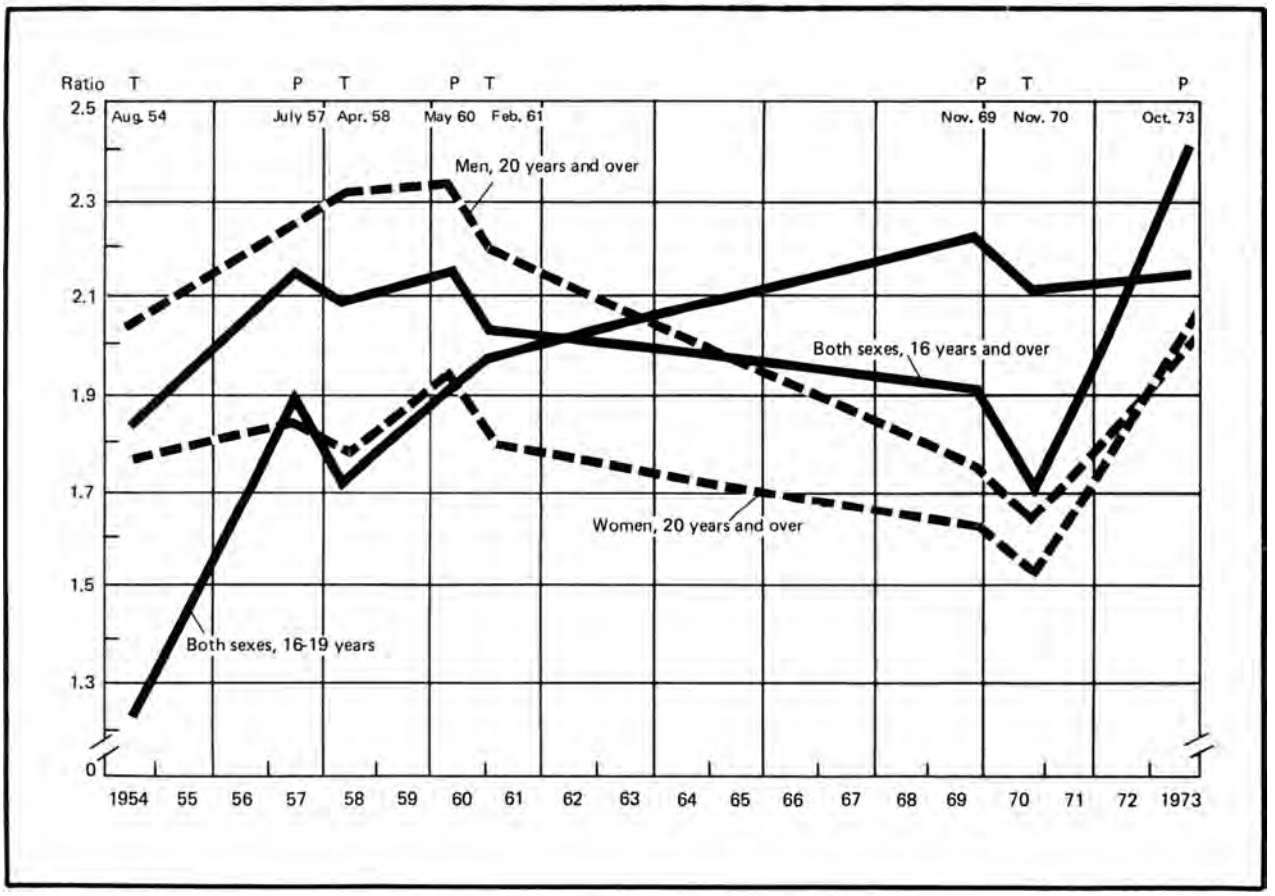
> People who stand at the end of the hiring line and the top of the lay-off list have the most to gain from a tight labor market. It is not surprising that the position of Negroes relative to that of whites improves in a tight labor market and declines in a slack market.[7]

Peak to trough; trough to peak

Characteristic of recessions is a slackening in the demand for labor; a feature of every recovery is an increase in the demand for labor services. Black workers have experienced a greater absolute increase in their unemployment rate than white workers in almost all cyclical downturns (peak-to-trough) and a greater absolute decrease in their unemployment rate than whites in the recovery periods (trough-to-peak). (See chart 2.) This differing cyclical unemployment experience of blacks relative to whites is revealed by the incremental unemployment rate ratio, which is consistently greater than 1.0.

The peak-to-trough and trough-to-peak changes in the seasonally adjusted unemployment rates for white and black workers are shown in tables 1 and 2 for selected age, occupational, and industry groups. The

Chart 1. Black-white unemployment rate ratio at peaks and troughs of business cycles, 1954–73



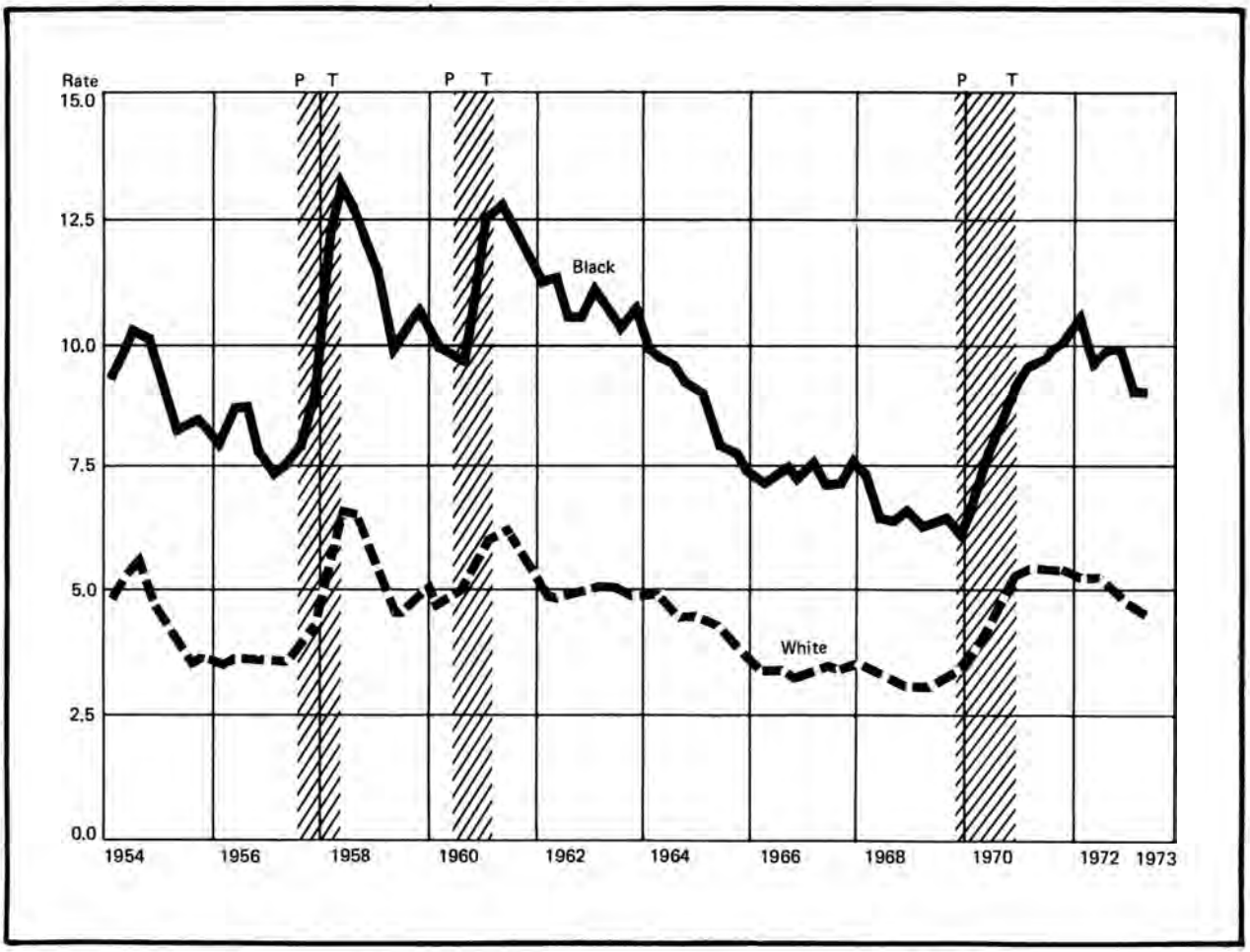
NOTE: Unemployment rates for the peaks and troughs were obtained by averaging the three seasonally adjusted monthly observations centered at each turning point of the cycle.

unemployment rates for the peaks and troughs were obtained by averaging the three monthly observations made at each turning point of the cycle.[8] Constrained by the availability of unemployment data by color for the various age groups, our observations of three peak-to-trough and trough-to-peak movements occur during 1954–73; for occupations and industries, observations covering two peak-to-trough and one trough-to-peak movements during 1959–73 are presented.[9]

The phenomenon of blacks being more adversely affected than whites by business downturns has been mitigated over the last several business cycles. For every successive peak-to-trough period, black workers have shared less of the increase in unemployment. In the 1957–58 downturn, for example, proportionate to the size of their labor force, 20 black workers were added to the unemployment totals for every 10 white workers; however, during the 1969–70 recession, only 14 blacks became jobless for every 10 white workers. (See table 1.) Moreover, proportionately more blacks than whites have left the ranks of the unemployed with each successive recovery period. During the 1954–57 recovery, 13 black workers for every 10 white workers left the unemployed ranks, while in the 1961–69 period of prosperity, there was a decrease of 22 unemployed black workers for every 10 white workers.

Among the age-sex groups, adult black men have borne the brunt of the increase in unemployment in the cyclical downturn but have also experienced proportionately more of the decline in unemployment when economic activity picked up. While adult black men and women shared about equally in the increase in unemployment in the most recent downturns—the incremental ratios are similar in size—black women

Chart 2. White and black unemployment rates, all workers, 16 years and over, 1954–73
[Seasonally adjusted quarterly averages]



do not benefit as much as black men in the upswing.

In most of the major occupational groups, the ratio was smaller in the most recent recession than in the 1960–61 downturn. (See table 2.) This indicates that black workers suffered a smaller increase in joblessness than white workers during the 1969–70 slowdown. This occurred particularly among clerical and sales workers, operatives, and service workers—those occupations in which two-thirds of the black labor force are employed.

An example of the particular usefulness of the incremental ratio arises from examining the experience of the professional and managerial occupational group. The negative sign of the incremental ratio for this group indicates that the rates for blacks and whites moved in opposite directions. In this case, not

Table 2. Peak-to-trough and trough-to-peak changes in unemployment rates by color, by selected occupation and industry groups, 1959–70

Occupation and industry	Peak	Trough	Over-the-period change	Peak	Trough	Over-the-period change	Trough	Peak	Over-the-period change
	May 1960	February 1961		November 1969	November 1970		February 1961	November 1969	
Occupation									
Professional, technical, and managerial:									
White	1.5	2.0	0.5	1.1	1.8	0.7	2.0	1.1	−0.9
Black	2.8	3.6	.8	2.1	1.4	−.7	3.6	2.1	−1.5
Incremental ratio			1.6			−1.0			1.7
Clercial and sales workers:									
White	3.6	4.6	1.0	2.7	4.3	1.6	4.6	2.7	−1.9
Black	7.5	9.8	2.3	5.6	8.4	2.8	9.8	5.6	−4.2
Incremental ratio			2.3			1.8			2.2
Craft and kindred workers:									
White	4.3	9.1	4.8	2.0	4.1	2.1	9.1	2.0	−7.1
Black	10.4	15.3	4.9	3.2	5.5	2.3	15.3	3.2	−12.2
Incremental ratio			1.0			1.1			1.7
Operatives:									
White	7.7	11.5	3.8	4.4	7.7	3.3	11.5	4.4	−7.1
Black	10.5	17.4	6.9	5.2	9.3	4.1	17.4	5.2	12.2
Incremental ratio			1.8			1.2			1.7
Nonfarm workers:									
White	11.2	19.8	8.6	7.0	10.2	3.2	19.8	7.0	−12.8
Black	13.1	20.6	7.5	6.9	11.7	4.8	20.6	6.9	−13.7
Incremental ratio			.9			1.5			1.1
Service workers:									
White	5.5	6.8	1.3	3.4	5.5	2.1	6.8	3.4	−3.4
Black	9.4	11.8	2.4	6.3	7.9	1.6	11.8	6.3	−5.5
Incremental ratio			1.8			.8			1.6
Industry									
Construction:									
White	10.9	24.0	13.1	5.4	9.2	3.8	24.0	5.4	−18.6
Black	17.2	30.1	12.9	7.1	14.1	7.0	30.1	7.1	−23.0
Incremental ratio			1.0			1.8			.7
Manufacturing:									
White	5.4	8.7	3.3	3.3	6.3	3.0	8.7	3.3	−5.4
Black	11.3	19.2	7.9	5.1	10.2	5.1	19.2	5.1	−14.1
Incremental ratio			2.4			1.7			2.6
Trade:									
White	5.3	7.3	2.0	3.3	5.3	2.0	7.3	3.3	−4.0
Black	12.1	14.3	2.2	7.0	9.1	2.1	14.3	7.0	−7.3
Incremental ratio			1.1			1.1			1.8
Services:									
White	3.8	5.7	1.9	2.9	5.0	2.1	5.7	2.9	−2.8
Black	9.1	12.8	3.7	5.9	7.6	1.7	12.8	5.9	−6.9
Incremental ratio			1.9			.8			2.5
Government:									
White	1.9	2.2	.3	1.5	1.9	.4	2.2	1.5	−.7
Black	3.6	5.6	2.0	3.9	5.2	1.3	5.6	3.9	−1.7
Incremental ratio			6.7			3.3			2.4

only did blacks experience a lower incidence of unemployment relative to whites around the bottom of the cycle, but their incidence of joblessness actually decreased in the recession while that for whites rose. This was due in large part to the increase in overall unemployment during the last recession being relatively more concentrated in the professional and technical occupations; for example, in aerospace, electronics, and other defense-related industries in which only a small proportion of black workers were employed. Throughout the period of recovery, the incremental ratios show that blacks, proportionate to the size of their labor force, experienced a greater decrease in unemployment than white workers. In each of the occupational groups, the incremental ratio was in excess of 1.0.

Patterns similar to the occupational ones exist for the major industry groups from peak to trough and the trough to peak. Although the incremental ratio was greater than 1.0, substantial decreases in the ratios occurred within manufacturing, service, and government over the last two recessions. In the recovery period, black unemployment decreased at a faster rate than white with the exception of the construction industry, where black workers became unemployed in greater relative numbers than white workers and have been less likely than whites to be rehired.

Black-white differences over time

The degree to which changes in overall economic conditions affect the unemployment rates of various labor market subgroups has been the concern of several analysts.[10] Few, however, have attempted to systematically measure the impact on the various demographic subgroups by color.[11] This section will show the impact of the business cycle on the unemployment rate of black and white workers and will measure the extent to which the jobless rates of blacks have been affected proportionately more than those for whites over time. Thirty regressions were run by the selected age-sex, occupational, and industry subgroups by color. The dependent variable (Y) was the subgroup unemployment rate by color, and the independent variables—(X_1 and X_2)—the unemployment rate of males 35–44 years old, and time, respectively.[12] By using the jobless rate of men 35–44 years old as a proxy for the changing level of economic activity, the regression equations will permit the estimation of what the unemployment rates of various subgroups would be as economic conditions change. The labor market becomes "loose" or "tight" roughly coincident with changes in aggregate demand defining the various phases of the business cycle. Quarterly data from the Current Population Survey were used covering the years 1954–73 for the age-sex groups and 1959–73 for occupations and industries. The results of the regressions appear in table 3.

All the equations show a high degree of statistical significance and demonstrate a close and positive relationship between the surrogate measure for economic change (henceforth referred to as the "prime age unemployment rate") and the incidence of unemployment among the various labor market subgroups. The extent to which a given change in the prime rate would affect the subgroup rate is substantially greater for blacks than for whites in all equations. For example, a change of one percentage point in the prime rate (X_1) results in a change in the same direction of 1.05 percentage points for adult white males but an increase of 2.26 percentage points in that for adult black males. Among both blacks and whites, the coefficients are larger—indicating greater movement in rates—for blue-collar than for white-collar workers, since the former group, which has proportionately more semiskilled and unskilled labor, is considerably more affected by changing business conditions.[13] Moreover, the coefficients of the goods-producing relative to the service-producing industries are larger, due to the faster growth of the latter and the fact that they are cyclically less sensitive.

A time variable was included in the regression equations to show the extent to which a trend could be discerned in the various unemployment rate series. Although care must be taken in interpreting the effect of the time variable because it tends to include all factors varying with time, the results of the regressions do show a worsening in the overall employment situation for both blacks and whites. The sign of the coefficient (b_2) of the time variable (X_2) is positive, which indicates that over the period 1954–73, the subgroup unemployment rates have trended upward. A significant exception was that for adult black men, whose rate has trended downward secularly. The upward trend was greatest in teenage unemployment, both among blacks and whites; the upward trend among teenage blacks was significantly greater than for all other groups and confirms the fact that much of the black unemployment problem is a youth problem as well; that is, a greater num-

Table 3. Regression results showing relationships between unemployment rates of various labor market subgroups, prime male unemployment rate, and time

Dependent variable	Color	(a)	(b_1)	(b_2)	(r_2)	(s)	D-W
Age-sex-color 1954(I)–1973(I)							
Both sexes, 16 years and over	White	.680	1.024	.019	.93	.24	1.11
		(4.96)	(32.09)	(12.84)			
	Black	2.957	1.852	.019	.89	.60	.85
		(8.68)	(23.38)	(5.31)			
Men, 20 years and over	White	.043	1.051	.007	.95	.22	1.25
		(.34)	(35.84)	(5.48)			
	Black	1.657	2.256	−.018	.94	.65	1.15
		(4.48)	(26.25)	(4.71)			
Women, 20 years and over	White	1.339	.814	.016	.87	.27	1.00
		(8.58)	(22.42)	(9.58)			
	Black	3.643	1.240	.018	.68	.77	.74
		(8.37)	(12.26)	(3.83)			
Both sexes, 16–19 years	White	4.941	1.817	.062	.72	1.02	.75
		(8.52)	(13.48)	(10.20)			
	Black	7.603	2.875	.233	.77	2.48	1.20
		(5.40)	(8.79)	(15.71)			
Occupation-color 1959(I)–1973(I)							
Professional, technical, and managerial	White	−.371	.456	.021	.76	.20	2.15
		(2.52)	(12.85)	(10.43)			
	Black	.864	.603	.008	.35	.70	1.60
		(1.63)	(4.72)	(1.11)			
Clerical and sales workers	White	.560	.774	.026	.78	.31	2.18
		(2.55)	(13.77)	(8.04)			
	Black	1.614	1.470	.048	.42	1.34	1.97
		(1.60)	(6.16)	(3.43)			
Craftsmen and kindred workers	White	−.235	1.383	.010	.56	1.11	2.07
		(.28)	(6.85)	(.86)			
	Black	1.249	2.285	−.027	.70	1.65	2.04
		(1.00)	(7.63)	(1.59)			
Operatives	White	−.007	1.881	.033	.77	.85	1.91
		(.01)	(12.15)	(3.67)			
	Black	.423	2.937	.025	.77	1.41	2.24
		(.40)	(11.46)	(1.66)			
Nonfarm laborers	White	2.255	2.466	.017	.67	2.23	2.22
		(1.23)	(5.60)	(.69)			
	Black	4.287	3.014	−0.25	.46	2.42	2.05
		(2.54)	(7.42)	(1.06)			
Service workers, excluding private household	White	1.803	.941	.019	.72	.47	1.90
		(5.04)	(10.94)	(3.91)			
	Black	5.215	1.317	−.010	.71	.88	1.47
		(7.80)	(8.19)	(1.12)			
Industry-color 1959(I)–1973(I)							
Manufacturing	White	6.445	2.482	−.118	.82	1.89	.99
		(4.52)	(7.23)	(5.95)			
	Black	.619	3.081	.006	.82	1.37	2.13
		(.60)	(12.40)	(.43)			
Construction	White	3.038	2.637	−.010	.31	3.98	2.10
		(1.01)	(3.65)	(.24)			
	Black	10.191	4.955	−.219	.52	7.44	1.44
		(1.81)	(3.66)	(2.81)			
Wholesale and retail trade	White	1.086	1.116	.026	.68	.60	2.19
		(2.40)	(10.24)	(4.22)			
	Black	3.977	2.210	.029	.60	1.53	1.57
		(3.45)	(7.96)	(1.84)			
Services, excluding private household	White	1.003	.894	.025	.73	.41	1.47
		(3.21)	(11.89)	(5.88)			
	Black	3.105	1.726	.021	.62	1.16	1.90
		(3.56)	(8.22)	(1.74)			
Government	White	.379	.388	.015	.50	.29	2.19
		(1.74)	(7.40)	(5.02)			
	Black	1.010	.726	.014	.37	.77	1.60
		(1.73)	(5.15)	(5.11)			

NOTE: t values are in parentheses.

ber of teenagers entering the labor market relative to job opportunities available to them.

During 1959–73, the trend in unemployment among the various occupational groups has been generally upward. Those downward trends that occurred for blacks in the blue-collar and service occupations, were statistically insignificant. The significant upward trends were predominant in the white-collar professions, which may partly be explained by the difficulty in securing employment for a more highly educated and trained labor force at a time when there were severe cutbacks—as in 1970–71—in the aerospace, electronics, and other defense-related industries.

Unemployment appears to have become more concentrated among the service-producing industries for both blacks and whites and less prevalent in the goods-producing sector. This may be due in part to the service-producing sector's having attracted many women and young workers who characteristically have higher unemployment rates.

The coefficient of determination (r^2) shows the extent to which the regression equations explain the variations in the unemployment rate of the subgroups. In general, a greater amount of the variation in the white than of the black subgroup unemployment rates could be explained by the regression equation.[14] The greater unexplained portion of the variation in black unemployment (in addition to greater sampling variability) is undoubtedly due to such structural factors as educational deficiencies, growth rates of various labor force subgroups, regional distribution, employment discrimination, and the like. The standard error of the estimate(s), which is a measure of how much, on the average, the actual unemployment rate deviates from that calculated from the regression equation is larger for the black regressions than those for the white.

The proposition that blacks are affected relatively more than whites by changes in the demand for labor is further substantiated by a comparison of the coefficients (b_1) of the prime male unemployment rate (X_1). Expressing these coefficients as the ratio B_{b_1}/W_{b_1} (where B and W denote the black and white coefficients), the relative change in black and white unemployment rates can be seen. This is clearly the incremental ratio. Since B_{b_1} and W_{b_1} are consistently positive, and $B_{b_1} > W_{b_1}$, the ratio is positive and greater than 1.00. (See table 4.) This means that over the long period, whenever business conditions have deteriorated, black unemployment has risen proportionately more than white; however, when conditions improved, blacks have left the ranks of the unemployed in greater relative proportions.

Table 4. A comparison of black and white coefficients of the independent variable X_1 (male prime unemployment rate)

Subgroup	Black coefficient (B_{b_1})	White coefficient (W_{b_1})	Black coefficient ÷ White coefficient (B_{b_1}/W_{b_1})
Age-sex			
Both sexes, 16 years and over	1.852	1.024	1.809
Men, 20 years and over	2.256	1.051	2.147
Women, 20 years and over	1.240	.814	1.523
Both sexes, 16–19 years	2.875	1.817	1.582
Occupation			
Professional, technical, and managerial	.603	.456	1.322
Clerical and sales workers	1.470	.744	1.899
Craftsmen and kindred workers	2.285	1.383	1.652
Operatives	2.937	1.881	1.561
Nonfarm laborers	3.014	2.466	1.222
Service workers, excluding private household	1.317	.941	1.400
Industry			
Construction	4.955	2.637	2.093
Manufacturing	3.081	2.482	1.241
Wholesale and retail trade	2.210	1.116	1.980
Services, excluding private household	1.726	.894	1.931
Government	.726	.388	1.871

SOURCE: Table 3.

WE MAY CONCLUDE from our analysis that in recovery and downturn, blacks are affected relatively more than whites by changes in the demand for labor. The differing cyclical unemployment experience of blacks relative to whites is more accurately portrayed by a measure introduced in this article—the *incremental ratio*. Utilization of this ratio of the difference between the unemployment rates of blacks and whites ($\triangle B/\triangle W$) reconciles the inconsistency in patterns which emerges when comparing black and white unemployment rates at two points in time using the traditional measures—the absolute unemployment differential (B-W) and the more popular relative unemployment differential (B/W).

A primary advantage of the incremental ratio is that it takes into account the widely different bases from which the changes in unemployment are measured. Consequently, use of the incremental ratio is desirable because it permits a fuller understanding of the dynamics of black and white unemployment over the business cycle. For example, a narrowing of the traditional ratio, which generally occurs during recessions, has created a misleading impression that blacks were less affected than whites by increases in unemployment. The incremental ratio shows, in fact, that black unemployment has risen proportionately more than that for whites during such periods; this finding was buttressed in this article by regression and variance analysis. Likewise, a widening of the differential is characteristic of recovery periods. This is also misleading because it implies that blacks become worse off than whites when the economy expands. The incremental ratio, however, shows that black unemployment has decreased proportionately more than white unemployment during such periods. □

FOOTNOTES

[1] Statistics for members of the black and other U.S. minority races—called "Negro and other races"—are used to indicate the situation for black workers. Blacks constitute 89 percent of the larger group.

[2] In a pioneering study, Harry Gilman examines the cyclical variability of the relative incidence of black and white unemployment in "The White/Non-White Unemployment Differential," in Mark Perlman, ed., *Human Resources in the Urban Economy* (Washington, D.C., Resources for the Future, Inc., 1963), pp. 75–113. See also Curtis L. Gilroy, Investment in Human Capital and the Nonwhite-White Unemployment Differential, unpublished Ph. D. dissertation, State University of New York (Binghamton), 1973.

[3] This procedure was suggested by Paul O. Flaim who utilized it in an unpublished Bureau of Labor Statistics analysis, "The Negro-White Unemployment Relationship," March 1970.

[4] See *Black Americans, a chartbook*, Bulletin 1699 (Bureau of Labor Statistics, 1971); Gloria P. Green, *Employment in Perspective: The Negro Employment Situation*, Re-

port 391 (Bureau of Labor Statistics, 1971); and *The Social and Economic Status of the Black Population in the United States, 1972, Current Population Reports*, Series P–23, No. 46 (Bureau of the Census, 1973) and similar Census reports in previous years.

[6] See, for example, Gary S. Becker, *The Economics of Discrimination* (Chicago, 1967); Harry Gilman, "Economic Discrimination and Unemployment," *American Economic Review*, December 1965, pp. 1077–1096; Ralph E. Smith and Charles C. Holt, "A Job Search-Turnover Analysis of the Black-White Unemployment Ratio," in Industrial Relations Research Association, *Proceedings of the Twenty-Third Annual Winter Meeting*, December 1970, pp. 76–86; Lester Thurow, *Poverty and Discrimination* (Washington, The Brookings Institution, 1969).

[8] Harry Gilman, for example, has dismissed the relative unemployment differential (B/W) as a desirable index, instead using the difference between white and black unemployment rates (B–W) at two points in time as the appropriate measure. See Harry J. Gilman, "The White/Non-white Unemployment Differential," p. 92.

[7] James Tobin, "Improving the Economic Status of the Negro," *Daedulus*, Fall 1965, p. 406.

[8] The cycle turning point dates used are those defined by the National Bureau of Economic Research. They are, peak-to-trough: July 1957–April 1958; May 1960–February 1961; and November 1969–November 1970.

Three-month averages were computed to smooth out inherent sampling variability (particularly among blacks because of the relatively small sample size from the Current Population Survey) and to mitigate somewhat the discrepancy which may occur between the NBER cycle turning points and the turning points in unemployment.

[9] The year 1959 was chosen because that is the year the data first became available for occupations and industries by color. The choice of 1959 as a starting date for this analysis may be questioned, however, because it is viewed by some as not a representative year in that it was sandwiched in between two recessions. In addition, a major steel strike in that year may have adversely affected the employment situation for blue-collar workers.

[10] See, for example, Paul M. Ryscavage, "Impact of Higher Unemployment of Major Labor Force Groups," *Monthly Labor Review*, March 1970, pp. 21–25; Robert A. McMillan, "What Happens When the Unemployment Rate Changes?," *Economic Review*, Federal Reserve Bank of Cleveland, June–July 1972, pp. 3–16; Vladimir Stoickov, "Increasing Structural Unemployment Re-examined," *Industrial and Labor Relations Review*, April 1966, pp. 368–376; Comment by Arthur Butler, "Identifying Structural Unemployment," and Reply by Stoickov in *Industrial and Labor Relations Review*, April 1967, pp. 441–446; and Lester Thurow, "The Changing Structure of Unemployment: An Econometric Study," *Review of Economics and Statistics*, May 1965, pp. 137–149.

[11] Barbara R. Bergman and David E. Kaun looked at detailed age groups by color in their *Structural Unemployment in the United States* (U.S. Department of Commerce, Economic Development Administration, 1967) pp. 77–81.

[12] The equation took the form $U = a + b_1X_1 + b_2X_2$ where U represents the subgroup unemployment rate; a, a constant term; b_1 and b_2, coefficients of the independent variables X_1 and X_2; and X_1 and X_2, the unemployment rate of "prime" age males 35–44 years old and time respectively. The use of the "prime" age male unemployment rate as a cyclical indicator rather than the more popular aggregate unemployment rate was to avoid having much the same variable on both sides of the equation. See Bergman and Kaun, p. 78.

[13] See Malcolm S. Cohen and William H. Gruber, "Variability by Skill in Cyclical Unemployment," *Monthly Labor Review*, August 1970, pp. 8–11.

[14] The cyclical variability of the various black and white unemployment rate series can be seen by comparing the standard deviations of the respective series. If blacks are more affected than whites by changes in the demand for labor, it will be reflected in a greater variability in their unemployment rate series through a larger standard deviation. The standard deviation, while reflecting the particular cycle amplitudes, will also include additional variability. Some of this variability is due to the fact that the black and white unemployment rates have different size bases. When the variances of two such series are to be compared, a measure of *relative* variance may be more useful because it expresses the magnitude of the variation relative to the size of the quantity that is being measured. If the absolute variability of the unemployment rate is assumed to depend in part upon the average level of unemployment, then the standard deviation as a percentage of the mean—coefficient of variation—is an appropriate measure. In all cases, the standard deviations as well as the coefficients of variation were greater for the black than for the white series.

Some of this variability will be due to sampling error. For the white series, the Current Population Survey is large enough to make the random sampling error variance small. On the other hand, the unemployment rate series for black workers rest on smaller samples for which the sampling error variance is substantially larger. Harry Gilman found that, even after adjusting for differing sample size among blacks and whites, black workers still had a greater absolute variability in their unemployment rates than whites in 64 percent of the intermediate occupational groups studied. Those occupations within which the variability was similar for both blacks and whites were the higher skilled professional jobs where blacks are relatively few in number. See Gilman, "The White/Non-White Unemployment Differential," pp. 90–92.

Quits in manufacturing: a study of their causes

The rate of voluntary separations is a good economic indicator; the reasons for quitting are changeable and derive from workers' attitudes toward the economy

PAUL A. ARMKNECHT AND JOHN F. EARLY

LABOR MOBILITY is the sine qua non for the efficient allocation of labor factors in the production process. The only reliable labor mobility data available on a continuing and current basis are those reported by the Bureau of Labor Statistics in its monthly series on labor turnover in manufacturing, particularly the rate of voluntary separations. This article undertakes to lay a foundation for the use of the series in current economic analysis and to discover the reasons for variation in the quit rate over time and among industries.

The quit rate as a cyclical indicator

In the post-World War II era, the quit rate in manufacturing has been a smooth, well-behaved series that has rather consistently led the business cycle at its peak and coincided with it at the trough. (See chart 1.) A test of its adequacy as an economic indicator by means of the methods adopted by Geoffrey H. Moore and Julius Shiskin[1] placed it on a par with the most commonly accepted indicators. Of a possible summary score of 100, the quit rate scored 71, compared with 69 and 65, respectively, for the layoffs and total accession rates. Tables 1 and 2 show the smoothness and small revisions in the quit rate which are two of the important factors contributing to its quality as an indicator. These desirable traits may arise, in part, from the fact that while the BLS labor turnover survey is based on a sample of approximately 38,000 establishments, the true size of the sample underlying the quit rate estimate is the 10.4 million workers employed in these establishments, since quit decisions are made by individual workers.

Since the beginning of the series, the quit rate has exhibited a median lead of 15 months at the business cycle peak and a median lead of 1 month at the trough. This long lead and the desirable statistical properties of the series make it a good forecaster of possible downturns in the economy.

Time series regression

The highly cyclical nature of the quit rate has already been noted, but the literature on the subject has developed a controversy over the question of whether the rate also has a trend.[2] It has been argued (1) that there is no trend in the rate, (2) that there is a decline in the rate because of nontransferability of pensions and other fringe benefits —the so-called industrial feudalism hypothesis, and (3) that there has been a decline in the quit rate because of endemic factors, such as the aging of the work force. Our study supports the view that there has been no trend.

To determine whether there has been any measurable trend in the quit rate in the past two decades, a number of time-series regression models were tested, using both quarterly and annual data. Only the final equations for the quarterly model will be presented and discussed here. A more detailed description of other hypotheses tested and of statistical difficulties that had to be overcome will be found in a forthcoming BLS staff paper. The following is the two-stage least-squares estimate of the model which explains the data best over time. All insignificant terms, including the constant, have been removed.

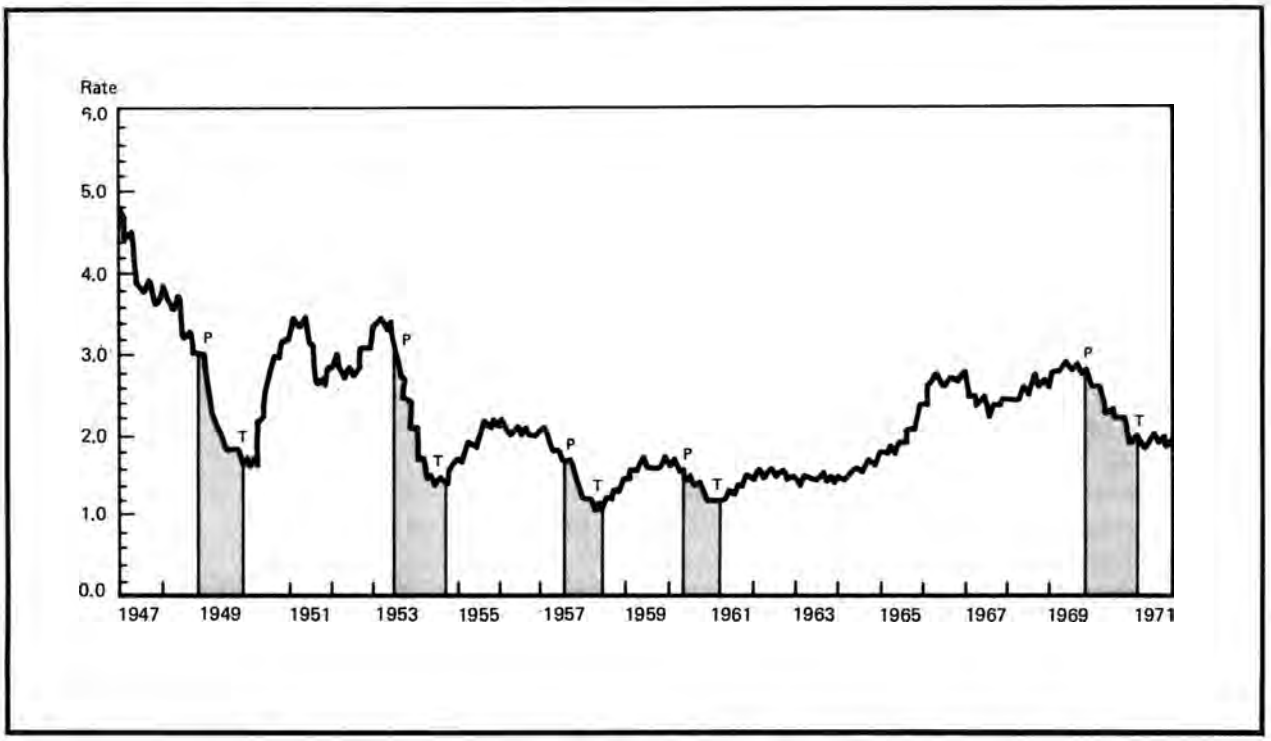
$$(1)\quad q_t = \underset{(.074)}{.238\,A(h_t)} + \underset{(.064)}{.405\,D(h_t)} + \underset{(.043)}{.310\,h_{t-1}}$$

$$R_c^2 = .763 \qquad \textit{Durbin-Watson} = 2.18$$

Paul A. Armknecht and John F. Early are economists in the Division of Industry Employment Statistics, Bureau of Labor Statistics. An earlier version of this article was presented at the meeting of the American Statistical Association in Montreal, Canada, on August 16, 1972. A more detailed study will appear in a forthcoming BLS staff paper.

From the *Review* of November 1972

Chart 1. Manufacturing quit rate, seasonally adjusted, 1947–71



NOTE: Peaks (P) and troughs (T) refer to business cycle turning points determined by the National Bureau of Economic Research.

The standard errors are contained in parentheses, and the following definitions apply:

q_t = the change in the quit rate in quarter t.

$A(h_t)$ = the positive change in the new hire rate in quarter t, zero if the change was negative.

$D(h_t)$ = the negative change in the new hire rate in quarter t, zero if the change was positive.

h_{t-i} = the change in new hires in the quarter previous to t.

The new hire rate explains the quit rate so well probably because it is a measure of the jobs available and of job security, and it seems quite likely that the more jobs there are and the more secure a worker feels the more inclined he will be to seek a better paying job. As already indicated, the constant term in this equation was not significant, which means that there was no constant change in the quit rate for the past two decades—that is, there was no trend. Our model differs from the models used by those who have found negative trends in the quit rate in at least two important ways. First, our model was statistically much more rigorous than that employed by some who used a rather impressionistic mode of analysis. Second, the new hire rate seems to be a more appropriate measure of the cyclical swings in job availability and security than were the variables used by Pencavel to remove cyclical effects. The absence of a trend in the quit rate does not mean that there have been no long term shifts in the patterns of mobility. We will, in fact, show later that there have been some rather dramatic shifts. But the absence of a trend does suggest that, on the average, the manufacturing worker is no more or less mobile in seeking new employment than he was in the years immediately following World War II.

It will be noted that for the current quarter the effects of the new hire rate have been divided into two parts—the increases, or "absorption," and the decreases, or "disabsorption."[3] There appears to be a distinct asymmetry of behavior here. A decline in hiring during the current quarter will depress the propensity to quit by 70 percent more than a similar expansion in hiring would have increased it. In short, the manufacturing worker is very cautious and can have his confidence shaken much more readily than restored. Such behavior helps explain the difference

in the leading behavior of the quit rate at business cycle peaks and troughs.

One other hypothesis that we wanted to test was whether there was an additional, forward-looking attitudinal factor in the determination of the quit rate. It was our hypothesis that the workers' decisions to quit were based not only on recent hiring practices, but also on their views of the future, which might depart from past experience. We further hypothesized that this future expectation about the condition of the labor market would also be closely tied with the workers' consumption plans. As a result we expected two things: that the quit rate and the savings rate should be positively correlated; and that, even after the removal of current and past hiring effects, there should remain an unexplained portion of variation in the quit rate that would correlate positively with the growth of aggregate economic activity in the following quarter.

Our first test found a significant positive correlation between the savings ratio and the quit rate. The second resulted in the following equation, where $G(Y_{t+1})$ is the rate of growth of the real Gross National Product in the next quarter:

$$(2)\quad q_t = \underset{(.077)}{.160\,A(h_t)} + \underset{(.062)}{.424\,D(h_t)} + \underset{(.042)}{.292\,h_{t-1}} + \underset{(.007)}{.019\,G(Y_{t+1})}$$

$$R_c^2 = .781 \qquad \textit{Durbin-Watson} = 2.11$$

Equation 2 preserves the essential characteristics of equation 1. The $G(Y_{t+1})$ term has a significant positive coefficient, indicating the presence of a forward-looking attitude on the part of workers in their quit decisions. The only difference between equations 1 and 2 is the spread between the absorption and disabsorption coefficients for new hires. This increase further emphasizes the cautious nature of the American manufacturing worker. When future expectations are indirectly entered into the equation, it becomes even more difficult to restore lost confidence unless expectations for future growth reinforce current improvements.

Table 1. Labor turnover economic indicators, 1955–71

Measure	Quits	Layoffs	Accessions	New hires
Average percent change:				
Original series	18.61	15.20	16.59	19.23
Seasonal factors	18.02	12.87	16.61	19.24
Seasonally adjusted series	3.87	8.09	4.18	4.27
Irregulars	3.41	6.94	3.72	3.48
Trend-cycle	1.86	2.62	1.16	2.14
Irregular/trend-cycle ratio	1.83	2.65	3.21	1.63
Number of months of cyclical dominance (MCD)	2	3	4	2

NOTE: These statistics for the layoff and accession rates differ slightly from those published by the Bureau of the Census in Business Conditions Digest since seasonal adjustment methods used by the bureaus differ.

Table 2. Labor turnover rate revisions, 1966–69

Change	Total accessions	New hires	Quits	Layoffs
Average monthly change	0.8	0.7	0.5	0.3
Average monthly revision	.1	.1	(1)	.1
Percent revision to change	11.9	9.0	9.0	27.2

[1] Less than .05.

Cross-section regression

As noted above, changes in the quit rate over time seem to be largely caused by changes in economic factors as well as expectations about future changes. But there still remain questions about the causes of the variations in quit rate behavior among industries. One should certainly expect low-paying industries to experience higher quit rates since their employees are most likely to find higher paying jobs and have less to lose by quitting. Industries that are hiring large numbers of new employees may experience higher quit rates since workers will be less concerned about job security. Highly seasonal industries may offer lower job security, attract the casual worker, and, as a result, show a higher proportion of quits.

In addition to the characteristics of the industry, characteristics of the workers may also contribute to quit behavior. Women, for instance, may either exhibit a casual attachment to the labor force and thus have low opportunity costs associated with high quit propensities, or they may believe that they will face discrimination in hiring and thus be reluctant to quit. Production workers, who are generally affected more than other workers by seasonal and cyclical changes in the economy, may exhibit greater propensities to quit since the nature of their work is marked by such problems as work hazards, lack of opportunity for promotion, poor supervision, and low wages, all of which weigh more heavily in their evaluation of their jobs. On the other hand, it may be true that the lower education of the production worker may impede his mobility by reducing his knowledge of the market.

Procedure. To test these hypotheses we ran ordinary least-squares regressions for each year from 1959 through 1971, using annual averages for the 94 industry groups in manufacturing for which the Bureau of Labor Statistics publishes labor turnover data. The model we used regressed the quit rate for each industry (Q) on the average hourly earnings of production workers (E), the ratio of production workers to all employees (P), the amplitude of the seasonal factors for employment (S),[4] the net new hire rate—calculated as the difference between the quit and new hire rates—(H_n), and the ratio of women to all employees (W) for that industry. An equation was estimated for each year, using index forms of the data with the manufacturing average for that year as the base to remove secular trends from some of the data. The final regression coefficients were transformed to beta coefficients. This transformation was made for the purpose of allowing for differences in variation among the variables. (See table 3.) Those coefficients which are not significantly different from zero are in parentheses. With these transformations of the data it was possible to establish the importance and direction of each variable in determining the interindustry variation in quit behavior. It is interesting to note that for 1960 the results we obtained were very similar to those obtained by Pencavel using a somewhat different model.[5]

Findings. The results substantiate our qualitative assessments of the relationship between quits and the explanatory causes, even down to the indeterminacy of the role of women and production workers in overall quit behavior. By far the most important factor determining interindustry variations in voluntary separations is the relative level of earnings. Next in order of importance are relative net hires, followed closely by the relative proportion of female employment. Finally, in the latter years of the decade, the relative proportion of production workers proved to be significant, while variations in seasonality were of minimal significance in all but a few key years.

Table 3. Beta coefficients for variables in cross sectional analysis, 1959–71

Year	E	P	S	H_n	W
1959	-0.579	(0.048)	0.143	0.371	(0.114)
1960	- .559	(.030)	(.026)	.394	.249
1961	- .452	(.026)	(.040)	.422	.272
1962	- .602	(- .011)	(.000)	.408	.172
1963	- .695	(- .016)	(.054)	.364	(.056)
1964	- .788	(- .005)	(.041)	.386	(- .075)
1965	- .856	(.100)	(.074)	.301	- .219
1966	- .874	.209	.116	.298	- .287
1967	- .844	.192	(.046)	.300	- .197
1968	- .911	.180	.127	.184	- .234
1969	- .943	.149	.121	.253	- .229
1970	- .914	.164	(.165)	.224	- .188
1971	- .904	.164	(.110)	(.126)	- .289

NOTE: The variables in this table are: E=average hourly earnings of production workers; P=ratio of production workers to all employees; S=seasonal amplitude; H=net new hire rate; W=ratio of women to all employees.
Numbers in parentheses indicate insignificant coefficients.

Earnings versus security

Pecuniary motivations cause relatively high levels of voluntary separations in low paying industries. Skill requirements in such jobs are generally low. Such positions are readily available to new or inexperienced workers, only to be vacated as soon as the workers develop some skill and become aware of other job opportunities. In high paying industries, voluntary turnover is lower because of the low probability of obtaining a better paying job.

The earnings variable may also reflect other related market phenomena. For example, industries with relatively low wage levels may be highly competitive, labor-intensive industries where cost conscious entrepreneurs have minimal regard for human capital. In such situations poor working conditions reflected in the low levels of earnings may also explain quit behavior. On the other hand, industries with higher wage levels may be highly unionized, in which case unionization may be a contributor to the higher earnings level as well as better working conditions. In addition, the greater importance of human capital in these latter industries may give management a stake in reducing turnover.

Earnings differentials may reflect, in part, skill and age differentials among industries. However, when variables for occupational and age differences among industries were introduced by Pencavel, the results were highly insignificant. Such industry occupational and age composition items are only available from the decennial census and could, of course, have changed substantially during the 1960's.

An examination of the coefficients for earnings in table 3 reveals that this pecuniary factor has become an increasingly important one in determining interindustry variations in quits. With the exception of periods of economic recession in the manufacturing sector (1960–61, 1967, and 1970–71), there has been a steady progression in the importance of this variable over the decade of the 1960's. The slight decline in relative importance for this factor in times of

business cycle downswings reflects the shift in importance from wage betterment to job security motivations.

The job security factor itself tends to show a gradual decline over the decade as net new hires become a less important variable, although this trend is also interrupted during periods of cyclical downturns. The shifts in degree of importance between the pecuniary and job security factors over the years tested, point out the counterbalancing relationship of these two factors in workers' motivations to leave their jobs voluntarily.

In analyzing these two trends, one must remember that the years studied are the only postwar period characterized by prolonged economic growth. Therefore, the increasing importance of pecuniary factors and the decreasing importance of job security may have been influenced to a degree by this extended period of growth. To some extent, the expansion of industrial centers from urban to suburban areas resulting in extended labor market areas has probably increased the worker's knowledge of opportunities within the market. Increasing educational attainment and mass communication also may have increased the information reaching the worker. Such information makes the jobholder's behavior more consistent with the neoclassical concept of "economic man" trying to increase his earnings and consumption power under the constraint of his pains for laboring.

Women workers

In the manufacturing sector women tend to have higher quit rates than men, partially owing to the fact that industries with a high proportion of women employees are also among the lower paying ones. Hence, part of the reason for differences in quit propensities between the sexes is the concentration of women in lower paying jobs. Our model, however, takes account of earnings differentials, so that it can measure more accurately the true effect of women's employment as a factor in determining variations in quits among industries. Considering the beta coefficients shown in table 3, one can see that the role women play in determining quit propensities underwent a drastic reversal during the last decade. From 1960 to 1962 the proportion of women employed in an industry was a significant factor directly affecting the frequency of quits. As the relative proportion of women increased so did the quit rate. In the next 2 years their effect was not significant, but the direction of the relationship changed. In 1965, the proportion of female workers again became a significant factor, but the relationship with quits was inverse. As the relative proportion of women workers among industries increased, the quit rate decreased.

There were several important undercurrents in the labor market during the last half of the 1960's which could account for this reversal. The manufacturing labor market became very tight. This in part was due to the Vietnam war buildup, which increased the demand for war related goods, generated more income which increased demand for consumer goods, and produced a manpower shortage arising from the increased manpower needs in the military services. As a result, there was a large influx of women into the labor force. In addition, demographic factors may have had their effect as there was evidence of a slight "marriage squeeze" in 1963 and a more drastic one beginning in 1966.[6] This would also account for the rapid increase in labor force participation among women as well as declines in labor force withdrawal for reasons related to marriage.

Social, cultural, and technological changes are also quite relevant to this shift in quit behavior among women. Such factors as the social approval and safer methods of contraception, increasing educational attainment, antidiscriminatory legislation, introduction of labor saving equipment for household and office use, and many others have led to the acceptance of the modern woman as a productive worker and economic competitor.

Despite the decline in the attitude that a "woman's place is in the home," sex discrimination in hiring still may serve as a deterrent to voluntary job mobility for women. Since social and technological changes have lessened the necessity for the casual attachment of women in the labor force, the previously mentioned discrimination factor would seem to be a more plausible explanation of the women's influence on voluntary separations in recent years.

Production workers and seasonality

The relative concentration of production workers does not emerge as a significant factor until 1966. It was in this period that demographic factors became important in labor supply. Many young workers born during the postwar period entered the labor market. With a tight market and low skill requirements, members of this group were available for many semiskilled production line positions which may not have

been entirely to their liking. The sudden change in age composition and labor supply may account for part of this shift. Still another factor, somewhat related, is that in the tight market job information was diffused more widely to a workforce of increasing education and sophistication. This situation resulted in better knowledge of alternative opportunities and made it possible for the worker to behave more like the classical economic man. Combined with disillusionment of the young, job satisfaction among production employees may also have declined. As the labor market slackened in 1969 and 1970 the production worker effect became less important, as is borne out by the coefficients in table 3. Even in a very slack labor market the greater propensity of the production workers to quit remained, indicating the presence of a shift in the basic pattern of manufacturing quit behavior.

Finally, we come to the question of seasonality. As our beta coefficients indicate, it is the least important of our variables and proves to be significant only in the years when the manufacturing business cycle is at a peak (1959, 1966, 1969). This fact suggests that seasonality becomes an important factor only when jobs and alternative opportunities are plentiful.

The combined effects of these trends and shifts in the individual variables are manifested in differences among the various equations. We tested all pairs of regression equations based on Chow's test for differences between pairs of equations.[7] We noted that there are no significant differences among equations which are separated by 1 or 2 years. There are no significant differences in the quit experience among the 15 pairs of equations preceding 1965, and there are only two significant differences among the pairs which lie entirely in the latter half of the period. Of the remaining 36 pairs of equations that span both subperiods, however, there are only three which do not exhibit a significant difference in quit experience, and these are separated in time by 1 or 2 years. We can safely conclude, therefore, that the changes in the effects of the individual variables resulted in a sudden, dramatic shift in the overall basis for the interindustry quit rate variation in the middle of the last decade.

Summary and conclusions

We have viewed voluntary separations in American manufacturing industries from three different perspectives: the properties of the average quit rate for all manufacturing which make it a good economic indicator, the variations in the quit rate through time and the sources of these variations, and the differences in quit rates among industries and the changing bases for these differences. Through these analyses we have obtained several results which should be helpful in the examination of the quit rate itself, the functioning of the labor market, and the economic situation as a whole.

- The total manufacturing quit rate is a statistically reliable and well behaved series. Preliminary estimates are revised only rarely and only in the most unusual cases does this revision exceed 0.1 of a percentage point. The seasonally adjusted series is quite smooth and serves as a reasonably reliable economic indicator.
- Workers are very conscious of job security and can have their confidence easily shaken, while restoration of that confidence is quite difficult. As a result, the changes in the quit rate may precede aggregate economic activity by as much as five quarters during periods of prosperity, but remain quite close to movements in the total economy during periods of slowed economic activity. Worker assessment of job security seems to be built largely on the behavior of the labor market during the past two quarters or so, with extra weight being given to recent adverse developments. The variations in hiring among industries explains some of the variation in quits, although this effect has been declining in recent years, with the exception of recession years. This result suggests that a worker draws his clues to the labor market situation not only from the closest period in time but also from the situation that exists in the plant and industry in which he is employed. The decline in the importance of job security in the interindustry variations suggests that, with time, the worker's horizons are broadening and he keys his behavior to wider economic occurrences, although there is some reversion to the most immediate clues during times of uncertainty and insecurity.
- The quit rate may be the best summary measure of manufacturing workers' attitudes, which in turn make an important contribution to aggregate demand and the course of the total economy. It is possible that the observed correlation of quits and future aggregate economic activity arises from the fact that an uncertain worker is a cautious consumer. Such a dynamic of aggregate demand suggests that the public policy of creating jobs in time of slack economic activity will do more than just increase aggregate

demand through the usual accelerator-multiplier principles: it will also serve to restore the confidence of the worker as consumer and thereby increase aggregate demand in a shorter period of time.

• Through time, the average worker has based his decision to quit on different factors, and the importance he has attributed to each of them has been changing. But he seems to have retained essentially the same risk-taking posture which is modified only by changes in the availability of jobs. The absence of a secular decline in the quit rate, the increasing importance of earnings levels in quit decisions, and the sudden emergence of the production worker's greater propensity to quit, all suggest that there are no structural shifts taking place in the economy which would impede the mobility of labor. The data on women, however, suggest that there still remain some structural deficiencies in the labor supply process. □

FOOTNOTES

[1] Geoffrey H. Moore and Julius Shiskin, *Indicators of Business Expansions and Contractions* (New York, Columbia University Press, 1967).

[2] For example: Ewan Clague, "Long-Term Trends in Quit Rates," *Employment and Earnings,* December 1956, pp. iii–ix; Arthur Ross, "Do We Have a New Industrial Feudalism?," *The American Economic Review,* December 1958, pp. 903–920; John E. Parker and John F. Burton, Jr., "Voluntary Labor Mobility in the U. S. Manufacturing Sector," *Proceedings of the Twentieth Annual Winter Meeting of the Industrial Research Association,* pp. 61–70; John H. Pencavel, *An Analysis of the Quit Rate in American Manufacturing Industry* (Princeton, Industrial Relations Section, Princeton University, 1970).

[3] This type of formulation has been suggested, in a somewhat different context, by Lester C. Thurow, "The Changing Nature of Unemployment," *Review of Economics and Statistics,* May 1965, pp. 137–149.

[4] A detailed discussion of this method is presented in *The BLS Seasonal Factor Method,* which is available upon request at the Bureau of Labor Statistics.

[5] In the Pencavel model (equation IA) the beta coefficient for the earnings variable was −0.428, for the female ratio 0.227, and for the hiring variable (accessions lagged) 0.321. The R^2 value for this equation is 0.778. His equation also contained a significant unionization variable and an insignificant one for earnings variability. (See Pencavel, op. cit., p. 21.)

[6] The marriage squeeze occurs when there is an abundance of women of marriageable age over men of marriageable age. See *Current Population Reports,* Series P–25, No. 388, U.S. Bureau of the Census, for a more detailed explanation.

[7] G. C. Chow, "Tests for Equality Between Sets of Coefficients in Two Linear Regressions," *Econometrica,* July 1960, pp. 591–605. The test outlined by Chow uses the F-ratio. The numerator is the difference between the sum of squared residuals from the regression of the pooled data less the sum of the squared residuals for the individual regressions. The denominator is the latter sum. Both numerator and denominator are adjusted for degrees of freedom.

Job losers, leavers, and entrants: a cyclical analysis

New models trace shifts among job losers, leavers, and entrants during economic downturns and recoveries

CURTIS L. GILROY AND ROBERT J. McINTIRE

WHAT HAPPENS to unemployment when there is a significant drop in economic activity? To what extent does it increase, how fast, and what happens to four groups that make up the unemployed—job losers, job leavers, reentrants, and new entrants into the labor force—the groups denoted by the Bureau of Labor Statistics' "reasons for unemployment." This study shows that job losers account for the greatest increase in unemployment and that their response is more immediate than for other groups.

A recent *Monthly Labor Review* article [1] provided a description of the unemployed by indicating which ones have lost their last job (job losers), voluntarily quit their last job (job leavers), reentered the labor force after a period of absence (reentrants), or entered the job market for the first time, never before having held a full-time job (new entrants).

As that article emphasized, the job-loser group is of particular interest to analysts. First, this category comprises the largest single grouping of the unemployed by reason (about 40 percent) and is the most cyclically sensitive. Second, the plight of job losers is viewed by some as being more acute than that of the other groups, since over one-half of the job losers are heads of households who generally bear substantial family responsibility. Third, job losers are the only group of unemployed whose joblessness stems, not from voluntary action, but from forces outside their control (that is, decisions by employers).

Because the main purpose of the previous article was an analysis of the changing characteristics of the unemployed by reason over the 1967–72 period, only cursory examination was given to the cyclical behavior of the groups. The average extent to which the "unemployment rate" for each of the groups, as well as their proportion of total unemployment, exhibits different cyclical patterns was shown in the original article by a simple regression equation ($Y_t = \alpha + \beta Q_t + \epsilon_t$). In that equation, Y represented either the rate or proportion of the unemployed for each group, α was the constant term, β was the coefficient of Q, a cyclical indicator (the overall jobless rate), and ϵ was the error term.

This basic model, while useful, did not adequately specify the relationship between movements of the various groups of the unemployed and changes in the level of economic activity. First, the use of the aggregate unemployment rate as a proxy for the business cycle was questionable, since the dependent variables (particularly job losers and reentrants) comprise much of the independent variable (the overall jobless rate). Second, as the low Durbin–Watson statistics suggested, serious correlation problems existed. Third, no time variable was incorporated into the model. Finally, an additional problem arose because the *rates* of unemployment by group were used instead of the actual *number* of unemployed by group as a dependent variable.[2]

A new model

To remedy some of these deficiencies, the first approach in this followup study was to design a new model which takes the form

$$Y_t = \alpha + \beta Q_t + \lambda T_t + \varepsilon_t \qquad (1)$$

where Y represents the number of unemployed by reason; α is the constant; β and λ are the coefficients of Q and T (a cyclical indicator and a time variable, respectively); and ϵ is the error term.

The index of industrial production (1967=100) compiled by Federal Reserve Board is used here as a coincident cyclical indicator. This eliminates the problem which may arise when much the same variable appears on both sides of the equation.

Curtis L. Gilroy is a labor economist in the Office of Current Employment Analysis, and Robert J. McIntire is a mathematical statistician in the Office of Systems and Standards, Bureau of Labor Statistics.

From the *Review* of November 1974

A time variable was included in the regression equation because a linear trend is assumed to be prominent in the various series, independent of cyclical movements—an upward trend related to growth in the size of both the labor force and output over time. Thus, a correction for trend is necessary to obtain a more accurate measure of cyclical effects.

The results from this initial step appear in table 1, part (a), and show that as industrial production rises (falls), signaling a pickup (downturn) in economic activity, the number of unemployed in all of the categories falls (rises). A comparison of the standardized (beta) coefficients indicates that job losers are the most cyclically sensitive because they experience the greatest relative change.

Even in this form, however, the equations generated low Durbin–Watson statistics, the patterns of residuals indicating that serial correlation was still present. This typically occurs when observations are made over time and the effect of a disturbance occurring at time period t carries over into the next period, t + 1. It is crucial, because it violates a basic assumption of ordinary least-squares estimation, that the disturbances be independent of one another; that is, that the error terms be generated randomly. The regression equations above assumed there was no serial correlation, that *rho* ($\hat{\rho}$), the coefficient of serial correlation, equals zero (where serial correlation is assumed to be first order of the form $\epsilon_t = \rho\epsilon_{t-1} + \nu_t$). If, in fact, the disturbances are not independent, the least-squares estimators would not be the best linear unbiased estimators. They would lose *efficiency*, because the dependence among the disturbances reduces the *effective* number of independent pieces of information in the sample. Thus, conventional formulas for carrying out tests of significance or constructing confidence limits with respect to regression coefficients would lead to incorrect inferences. If such positive serial correlation exists, standard errors would be underestimated (t-statistics overestimated) and confidence intervals narrowed. In short, the test would be likely to show more statistical significance than it really should.

In an attempt to overcome this problem, the regressions were rerun using the method of first differences, with the equation taking the form

$$(Y_t - Y_{t-1}) = \alpha' + \beta\,(Q_t - Q_{t-1}) + \epsilon' \qquad (2)$$

where $\alpha' = 0$ and $\epsilon' = \epsilon_t - \epsilon_{t-1}$. This method recognizes that there *is* serial correlation but further assumes that the true value of ρ is unity. The results indicated negative serial correlation (high Durbin–Watson) and continued to cast doubt on the significance of the regression coefficients for all equations.

The serial correlation indicates that the functional form of the model may have been misspecified or that relevant independent variables may have been missing. The authors investigated various functional forms for the independent variables without

Table 1. Regression results showing relationships between unemployed persons by reason and the index of industrial production and time, 1967–73

[Numbers in thousands]

(a) Dependent variable (Y_t)	Constant	Q_t	T_t	$\bar{R}^2$	s	Durbin-Watson	Q_t^*
Job losers	9,275.39	−83.98	36.68	.949	112.77	.55	−1.34
	(32.18)	(28.74)	(38.56)				
Job leavers	672.96	−3.04	4.64	.825	43.08	.84	−.24
	(6.11)	(2.73)	(12.77)				
Reentrants	3,509.75	−27.16	15.52	.894	78.24	1.16	−.90
	(17.55)	(13.40)	(23.52)				
New entrants	1,165.76	−8.48	6.82	.861	46.25	.79	−.54
	(9.86)	(7.07)	(17.49)				

(b) Dependent variable ($Y_t - \hat{\rho}Y_{t-1}$)	Constant	$(Q_t - \hat{\rho}Q_{t-1})$	$(T_t - \hat{\rho}T_{t-1})$	$\bar{R}^2$	s	Durbin-Watson	$(Q_t - \hat{\rho}Q_{t-1})^*$
Job losers, $\hat{\rho} = .715$	2,301.74	−72.20	34.10	.769	74.78	2.21	−1.13
	(14.18)	(12.46)	(16.52)				
Job leavers, $\hat{\rho} = .566$	269.84	−2.59	4.67	.572	35.59	2.15	−.17
	(3.17)	(1.30)	(6.89)				
Reentrants, $\hat{\rho} = .361$	2,196.57	−26.74	15.73	.826	67.23	2.14	−.85
	(13.07)	(9.99)	(17.67)				
New entrants, $\hat{\rho} = .592$	447.94	−7.91	6.74	.611	36.70	2.07	−.45
	(5.16)	(3.64)	(9.07)				

NOTE: t — statistics are in parentheses. Q_t^* and $(Q_t - \hat{\rho}Q_{t-1})^*$ = standardized (beta) coefficients.

achieving any significant reduction in serial correlation. This paper reports on the results of adding lagged monthly differences as independent variables. But, for a given model, with a given set of variables, a method exists for obtaining improved estimates of the coefficients if the value of ρ, the coefficient of serial correlation, can be estimated.

An estimate of ρ, which we label $\hat{\rho}$, was obtained from the regression procedure on the original equation $Y_t = \alpha + \beta Q_t + \lambda T_t + \varepsilon_t$. Constructing new variables, then, the following equation was run for each of the groups:

$$(Y_t - \hat{\rho}Y_t) = \alpha^* + \hat{\beta}(Q_t - \hat{\rho}Q_{t-1}) + \hat{\lambda}(T_t - \hat{\rho}T_{t-1}) + \varepsilon^* \qquad (3)$$

where $\alpha^* = \alpha(1 - \hat{\rho})$ and $\varepsilon^* = \varepsilon_t - \hat{\rho}\varepsilon_{t-1}$.

These results are shown in table 1, part (b), and are not materially different from the original estimates. The coefficients $\hat{\beta}$ and $\hat{\lambda}$, estimated with the *rho* transformed variables, are improved estimates of β and λ in the original equation. The coefficients are more efficient and more reliable for tests of significance.

Run in this form, the regression equations indicated that, on the average, 72,000 workers (or two-thirds of the overall increase in unemployment) would lose their jobs with a 1.0 absolute decrease in the industrial production index. The smallest increase in unemployment would occur among job leavers, who would account for only 2 percent of increased joblessness. This finding is consistent with workers' reluctance to voluntarily leave their jobs when the economy is weakening, and is in line with the behavior of the quit rate in manufacturing which falls in times of job scarcity. In fact, with respecification of the model, the coefficient of Q was no longer statistically significant for job leavers.

The model with lagged monthly differences

Although the credibility of the equations has been enhanced, one might rightly inquire as to whether the response of the various groups to changes in economic activity is immediate, or whether it is drawn out over a number of time periods.

To test for lagged responses, the following model was run for each of the groups:

$$Y_t = \alpha + \phi Q_{t-4} + \beta_1(Q_t - Q_{t-1}) + \beta_2(Q_{t-1} - Q_{t-2}) + \beta_3(Q_{t-2} - Q_{t-3}) + \beta_4(Q_{t-3} - Q_{t-4}) + \lambda T_t + \varepsilon_t \qquad (4)$$

where Y represents, as before the number of unemployed by reason; $(Q_t - Q_{t-1}) \ldots (Q_{t-3} - Q_{t-4})$ are month-to-month differences lagged from the most recent monthly change $(Q_t - Q_{t-1})$ back through the fourth previous month $(Q_{t-3} - Q_{t-4})$. The coefficients of these lagged differences represent the relatively "short-run" cumulative effects of a "once-and-for-all" change in economic activity; that is, β_1 measures the effect after 1 month, β_2 measures the accumulated effect after 2 months, and so forth. Four successive periods were included in the model after investigation with up to six periods. These investigations indicated that the short-run effects of a change in Q on each of the reasons groups run out by the fifth month; that is, monthly differences beyond the fourth previous month did not have significant coefficients and did not change the results for the first four periods. The variable Q_{t-4} serves to represent the cyclical influence not accounted for by the short-run differences, and therefore is tantamount to the relatively "long-run" effect.

Because there appeared to be serious auto-correlation problems in the regression equations run in this form, the model was reestimated with first differences adjusted using an estimate of the coefficient of first

Table 2. Regression results showing relationships between unemployed persons by reason and 'short-run' and 'long-run' changes in the index of industrial production and time, 1967–73 [1]

[Numbers in thousands]

Dependent variable $(Y_t - \hat{\rho}Y_{t-1})$	Constant	$(Q_{t-4} - \hat{\rho}Q_{t-5})$	X_1	X_2	X_3	X_4	$(T_t - \hat{\rho}T_{t-1})$	$\bar{R}^2$	s	Durbin-Watson
Job losers..... $\hat{\rho} = .760$	2,236.46	−85.25	−25.98	−61.17	−57.47	−75.51	37.69	.794	62.58	2.14
	(15.22)	(13.66)	(2.84)	(5.93)	(5.44)	(7.42)	(17.30)			
Job leavers..... $\hat{\rho} = .572$	268.85	−2.76	2.37	−4.32	4.33	−9.82	4.88	.567	35.62	2.09
	(2.92)	(1.26)	(0.46)	(0.79)	(0.79)	(1.84)	(6.78)			
Reentrants..... $\hat{\rho} = .131$	3,180.03	−29.13	1.28	−14.92	−27.69	−21.52	16.44	.915	62.02	1.98
	(18.71)	(14.66)	(0.14)	(1.63)	(3.04)	(2.38)	(26.21)			
New entrants..... $\hat{\rho} = .292$	996.80	−11.02	7.21	6.46	−2.68	0.15	7.26	.848	34.01	1.92
	(10.85)	(8.36)	(1.47)	(1.30)	(0.54)	(0.03)	(17.26)			

NOTE: t — statistics are in parentheses.

[1] The "short-run" lagged independent variables, are:
$X_1 = [(Q_t - Q_{t-1}) - \hat{\rho}(Q_{t-1} - Q_{t-2})]$
$X_2 = [(Q_{t-1} - Q_{t-2}) - \hat{\rho}(Q_{t-2} - Q_{t-3})]$
$X_3 = [(Q_{t-2} - Q_{t-3}) - \hat{\rho}(Q_{t-3} - Q_{t-4})]$
$X_4 = [(Q_{t-3} - Q_{t-4}) - \hat{\rho}(Q_{t-4} - Q_{t-5})]$

order serial correlation as shown by

$$(Y_t - \hat{\rho}Y_{t-1}) = \alpha^* + \phi\,(Q_{t-4} - \hat{\rho}Q_{t-5}) + \beta_1\,[(Q_t - Q_{t-1}) - \hat{\rho}(Q_{t-1} - Q_{t-5})] + \ldots + \lambda\,(T_t - \hat{\rho}T_{t-1}) + \epsilon^* \qquad (5)$$

where $\alpha^* = \alpha\,(1 - \hat{\rho})$, $\epsilon^* = \epsilon_t - \hat{\rho}\epsilon_{t-1}$, and all coefficients are estimates of the coefficients in the original lagged equation; that is, the coefficient calculated for ϕ in equation (5) is an estimate of ϕ in equation (4), and so forth for the other coefficients. The results appear in table 2 and conform in general to what would be intuitively expected.

The number of unemployed job losers shows a substantial degree of cyclical sensitivity and the response is distributed over the four periods. The instantaneous response by employers to a downturn in business activity (here defined as an absolute decrease of 1.0 in the index of industrial production) is to lay off 25,000 workers. In the next month, an additional 36,000 workers lose their jobs for a total of 61,000 after 2 months. In the "long-run"—after 4 months—85,000 workers are laid off.

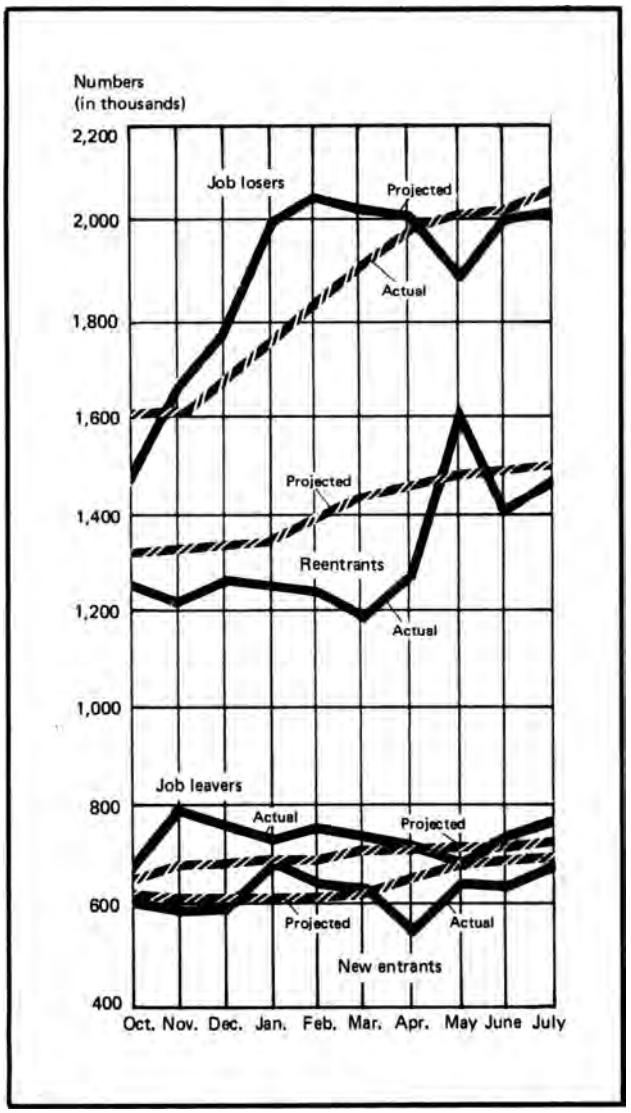
The number of unemployed job leavers, on the other hand, is not cyclically sensitive, and the group's short-term response to changing economic conditions is erratic. In the long run, the increase in the number of job leavers due to a drop in industrial production is the smallest of all the groups. This is consistent with the findings in the previous section.

Reentrant unemployment, however, clearly responds to cyclical swings in the economy. As in the case of job losers, the effect is distributed over several months; unlike job losers, however, there is little instantaneous response. There is virtually no effect in the current period to a 1.0 decrease in the production index. In the second month, however, 15,000 of the additional unemployed workers are reentrants; in the "long run," there are nearly 30,000 unemployed reentrants. This development probably reflects the fact that a greater proportion of the labor force reentrants must pass through the unemployment stream when the demand for labor slackens.

The number of new entrants appear to be somewhat sensitive to cyclical swings, although their response is less pronounced and rather different. The positive, although insignificant, instantaneous response reflects perhaps the fact that new entrants are motivated in the short run by phenomena other than changing levels of economic activity. The impact of the business cycle appears to take hold after several months, however, as indicated by the significant and negative long-run response. Presumably, uncertain economic conditions do not encourage additional new entrants to the labor force. But it does seem reasonable that, if economic conditions are deteriorating, new entrants unemployed in previous months are more likely to remain unemployed and any additional new entrants are more likely to be unemployed.

The results of this study are not strictly comparable to those of the study of this type previously reported in the *Monthly Labor Review* because of conceptual and methodological differences. However, both studies show job losers, the largest group,

Chart 1. Actual and projected numbers of unemployed by reason, October 1973–July 1974



to be most affected by changes in economic activity.

Application to recent data

Although the purpose of this article is not so much to develop a predictive model as to obtain better estimates of selected coefficients, the results of the equation, when applied to dates for the most recent economic slowdown, seem to track fairly well with the actual changes in the number of unemployed by reason. This can be seen from chart 1, which traces the predicted changes and the actual changes over the October 1973 to July 1974 period.

October 1973, in this case, coincides roughly with the beginning of the energy crisis which caused a very abrupt slowdown in economic activity in some sectors. Because of this abrupt slowdown, which caused a sudden decline in the industrial production index, the actual number of unemployed job losers increased rapidly from October to February, but then remained relatively stationary through July.

As shown in the chart, the projected number of job losers—derived by using the coefficients of the *rho* adjusted model with lagged monthly differences—rose much more gradually. Although its steepest rise occurred in the first months of 1974, when the effects of the energy crisis were becoming more widespread, it did not catch up with the level of the actual series until April. There was then a relatively large gap between the actual and the projected series from January to March.

However, given the unusual nature of the recent slowdown, and the fact that the regression line measures average movements, this gap is not too surprising. Compared with previous slowdowns, the one which occurred last winter had a serious impact on only a limited number of industries—principally automobile factories and gasoline stations. It was the sharp cutbacks in these industries which caused the surge in the number of unemployed job losers. Other industries were hardly affected during this period, and this may account for the fact that the number of unemployed reentrants, although projected to rise gradually, did not show an actual increase until spring. In sum, given the abrupt nature and industry concentration of the recent slowdown, the divergences between the projected and actual series appear to be within reasonable bounds. □

——FOOTNOTES——

[1] Curtis L. Gilroy, "Job losers, leavers, and entrants: traits and trends," *Monthly Labor Review*, August 1973, pp. 3–15.

[2] The main drawback of the use of component rates is that each rate is really not a rate in and of itself. For a true unemployment rate, the numerator and denominator must consist of groups with like characteristics. For example, the "true" unemployment rate for job losers would be the number of job losers divided by the job-loser labor force, not the entire civilian labor force. But the job-loser labor force does not exist; it has no meaning. Thus, use of the component rates, though an interesting and sometimes useful breakdown of the aggregate unemployment rate, is little more than a tautology.

Comparing employment shifts in 10 industrialized countries

Canada, the United Kingdom, Belgium, the Netherlands, and Sweden, like the United States earlier, have become primarily service economies

CONSTANCE SORRENTINO

GENERALLY, with a nation's economic development and its progress in industrialization, the distribution of the employed population shifts from agricultural to industrial activities, particularly manufacturing, and further from these sectors to service activities.

The United States emerged as the world's first service economy—over 50 percent of employment in service industries—shortly after World War II. With some lag, the other industrial nations of the world appear to be following that pattern. By 1970, 6 of the 10 industrial countries had over half their civilian employment in the service sector.

Sectoral shifts in employment largely reflect differing rates of change in demand and productivity. In turn, these changes affect overall rates of change in productivity and economic growth. Manpower shifts from the low productivity farm sector to higher productivity sectors result in increases in productivity growth. On the other hand, shifts from the industrial sector to the services sector generally have a moderating effect on overall productivity growth.

This article presents data on comparative civilian employment by sector in 10 developed countries at 5-year intervals from 1950 to 1970. The data for 1950, and perhaps for 1955, were affected by the recovery from wartime conditions in many of the European countries and Japan. These recovery elements may have distorted the usual relationship in some countries. Certainly, the substantial gains in industrial employment experienced by Italy, Japan, and Germany from 1950 to 1970 should be viewed against this background.

Data are provided for three broad sectors: (1) agriculture, forestry, hunting and fishing (called "agriculture" in the text); (2) industry (comprising mining, manufacturing, and construction); and (3) services (transportation, communication, public utilities, trade, finance, public administration, private household services and miscellaneous services[1]). Employment in government enterprises is classified according to the sector appropriate to the output of the enterprise. In addition to information for the three broad breakdowns, separate figures are provided for manufacturing.

Foreign country data were adjusted to United States concepts wherever significant conceptual differences existed. The adjustments made as well as the sources of the data are discussed in an appendix.

Constance Sorrentino is an economist in the Division of Foreign Labor Statistics and Trade, Bureau of Labor Statistics.

Shifts in employment

A vast reallocation of sectoral manpower took place in Canada, France, Italy, Germany, Japan, and Sweden during 1950–70. More moderate shifts occurred in Belgium, the Netherlands, the United Kingdom, and the United States. In general, employment disparities among the 10 countries narrowed significantly.

Table 1 provides employment data by economic sector, and table 2 shows percent distributions of employment by sector. Data for 1950 were not available for France's industry and services; therefore, the French data cover only the period from 1955, except for agriculture.

Agriculture. Employment in agriculture declined in all countries, usually quite rapidly. In conjunction with the growth in total employment in most countries, this resulted in a significant fall in agriculture's share of employment.

Large differences among countries in the proportion of employment in agriculture narrowed between 1950 and 1970. In 1950, agriculture dominated in Italy and Japan, accounting for 40 percent of all workers. One-fifth to one-fourth of total employment in Canada, Germany, and Sweden was in agri-

culture. The United Kingdom had, by far, the lowest proportion of workers in agricultural activities, at 5 percent. The United States and Belgium were next, at 12–13 percent.

By 1970, agriculture accounted for more than 10 percent of employment in only France, Italy, and Japan. The United Kingdom continued to have the smallest proportion, 3 percent, and the United States and Belgium followed closely with about 5 percent.

In most countries, the rate of decline in agricultural employment accelerated in the sixties (table 3). Agricultural employment in Italy fell by 3 percent a year between 1951 and 1960 and at almost 6 percent a year from 1960 to 1970. The only exception was Canada, where the decline slowed from 3.7 percent a year in the 1950's to 2.6 percent in the 1960's.

Movement out of agriculture generally makes additional manpower available for industry and services. However, rural to urban migration in Italy and Japan actually tended to curb the total labor supply during 1950–70. Many women and children who formerly worked as unpaid farm laborers with-

Table 1. Civilian employment by economic sector, 1950–70
[In thousands]

Year	United States	Belgium	Canada	France	Germany	Italy	Japan	Netherlands	Sweden	United Kingdom
	Civilian employment									
1950 [1]	58,920	3,402	4,976	18,752	22,869	19,098	34,940	3,575	3,424	22,608
1955	62,171	3,414	5,364	18,727	([2])	19,701	39,250	3,815	([2])	23,527
1960	65,778	3,438	5,965	18,712	25,954	19,877	43,370	4,019	3,558	24,256
1965	71,088	3,608	6,862	19,560	26,699	18,915	46,200	4,349	3,704	25,327
1970 [3]	78,627	3,670	7,879	19,967	26,327	18,698	50,150	4,477	3,852	24,710
	Agriculture [4]									
1950 [1]	7,268	430	1,139	5,631	5,183	8,510	15,070	572	795	1,228
1955	6,551	361	954	5,041	([2])	7,624	14,070	525	([2])	1,122
1960	5,572	300	795	4,189	3,623	6,470	12,800	465	570	1,028
1965	4,477	230	694	3,480	2,566	4,884	10,500	388	432	847
1970 [3]	3,566	191	613	3,009	2,533	3,639	8,500	340	325	711
	Industry [5]									
1950 [1]	19,850	1,584	1,722	([2])	9,854	5,702	8,200	1,465	1,323	10,507
1955	21,825	1,612	1,850	6,849	([2])	6,540	9,910	1,592	([2])	11,235
1960	21,995	1,584	1,906	7,136	12,449	7,267	12,380	1,678	1,431	11,462
1965	24,311	1,670	2,233	7,819	13,183	7,594	15,010	1,845	1,565	11,739
1970 [3]	26,066	1,621	2,377	7,918	12,899	8,048	17,850	1,818	1,480	11,081
	Manufacturing									
1950 [1]	15,448	1,165	1,316	([2])	7,415	4,448	6,180	1,103	1,069	8,194
1955	17,097	1,191	1,373	5,043	([2])	4,773	7,530	1,177	([2])	8,852
1960	17,149	1,201	1,471	5,240	9,718	5,344	9,430	1,241	1,128	9,122
1965	19,190	1,278	1,636	5,570	10,288	5,518	11,450	1,331	1,215	9,242
1970 [3]	20,737	1,249	1,790	5,662	10,306	5,954	13,730	1,309	1,089	9,026
	Services [6]									
1950 [1]	31,800	1,388	2,116	([2])	7,832	4,885	11,670	1,538	1,306	10,873
1955	33,796	1,441	2,560	6,837	([2])	5,538	15,270	1,698	([2])	11,170
1960	38,212	1,554	3,264	7,387	9,882	6,141	18,190	1,876	1,557	11,766
1965	42,301	1,708	3,934	8,261	10,550	6,437	20,690	2,116	1,707	12,741
1970 [3]	48,994	1,858	4,888	9,040	10,895	7,012	23,800	2,319	2,047	12,918

[1] 1951 data for Italy.
[2] Not available.
[3] 1969 data for Belgium, France, Germany, and the Netherlands. Data for other countries, except the United States, are preliminary estimates for 1970. For the United States, 1970 data are final.
[4] Includes forestry, hunting, and fishing.
[5] Manufacturing, mining, and construction.
[6] Transportation, communication, public utilities, trade, finance, public administration, private household services, and miscellaneous services.

NOTE: Wherever significant conceptual differences occur, data have been adjusted to U.S. concepts. Modifications have also been made so that the data for each country reflect a compatible time series.

SOURCE: Organization for Economic Cooperation and Development, **Labor Force Statistics** (various issues); International Labor Office, **Yearbook of Labor Statistics** (various issues); and national statistical publications. Some data based partly on estimates.

Table 2. Percent distribution of civilian employment by economic sector, 1950–70

Year	United States	Belgium	Canada	France	Germany	Italy	Japan	Netherlands	Sweden	United Kingdom
	Agriculture [2]									
1950 [1]	12.3	12.6	22.9	30.0	22.7	44.6	43.1	16.0	23.2	5.4
1955	10.5	10.6	17.8	26.9	(3)	38.7	35.8	13.8	(3)	4.8
1960	8.5	8.7	13.3	22.4	14.0	32.6	29.5	11.6	16.0	4.2
1965	6.3	6.4	10.1	17.8	11.1	25.8	22.7	8.9	11.7	3.3
1970 [4]	4.5	5.2	7.8	15.1	9.6	19.5	16.9	7.6	8.4	2.9
	Industry [5]									
1950 [1]	33.7	46.6	34.6	(3)	43.1	29.9	23.5	41.0	38.6	46.5
1955	35.1	47.2	34.5	36.6	(3)	33.2	25.2	41.7	(3)	47.8
1960	33.4	46.1	32.0	38.1	48.0	36.6	28.5	41.8	40.2	47.3
1965	34.2	46.3	32.5	40.0	49.4	40.1	32.5	42.4	42.3	46.3
1970 [4]	33.2	44.2	30.2	39.7	49.0	43.0	35.6	40.6	38.4	44.8
	Manufacturing									
1950 [1]	26.2	34.2	26.4	(3)	32.4	23.3	17.7	30.9	31.2	36.2
1955	27.5	34.9	25.6	26.9	(3)	24.2	19.2	30.9	(3)	37.6
1960	26.1	34.9	24.7	28.0	37.4	26.9	21.7	30.9	31.7	37.6
1965	27.0	35.4	23.8	28.5	38.5	29.2	24.8	30.6	32.8	36.5
1970 [4]	26.4	34.0	22.7	28.4	39.1	31.8	27.4	29.2	28.3	36.5
	Services									
1950 [1]	54.0	40.8	42.5	(3)	34.2	25.6	33.4	43.0	38.1	48.1
1955	54.4	42.2	47.7	36.5	(3)	28.1	38.9	44.5	(3)	47.5
1960	58.1	45.2	54.7	39.5	38.1	30.9	41.9	46.7	43.8	48.5
1965	59.5	47.3	57.3	42.2	39.5	34.0	44.8	48.7	46.1	50.3
1970 [4]	62.3	50.6	62.0	45.3	41.4	37.5	47.5	51.8	53.1	52.3

[1] 1951 data for Italy.
[2] Includes forestry, hunting, and fishing.
[3] Not available.
[4] 1969 data for Belgium, France, Germany, and the Netherlands.
[5] Manufacturing, mining, and construction.
SOURCE: Calculated from data in table 1.

drew from the labor force entirely when their families left agriculture. Thus, the female participation rate declined in both countries.[2] In most other countries, this effect was outweighed by the increasing number of married women entering the labor force when their children reached school age.

Industry and manufacturing. Industrial employment rose in all countries during 1950–70. However, in six countries, the increase did not keep pace with overall employment expansion; consequently, the proportion in industry actually declined. Canada's industrial sector experienced the greatest loss in share, falling over 4 percentage points. The industrial sectors in Belgium and the United Kingdom lost about 2 percentage points, while losses of less than 1 percentage point occurred in the United States, the Netherlands, and Sweden. (See table 4.)

The industrial sectors in Italy and Japan experienced substantial gains of 12–13 percentage points in share of total employment. France and Germany were the only other countries having industry gain in employment share from 1950 to 1970. In the period from 1960 to 1970, France, Germany, Italy, and Japan were also the only countries with industry employment rising as a proportion of total employment. However, the 1960–70 gain in Germany was only 1 percentage point, after a rise of almost 5 percentage points in the earlier decade.

Japan's industrial sector grew most, with employment more than doubling between 1950 and 1970, greatly outpacing the rise in total civilian employment. Italy's industrial employment rose 41 percent but increased in relative size even more than Japan's because total civilian employment declined.

In the United States, industrial activities now account for one-third of total employment, about the same as in 1950. By 1970, all other countries except Canada had more than a third of their manpower in industry. With almost half of total employment in industry, Germany had the highest relative proportion. The United Kingdom, the Netherlands,

Italy, and Belgium had over 40 percent of their employed manpower working in industry.

Employment in manufacturing grew slightly faster than employment in overall industry in the United States, Belgium, Germany, Japan, and the United Kingdom. Manufacturing growth matched industrial growth in Canada. In the remaining countries, rapid increases in construction employment pushed industrial growth ahead faster than manufacturing growth.

Foreign trade is an important factor in analysis of comparative trends in manufacturing employment. In many other countries, exports of manufactured goods are larger relative to total GNP than in the United States and have grown faster than U.S. exports in the postwar years.

Postwar expansion of Japanese, Italian, and German exports of goods has been a particularly important factor in their rapid rise in manufacturing employment. Japanese manufacturing employment expanded from 18 to 27 percent of total employment between 1950 and 1970; Italy's from about 23 to 32 percent of the total; and Germany's from 32 to 39 percent. In contrast, U.S. manufacturing employment remained at about 26 to 27 percent of the total. U.S. exports of goods had a slower rate of increase than those of any other country studied except the United Kingdom. According to data of the Organization for Economic Cooperation and Development (OECD) and the United Nations, trade in manufactured goods during 1955–68 increased faster than manufacturing output in all major industrial countries except the United Kingdom and the United States.[3]

Services. Prior to the shift from a predominantly industrial to a predominantly service economy shortly after World War II, over half of the employed population in the United States was producing goods—agricultural commodities and industrial products. Until 1958, the United States was the only industrialized country with over half its employment in services. Then Canada crossed the 50 percent level. The United Kingdom joined them around 1965. Since 1965, Belgium, the Netherlands, and Sweden have also become predominantly service economies. Only France, Italy, Japan, and Germany continue to have more workers employed in the production of goods than of services. Japan and France appear likely to become service economies during the 1970's.[4] But Italy and Germany will probably not shift until later, because service employment constitutes only 38 percent of total employment in Italy and 41 percent in Germany.

In 1970, the United States and Canada had about

Table 3. Average annual rates of change in employment by sector, 1950–70, 1950–60, and 1960–70

Sector	United States	Belgium	Canada	France	Germany	Italy	Japan	Netherlands	Sweden	United Kingdom
	1950–70[1]									
Civilian employment	1.5	0.4	2.3	0.3	0.7	−0.1	1.8	1.2	0.6	0.4
Agriculture	−3.6	−4.4	−3.2	−3.4	−3.8	−4.6	−2.9	−2.8	−4.6	−2.8
Industry	1.4	.1	1.6	(2)	1.4	1.8	4.0	1.1	.6	.3
Manufacturing	1.5	.4	1.6	(2)	1.7	1.6	4.1	.9	.1	.5
Services	2.2	1.6	4.3	(2)	1.8	1.9	3.6	2.2	2.3	.9
	1950–60[3]									
Civilian employment	1.1	0.1	1.8	(4)	1.3	0.5	2.2	1.2	0.4	0.7
Agriculture	−2.7	−3.7	−3.7	−3.3	−3.7	−3.1	−1.6	−2.1	−3.4	−1.8
Industry	1.0	0	1.0	(2)	2.4	2.7	4.2	1.4	.8	.9
Manufacturing	1.1	.3	1.1	(2)	2.8	2.1	4.3	1.2	.5	1.1
Services	1.9	1.1	4.4	(2)	2.4	2.6	4.5	2.0	1.8	.8
	1960–70[5]									
Civilian employment	1.8	0.7	2.8	0.7	0.2	−0.6	1.5	1.2	0.8	0.2
Agriculture	−4.6	−5.1	−2.6	−3.8	−4.1	−5.9	−4.2	−3.5	−5.3	−3.8
Industry	1.7	.3	2.2	1.2	.4	1.0	3.7	.9	.3	−.3
Manufacturing	1.9	.4	2.0	.9	.7	1.1	3.8	.6	−.4	−.1
Services	2.5	2.0	4.1	2.3	1.1	1.3	2.7	2.3	2.8	.9

[1] 1950–69 for Belgium, France, Germany, and the Netherlands; 1951–70 for Italy.
[2] Not available.
[3] 1951–60 for Italy.
[4] Less than .05 percent per year.
[5] 1960–69 for Belgium, France, Germany, and the Netherlands.
SOURCE: Calculated from data in table 1.

Table 4. Change in share of total employment by sector, 1950–70 [1]

[Percentage points]

Country	Agriculture	Industry		Services
		Total	Manufacturing	
United States	−7.8	−0.5	0.2	8.3
Belgium	−7.4	−2.4	−.2	9.8
Canada	−15.1	−4.4	−3.7	19.5
France	−11.8	3.1	1.5	8.8
Germany	−13.1	5.9	6.7	7.2
Italy	−25.1	13.1	8.5	11.9
Japan	−26.2	12.1	9.7	14.1
Netherlands	−8.4	−.4	−1.7	8.8
Sweden	−14.8	−.2	−2.9	15.0
United Kingdom	−2.5	−1.7	.3	4.2

[1] 1950–69 for Belgium, Germany, Netherlands; 1955–69 for France; 1951–70 for Italy.

SOURCE: Calculated from data in table 1.

62 percent of their employment in services. The next highest proportion was in Sweden with 53 percent. Canada experienced the most dramatic increase in services, with employment growing at 4.3 percent a year and going from about 43 to 62 percent of total employment between 1950 and 1970. Thus Canada accomplished in 12 years what it took the United States 25 years to do—move from half to over three-fifths of total employment in services.

During the 1950–70 period, the services sector expanded more rapidly than the industrial sector in all countries except Japan. In Italy, the annual rate of growth in services was only slightly higher than that in industry. In the other countries, however, the rate of growth in services was much faster than in industry.

Output and productivity trends

Changes in employment structure are the net result of varying rates of change in demand and in productivity. Other things being equal, increased output requires more employees. However, productivity increases reduce the number of workers required for a given output.

Nine countries' rates of growth in real output (gross domestic product) by sector during 1950–69 are presented in table 5. Data by sector on the growth of output per employed person (includes wage and salary employees, unpaid family workers, and the self-employed) are also provided. Constant price data by sector are not available for Japan.

In general, the agricultural sector experienced the slowest rate of growth in output and the fastest rate of increase in productivity. These two factors combined to cause the sharp reduction in agricultural employment discussed earlier.

Industry grew fastest in output in all countries except the United States, where services led in growth. Of the countries covered in table 5, Germany and Italy had the sharpest increases in industrial output. Output in Japan's industrial sector probably grew faster than in either of these countries, however, as overall gross domestic product in Japan increased at a rate of almost 10 percent a year during 1952–69. Productivity growth in industry was rapid in most countries, although not as rapid as in agriculture.

Growth in services output was generally rapid, and outpaced growth in total output in the United States, Belgium, and Sweden. However, productivity increases in services were relatively low, resulting in the sharp rise in services employment in most countries.[5]

In the United States, the level of productivity in agriculture is well below that in industry and services. The industry sector has the highest level of productivity of the three sectors, and services ranks second. It should be recognized, however, that within each sector productivity can vary considerably. In services, for example, productivity ranges from a level lower than agriculture in miscellaneous services to a level 4 times that of agriculture in finance, insurance, and real estate. Furthermore, in the industry sector, mining productivity is over double that of manufacturing, while output per man-hour in construction is well below manufacturing. In general, the relationships discussed above also hold true for most of the foreign countries studied.[6]

Movement of employment out of the low productivity agricultural sector, which occurred in all countries studied, to sectors with higher output per worker tends to raise the level of productivity in the whole economy, and hence, contributes to economic growth. The following tabulation is based on OECD calculations of the contribution to economic growth of shifts in employment between sectors during 1955–68.[7] The proportion of the total increase in output attributed to such shifts in eight countries was:

United States	11.3
Belgium	12.9
Canada	15.3
France	18.3
Germany	14.9
Italy	36.8
Netherlands	10.3
United Kingdom	5.2

Table 5. Average annual rate of change in output [1] and in output per employed person by sector, 1950–69

Country [2]	Output				Output per employed person			
	Total	Agriculture	Industry	Services	Total	Agriculture	Industry	Services
United States	3.8	1.0	3.8	4.2	2.3	4.7	2.2	2.0
Belgium [3]	3.6	1.7	3.8	3.7	3.3	6.4	4.1	1.9
Canada [4]	4.8	2.0	5.6	4.8	2.4	5.2	3.8	.4
France [5]	5.6	1.6	6.6	5.6	5.1	5.4	5.5	3.6
Germany	6.7	2.6	8.0	5.8	5.9	6.6	6.5	4.0
Italy [6]	5.4	2.6	7.6	5.0	5.6	7.0	5.7	3.1
Netherlands [6]	5.1	2.7	6.0	4.8	3.9	5.5	4.9	2.6
Sweden	4.0	.4	5.0	4.4	3.5	5.1	4.3	2.3
United Kingdom	2.6	2.2	2.9	2.2	2.1	5.1	2.5	1.3

[1] Gross domestic product at constant (1963) market prices for the United States, France, Germany, and Sweden and at factor cost for all other countries.
[2] Not available for Japan.
[3] 1956–68.
[4] 1950–68.
[5] 1955–69.
[6] 1951–69.

SOURCE: Calculations based on output data from the Organization for Economic Cooperation and Development, National Accounts of OECD Countries, 1950–1968 (Paris, OECD, 1970) and estimates for 1969; and employment data comparable to the statistics in table 1.

Although the OECD did not make calculations for Japan, it is probable that the shift from agriculture contributed substantially to Japanese economic growth, as was the case in Italy. The effect of the shift was, of course, strongest in countries where agriculture acounted for a large proportion of employment in the base year, 1955.

Not all sectoral shifts necessarily result in increased growth of productivity for the economy. The movement into services employment, which has occurred in all countries studied, generally tends to reduce the rate of growth in productivity. As table 5 indicates, the service sector has a slower rate of growth in productivity than agriculture and industry in all countries. Movement out of agriculture into many of the service industries represents a shift to a sector with a higher level of productivity, but lower rate of growth in productivity. Movement from industry to services generally represents a shift to a sector with a lower level of productivity and a lower rate of growth in productivity.

Projected shifts in the structure of the U.S. economy during the 1970's are not likely, therefore, to promote a faster rate of productivity growth. Sectors with typically low rates of growth are expected to expand employment faster than those with high rates.[8] For example, rapid expansion of employment in miscellaneous services is expected. This sector has both a low rate of growth in productivity and a relatively low level. OECD projections for foreign countries also indicate a slowdown in the contribution to growth in productivity of sector shifts in the 1970's. In Italy, the contribution of sectoral shifts to economic growth in the present decade is expected to drop to less than half the level estimated for 1955–68.[9] □

FOOTNOTES

[1] Miscellaneous services include hotel, repair, recreational, personal, medical, legal and educational services.

[2] In Italy, the female labor force participation rate dropped from 32 percent to 25 percent between 1960 and 1970; in Japan, it fell from 57 percent in 1955 to 47 percent by 1970. In contrast, female participation in the U.S. labor force rose from 36 percent in 1955 to 38 percent in 1960 and to 43 percent by 1970.

[3] Organization for Economic Cooperation and Development, *The Growth of Output, 1960–1980* (Paris, OECD, 1970), p. 61.

[4] According to the Statistics Bureau of the Prime Minister's Office, Japan will probably have half of its employed popuation in services by 1975.

[5] Part of the slow productivity rise in services reflects a measurement problem: in the absence of better methods, output in constant prices in services is often measured by statistics on employment and wages. The largest sector affected is government services, where only Belgium and Germany make some allowance (necessarily arbitrary) for productivity increases. Clearly, it would have been desirable to show government services separately from other services, but comparable data are not available. Also, the use of employment data rather than man-hours may somewhat overestimate labor input and therefore underestimate productivity in services, as compared with other sectors, because there is probably more part-time work in services. Canadian authorities suggest this may be one reason for the apparent small increase in output per employed person in Canadian service industries.

[6] For rough calculations of relative output per employed person by sector in foreign countries, see OECD, op. cit., p. 36.

[7] OECD, op. cit., p. 39. In the OECD calculations, it was assumed that the overall increase in output is the sum of

increases in four independent components: (1) agricultural output; (2) output attributable to the growth in productivity in industry and services; (3) output due to the increase in total employment; and (4) output due to shifts in employment between sectors.

The increase in output due to shifts in employment between sectors was based on the following assumptions; (1) output in agriculture at the end of the period would have been the same even if labor had not left this sector; and (2) productivity in industry and services would have been the same whether or not labor had moved into these sectors. Given these assumptions, the sectoral shift effect is measured by the difference between actual output at the end of the period and output as it would have been with end-period productivity in industry and services, but the same percent distribution of employment as the beginning of the period.

[1] *Patterns of U.S. Economic Growth* (BLS Bulletin 1672, 1970).

[2] OECD, op. cit., p. 92.

Appendix: concepts used and limitations of data

Sources. With the exception of the United Kingdom, the employment data used in this study refer to total civilian employment; that is, wage and salary workers, unpaid family workers, and the self-employed. Data for the United Kingdom exclude unpaid family workers; however, such workers account for a very small fraction of total employment.

Employment statistics for the United States and Canada were derived solely from sample surveys of households. Statistics for most recent years (generally 1960 onward) for Germany, Italy, Japan, and Sweden are from household surveys while data for the 1950's were from other sources, such as population censuses and official estimates based on censuses and various other sources. Data for France, Belgium, and the Netherlands are derived from official estimates by their statistical offices. Employment figures for the United Kingdom are based on compulsory national insurance statistics and official estimates of the self-employed. Distribution of the self-employed by sector for the United Kingdom was estimated by the Organization for Economic Cooperation and Development.

For all countries, employment in government enterprises is classified according to the sector appropriate to the output of the enterprise. This is the procedure followed by the International Standard Industrial Classification (ISIC).[1] In the BLS establishment survey, government-operated establishments are classified in a separate economic division, as provided for in the U.S. Standard Industrial Classification (SIC). However, the U.S. employment data in this report are on the ISIC basis as regards the treatment of government enterprises. These data are obtained from the U.S. labor force survey in which the economic division claimed by the respondent is recorded. Thus, a person working in a government-operated manufacturing establishment is classified in the manufacturing sector.

Output (gross domestic product) figures used in this article are based on OECD definitions; therefore, data for the United States differ somewhat from the statistics published by the U.S. Office of Business Economics (OBE). The major difference is that OECD figures include an estimate of capital consumption by government, whereas no such estimate is made by OBE in the national accounts.

Figures for output per employed person in the United States presented in this article differ from the indexes regularly published by the Bureau of Labor Statistics. BLS data relate solely to the private economy whereas the data in this article include output and employment in the government sector.[2] BLS figures on output per employed person are based on output figures from OBE. In contrast, output figures used in the calculations in this article are based on the OECD definitions. There are also some minor differences in the employment data used. BLS data for the farm sector are somewhat different in coverage from the agricultural statistics used in this report. (The agricultural sector includes forestry, hunting, and fishing as well as farming.)

Adjustments. Certain modifications in the basic employment data were necessary for greater comparability among countries. Military personnel are included in the basic employment data in some foreign countries and allocated to the services sector. Adjustment to omit the military has been made in all cases. Unpaid family workers who work fewer than 15 hours are excluded from employment data in the United States, but usually are included in other countries. Adjustments were made to exclude such workers from the Japanese and Italian data.

Numbers of unpaid family workers in the other countries were not large enough to make a significant difference in employment proportions; consequently, no other adjustments for unpaid family workers were made.

No adjustment was made for the varying lower age limits used for employment statistics in different countries. The lower age limit for U.S. data was 16, while the limit in the other countries was 14 or 15.

Other adjustments to achieve consistency of the employment data within certain countries were made. For the United States, adjustments were made in 1950 and 1955 data to reflect changes in survey definitions occurring in 1957, when persons on temporary layoff and persons waiting to begin a new job were shifted from the employed to the unemployed count. Since 14- and 15-year-olds were excluded from the U.S. labor force by 1967 changes in definition, data for all years prior to 1967 were adjusted to exclude them. However, no adjustments were made in the U.S. data for inconsistencies in the series resulting from the introduction of data from the decennial censuses into the estimation procedure in 1953 and 1962, the inclusion of Alaska and Hawaii in 1960, and the shifting from unemployed to employed status in 1967 of persons absent from their jobs during the survey week and seeking other jobs.[3]

Adjustments were also made for such breaks in the comparability of time series as the 1967 introduction of a redesigned labor force survey in Japan and the introduction of three different Standard Industrial Classification systems (in 1948, 1958, and 1968) in the United Kingdom. Also, where population census data were used in lieu of labor force survey statistics for 1950, these data were adjusted to a compatible basis with the survey data based on a comparison of survey and census data in a year when both were available.

Limitations. The adjustments discussed above have accounted for all major definitional differences in employment statistics between countries and all significant time series differences within countries. However, it should be emphasized that only approximate comparability was achieved among countries. In some instances, it was necessary to make adjustments based on incomplete data or on overlapping data in one year which may not be fully applicable to other years. Nevertheless, the adjusted figures provide a more accurate basis for international comparisons and for trends over time than the figures regularly published for each country.

The average annual rates of change in tables 3 and 5 were calculated by the method of selected points. In this method, the growth rate is obtained by connecting the logs of the beginning and terminal values of the period of years considered with a straight line (this trend line is given by the compound interest rate formula). Therefore, the growth rates are affected by the selection of the terminal years.

This study omits the effects of intrasectoral shifts in civilian employment. There have been large differences in the employment experience of industries within the major sectors studied. There is considerable heterogeneity in the service sector. For example, the U.S. has seen a dramatic growth in services supplied to businesses, and in educational and health services; at the other end of the scale, the number of persons employed in domestic household service and in transporation has been sharply reduced.

Comparisons in this study relate to the number of persons employed. Distribution of hours by sector would have shown somewhat different results since trends in and levels of hours may differ. A significant portion of the increase in U.S. services employment, for example, was in part-time work. The U.S. services sector has shown a consistent postwar decline in average hours paid for. The industry sector, on the other hand, showed very little change in hours paid for from 1950 until a rise in overtime hours occurred in 1964–65.[4] Office of Business Economics' figures on the number of full-time equivalent employees by sector eliminate the effects of part-time work on the sectoral distribution of employment in the United States. The 1950 and 1970 percent distributions by sector of full-time equivalent wage and salary workers and the self-employed according to OBE statistics are as follows:

	1950	*1970*
Agriculture	11.8	4.5
Industry	34.9	32.2
Services	52.0	61.7
Government enterprises	1.3	1.7

The United States employment data used in this report show a similar percent distribution by sector. (See table 2.) It should be remembered that employment in government enterprises is distributed according to the sector most appropriate to the output of the enterprise in tables 1 and 2.

By limiting the analysis to civilian employment, two important segments of the labor force are omitted—military personnel and the unemployed. The size of a nation's military forces can have major economic implications, but the forces themselves are not considered to be engaged in economic activity. The unemployed are omitted because by definition they are not productively engaged and their association with a particular economic sector is tenuous at best. In the United States, these excluded groups represented 7 to 10 percent of the labor force between 1950 and 1970. Elsewhere, the military and unemployed generally accounted for much smaller proportions of the labor force. □

——*APPENDIX FOOTNOTES*——

[1] United Nations, *International Standard Industrial Classification of All Economic Activities*, Statistical Papers, Series M, No. 4, Revision 2 (New York, United Nations, 1968).

[2] BLS figures on the private economy do include output and employment of government enterprises, but exclude public administration.

[3] Beginning in 1953, population levels were raised by about 600,000 and labor force and employment raised by about 350,000; beginning in 1962, the introduction of figures from the 1960 census reduced the population by 50,000 and labor force and employment by 200,000. The inclusion of Alaska and Hawaii beginning in 1960 resulted in an increase of about 500,000 in the population and about 300,000 in the labor force. The 1967 shift of persons absent from their jobs and seeking other jobs to the employed category increased total employment by about 80,000.

[4] *Patterns of U.S. Economic Growth* (BLS Bulletin 1672, 1970), p. 13.

Chapter II. Changes in the Labor Force

The U.S. labor force: projections to 1990

Special Labor Force Report shows work force expanding to 101.8 million by 1980; rate of growth is then expected to decline, with labor force reaching 107.7 million by 1985 and 112.6 million by 1990

DENIS F. JOHNSTON

DURING THE 1970's, the total labor force of the United States is estimated to expand by 15.9 million, reaching 101.8 million by 1980, according to the latest projections of the Bureau of Labor Statistics. This increase implies an average annual growth rate of 1.7 percent, about the same as the average annual rate for the 1960's. After 1980, the rate of growth is expected to decline, averaging only 1.0 percent a year during the eighties. At this decelerated rate, the labor force is estimated to reach 107.7 million by 1985 and 112.6 million by 1990.

Projected changes in the labor force are of necessity closely related to changes projected in the size and age composition of the working-age population —those 16 and over. Projected changes in labor force participation rates (the percent of the population in the labor force) for specific age-sex groups are also significant, but their impact is overshadowed by the effect of the projected population changes. Between 1970 and 1990, for example, 89 percent of the projected change in the male labor force and 68 percent of that of the female labor force can be attributed to projected population changes. Only among men 65 and over, and women 20 to 24 and 45 to 54, do projected changes in labor force participation rates have a greater effect on the labor force than changes in population.

This article presents projections of the total labor force of the United States, by age and sex, for 1980, 1985, and 1990.[1] It includes a discussion of past trends, as background for the analysis of changes implied by the projections, together with a brief summary of the assumptions which underlie the projections and the methods employed in their development.

Changes in the 1970's

The projected 1980 labor force differs markedly from the actual labor force of 1960 and 1970 in its composition by age and sex. The median age of the labor force, which declined from 40 to 38 years during the 1960's, is expected to fall still more rapidly during the present decade, reaching 35 years by 1980. The major factor in this decline is the sharp rise in the number of young adult workers aged 25 to 34 years—from 17.7 to 26.8 million—as the "baby boom" generation moves inexorably through the life cycle. This age group—one-fifth of the labor force in 1970—is estimated to make up over one-fourth of the labor force 10 years later (table 1).

These projections also indicate a continuing increase in the proportion of the labor force that are women—from 36.7 percent in 1970 to 38.5 percent in 1980. This projected increase is much less pronounced, however, than the rise since 1960, when 32.1 percent of those in the labor force were women (table 2). Two major reasons may be cited in support of the more modest growth projected for women workers during the present decade. First, the largest changes in the female population in the 1970's are in the age group (25 to 34 years) whose labor force participation rate is lower than for those age groups where the largest population increases occurred in the 1960's. Second, the unusually rapid increase in women's labor force participation rates during the past decade is associated with the precipitous decline in the birth rate. These projections assume that no further drastic declines in birth rates are in prospect. Thus, the labor force participation rate of women 25 to 34 years old, which rose from 35.8 percent in 1960 to 44.8 percent in 1970, is projected to rise only 5.4 percentage points during

Denis F. Johnston is Senior Demographic Statistician, Office of Manpower Structure and Trends, Bureau of Labor Statistics. William V. Deutermann, Jr., of the Division of Labor Force Studies, assisted in developing the statistical materials.

From the *Review* of July 1973

Table 1. Total population, total labor force, and labor force participation rates, by age and sex, actual 1960 and 1970 and projected 1980, 1985, and 1990

[Numbers in thousands]

Sex and age group	Total population, July 1					Total labor force, annual averages					Labor force participation rates, annual averages (percent of population in labor force)				
	Actual		Projected			Actual		Projected			Actual		Projected		
	1960	1970	1980	1985	1990	1960	1970	1980	1985	1990	1960	1970	1980	1985	1990
BOTH SEXES															
Total, 16 years and over	121,817	142,366	167,339	175,722	183,078	72,104	85,903	101,809	107,716	112,576	59.2	60.3	60.8	61.3	61.5
16 to 24 years	21,773	32,257	37,463	34,405	31,643	12,720	19,916	23,781	22,184	20,319	58.4	61.7	63.5	64.5	64.2
25 to 54 years	67,764	71,777	84,740	94,028	103,309	46,596	51,487	61,944	69,202	76,421	68.8	71.7	73.1	73.6	74.0
55 years and over	32,279	38,333	45,136	47,289	48,126	12,788	14,500	16,084	16,330	15,836	39.6	37.8	35.6	34.5	32.9
MEN															
Total, 16 years and over	59,420	68,641	80,261	84,285	87,911	48,933	54,343	62,590	66,017	68,907	82.4	79.2	78.0	78.3	78.4
16 to 19 years	5,398	7,649	8,339	7,141	7,045	3,162	4,395	4,668	3,962	3,901	58.6	57.5	56.0	55.5	55.4
16 and 17 years	2,880	3,937	4,111	3,515	3,373	1,322	1,840	1,887	1,603	1,530	45.9	46.7	45.9	45.6	45.4
18 and 19 years	2,518	3,712	4,228	3,626	3,672	1,840	2,555	2,781	2,359	2,371	73.1	68.8	65.8	65.1	64.6
20 to 24 years	5,553	8,668	10,666	10,305	9,021	4,939	7,378	8,852	8,496	7,404	88.9	85.1	83.0	82.5	82.1
25 to 34 years	11,347	12,601	18,521	20,540	21,040	10,940	11,974	17,523	19,400	19,853	96.4	95.0	94.6	94.4	94.4
35 to 44 years	11,878	11,303	12,468	15,409	18,378	11,454	10,818	11,851	14,617	17,398	96.4	95.7	95.1	94.9	94.7
45 to 54 years	10,148	11,283	10,781	10,630	11,922	9,568	10,487	9,908	9,744	10,909	94.3	92.9	91.9	91.7	91.5
55 to 64 years	7,564	8,742	9,776	9,874	9,424	6,445	7,127	7,730	7,716	7,307	85.2	81.5	79.1	78.1	77.5
55 to 59 years	4,144	4,794	5,263	5,129	4,787	3,727	4,221	4,558	4,421	4,112	89.9	88.0	86.6	86.2	85.9
60 to 64 years	3,420	3,948	4,513	4,745	4,637	2,718	2,906	3,172	3,295	3,195	79.5	73.6	70.3	69.4	68.9
65 years and over	7,530	8,395	9,710	10,386	11,081	2,425	2,164	2,058	2,082	2,135	32.2	25.8	21.2	20.0	19.3
65 to 69 years	2,941	3,139	3,633	3,852	4,065	1,348	1,278	1,289	1,322	1,365	45.8	40.7	35.5	34.3	33.6
70 years and over	4,590	5,256	6,077	6,534	7,016	1,077	886	769	760	770	23.5	16.9	12.7	11.6	11.0
WOMEN															
Total, 16 years and over	62,397	73,725	87,078	91,437	95,167	23,171	31,560	39,219	41,699	43,669	37.1	42.8	45.0	45.6	45.9
16 to 19 years	5,275	7,432	8,057	6,910	6,776	2,061	3,250	3,669	3,203	3,188	39.1	43.7	45.5	46.4	47.0
16 and 17 years	2,803	3,828	3,969	3,397	3,243	801	1,324	1,427	1,247	1,205	28.6	34.6	36.0	36.7	37.2
18 and 19 years	2,472	3,604	4,088	3,513	3,533	1,260	1,926	2,242	1,956	1,983	51.0	53.4	54.8	55.7	56.1
20 to 24 years	5,547	8,508	10,401	10,049	8,801	2,558	4,893	6,592	6,523	5,826	46.1	57.5	63.4	64.9	66.2
25 to 34 years	11,605	12,743	18,442	20,301	20,750	4,159	5,704	9,256	10,339	10,678	35.8	44.8	50.2	50.9	51.5
35 to 44 years	12,348	11,741	12,903	15,741	18,524	5,325	5,971	6,869	8,560	10,219	43.1	50.9	53.2	54.4	55.2
45 to 54 years	10,438	12,106	11,625	11,407	12,695	5,150	6,533	6,537	6,542	7,364	49.3	54.0	56.2	57.4	58.0
55 to 64 years	8,070	9,763	11,307	11,492	10,934	2,964	4,153	5,057	5,213	5,003	36.7	42.5	44.7	45.4	45.8
55 to 59 years	4,321	5,257	5,966	5,804	5,396	1,803	2,547	3,055	3,033	2,853	41.7	48.4	51.2	52.3	52.9
60 to 64 years	3,749	4,506	5,341	5,688	5,538	1,161	1,606	2,002	2,180	2,150	31.0	35.6	37.5	38.3	38.8
65 years and over	9,115	11,433	14,343	15,537	16,687	954	1,056	1,239	1,319	1,391	10.5	9.2	8.6	8.5	8.3
65 to 69 years	3,347	3,780	4,595	4,942	5,267	579	644	758	814	864	17.3	17.0	16.5	16.5	16.4
70 years and over	5,768	7,653	9,748	10,595	11,420	375	412	481	505	527	6.5	5.4	4.9	4.8	4.6

SOURCE: Population and labor force data for 1960 are from Special Labor Force Report 119 and differ slightly from later estimates. Corresponding 1970 data are from Current Population Survey estimates. Projected population data are from Current Population Reports, Series P-25, No. 493, Series E.

the current decade, reaching 50.2 percent in 1980.

The large increase in the number of young adult workers, and the continued rise in the number of women in the labor force, are the salient features of the changes in prospect during the remainder of the present decade. However, the changes which are foreseen in the other age-sex groups of the working-age population are also significant (table 3).

First, the teenage labor force, which increased from 5.2 million in 1960 to over 7.6 million in 1970, is projected to increase still further, but at a slower pace, reaching a peak in the late 1970's. Thereafter, this group may be expected to decline slowly in number, reaching 8.3 million in 1980. This development has important implications for the absorption of these new young labor force entrants into the Nation's economy. During the 1960's when the number of teenage workers was rising by about 240,000 a year, on average, teenage unemployment fluctuated between 12.2 and 17.2 percent (on an annual average basis). In contrast, the size of the teenage labor force is estimated to increase by only about 70,000 a year, on average, during the current decade. This slower pace of increase should enhance the effectiveness of measures designed to reduce the unemployment rate among teenagers. (See chart 1.)

Second, the group aged 20 to 24 is projected to continue to grow rapidly in size during the current

decade, but again at a slower pace than during the 1960's. This group increased by an average of 480,000 a year during the 1960's, but is expected to increase at the more moderate pace of 320,000 a year during the current decade, reaching 15.4 million workers by 1980.

Third, the group aged 35 to 44, which was the same size in 1970 as in 1960, is projected to increase by 1.9 million during the current decade, reaching 18.7 million in 1980, as the larger number of persons born between 1935 and 1944 moves into this age group of workers.

Fourth, the group aged 45 to 54, which increased by 2.3 million between 1960 and 1970, is projected to decline by nearly 600,000 during the present decade, reaching 16.4 million workers in 1980. At that time, this group will consist mostly of the relatively small number of persons born between 1925 and 1934—the "depression" cohort.

Fifth, the Nation's older workers (aged 55 and over) are projected to continue to increase in number at a somewhat more moderate pace during the current decade. This group increased by about 1.7 million during the 1960's, and is expected to increase by an additional 1.6 million during the 1970's, reaching 16.1 million workers in 1980. Within this group, the number of workers aged 65 and over is projected to remain nearly constant, rising from 3.2 million in 1970 to 3.3 million in 1980. This trend is in contrast to the steady increase in the size of the population 65 and over, which is expected to grow from 19.8 million in 1970 to over 24 million by 1980. Projected reductions in the labor force participation rates of persons in this age group yield a nearly constant number of workers despite the substantial increase in the population.

Comparison with earlier projections

In general, the present set of labor force projections differs from the previous BLS study in two major respects. First, the participation rates for men in all age groups are now estimated to decline over time, reflecting the observed downward movement over the 1955–72 period. [2] Second, the participation rates for women are considerably higher than those

Table 2. Distribution of total labor force, by age and sex, actual 1960 and 1970 and projected 1980, 1985, and 1990

Sex and age group	Number (in thousands)					Percent distribution				
	Actual		Projected			Actual		Projected		
	1960	1970	1980	1985	1990	1960	1970	1980	1985	1990
BOTH SEXES										
Total, 16 years and over	72,104	85,903	101,809	107,716	112,576	100.0	100.0	100.0	100.0	100.0
16 to 24 years	12,720	19,916	23,781	22,184	20,319	17.6	23.2	23.4	20.6	18.0
16 to 19 years	5,223	7,645	8,337	7,165	7,089	7.2	8.9	8.2	6.7	6.3
20 to 24 years	7,497	12,271	15,444	15,019	13,230	10.4	14.3	15.2	13.9	11.8
25 to 54 years	46,596	51,487	61,944	69,202	76,421	64.6	59.9	60.8	64.2	67.9
25 to 34 years	15,099	17,678	26,779	29,739	30,531	20.9	20.6	26.3	27.6	27.1
35 to 44 years	16,779	16,789	18,720	23,177	27,617	23.3	19.5	18.4	21.5	24.5
45 to 54 years	14,718	17,020	16,445	16,286	18,273	20.4	19.8	16.2	15.1	16.2
55 years and over	12,788	14,500	16,084	16,330	15,836	17.7	16.9	15.8	15.2	14.1
55 to 64 years	9,409	11,280	12,787	12,929	12,310	13.0	13.1	12.6	12.0	10.9
65 years and over	3,379	3,220	3,297	3,401	3,526	4.7	3.7	3.2	3.2	3.1
Median age	39.9	38.2	35.2	35.8	37.0					
MEN										
Total, 16 years and over	48,933	54,343	62,590	66,017	68,907	67.9	63.3	61.5	61.3	61.2
16 to 24 years	8,101	11,773	13,520	12,458	11,305	11.2	13.7	13.3	11.6	10.0
25 to 54 years	31,962	33,279	39,282	43,761	48,160	44.3	38.7	38.6	40.6	42.8
55 years and over	8,870	9,291	9,788	9,798	9,442	12.3	10.8	9.6	9.1	8.4
Median age	39.7	38.2	35.2	35.8	36.9					
WOMEN										
Total, 16 years and over	23,171	31,560	39,219	41,699	43,669	32.1	36.7	38.5	38.7	38.8
16 to 24 years	4,619	8,143	10,261	9,726	9,014	6.4	9.5	10.1	9.0	8.0
25 to 54 years	14,634	18,208	22,662	25,441	28,261	20.3	21.2	22.3	23.6	25.1
55 years and over	3,918	5,209	6,296	6,532	6,394	5.4	6.1	6.2	6.1	5.7
Median age	40.3	38.2	35.1	35.9	37.1					

The uses of projections

. . . The basic distinction between a projection and a forecast reflects the purpose it is intended to serve rather than the method of its preparation or the degree of understanding which it reflects. A forecast may be defined as a projection which has been selected as representing the "most likely" outcome in situations whose determinants are insufficiently known or controlled to permit outright prediction. Its distinguishing characteristic is the element of judgment or decision which is necessary in making such a selection. If projections are race horses, the forecast is the horse you decide to bet on.

Whereas projections may serve a number of functions, the basic function on a forecast is to delineate the most probable outcome in a specified area of concern over a specified period in the future. The need for a forecast does not arise until and unless the user must commit himself to a definite plan of action extending into the future. Given such a commitment, the preparation or adoption of some kind of forecast is inescapable.

Projections in general, and economic-demographic projections in particular, may be used to meet a number of purposes. First, they are most commonly designed to fulfill an anticipatory function—allowing the user to anticipate the probable magnitude or impact of some probable or postulated set of conditions or changes at some future time. . . .

Second, projections—or the forecast which is selected from among them—are an essential input for planning and program development. If our plans and programs are rational, they must be future-oriented, and they must therefore incorporate some systematic appraisal of the environment in which these plans are likely to operate in the future. . . .

Third, projections are an essential—though sometimes implicit—ingredient in program evaluation. Attempts at program evaluation, especially in areas involving social behavior, commonly encounter the problem that program benefits cannot be estimated with nearly the confidence or accuracy that surrounds estimates of program costs. The social researcher recognizes in this difficulty the truism that the impact of any social program is entangled in a web of cross-impacts reflecting the totality of interactions occurring in the society. One way to avoid this difficulty is to project the course of developments which might be anticipated in the absence of the particular program, so that comparison of this projection with actual post-program outcomes may yield an estimate, however crude, of program impact or "benefit."

Fourth, projections may be viewed as essential links in a chain of conjecture; each projection includes among its underlying assumptions certain conditions which are derived from a prior projection, and most projections are likely, in turn, to provide inputs to other projections. . . .

Fifth, projections serve a public information function. Our justifiable concern with the manipulative and propagandistic elements which may be found in projections prepared for public effect should not obscure the fact that projections, when freed of such influences, have a unique educational value. . . .

Finally, projections serve an exploratory or heuristic function, insofar as they may be developed in order to delineate the probable (or possible) consequences of alternative sets of initial conditions and determining factors. While the chief value of such exercises may be educational, they may be of considerable practical value to the decisionmaker as well. To the extent that they expand his awareness of the "degrees of freedom" which he enjoys in a given situation, they may prompt his consideration of alternative solutions which he might not otherwise have recognized.

Each of these six functions provides a perspective from which to suggest a course of action in "building upon" the available economic and demographic projections. However, it is the last of these functions which most clearly reflects the nature and potential value of projections in their purest sense, and it is the fulfillment of this function which most nearly implies a capacity to carry out the other functions as well.

* * * * *

. . . To build upon economic and demographic projections, it is necessary to recognize the different purposes for which projections are developed and the different strategies which are called for in pursuing these purposes. From the standpoint of the technician, the necessary strategy is straightforward: we need to integrate our economic and demographic models, incorporating additional indicators of relevant social processes, so as to develop more inclusive social systems models. But for the decisionmaker and social critic alike, a different strategy must be employed—one which recognizes in the failures of past predictions not the need for improved analytical systems, but rather the existence of opportunities for the expression of human values which alone give meaning to our decisions.

—DENIS F. JOHNSTON,

"Building on Economic and Demographic Projections," a paper presented at a meeting of the Society of Actuaries, Toronto.

Table 3. Net changes in total labor force 16 years old and over, by age and sex, 1960–70, 1970–80, and 1980–90

Sex and age group	Net change (in thousands)			Percent change			Average annual rate of change [1] (in percent)		
	1960–70	1970–80	1980–90	1960–70	1970–80	1980–90	1960–70	1970–80	1980–90
BOTH SEXES									
Total, 16 years and over	13,799	15,906	10,767	100.0	100.0	100.0	1.75	1.70	1.01
16 to 19 years	2,422	692	−1,248	17.6	4.4	−11.6	3.81	.87	−1.62
20 to 24 years	4,774	3,173	−2,214	34.6	19.9	−20.6	4.93	2.30	−1.55
25 to 34 years	2,579	9,101	3,752	18.7	57.2	34.8	1.58	4.15	1.31
35 to 44 years	10	1,931	8,897	.1	12.1	82.6	(2)	1.09	3.89
45 to 54 years	2,302	−575	1,828	16.7	−3.6	17.0	1.45	−.34	1.05
55 to 64 years	1,871	1,507	−477	13.6	9.5	−4.4	1.81	1.25	−.38
65 years and over	−159	77	229	−1.2	.5	2.1	−.48	.24	.67
MEN									
Total, 16 years and over	5,410	8,247	6,317	39.2	51.8	58.7	1.05	1.41	.96
16 to 24 years	3,672	1,747	−2,215	26.6	11.0	−20.6	3.74	1.38	−1.79
25 to 54 years	1,317	6,003	8,878	9.5	37.7	82.5	.40	1.66	2.04
55 years and over	421	497	−346	3.0	3.1	−3.2	.46	.52	−.36
WOMEN									
Total, 16 years and over	8,389	7,659	4,450	60.8	48.2	41.3	3.09	2.17	1.07
16 to 24 years	3,524	2,118	−1,247	25.5	13.3	−11.6	5.67	2.31	−1.30
25 to 54 years	3,574	4,454	5,599	25.9	28.0	52.0	2.18	2.19	2.21
55 years and over	1,291	1,087	98	9.4	6.8	.9	2.85	1.90	.15

[1] Compounded continously.

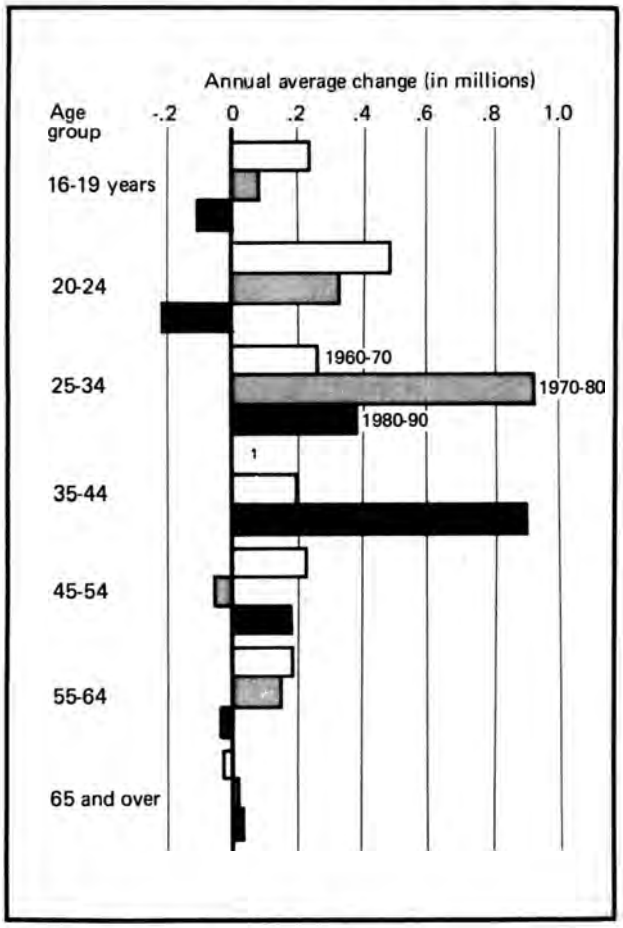
[2] Less than .05 percent.

formerly estimated, although the rate of increase is generally slower than that observed during the 1960 decade (table 4). The net effect of these changes is to reduce the 1980 male labor force by 1.0 million (in comparison with the previous BLS projection) and to raise the female labor force by 2.1 million, for a net increase of 1.1 million (from 100.7 to 101.8 million workers).

The direction of both of these major changes is the same as that of earlier revisions in the BLS projections (as shown in table 4). However, unlike the earlier revisions, the present projection does not hold the participation rates for men in the central working ages (25 to 54) at a constant level. Instead it allows these rates to edge downward slowly, on the assumption that the observed reductions between 1955 and 1972 are not attributable to cyclical factors, but rather reflect a long-term secular trend. As has been noted in previous BLS projections, the projected declines in the participation rates of younger men (16 to 24) are assumed to reflect the net effect of continued growth in school enrollment, while the declines projected among men 55 and over reflect a long-term trend toward earlier retirement—an option which is increasingly supportable by virtue of the improved terms and increased coverage afforded by a host of private and public pension plans and personal savings. [3]

In regard to the upward revision in the participation rates for women, three major points should be made. First, the current projection implies a substantial reduction in the rate of increase of participation rates of women under 35. This is particularly noticeable in comparison with the very rapid gains observed among women in this age group during the 1964–72 period, when their participation rates increased by 10 percentage points, reaching 50.4 percent in 1972. The projected gain over the following 8-year period (1972–80) is only 2.5 percentage points. As noted previously, the more modest growth projected in the labor force participation rates of these younger women reflects the judgment that the extraordinary growth observed during the past decade was accelerated by certain factors which are not expected to have a significant impact in the future. The most important of these is the rapid decline in fertility that occurred during the 1960's. Between 1960 and 1972, the general fertility rate declined from 118.0 to 73.4—a drop of 38 percent.[4] Since the presence of young children in the home limits the availability of mothers for work outside the home (ceteris paribus), this reduction in fertility allowed a growing proportion of young women to enter the labor force. In addition, the Vietnam buildup of the late 1960's afforded unusually favorable employment opportunities for these women.

Chart 1. Change in labor force (annual average) over successive decades, 1960 to 1990, by age group



[1] An increase of one thousand per year, on average.

Also, in the late 1960's the number at or near the median age at which women married for the first time was considerably larger than the number of men 2 to 3 years older than themselves whom they would normally have married. This temporary imbalance was exacerbated by the Vietnam buildup, thus inducing considerable delay in marriage. Each of these factors is assumed to have had a strong positive influence on the participation rates of young women in the recent past, and none of these factors is expected to be operative in the future.

Second, the current projection implies a more moderate reduction in growth of the participation rate among women 35 to 54 years old. Between 1964 and 1972, their participation rate increased by 5 percentage points, reaching 52.7 percent in 1972. The corresponding increase for 1972–80 is only 2.0 percentage points. This slower projected growth reflects in part the slow increase in labor force participation among women 45 to 54 years old observed during the past decade. In addition, it is felt that the very large increases projected in the number of young women workers 25 to 34 years old may have a limiting effect on the employment opportunities of older women.

Finally, the projection for older women (55 and over) shows a small increase in their rate of labor force participation during the remainder of the current decade. This projected increase occurs only among women 55 to 64 years old; the long-term decline in participation among women 65 and over is expected to continue. Although the projected labor force of women 55 and over in 1980 is practically identical with the previous BLS projection, the projected participation rates are somewhat lower, reflecting the stabilized rates observed in the recent past. This apparent discrepancy is accounted for by the larger size of the population of women 55 and over currently projected for 1980.

Changes in the 1980's

The outstanding feature of the projected 1980–90 increase in the total labor force is the slower pace of growth—from an average annual rate of 1.7 percent in the 1970's to 1.0 percent in the 1980's. At this reduced rate, the labor force is projected to increase by 10.8 million during the 1980 decade, reaching 107.7 million by 1985 and 112.6 million by 1990. Also significant is the expected shift in the locus of major expansion, from the 25- to 34-year-old group in the 1970's to the 35- to 44-year-old group during the 1980's. The latter group, whose number is projected to increase by about 190,000 a year, on average, during the current decade, is projected to grow by nearly 900,000 a year, on average, during the 1980's. One manifestation of this shift is the estimated rise in the median age of the labor force—from 35.2 years in 1980 to 37.0 years in 1990.

The number of young workers (16 to 24 years old) is projected to decline by nearly 350,000 a year, on average, during the 1980's from 23.8 million in 1980 to 22.2 million by 1985 and 20.3 million by 1990—only 400,000 more than their number in 1970. (See chart 2.) However, this younger group in 1990 is expected to differ sharply from that of 1970, with nearly 500,000 fewer men and 900,000 more women workers—reflecting the assumed continuation in both the downward trend in

Table 4. Comparison of current labor force projection with earlier BLS projections, 1980 and 1985

[In thousands]

Sex and age group	Total labor force 16 years old and over, by age and sex							
	1980					1985		
	Current projection	SLFR 119 [1]	1980 SLFR 49 [2]	Differences		Current projection	1985 SLFR 119 [1]	Difference (6) − (7)
				(1) − (2)	(1) − (3)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BOTH SEXES								
Total, 16 years and over	101,809	100,727	99,942	1,082	1,867	107,716	107,156	560
16 to 24 years	23,781	23,130	22,554	651	1,227	22,184	22,242	−58
25 to 54 years	61,944	61,377	60,431	567	1,513	69,202	68,525	677
55 years and over	16,084	16,220	16,957	−136	−873	16,330	16,389	−59
MEN								
Total, 16 years and over	62,590	63,612	64,061	−1,022	−1,471	66,017	67,718	−1,701
16 to 24 years	13,520	13,690	13,888	−170	−368	12,458	13,179	−721
25 to 54 years	39,282	39,983	39,893	−701	−611	43,761	44,542	−781
55 years and over	9,788	9,939	10,280	−151	−492	9,798	9,997	−199
WOMEN								
Total, 16 years and over	39,219	37,115	35,881	2,104	3,338	41,699	39,438	2,261
16 to 24 years	10,261	9,440	8,666	821	1,595	9,726	9,063	663
25 to 54 years	22,662	21,394	20,538	1,268	2,124	25,441	23,983	1,458
55 years and over	6,296	6,281	6,677	15	−381	6,532	6,392	140

[1] Sophia C. Travis, "The U.S. labor force: projections to 1985," **Monthly Labor Review**, May 1970, pp. 3–12, reprinted as Special Labor Force Report 119.

[2] Sophia C. Travis and Denis F. Johnston, "Labor Force Projections for 1970–80," **Monthly Labor Review**, February 1965, pp. 129–40, reprinted as Special Labor Force Report 49.

Table 5. Effect of alternative fertility assumptions on projected total labor force of women 16 to 49 years old, by age, 1980, 1985, and 1990 [1]

[In thousands]

Sex and age group	1980			1985			1990 [2]		
	Series D	Series E	Series F	Series D	Series E	Series F	Series D	Series E	Series F
BOTH SEXES									
Total, 16 years and over	101,138	101,809	102,166	106,932	107,716	108,247	112,119	112,576	113,031
MEN									
Total, 16 years and over	62,590	62,590	62,590	66,017	66,017	66,017	69,102	68,907	68,834
WOMEN									
Total, 16 years and over	38,548	39,219	39,576	40,915	41,699	42,230	43,017	43,669	44,197
16 and 17 years	1,425	1,427	1,429	1,245	1,247	1,247	1,356	1,205	1,149
18 and 19 years	2,228	2,242	2,253	1,943	1,956	1,964	1,971	1,983	1,991
20 to 24 years	6,372	6,592	6,730	6,307	6,523	6,686	5,643	5,826	5,965
25 to 29 years	4,770	5,038	5,176	5,167	5,505	5,743	5,042	5,387	5,646
30 to 34 years	4,104	4,218	4,268	4,689	4,834	4,920	5,116	5,291	5,416
35 to 39 years	3,593	3,632	3,646	4,588	4,641	4,668	5,202	5,268	5,307
40 to 44 years	3,225	3,237	3,241	3,904	3,919	3,927	4,931	4,951	4,963
45 to 49 years	3,203	3,205	3,205	3,384	3,386	3,387	4,052	4,054	4,056
50 years and over	9,628	9,628	9,628	9,688	9,688	9,688	9,704	9,704	9,704

[1] As currently defined by the Bureau of the Census in **Current Population Reports**, Series P–25, No. 493, Series D implies an ultimate completed cohort fertility rate of 2,500, that is, 1,000 women would have, on average, 2,500 births throughout their childbearing period. Series E implies a corresponding rate of 2,100, and Series F implies a rate of 1,800. The basic projections in this report are based on the Series E population projections.

[2] The differences in the projected male labor force in 1990 are due to differences among the three series in the number of births projected for 1973 and 1974—cohorts which would be 16 and 17 years old in 1990. The projected female labor force 16 and 17 in 1990 is similarly affected.

the participation rates of young men and the upward trend for young women.

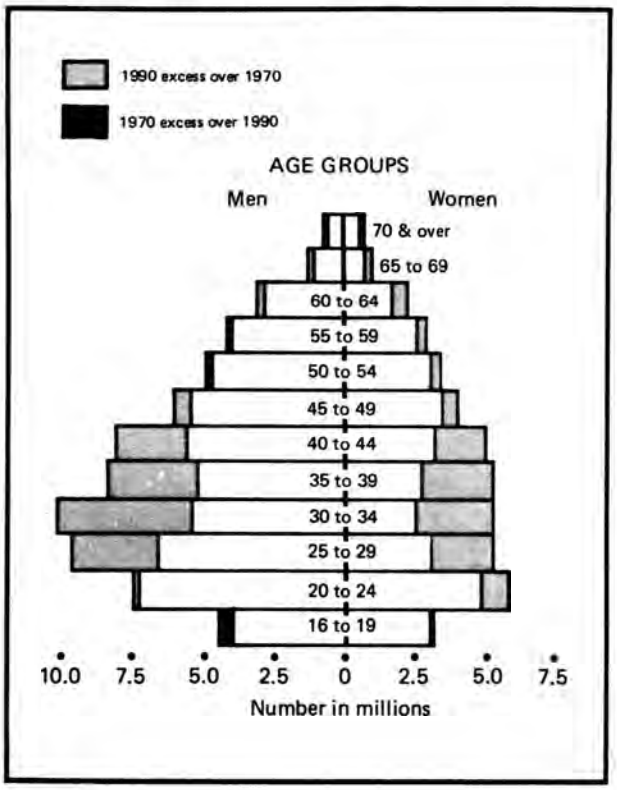
Workers in the 25- to 34-year-old group are estimated to continue to increase in number during the 1980's but at a much slower pace than in the 1970's, reaching 29.7 million by 1985 and 30.5 million by 1990. Moreover, this gain is expected to occur primarily during the first half of the 1980 decade, with an annual average increase of 600,000 a year, in contrast to an increase of only 160,000 a year, on average, between 1985 and 1990.

The prospects among workers 45 to 54 years old imply a reversal of the trend foreseen for the current decade—from an annual average decline of nearly 60,000 in the present decade to an average gain of 180,000 a year in the 1980's. Meanwhile, the smaller number of persons born in the 1925–34 period will be moving into the 55- to 64-year-old age group, whose labor force numbers are therefore expected to decline by nearly 50,000 a year, on average.

Finally, the outlook for workers 65 and over during the 1980's is for a slow but steady increase in number (20,000 a year), as the assumed continuing decline in their participation rates is more than offset by the continued rise in the underlying population of older persons—from 24 million in 1980 to 25.9 million in 1985 and 27.8 million by 1990.

The sex distribution of the projected labor force is not expected to change greatly in the 1980's. The proportion of workers who are women is expected to rise from 38.5 percent in 1980 to 38.7 percent in 1985 and 38.8 percent in 1990. This stabilization reflects primarily the changing age composition of the working-age population during the decade, with declines in the number of young women and very small increases in the number of women 45 to 64 years old—the two age groups whose participation rates have been relatively high (chart 3).

Chart 2. Age-sex profile of total labor force, 1970 actual and 1990 projected



Alternative projections

The alternative projections shown in table 5 describe the estimated effect of specified changes in a single variable (fertility) upon the size and age-sex distribution of the projected labor force.[5] Table 5 shows the projected total labor force of women 16 to 49 years old, by age, for 1980, 1985, and 1990, under three alternative assumptions concerning fertility: Series "D," "E," and "F." As is explained in the following section on methodology, Series E (defined as 2,100 births per 1,000 women) is the series adopted for the basic set of projections in this report; it represents a level of fertility whereby each generation is barely replaced by the next one, so that the population eventually stops growing (except for immigration). Series D implies a higher fertility rate of 2,500 births per 1,000 women, while Series F implies a lower rate of 1,800 births per 1,000 women. Thus Series E is somewhat closer to F than to D. In developing these alternative projections, the assumed participation rates for women with and without children under 5 years old are the same for each series; the only difference among the three series is the difference in the proportions of the population of women with and without children under 5. Series D implies a larger proportion of women in each childbearing age group with children under 5, while Series F implies a lower proportion, with Series E falling in between.

The effect of these alternative fertility assumptions (ceteris paribus) can be illustrated by examining the 1980 projection. As noted previously, the basic Series E projection yields a total labor force

of 101.8 million. A shift to Series D has the effect of reducing the female labor force (and thus the total labor force) by about 670,000, while a shift to Series F increases the labor force by about 360,000. Thus, the range of the projected variation in the size of the labor force, as we move from Series D to Series F, amounts to about 1.0 million, or 1 percent of the basic projection for 1980. Among all women workers, however, that range amounts to 2.6 percent of the basic projection, and among women in the principal childbearing ages (16 to 49), it amounts to 3.5 percent of the basic projection.[6]

It should be noted, parenthetically, that the previous projections assumed continuation of the Series C fertility levels (the level which approximates the actual fertility rate of the mid-1960's). Since that time, fertility has declined to its present level, which is close to Series E. On the basis of the above calculations, the shift from Series C to Series E would account for an increase in the size of the female labor force of about 700,000 in 1970. Thus, the "error" in the fertility assumption alone accounts for over one-third of the 1.9 million underestimate of the 1970 female labor force in the BLS projections prepared in 1964.[7]

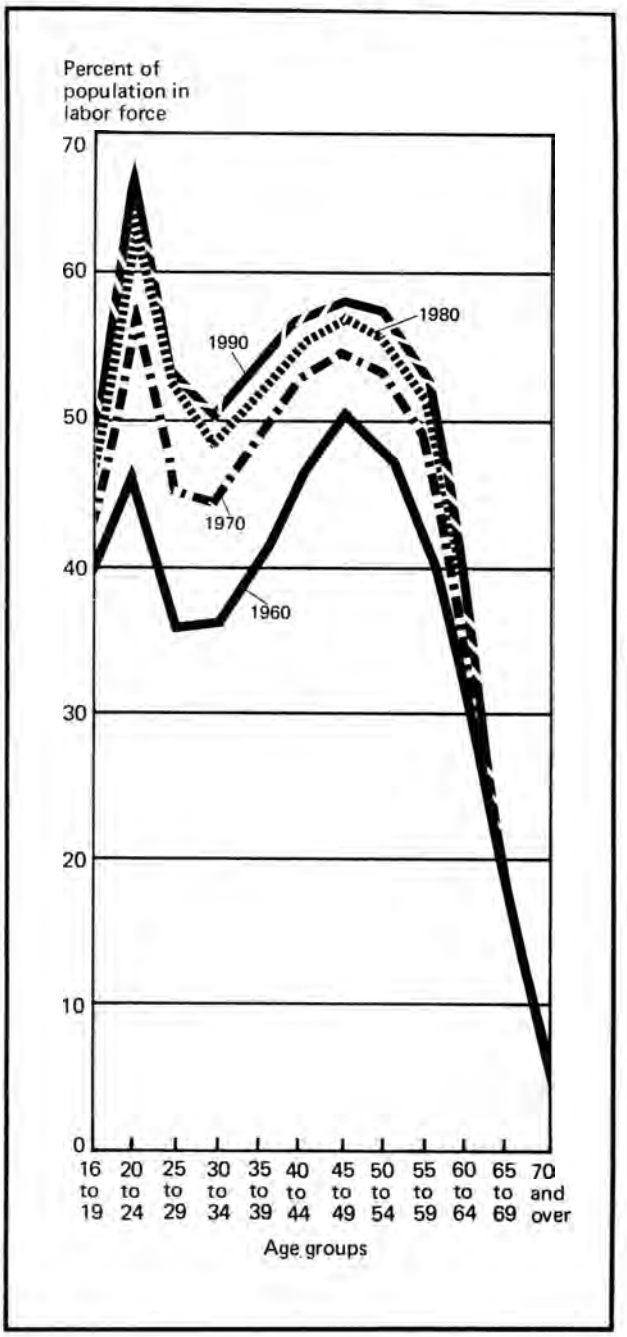
Methods and assumptions

The projections in this report reflect anticipated changes in the demographic composition of the population of working age, combined with our judgments as to the changes which might be expected in the labor force participation rates of the several age-sex groups in the population. The predominant factor in these projections is the anticipated change in the size and age-sex composition of the population. The projections assume no drastic changes in the propensity of the several population groups to seek work. They also assume a generally favorable demand situation, together with the absence of major wars or other major social or economic disturbances. Finally, the projections assume no major legislative or social changes which would alter the conditions under which individuals choose to enter or remain out of the labor force, or which would alter the prevailing definitions of "labor force," "employment," or "unemployment."[8]

The general approach is to extrapolate observed trends in the participation rates of each age-sex group to the terminal date of the projection (1990),

Chart 3. Labor force participation rates of women, by age, 1960, 1980, and 1990

[Percent of total population in total labor force]



and to apply the projected rates to the projected population to obtain the labor force. The major steps in this procedure are as follows:

Step 1. Annual average rates of labor force participation (the percent of the total population in the total

labor force) were obtained for each year, 1955 through 1972, for men and women separately in the following age groups: 16–17, 18–19, and 5-year groups thereafter to 70 and over. By means of linear regression, the average annual change in the participation rates of each age-sex group over the 1955–72 period was obtained. That average annual change, times 5, was taken as representative of the average observed 5-year change in the participation rate of each age-sex group.

Step 2. Each of the observed 5-year changes in participation rates was then gradually reduced by a constant proportion for successive 5-year periods, so as to reduce all changes to approximately zero in 50 years (that is, in 10 5-year periods). Such a "tapering" of trends is designed to prevent the occurrence of future rates that might otherwise fall outside plausible (or possible) limits. It also reflects the assumption that each rate is moving toward some asymptotic level which can only be defined arbitrarily. To accomplish this reduction, a constant multiplier (M) was applied to each observed average 5-year change to obtain the projected change over the first projected period (1970–75). That change was again multiplied by M to obtain the projected change for the next 5-year period (1975–80), and so on to 1985–90. For example, the largest observed 5-year change was −4.64 percentage points (among males 65 to 69); the multiplier (M) was assigned a value such that $4.64 \times M^{10} < 0.05$. In this case, M = .63. Similarly, the smallest observed 5-year change (among women 65 to 69) was −.22; here, the appropriate value for M is .84.

Step 3. The projected 5-year change for each age-sex group, 1970–75, added algebraically to the 1969–71 average labor force participation rate for the specified group (used as a base) yields the projected participation rate for 1975. Repeating this procedure yields projected participation rates for 1980, 1985, and 1990.

Step 4. For women in the childbearing ages (16 to 49), the trends in the ratio of the observed participation rates among women with children under 5 and those without children under 5 to the participation rates for all women in the specified age groups were estimated and projected. The projected ratios were then used to obtain projected participation rates for women with and without children under 5, by age, to 1990.

Step 5. The percentages of women in each age group (16 to 49) who would have children under 5, consistent with the fertility levels of the Bureau of the Census' Series C, D, E, and F projections of population (as given in *Current Population Reports*, Series P-25, No. 493) were estimated for the years 1975, 1980, 1985, and 1990. These percentages were then applied to the projected total population of women in these ages to obtain the number of women with and without children under 5 for the target years.

Step 6. The projected participation rates for women with and without children under 5 (as obtained in step 4) were then applied to the projected numbers of women with and without children under 5 (by age), yielding a projected labor force consistent with the Series C, D, E, and F population projections.

Step 7. An analysis of recent trends in the fertility of American women and of information relating to the fertility expectations of young married women led to the decision to adopt the Series E projections for the basic set of labor force projections. Aggregating the projected labor force of women 16 to 49, by presence of children under 5, and dividing by the corresponding population produced a final projected set of participation rates for all women 16 to 49 for the target years, consistent with Series E population projections.

Step 8. On the assumption that changes in fertility would not affect the participation rates for men or for women 50 and over, the projected labor force for these latter groups was obtained by multiplying the projected population by the projected participation rates obtained in step 3. □

FOOTNOTES

[1] These projections supersede those which were presented by Sophia C. Travis in "The U.S. labor force: projections to 1985," *Monthly Labor Review*, May 1970, pp. 3–12, reprinted as Special Labor Force Report 119. Information by color or race, a category included in the earlier report, is not yet available, and will be published in a forthcoming report in 1974. The new projections are based on the Series E projections of population, as given in the *Current Pop-*

Determining the labor force status of men missed in the census

Special Labor Force Report describes pilot use of a new technique for securing labor force data in urban poverty areas

DEBORAH P. KLEIN

RECENT attempts have been made to obtain heretofore unavailable social and economic data about men missed in the census—especially men from minority groups between 20 and 50 years of age who are estimated to have high rates of undercount. The studies, which were conducted in New Haven, Conn., Central Harlem in New York, N.Y., and Trenton, N.J., used a "casual interview" technique. This approach consisted of interviews in bars, poolrooms, restaurants, on street corners, park benches, and similar locations. This article discusses the results of the new approach, which is one way to obtain more extensive social and economic data for those parts of the population that have been difficult to fully enumerate in censuses.

Background: the undercount

It is estimated that about 3 percent of the population was missed in the 1960 census. All the studies undertaken to estimate the number of persons missed indicate that the undercount rate (percent of persons missed) varies significantly by race, age, and sex. The 1960 census enumerated 98 percent of white persons but only 90 percent of persons of other races,[1] according to Census Bureau estimates.[2] The total number of unenumerated persons has been estimated to be 5.7 million, of whom 38 percent were members of races other than white. Thus, while the number of uncounted white persons is greater than the number of uncounted persons of other races, the proportion of white persons missed is considerably smaller than the proportion of persons of other races.

Deborah P. Klein is an economist in the Urban Employment Studies Group of the Office of Manpower and Employment Statistics, Bureau of Labor Statistics.

Completeness of coverage varies by age and sex, as well as by race and ethnic group. Coverage is proportionately better for children than adults, and better for females than for males. A relatively large number of persons over 65 years of age were missed. The highest rates of undercount were found among men 20–34 years old and 50–54 years. Women's undercount rates are lower than men's at every age below 50, and it is possible that age misstatement accounts for part of the undercount for women at the older ages.

The census data provide benchmarks for preparing monthly population estimates between censuses. These estimates are used to weight the data from the Current Population Survey (CPS) which provide monthly statistics on economic characteristics of the population. Thus, any undercount in the decennial census is transmitted to the intercensal statistics and may affect the reliability of the published labor force data.

The Bureau of Labor Statistics tried to quantify the possible effect of the undercount on national unemployment rates. Two different assumptions about the labor force status of uncounted persons were used to analyze population data that had been adjusted for the estimated undercount.[3] Under the "comparability" assumption, missed persons were assigned the same labor force status as counted persons in the same age-sex-color group. Under the "poverty-neighborhood" assumption, missed individuals were assigned the characteristics of persons living in urban poverty areas and in the same age-sex-color cell.

Regardless of which assumption was used, the resulting estimates of labor force size and employment were substantially larger when account was taken of the missed persons. Distributions by age, sex, and color changed only slightly, but the levels were higher than those indicated by the published

figures. The national unemployment rate was not appreciably different from the published one under either assumption. It would have required a very high undercount rate, coupled with a grossly higher unemployment rate among the uncounted persons, for the national published unemployment rate to have been significantly in error (table 1).

In some local areas, the undercount may constitute a greater proportion of the population than it does in the Nation as a whole. In these areas, including the estimated undercount might make a significant difference in labor force data as well as population data. It has been suggested that undercount rates are highest in crowded urban poverty areas and sparsely populated rural areas. Particular concern has been expressed about the quality of the population and labor force estimates for the Nation's largest cities. At the city level we do not know what percentage of the population is missed and what the characteristics of these missed people are. The demographic analysis which is used to obtain national estimates has not been done on a local level, primarily because adequate birth, death, and migration rates are available only on a national basis.

Bureau research on missed persons

The issue of severe unemployment in urban poverty areas highlighted the fact that failure to obtain information about all residents could significantly affect the labor force data for these areas. Consequently, the Bureau of Labor Statistics designed a pilot research program to improve statistics for urban poverty areas. This program, which included among its aims the gathering of more information about persons not counted in household surveys in these areas, was conducted in the spring of 1967. The undercount portion of the program, which complemented the previous work of the Census Bureau in this area, was concerned with identifying the labor force characteristics of men not enumerated in household surveys, such as the decennial census or the CPS.

The basic procedures of the BLS undercount study were to obtain a set of names and addresses through some source other than a household survey; to determine whether the individual would be reported in a household survey; and then to compare the characteristics of those individuals reported by the household to the characteristics of those who were not reported. One source used to obtain the names and addresses was "casual interviews," that is, interviews conducted in casual settings such as bars, poolrooms, and on street corners. A second source was lists obtained from establishments, such as restaurants, laundries, and hospitals, which often hire large numbers of low-paid workers. Another aspect of the BLS research project was to compare the effects of conducting an undercount study in conjunction with a complete census count, and conducting such a study without a complete population count.

The pilot program was conducted in two areas—the Negro poverty areas of New Haven, Conn., and the Central Harlem area of New York, N.Y. New Haven was selected because it was the site of a pretest of the 1970 decennial census. The BLS research project was timed to follow shortly after this pretest. In New York (which had had no recent census), two sources—employers' lists and casual interviews—were used to obtain names and addresses. The target populations in both areas were Negro men between the ages of 20 and 50 years, because the estimated rates of undercount were highest for this group.[4]

In New Haven, where casual interviews were the only source of names and addresses, the Census Bureau was able to check the names and addresses obtained from the casual interviews against the listing obtained in the census pretest. Followup interviews were conducted at households where the names and addresses obtained in the casual interviews could not be matched with records of that census pretest. These interviews inquired about the whereabouts of the individual in question. In New York, the procedure called for a household interview at every address obtained from either

Table 1. Effect on the unemployment rate of including omitted persons under selected assumptions, by color and sex, 1967

Color and sex	Unemployment rate				
	Official estimate	Comparability assumption		Poverty neighborhood assumption	
		Omitted persons	Adjusted rates	Omitted persons	Adjusted rates
White:					
Both sexes	3.4	3.4	3.4	5.1	3.4
Male	2.7	3.1	2.8	4.9	2.8
Female	4.6	3.7	4.6	5.7	4.6
Negro and other races:					
Both sexes	7.4	6.0	7.2	6.9	7.3
Male	6.0	4.9	5.9	6.5	6.2
Female	9.1	7.4	9.0	8.1	9.0

Source: Monthly Labor Review, March 1969, tables on pages 10, 11, and 12.

the casual interview or the establishment lists. The household interview was used to determine whether the person would be listed in a household interview such as the CPS, and to ascertain whether those persons not listed as household members were part of the undercount. This method revealed itself to be considerably less effective than the method of conducting such a study in conjunction with a census count.

The New Haven study identified 39 cases of persons missed in the census pretest. Obviously, the number of cases was too small to permit inferences about the characteristics of all uncounted Negro men in urban poverty areas. The results, however, were significant in providing some insight, albeit inconclusive, into the social and economic characteristics of the undercount, and into a method which would increase identification of the uncounted persons. (Even fewer cases were found in New York.[5])

The primary finding of the study was that the labor force status of the undercount group was very much like the labor force status of their neighbors who were counted. (See table 2.) Two significant differences between the enumerated group and the undercount group support the hypothesis that men are missed in census counts because they do not have family responsibilities and, as a result, frequently shift their places of residence. The differences were: (1) the undercounted group tended to have more casual attachments to their places of residence; that is, the proportion of those who had lived at their last place of residence 1 year or less was nearly 4 times higher for the undercount group than for the enumerated group, and (2) a large proportion of the undercount group had never been married. In addition, the New Haven study suggested that economic and social characteristics of undercounted Negro men in urban poverty areas could be identified through the technique of obtaining names and addresses through casual interviews following a complete census of the area.

Trenton undercount study

A recent study in Trenton, N.J., employed the casual interview technique used in the BLS New Haven Undercount Project already described. The study was undertaken by the Trenton Model Cities Agency to gain additional information about the situation of persons in poverty areas.

The primary finding of the Trenton study substantiated the tentative conclusions of the New Haven study—the labor force status of men who are not counted in a census is similar to that of men who are counted. (See table 3.)

The Trenton Model Cities Agency used a slightly revised version of the questionnaire designed by BLS for use in the New Haven study. The schedule covered the areas of educational and marital status, age, place of birth, residential history, labor force status, occupation, earnings, and hours worked.

Unlike the New Haven study, in the Trenton study there was no followup probe at addresses which were unmatched in the census record. In New Haven, there had been a complete census count, a series of casual interviews, a matching of names, and *then* a followup household interview. The address of each person who had not been enumerated in the census pretest was visited and the respondent was asked about the individual in question. If the respondent acknowledged that the individual did live at the address, then that person was considered to be part of the undercount. The Trenton study omitted this followup household interview. The Census Bureau classified all persons whose names could not be matched with enumeration lists and whose addresses were within the enumeration district as persons missed in the census pretest.

The Trenton survey was about twice as large as the one in New Haven. Over 900 names and

Table 2. Comparison of selected characteristics of casual interview respondents in New Haven

[Percent distribution]

Characteristics	Total persons in casual study	Persons matched in census records (men counted in the census)	Persons not matched in census records	
			Men found in field followup (undercount)	Men not found in field followup
Marital status:				
Married	48	57	33	40
Separated	16	9	18	23
Widowed or divorced	5	6	0	4
Never married	30	25	46	32
Information not available	2	2	3	1
Years at residence:				
1 year or less	21	12	46	27
More than 1 year	70	75	51	68
Information not available	9	12	3	5
Labor force status:				
Employed	78	78	77	77
Unemployed	11	11	13	12
Unemployment rate	13	12	14	13
Not in labor force	8	8	8	7
Information not available	3	3	3	3
Number of responses	507	249	39	219

Source: BLS Report 354, pp. 25–26.

addresses were obtained from casual interviews in Trenton. These names were divided into three groups. The first group consisted of 283 names that were matched with the census lists; that is, men who were enumerated in the census. The second group consisted of 290 names that could not be matched with census lists but whose addresses were within the city limits. This group was considered to be part of the undercount. The third group (350 names) contained persons whose enumeration status was unclear; they may or may not have been enumerated. Included in this group were schedules that could not be matched because of problems in address classifications and schedules which arrived past the deadline for Census Bureau checking. There were about 150 additional schedules that could not be classified because their addresses were outside Trenton city limits. Duplicate schedules (which typically occurred when more than one enumerator interviewed the same individual) were also excluded from the tabulations.

When the characteristics of the persons interviewed in a casual setting and counted in the census were compared with the characteristics of the persons interviewed in the same area and not counted in the census, the general finding was that the two groups were very similar in regard to labor force status. The unemployment rate for the missed individuals was almost identical to that of their counted neighbors. Furthermore, the unemployment rate for the men whose enumeration status was not known (the men for whom no census match could be made) was about the same as the others. The rate of nonparticipation in the labor force was somewhat larger for the undercount group than for the enumerated. However, the rate was less than 10 percent for both groups.

Table 3. Comparisons of labor force status of casual interview respondents in Trenton

[Percent distribution]

Labor force status	Total men in study	Men classified as enumerated in the census pretest	Men classified as part of the undercount	Men who could not be classified
Employed	83	86	79	85
Unemployed	9	9	9	10
Unemployment rate	10	10	10	10
Not in labor force	6	4	9	5
Information not available	1	1	2	(1)
Number of responses	923	283	290	350

[1] Less than 1 percent.

Table 4. Comparisons of selected characteristics of casual interview respondents in Trenton

[Percent distribution]

Characteristics	Total men in study	Men classified as enumerated in the census pretest	Men classified as part of the undercount	Men who could not be classified
Age:				
Less than 20 years	6	6	8	5
20-29	38	28	46	40
30-39	24	24	20	28
40-49	26	36	20	23
50 or more	5	6	5	3
Information not available	1	(1)	1	(1)
Marital status:				
Married	44	58	35	39
Separated, widowed or divorced	18	13	21	21
Never married	34	26	41	34
Information not available	4	3	3	6
Years at residence:				
Less than 1	13	9	14	15
1 or 2	22	20	25	21
3 or more	62	69	58	59
Information not available	3	2	4	4
Number of responses	923	283	290	350

[1] Less than 1 percent.

Another characteristic in which the unenumerated and the uncounted were similar was educational attainment. Among the men interviewed in the Trenton study, about 30 percent of each group had not attended high school and about 65 percent had not graduated from high school.

Despite the similarity of the two groups in terms of labor force status and educational attainment, there were some characteristics in which they differed. The uncounted group was somewhat younger, less likely to be married, and more mobile. (See table 4.) The differences in age distribution, of course, affected the other characteristics. Furthermore, the mobility aspects could reasonably be expected to affect enumeration. Young, unmarried men are more likely to shift their living arrangements, thus making it difficult to enumerate them.

The Trenton study added another dimension to the undercount question; it was possible to tabulate the results by race and ethnic group. The sample was approximately three-quarters Negro; another fifth were persons with Spanish surnames (primarily of Puerto Rican birth); the remainder were other Caucasians, some Orientals, and a few men of undetermined race. The Spanish surname group was younger, and less likely to have ever been married, than the Negro group. Most of the

men with Spanish surnames were born in Puerto Rico; the Negroes were evenly divided between those born in New Jersey and those born in a southern State. The persons with Spanish surnames were newer to the area than the Negroes.

In the Trenton study, the unemployment rate for Puerto Ricans was significantly higher than the rate for Negroes. The differential was maintained for each of the classification groups, although the extent of the differential varied. (See table 5.)

Characteristics of the undercount

Both the Trenton and New Haven studies were primarily methodological; that is, they were designed to test the feasibility of using the casual interview technique to collect data about persons ordinarily missed in a census of an urban poverty area. The data obtained from these surveys are not sufficient to describe the characteristics of all men living in urban poverty areas—counted or uncounted in a census—because the data were limited to two areas and we do not know whether the casual interview technique reaches a representative sample of the local population. However, some conclusions may be drawn about the relationships between the characteristics of counted and uncounted persons in urban poverty areas.

The significant social relationships deal with the ties of counted and uncounted men to a particular family and residence. In both New Haven and Trenton, the major difference between the group of men who would have been enumerated in a census and those who would not was in the strength of these ties. (See tables 2 and 4.) For example, in New Haven, only 33 percent of the undercount were married, compared with 57 percent of the enumerated. In Trenton, the percentages were 35 and 58, respectively. Length of time at current residence is another variable which may distinguish between the enumerated and the unenumerated. In New Haven, 46 percent of the undercount had lived at their current residence 1 year or less, compared with 12 percent of the enumerated; in Trenton the rates were 14 and 9 percent, respectively. While the differences were greater in New Haven, they were in the same direction as in the larger Trenton study. The general finding seems to be that a married man living with his wife at a stable address is more likely to be reached in a household survey than a single man who moves frequently.

The significant conclusion that can be drawn from these studies is that the labor force status of the uncounted is very similar to that of the counted in the same urban poverty area. (See tables 2 and 3.) In New Haven, the unemployment rate for the enumerated was quite close to that of the uncounted; in the larger Trenton study, the rates were virtually identical.

Equally important, from the standpoint of evaluating published unemployment statistics, is the implication that enumeration of all persons in an urban poverty area would not significantly change the unemployment rate for that area—and perhaps this is true for other areas as well. If this is true, it would provide greater credence to the estimates of labor force size and employment prepared by Johnston and Wetzel and discussed earlier. (See table 1 and discussion on page 26.) The findings of the studies in Trenton and New Haven provide evidence that could support either the comparability assumption or the poverty neighborhood assumption. If similar studies were conducted in nonpoverty areas, it might become apparent which assumption is more valid.

Table 5. Labor force status of casual interview respondents, by race or ethnic group, Trenton

(Percent distribution)

Labor force status	Negro men				Men with Spanish surnames			
	Total	Classified as enumerated in the census pretest	Classified as part of the undercount	Unclassified	Total	Classified as enumerated in the census pretest	Classified as part of the undercount	Unclassified
Employed	85	88	81	88	75	80	73	70
Unemployed	8	6	9	9	17	19	12	18
Unemployment rate	9	7	10	9	18	19	14	20
Not in labor force	5	5	8	3	9	1	16	10
Information not available	1	1	3	0	1	0	0	1
Number of responses	695	203	231	261	188	70	51	67

Characteristics of the method

An evaluation of these studies indicates that the technique of conducting casual interviews in conjunction with a complete census count merits serious consideration in any attempt to collect data on missed persons. This data collection technique produced, for the first time, information about the economic characteristics of men missed in a census.

There are several advantages to the casual interview technique. First, it can reach persons not usually contacted in household surveys. Whether the individual is missed because his entire household is not located, because he does not maintain a a stable relation with any one household, or because his household chooses not to acknowledge his presence, the casual technique offers a prospect of reaching him. Thus, this technique is suitable for identifying the characteristics of persons subject to various types of undercount. Second, it can be employed selectively; that is, it can be directed to a specific group by the designation of the interview locations and instructions to the interviewers. Furthermore, the questionnaire can be designed specifically for the selected group. For example, the choice of language and the approach of the enumerators can be tailored to fit the target population. Third, the use of the casual interview technique permits the enumerator to speak directly to the desired respondent during the initial contact. In household and other random surveys, on the other hand, the initial contact is often made with the wife, roominghouse owner, or other person. When a follow up with the desired respondent is not possible, the data that was obtained from the secondary respondent is less reliable than data from the desired respondent would have been. Fourth, the casual nature of the questioning and the relaxed atmosphere of the interview locations may induce candid responses. There is some evidence that this technique can obtain information of a kind not readily available from household surveys. For example, the New Haven study obtained information about illegal activities that had not been available from regular household surveys. Fifth, the technique is a relatively inexpensive method of obtaining a large number of responses in a short period of time. The elimination of callbacks to locate specific individuals resulted in a lower cost per schedule than in household interviews.

A major disadvantage of the casual interview technique is that it does not provide a sample with a scientifically delineated universe. This makes it difficult to establish the representativeness of the survey findings. This objection is partially blunted when the survey is done in conjunction with a complete census count. Under these circumstances, the individuals reached were members of the census universe, although not necessarily a random sample of this group. Despite this objection, the advantages of selectivity, direct access, candid responses, and low expense appear to make this technique a useful tool for determining the characteristics of the undercount.

There is no set requirement for the type of enumerator to use for casual interviews. In New Haven, all of the interviewers were men experienced in field work and familiar with the area of enumeration. In Trenton, the interviewers were young men and women of various ages with some survey experience. Both male and female enumerators were successful. Although experience with using nonindigenous interviewers in these situations is limited, a strong case could be made for the use of interviewers who are indigenous to the area.

Variation in the hours of enumeration served to prevent labor force bias. It appeared best to interview during day and evening hours, and over the weekend where that is possible.

The samples in both New Haven and Trenton were not designed to be representative of the city as a whole but rather of specific areas—minority group poverty areas. The enumerators were instructed to interview men from minority racial or ethnic groups between the ages of 20 and 50. This group was selected because of undercount rates estimated to be very high. In New Haven, the 500 men were primarily Negro; in Trenton the 900 men were primarily Negro and Puerto Rican. The data indicate that in each city about 10 percent of the men had ages outside of the boundaries set. However, this percentage was substantially lower than it would have been had there been no attempt to restrict the sample.

In each city, the casual interviews were conducted in poor areas, and the sites were such places as bars, restaurants, poolrooms, street corners, and park benches. In New Haven, this was done to increase the percentage of unemployed and marginally employed men (working in low-skilled, low-paying jobs) because it had been suggested that these men constituted a disproportionate

share of the undercount, whose characteristics were the focus of these studies. In Trenton, the sections of the city where interviews were conducted yielded a similar sample of men.

Thus, any differences between the men in each sample and the total population of their city would reflect the method of sample selection and would have no necessary correlation with the social and economic distribution of the undercount or the population of that city. However, the characteristics of the sample group are not atypical of other samples that have been drawn from urban poverty areas.[6]

The small sample size and the restricted nature of the selection process have precluded the drawing of any definitive conclusions about the characteristics of all persons not counted. We have no way of knowing whether the characteristics of unenumerated men reached through the casual interview technique are typical of the entire undercount. There are two reasons for this uncertainty. First, the characteristics of the undercount in other geographic areas, economic strata, or age groups may be very different from the characteristics of the undercount in an urban poverty area. Second, even within an urban poverty area, the technique of casual interviews may not reach all of the undercount. For example, there may be some men who never go to bars or stand on street corners. However, the quality of the findings that have been made thus far suggests that additional studies should be undertaken. The question now is whether the insights thus far obtained from studying the undercount among minority groups in urban poverty areas would be supported in similar or dissimilar studies of other groups in other areas. Wider application of the method described above may bring us closer to obtaining a better definition of the characteristics of the undercount, better understanding of the reasons for the undercount, insight into techniques that might reduce the extent of undercount, and a better appreciation of published data that is affected by the undercount. □

FOOTNOTES

[1] Refers to Negroes, Orientals, and American Indians. Nationwide, Negroes make up about 92 percent of races other than white, and a higher proportion in urban poverty areas.

[2] For sources of estimates and more detail, see Jacob S. Siegel, "Completeness of Coverage of the Nonwhite Population in the 1960 Census and Current Estimates, and Some Implications," in David M. Heer, ed., *Social Statistics and the City* (Cambridge, Mass., Joint Center for Urban Studies of Massachusetts Institute of Technology and Harvard University, 1968). A summary of the methods used to estimate the extent of the undercount will be found in BLS Report 354, *Pilot and Experimental Program of the Urban Employment Survey*. For a more detailed description, see Jacob S. Siegel and Melvin Zelnik, "An Evaluation of Coverage in the 1960 Census of Population by Techniques of Demographic Analysis and by Composite Methods," *1966 Proceedings of the Social Statistics Section, American Statistical Association;* Leon Pritzker and N. D. Rothwell, "Procedural Difficulties in Taking Past Censuses in Predominantly Negro, Puerto Rican, and Mexican Areas," and Eli S. Marks and Joseph Waksberg, "Evaluation of Coverage in the 1960 Census of Population through Case-by-Case Checking," in David M. Heer, ed., op. cit.

[3] See Denis F. Johnston and James R. Wetzel, "Effect of the Census Undercount on Labor Force Estimates," *Monthly Labor Review*, March 1969, pp. 3–13.

[4] For a detailed description of this research, see BLS Report 354, cited in footnote 2.

[5] In New York only three cases of undercount were identified. Because of this small number and because of the large number of unlocated addresses, meaningful comparisons between found and missed persons could not be made. There was considerable difficulty in locating apartment dwellers in the multiunit tenaments with poor or nonexistent tenant identification typical of the poverty areas in New York and other large cities.

[6] Tables providing detailed data on the characteristics of the respondents in the Trenton study are available from the Bureau of Labor Statistics.

Discouraged workers and changes in unemployment

First time series analysis of data from the Current Population Survey indicates the number of discouraged workers rises as unemployment increases

PAUL O. FLAIM

UNTIL A couple of decades ago, the many millions of working-age persons outside the labor force were of limited concern to labor economists and policymakers, either as a potential source of manpower or as a possible threat to the stability of the job market. It was then the general assumption that the Nation's labor supply consisted only of persons actually working or actively seeking work. The notion that many persons outside the labor force might have wanted work but were not seeking it because they believed that their search would be fruitless was not widely entertained.

This popular concept of the labor supply was probably relevant in the 1930's, when the ranks of the unemployed contained an apparently inexhaustible reservoir of manpower. It had to be gradually abandoned, however, as evidence accumulated during the post-World War II period showed that millions of persons entered and left the labor force each year, not only because of personal reasons but also in apparent response to changing labor market conditions.

Recognizing these facts, the President's Committee to Appraise Employment and Unemployment Statistics (more familiarly known as the Gordon Committee) stated in 1962 that "the relatively simple dichotomy between those in and out of the labor force . . . [no longer provides] . . . a satisfactory measure of the labor supply." The Committee went on to recommend that special efforts be made, through the Current Population Survey (CPS), to collect detailed data on persons not in the labor force, particularly on the so-called "discouraged workers" or "hidden unemployed"—those persons who want work but are not looking for a job because of a belief that their search would be in vain. In so doing, it should be noted, the Committee also recommended that these persons *not* be included in the unemployment count.

In 1964–66, following the recommendation of the Gordon Committee, the Bureau of Labor Statistics began to experiment with a special set of survey questions designed to elicit detailed information on the reasons persons outside the labor force did not participate in the job market. In January 1967, these questions were incorporated into the regular CPS questionnaire. The data which they have yielded have been published quarterly since late 1969 in a special set of tables in the monthly BLS periodical, *Employment and Earnings*.

The earlier analyses of these findings were, by necessity, limited to cross-sectional examinations done in snapshot fashion. Obviously, no time-series analysis could have been undertaken until a number of years had elapsed. Moreover, the first 3 years of data were collected in a period of very low unemployment, so that one could hardly draw any conclusion about their cyclical sensitivity.

Since the data have now been accumulated for 6 years—the last 3 years being a period in which vast cyclical changes took place in the Nation's economy—it is possible to determine, at least tentatively, to what extent workers will refrain from entering the job market or may be induced to leave it because of rising unemployment. Two variables are of particular interest for this purpose: (1) the number of "discouraged workers," and (2) the number of workers leaving the labor force because of "slack work," who may or may not wind up as "discouraged workers" under current definitions.

Identifying those discouraged

Determining the extent of discouragement over job prospects is a very difficult task. It involves the

Paul O. Flaim is an economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics. This article is based on a paper presented at the August 1972 meeting of the American Statistical Association in Montreal, Canada.

From the *Review* of March 1973

measurement of what are essentially subjective phenomena, specifically one's desire for work and one's perception of his or her chances of obtaining a job. The pinning down of these "states of mind" is rendered particularly uncertain by the fact that the housewife is typically the only person interviewed in each CPS household, and she must answer for all members of the household.

Even if interviewed individually, however, some persons may still not always admit their "real" reason for leaving the labor force. It is possible, for example, that some, although having been unable to find a job, may attribute their nonparticipation status to ill health or other "socially acceptable reasons" rather than admit that they have failed in the job market. Conversely, there may be some who indicate that they want a job and who then explain their failure to look for one in terms of unavailability, even though their desire for work is actually of very limited intensity. Given the subjective and elusive nature of "discouragement," the extent of its possible overstatement or understatement cannot be measured.

In order to identify the discouraged workers, the CPS interviewer asks first if the persons not in the labor force "want a regular job now, either full time or part time." If the answer is yes, or even a tentative yes, there is a follow-up question as to the reasons they are not looking for work. In order to be classified as discouraged, a person's principal reasons for not looking for work must fall into one of the following five categories:

1. Believes no work available in line of work or area;
2. Had tried but could not find work;
3. Lacks necessary schooling, training, skills, or experience;
4. Employers think too young or too old;
5. Other personal handicap in finding a job.

It may be argued that this screening process, particularly the requirement that a person must first be reported as wanting a job in order to be questioned about possible discouragement, yields a rather restrictive definition of hidden unemployment. What about those persons, one might ask, who, upon losing their job, may decide to return to school and who would then not want a job "now"? Should they not also be regarded as discouraged workers? To answer this, it should be noted that if the discouraged workers' data are to be useful as a measure of underutilization of manpower for policy purposes, they should hardly include persons who do not want a job, especially when their current activity may actually prevent them from taking a job.

It is also important to note that separate data are collected and published, from the same survey, on the reasons for leaving the last job for those persons who have recently left the labor force. As will be discussed later, these "flow" data are an important adjunct to the figures on discouraged workers in terms of understanding the dynamics of the labor force under changing economic conditions.

How many discouraged workers?

The first examinations of the data on persons not in the labor force, based on 1967–68 findings, showed that less than one-tenth of these persons professed any desire to be holding a job.[1] Among these, only about 700,000 were classified as discouraged—that is, as not looking for work because of a belief that they could not find a job. As shown in table 1, the other nonparticipants reported as wanting a job turned out either to be in school, in poor physical condition, or prevented from seeking work by household responsibilities. The ranks of the 700,000 discouraged workers, furthermore, were found to contain relatively few men of prime working age—less than 200,000. The great majority of discouraged consisted, instead, of teenagers, housewives, and elderly persons. These findings seemed to run counter to the contentions that there were virtually millions of discouraged workers and that they included large numbers of men.[2]

However, the data being analyzed in the late 1960's had been collected in a period of unusually low unemployment, when the jobless rate held below 4 percent. Not until 1970, when unemployment rose, could the relationship between changes in the unemployment rate and in the number of discouraged workers be discerned.

That the rise in unemployment in 1970 produced

'Hidden unemployment'

In this issue, three articles and a bibliography deal with "hidden unemployment," a problem that is also referred to as a "manpower gap," or "discouraged workers." The authors recognize that hidden unemployment may mean different things to different researchers. Consequently, each sets forth what the concept means within the context of his analysis.

Table 1. Distribution of persons not in the labor force, by reason, 1967-72

[Numbers in thousands]

Labor force status	1967	1968	1969	1970	1971	1972
Civilian noninstitutional population	129,873	132,026	134,335	136,995	139,775	143,325
In civilian labor force	77,347	78,737	80,734	82,715	84,113	86,542
Not in the labor force	52,484	53,289	53,596	54,275	55,662	56,783
Do not want job now, total	47,787	48,810	49,137	50,396	51,259	52,321
Current activity: In school	5,641	5,892	5,958	6,051	6,373	6,301
Ill, disabled	3,741	3,684	3,826	3,869	4,077	4,313
Homemaker	31,239	31,667	31,384	32,162	32,203	32,384
Retired, old	5,313	5,540	5,795	5,918	6,160	6,691
Other	1,853	2,027	2,174	2,396	2,446	2,632
Want a job now, total	4,698	4,477	4,459	3,877	4,404	4,461
Reason not looking: School attendance	1,104	1,115	1,126	1,075	1,242	1,200
Ill health, disability	768	656	627	489	555	632
Home responsibilities	1,325	1,263	1,257	926	1,020	1,098
Think cannot get job	732	667	574	638	774	765
All other reasons	769	777	875	749	813	766

NOTE: Because of separate computation, the figures on the civilian labor force and on persons not in the labor force may not in all cases add up precisely to the civilian noninstitutional population.

at least a temporary slackening in labor force participation is now a historical fact. The slackening was most evident in the first half of 1971, when the labor force hardly grew at all. The question is the extent to which this slackening in participation can be attributed to discouragement over job prospects caused by the rise in unemployment.

As chart 1 shows, there is, indeed, a positive relationship between the unemployment rate and the number of discouraged workers. Both series trended downward, though in differing degrees, during the 1967–69 period; both rose substantially during 1970; both showed little distinct movement during 1971; and both moved downward during 1972. In terms of the actual number of persons involved, however, it should be noted that the 1969–71 increase in the number of discouraged workers was relatively small when compared with the rise in the number of jobless persons. While the number of unemployed rose by 2.2 million between 1969 and 1971 (on an annual average basis), the number of discouraged workers increased by only 200,000.

Despite the positive relationship between unemployment and discouragement, the two series did not correlate very highly with each other. The coefficient of correlation between these two variables, derived on the basis of seasonally adjusted monthly data for the 1967–71 period,[3] was only 0.53. Nor was the coefficient raised when the relationship between the two series was tested on the basis of data disaggregated by age, sex, and race. (Correlation and regression results are shown in appendix table 1.)

Since it may be reasonably assumed that changes in the number of discouraged workers lag behind the changes in the unemployment rate, some experimentation with lags was also conducted. By lagging the discouraged workers' series by 3 and also by 6 months behind the unemployment rate, the coefficients of correlation were raised somewhat—to 0.61 in both cases—but were still far from indicating a very close relationship between the two variables.

'Cyclical' vs. 'structural' discouragement

A closer examination of the disaggregated data on discouraged workers for the 1967–71 period revealed a significant change in composition in terms of the specific reason cited by these persons for their belief that they could not obtain a job. Specifically, there was an increase in the proportion of workers whose discouragement appears to have been directly related to the changing conditions of the job market. Conversely, there was a decline in both the number and proportion of persons attributing their discouragement to personal situations or deficiencies.

Table 2 groups discouraged workers into these two broad categories. The first included the workers reported as believing that there were no jobs in their line of work or area and those who had tried unsuccessfully to find a job before giving up the search. The second category includes those workers reported as thinking they could not get a job due to their very young or advanced age, those who saw their lack of education or training as the major obstacle, and those who cited other personal handicaps, such as language difficulties.

It would appear, given the different nature of the reasons for discouragement, that the first category of discouraged workers should be much more cyclically sensitive than the second. Discouragement among the second category appears to be more of a "structural" nature and thus not necessarily related to the tightness, or looseness, of the job market. The data in table 2 confirm this hypothesis. As shown, all of the 200,000 increase in the number of discouraged workers between 1969 and 1971 took place among those blaming their situation on job-market weaknesses.

Chart 1. Unemployment rate and number of discouraged workers, 1967–72

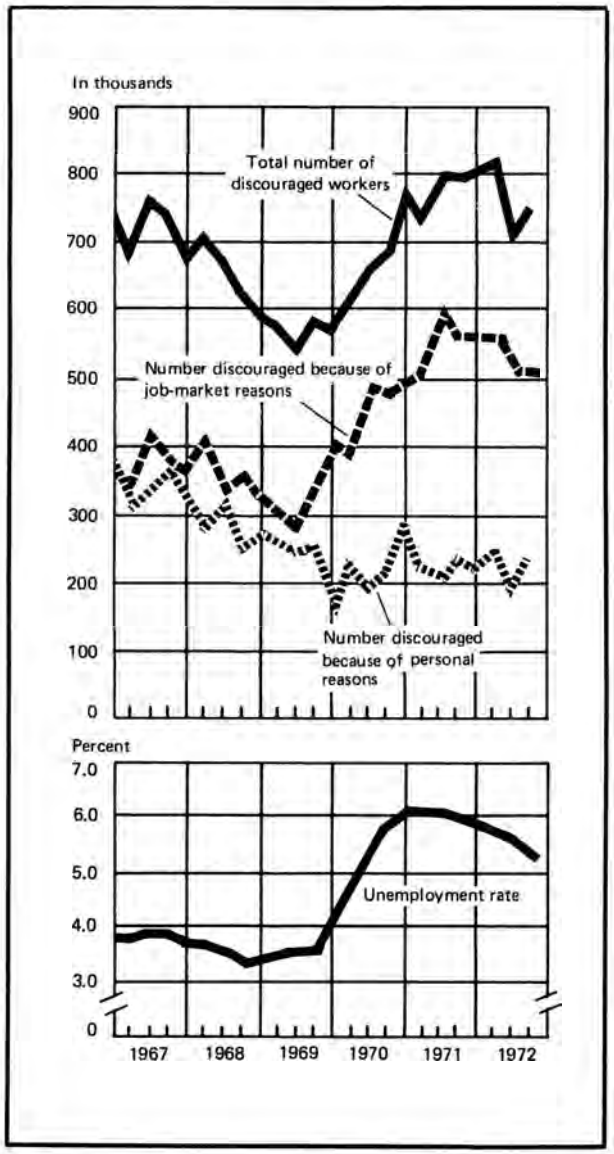


Table 2. Composition of discouraged workers by reason for believing they cannot find a job, 1967–72

[Numbers in thousands]

Reason	1967	1968	1969	1970	1971	1972
Total	732	667	574	638	774	765
Job-market factors	383	371	311	437	537	540
Had looked but could not find job	168	161	161	244	300	300
Thinks no job available	215	210	150	193	237	240
Personal factors	349	297	263	201	236	226
Employers think too young or too old	216	171	139	105	112	111
Lacks education, skills, training	84	74	78	60	85	78
Other personal handicap	49	52	46	36	39	37
Percent distribution	100.0	100.0	100.0	100.0	100.0	100.0
Job-market factors	52.3	55.5	54.2	68.5	69.5	70.6
Had looked but could not find job	23.0	24.1	28.0	38.2	38.8	39.2
Thinks no job available	29.4	31.4	26.1	30.3	30.7	31.4
Personal factors	47.7	44.5	45.8	31.5	30.5	29.5
Employers think too young or too old	29.5	25.6	24.2	16.5	14.5	14.5
Lacks education, skills, training	11.5	11.1	13.6	9.4	11.0	10.2
Other personal handicap	6.7	7.8	8.0	5.6	5.0	4.8

NOTE: Because of rounding, sums of individual items may not equal totals.

Correlation analysis also lent support to this hypothesis. Whereas, as noted above, the total number of discouraged workers did not correlate highly with the overall unemployment rate, yielding a coefficient of only 0.53, the number of workers discouraged because of job market reasons yielded a much higher correlation coefficient — 0.79 — when regressed against the unemployment rate.

On the other hand, when the number of persons whose discouragement seemed to hinge on personal factors was regressed against the unemployment rate, the result was a negative coefficient of correlation— —0.47. There is no ready explanation for this negative relationship, but some possibilities may be raised. For example, the passage of legislation designed to reduce job discrimination because of age may have accounted for a downward trend in the number of elderly workers who thought that they could not get a job due to their advanced age. It may also be hypothesized that when the unemployment rate rises, some workers who had previously been attributing their discouragement to personal reasons may then attribute their situation to the deteriorating job market.

It is clear, nevertheless, that if we limit our analysis to the group of discouraged workers who link their situation to the conditions of the job market, we find that their number did increase and decrease

in line with the underlying movement of the unemployment rate during the 1967–71 period.

Unexpected discontinuity

One of the findings from the 6 years of experience in obtaining statistics on labor force nonparticipants is that it apparently makes quite a bit of difference whether the questions about current desire for work and future jobseeking plans are asked in the first month in which they are visited by the CPS interviewer or in subsequent months.

Since a person's reasons for nonparticipation in the labor force are not likely to change from one month to another, this information is asked in only one of the four consecutive monthly interviews conducted in households falling in the CPS sample. From 1967 through 1969, the questions were asked in the month in which a given household first entered the CPS sample and then again 1 year later, when the same household reentered the sample for the second and final 4-month stint after an 8-month hiatus. In January 1970, the questions were switched from the first and fifth month-in-sample to the fourth and eighth. In effect, instead of being asked when a household enters or reenters the sample, they are now being asked only when the household leaves the sample.[4]

This switch turned out to have a noticeable effect on the data on persons not in the labor force. Following the switch, proportionately fewer persons, particularly among the housewives, were reported as either wanting a job at present or as planning to look for work in the near future. Evidently, having become increasingly more at ease with the interviewer with each passing month, a respondent is less likely to exaggerate his (or her) attachment to the labor force in the fourth monthly interview than in the first one.

As far as the data on discouraged workers are concerned, the switch appears to have caused a small drop in the number and proportion of persons attributing their discouragement to personal reasons (a factor which no doubt contributed to the negative relationship between this variable and the unemployment rate). Although this discontinuity did not have a great effect on the overall numbers, it is a good illustration of the difficulties which arise in the measurement of what are essentially attitudes on the part of workers or potential workers.

Profile, 1972

As was the case during the first years for which data on discouraged workers are available, the proportion of men of prime working age among this group is still relatively small. Of the 765,000 persons classified as discouraged workers in 1972, only about 70,000, or less than one-tenth, were men 25 to 59 years of age. (See table 3.)

Blacks are even more overrepresented among the discouraged workers than they are among the unemployed. They made up only one-ninth of all the persons of working age outside the labor force but one-fourth of the discouraged workers in 1972. (Blacks also make up one-ninth of the civilian labor

Table 3. Discouraged workers by time elapsed since last job and jobseeking intentions, 1972

Sex, age, and color	Total discouraged (in thousands)	Percent distribution by time elapsed since last job					Percent who intend to seek work within 12 months
		Total	Less than 1 year	1 to 5 years	More than 5 years	Never worked	
Total 16 years and over	765	100.0	36.3	30.6	19.0	14.1	77.1
Male, 16 years and over	240	100.0	45.0	30.0	9.6	15.4	77.1
16–19 years	64	100.0	40.0	12.3	1.5	46.2	84.4
20–24 years	33	100.0	[1]	[1]	[1]	[1]	[1]
25–59 years	67	100.0	55.2	32.8	9.0	3.0	83.6
60 years and over	75	100.0	37.3	42.7	18.7	.....	61.3
Female, 16 years and over	525	100.0	32.4	30.9	23.2	13.5	77.0
16–19 years	68	100.0	35.3	10.3	.....	54.4	82.4
20–24 years	79	100.0	44.3	32.9	3.8	20.3	89.9
25–59 years	299	100.0	29.8	33.4	32.1	5.4	77.9
60 years and over	79	100.0	28.8	37.5	30.0	3.8	55.7
White [2]	578	.....	.....	.....	.....	.....	.....
Negro and other races [2]	188	.....	.....	.....	.....	.....	.....

[1] Percent distribution not shown where base is less than 50,000.

[2] Breakdown of discouraged workers in terms of time elapsed since last job and future job-seeking intentions is not available separately for whites and Negroes.

force and account for about one-fifth of the unemployed.)

In terms of previous work history, nearly two-fifths of the discouraged workers had been out of the job market less than 1 year when interviewed. Only 14 percent had never worked before. These findings, however, differ by age and sex.

Evidently, most discouraged workers regard their status as only temporary. Although they do not deem it worthwhile to look for a job at the time of the interview, they are apparently more hopeful in terms of their future prospects. Nearly 80 percent of the total were reported as planning to actively seek work within the next 12 months. It would thus be erroneous to assume that most discouraged workers have permanently given up on the job market.

Examining out-flows

While the data on discouraged workers may not fully explain how cyclical changes in the employment situation affect the dynamics of the labor force, other data gathered through the same survey shed additional light on this phenomenon. For example, through the special set of questions asked of the nonparticipants since 1967, it has been possible to group those with recent work experience according to their reasons for leaving their last job—regardless of whether or not they are currently counted as discouraged workers.

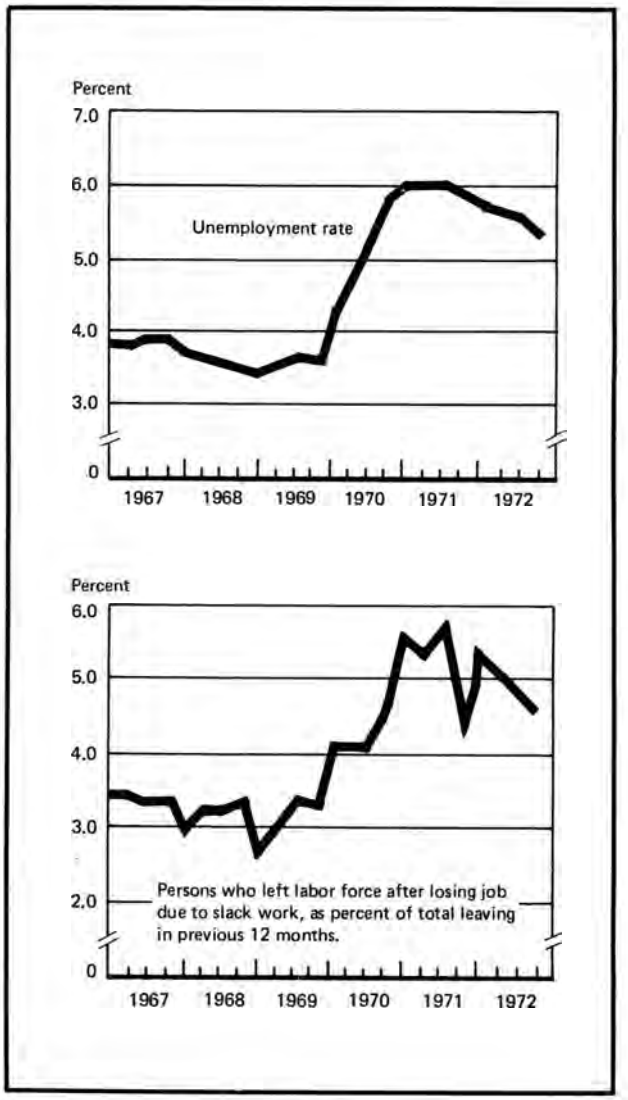
Unlike the questions designed to identify the discouraged workers, those designed to determine when and why a person left his last job deal with facts which are of a more overt, observable nature. As such, these questions should present fewer problems, particularly when the respondents, as is often the case, are persons other than those to whom the questions relate. The "flow" data which these questions produce should thus be subject to less response error than those on the actual number of discouraged workers.

As shown in table 4, the volume of the gross flows out of the labor force has not changed much in recent years, averaging close to 10 million. This would indicate that the cyclical changes in labor force growth during this period have stemmed primarily from fluctuations in the in-flow of new entrants and reentrants into the job market. There have been, however, some cyclical changes in the composition of the out-flows by reasons for leaving last job.

Table 4. Persons exiting from the labor force, by reason for leaving last job, 1967–72

Reason for leaving job during previous 12 months	1967	1968	1969	1970	1971	1972
Number (in thousands)	9,327	9,752	10,175	10,130	10,098	9,624
Percent	100.0	100.0	100.0	100.0	100.0	100.0
School, home responsibilities	49.2	50.3	50.5	49.3	47.7	46.8
Ill health, disability	9.5	9.2	9.6	8.9	8.7	9.1
Retirement, old age	5.3	6.0	6.1	6.7	7.4	8.1
Economic reasons	17.1	17.8	16.6	18.0	19.5	19.3
End of seasonal job	9.2	9.1	8.5	8.1	8.5	8.6
Slack work	3.3	3.1	3.1	4.3	5.2	4.9
End of temporary job	4.6	5.6	5.1	5.7	5.8	5.8
All other reasons	18.9	16.7	17.2	17.2	16.7	16.7

Chart 2. Unemployment rate and percent of persons leaving labor force because of "slack work," 1967–72



Specifically, there was an increase between 1969 and 1971 in the proportion of persons attributing their exit from the labor force to the fact that their jobs had been terminated, either temporarily or permanently, due to economic reasons. Of the three categories under the "economic" heading, "slack work" appears to have been most cyclically sensitive. As illustrated on chart 2, the changes in this variable have been closely related to the changes in the unemployment rate.

This relationship was also tested through regression and correlation analysis. The coefficient of correlation between the overall unemployment rate and the number of persons reporting they had left the labor force after having lost their jobs due to slack work was 0.83 on the basis of monthly data for the 1967–71 period. The substitution of data on unemployment due to job loss for the overall measurements of unemployment yielded coefficients of roughly similar magnitude. (See appendix table 2.)

Summary and conclusion

After 6 years of experience in the collection of data on discouraged workers through the Current Population Survey, it appears that this survey is, indeed, a viable vehicle for such a purpose. Although the definition of "discouragement" used for the purposes of the survey might not be universally agreed upon, the data gathered so far have shed important light both on the discouraged-worker phenomenon and other aspects of labor force dynamics.

While 6 years of data may not be sufficient to enable us to establish with any certainty the relationship between two variables, the hypothesis that changes in the number of discouraged workers are closely related to changes in the unemployment rate can now be verified at least tentatively. The same can also be said for changes in the number of workers leaving the labor force because of slack work.

To the extent that this is true, it would appear that we should take into account these variables, as well as the data on unemployment and underemployment, when assessing the waste of manpower which accompanies an economic recession. In the most recent slowdown, however, the increase in the number of discouraged workers, as currently defined, was relatively small when compared with the magnitude of the changes in unemployment. That being the case, it would be unreasonable to assume that the return of these workers to the job market as economic conditions improve could be of such magnitude as to act as a major brake against the lowering of the unemployment rate. □

FOOTNOTES

[1] See Robert L. Stein, "Reasons for Nonparticipation in Labor Force," *Monthly Labor Review*, July 1967, pp. 22–7, and Paul O. Flaim, "Persons not in the labor force: Who they are and why they don't work," *Monthly Labor Review*, July 1969, pp. 3–14.

[2] These contentions were based largely on econometrically derived estimates of hidden unemployment published in various journals during the mid-1960's. Among the first to construct such estimates were Alfred Tella and Thomas Dernburg and Kenneth Strand. See A. Tella, "The Relation of Labor Force to Employment," *Industrial and Labor Relations Review*, April 1964, pp. 454–69, and T. Dernburg and K. Strand, "Cyclical Variation in Labor Force Participation," *Review of Economics and Statistics*, November 1964. Many other economists, using a variety of econometric techniques, have since undertaken similar research. Essentially, they have attempted to measure the elasticity of labor force participation rates, especially for women and youth, in response to the intensity of the demand for labor as reflected by the unemployment rate, the wage rate, and other variables. Optimal participation rates, those consistent with conditions of "full employment," were then applied to the population to obtain a "full employment labor force." To the extent that the actual labor force, as measured through the Current Population Survey, fails to match this theoretical labor force, they ascribe the gap to the discouraged workers phenomenon or hidden unemployment.

For an analytical discussion of the early econometric estimates of "hidden unemployment" or "discouraged workers," see Jacob Mincer, "Labor Force Participation and Unemployment: A Review of Recent Evidence" in R. A. Gordon and M. S. Gordon, eds., *Prosperity and Unemployment* (New York, Wiley, 1966), pp. 73–112. For a comparison of the more recent econometric estimates with the survey data presented in this article, see the discussions by Joseph Gastwirth and Jacob Mincer elsewhere in this issue.

[3] Although the not-in-the-labor-force data are published only on a quarterly basis, they are being tabulated monthly. They have also been seasonally adjusted experimentally, although not yet regularly published in this form.

[4] The switch was instituted in an attempt to determine whether these added questions were having an effect on the so-called "first-month bias" in the unemployment figures. It had long been evident that the reported incidence of joblessness in households entering or reentering the CPS sample was higher than in households which had been in the sample for 2 consecutive months or more. This "first-month bias" became even larger around 1967, and it was hypothesized that the increase might have been related to the introduction of the not-in-the-labor-force questions. The reduction in the reported incidence of unemployment for the first and fifth month-in-sample groups and concomitant rise for the fourth and eighth following the January 1970 switch of the not-in-the-labor-force questions seems to have amply confirmed this hypothesis.

APPENDIX

In order to determine quantitatively to what extent workers may refrain from entering the labor force or may be induced to leave it because of rising unemployment, recourse was made to regression analyses. A large number of simple, or two-variable, regressions were run, with the variables consisting in each case of 60 monthly observations covering the 1967–71 period.

The independent variable (X) consisted in all cases of seasonally adjusted observations concerning the unemployment situation, either at the aggregate or disaggregated level. The dependent variable (Y) consisted of observations concerning either the number of "discouraged workers" or the number of workers having left the labor force after being laid off because of economic factors affecting their jobs. As was the case with the unemployment data used for the independent variable (X), all observations on the number of discouraged workers had also been seasonally adjusted. The data on the number and/or percent of persons who had left the labor force because of various economic reasons, on the other hand, were not seasonally adjusted. Although these latter data are obtained monthly, they refer to exits from the labor force occurring over a 12-month span. As such, these data are, in effect, 12-month moving averages, which should be relatively devoid of seasonal fluctuations.

The result of a selected number of regression analyses focusing on the relationship between unemployment and the number of discouraged workers are shown in appendix table 1. As shown, it is only when the number of discouraged workers is reduced to include only those whose discouragement is directly attributable to job market reasons, and which is thus of cyclical nature, that the regression yields a reasonably good fit—as denoted by relatively high values of the coefficient of correlation (r), the coefficient of determination (r^2), and the T-Ratio.

A smaller number of regressions were run spe-

Appendix table 1. Regression of selected categories of discouraged workers against various measurements of unemployment

Variables		Regression results					
Independent (X)	Dependent (Y)	Regression equation	r	r^2	s	T ratio	Durbin-Watson
Unemployment rate, overall	Discouraged, total	Y=472 + 47.0X (43.7) (10.0)	0.53	0.28	77.8	4.70	0.88
Unemployment rate, men age 20 or over	Discouraged, men age 20 or over	Y=145.6 + 6.8X (11.8) (4.1)	0.21	0.05	29.8	1.66	1.51
Unemployment rate, women age 20 or over	Discouraged, women age 20 or over	Y=257.4 + 31.7X (44.1) (9.9)	0.39	0.15	62.2	3.18	1.31
Unemployment rate, teens 16–19	Discouraged, teens 16–19	Y=-14.4 + 9.4X (31.9) (2.3)	0.47	0.22	35.8	4.10	1.90
Unemployment rate, overall	Discouraged, total lagged 3 months	Y=432.7 + 57.5X (42.2) (9.9)	0.61	0.36	72.7	5.80	1.02
Unemployment rate, overall	Discouraged, total lagged 6 months	Y=413.2 + 63.8X (44.9) (10.8)	0.61	0.37	72.3	5.90	1.08
Persons unemployed 15 weeks and over	Discouraged, total	Y=568.1 +142.3X (20.2) (26.4)	0.58	0.34	74.5	5.41	0.98
Average duration of unemployment	Discouraged, total	Y=285.6 + 43.1X (65.6) (7.2)	0.62	0.38	71.9	5.97	1.18
Unemployment rate, overall	Discouraged, job market reasons	Y= 77.2 + 76.0X (33.8) (7.7)	0.79	0.62	60.3	9.81	1.54
Unemployment rate, overall	Discouraged, personal reasons	Y=387.8 − 27.1X (31.2) (7.1)	−0.45	0.20	55.5	−3.80	0.67
Unemployment rate, overall	Discouraged, job market reasons lagged 3 months	Y= 58.6 + 82.4X (37.7) (9.1)	0.81	0.65	58.0	10.41	1.73
Unemployment rate, overall	Discouraged, job market reasons lagged 6 months	Y= 44.1 + 88.1X (37.7) (9.1)	0.79	0.62	60.7	9.70	1.61

Appendix table 2. Regression of selected categories of workers leaving labor force against various measurements of unemployment

Variables		Regression results					
Independent (X)	Dependent (Y)	Regression equation	r	r^2	s	T ratio	Durbin-Watson
Unemployment rate	Total leaving due to economic reasons	Y=1271.4+113.5X (68.7) (15.7)	0.69	0.47	112.3	7.2	1.17
Unemployment rate	Left due to slack work	Y= 2.1+ 86.3X (33.0) (7.6)	0.83	0.69	58.8	11.4	1.92
Number of unemployed who lost last job	Left due to slack work	Y= 140.7+ 0.15X (21.8) (1.46)	0.82	0.67	60.6	10.9	1.88
Job-losers rate	Left due to slack work as percent of total leaving labor force.	Y= 1.4+ 1.3X (0.2) (0.1)	0.82	0.67	0.6	11.0	2.04

cifically to determine the relationship between changes in unemployment and in the flow of workers out of the labor force following a job loss stemming from economic factors in general and slack work in particular. Results are shown in appendix table 2. These equations indicate that there is, indeed, a rather close and positive relationship between changes in unemployment and in the number and proportion of workers who drop out of the labor force after losing their jobs. □

Education of workers: projections to 1990

Special Labor Force Report shows rapid advances in educational attainment of workers during the next two decades

DENIS F. JOHNSTON

THE LATEST PROJECTION of the educational attainment of adult workers points to an accelerated rise in the number of college graduates and a rapid decline in the number of workers at the lower end of the educational ladder.[1] Starting with the March 1970–72 average, the number of workers 25 years and over with different amounts of formal education, as shown in table 1, is projected to change as follows:

—With 4 years of college or more—from 9.6 million to 14.3 million by 1980 and 21.8 million by 1990, increasing from 14.6 percent to 23.8 percent of the civilian labor force.
—With 1 to 3 years of college—from 7.9 million to 10.8 million by 1980 and 15.0 million by 1990, increasing from 12 percent to 16.4 percent of the labor force.
—With 4 years of high school—from 24.6 million to 31.4 million by 1980 and 37.7 million by 1990, from 37.5 percent to 41.2 percent of the labor force.
—With 1 to 3 years of high school—from 11.1 million to 11.7 million by 1980 and 11.4 million by 1990, from 16.9 percent to 12.5 percent of the labor force.
—With 8 years of elementary school or less—from 12.5 million to 9.1 million by 1980 and 5.6 million by 1990, from 19 percent to 6.1 percent of the labor force.

The imbalance between the rates of growth of the adult male civilian labor force and of the number of college graduates among them has been especially pronounced. Over the 13 years between 1958 and 1971, the labor force has increased by only 0.6 percent a year, on average, while its component of men with at least 4 years of college has grown at the average annual rate of 3.8 percent, or about six times as rapidly. The corresponding disparity among adult working women has been much smaller—2.5 and 4.8 percent.

According to the projections, this disparity in growth rates may be expected to continue in the future. Between the early 1970's and 1990, the adult male civilian labor force is estimated to increase at an annual average rate of 1.6 percent, with the holders of college degrees increasing at the average rate of 4.0 percent. The corresponding increases during that period for the adult female civilian labor force are estimated at average rates of 1.9 and 5 percent a year. It is apparent that one of the major challenges to be met by the economy, both during the current decade and the 1980's, is the continued absorption of this rapidly growing supply of well educated workers.

The prospective change in the number of less educated workers is equally dramatic. In the late 1950's, over one-third of the adult civilian labor force—19.3 million workers—had completed 8 years or less of formal education. By the early 1970's, this group had been reduced to about 12.5 million, or less than one-fifth of the entire labor force. It is projected to decrease to about one-eighth of the labor force by 1980 and to about one-sixteenth by 1990. This continuing drop in the number of less educated adult workers implies an average annual rate of decline of 3.9 percent throughout the 1958–90 period (chart 1).

Changes in the 1970's

Between 1972 and 1980, the civilian labor force 16 years old and over is projected to increase by nearly 13.3 million, reaching 99.8 million in 1980.[2] Nearly 60 percent, or 7.6 million, of this increase is expected to consist of workers aged 25 to 34 years. The concentration of the projected increase in the number of workers with at least 4 years of college education is similar, with 55 percent of the 4.7-mil-

Denis F. Johnston is senior demographic statistician in the Office of Manpower Structure and Trends, Bureau of Labor Statistics.

From the *Review* of November 1973

Table 1. Years of school completed by persons 25 years old and over in the civilian labor force, actual 1957–72, projected to 1980, 1985, and 1990

[Percent distribution]

Sex and year	Total		Elementary school			High school		College			
	Number in thousands	Percent	Less than 5 years[1]	5 to 7 years	8 years	1 to 3 years	4 years	1 to 3 years	4 years or more	4 years	5 years or more
BOTH SEXES											
1957–59 average[2]	55,909	100.0	6.3	11.4	16.8	19.2	27.8	8.4	10.2	(3)	(3)
1964–65–66 average	60,067	100.0	4.1	8.7	13.4	18.9	32.8	9.6	12.5	7.4	5.1
1967–68–69 average	63,618	100.0	3.1	7.2	11.0	17.6	36.4	11.0	13.7	8.1	5.6
1970–71–72 average	65,655	100.0	2.6	6.4	10.0	16.9	37.5	12.0	14.6	8.3	6.3
Projected: 1980	77,227	100.0	1.5	3.9	6.4	15.1	40.7	14.0	18.5	10.4	8.1
1985	84,731	100.0	1.0	2.7	4.8	13.8	41.3	15.2	21.2	11.6	9.6
1990	91,456	100.0	.6	1.9	3.6	12.5	41.2	16.4	23.8	12.7	11.1
MEN											
1957–59 average[2]	38,527	100.0	7.1	12.1	17.6	19.2	25.1	8.2	10.8	(3)	(3)
1964–65–66 average	39,821	100.0	4.8	9.3	14.1	18.7	30.0	9.7	13.6	7.7	5.9
1967–68–69 average	40,941	100.0	3.6	7.7	11.7	17.3	33.0	11.5	15.2	8.5	6.7
1970–71–72 average	41,668	100.0	3.1	7.1	10.7	16.6	34.0	12.2	16.3	8.9	7.4
Projected: 1980	48,283	100.0	1.8	4.3	6.9	14.4	37.5	14.7	20.4	10.6	9.8
1985	52,772	100.0	1.2	3.0	5.3	12.8	38.4	16.2	23.1	11.5	11.6
1990	56,815	100.0	.8	2.2	4.0	11.4	38.6	17.6	25.5	12.2	13.3
WOMEN											
1957–59 average[2]	17,382	100.0	4.5	9.9	15.2	19.1	33.7	8.9	8.7	(3)	(3)
1964–65–66 average	20,246	100.0	2.8	7.8	12.0	19.3	38.5	9.5	10.3	6.7	3.6
1967–68–69 average	22,677	100.0	2.2	6.2	9.6	18.2	42.5	10.3	11.1	7.3	3.8
1970–71–72 average	23,987	100.0	1.8	5.2	8.6	17.6	43.6	11.4	11.8	7.5	4.3
Projected: 1980	28,944	100.0	1.0	3.2	5.5	16.4	46.1	12.7	15.3	10.0	5.3
1985	31,959	100.0	.6	2.2	4.0	15.4	46.1	13.6	18.1	11.7	6.4
1990	34,641	100.0	.4	1.5	2.9	14.4	45.3	14.5	21.0	13.4	7.7

[1] Includes persons reporting no formal education.

[2] Totals exclude persons whose educational attainment was not reported.

[3] Data not available.

NOTE: Data for combined years are averages of March Current Population Survey figures.

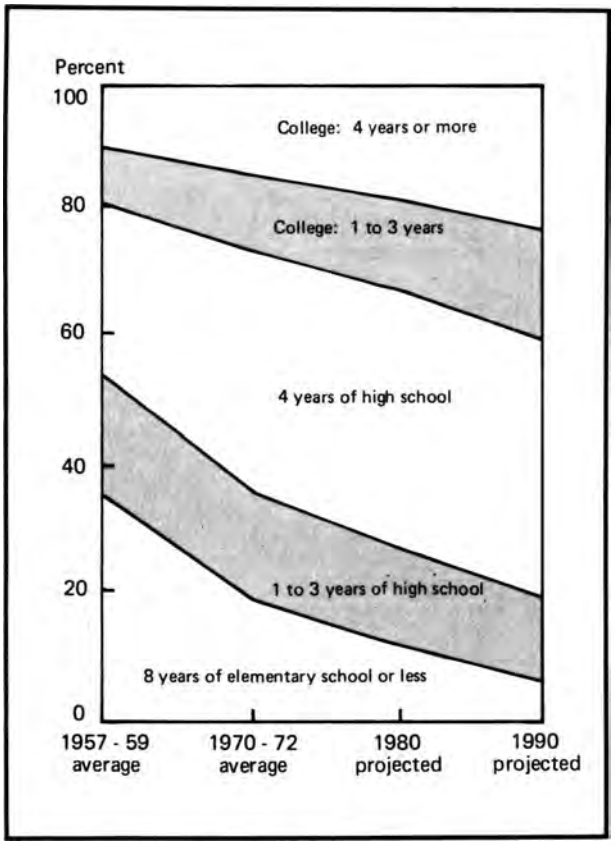
lion increase in their number to be found among workers 25 to 34 years old. In 1972, about 32 percent of the 11.8 million college graduates in the labor force were in the 25-to-34 age group; by 1980, it is estimated that about 38 percent, or 6.3 million, of the projected 16.4 million college graduates in the labor force will be in this age group. Among women workers, the sharpest increase in the number of college graduates in the labor force is projected to occur in the 25-to-34 age group. In March 1972, this group of women college graduates numbered about 1.2 million; by 1980, its number is estimated to reach nearly 2.1 million—an average annual gain of 6.8 percent. The corresponding rate of increase among men college graduates in this age group is 6.2 percent a year.

The current decade is also expected to witness significant changes in the median age of workers with different amounts of formal schooling. During a period when the median age of the labor force is rapidly declining (from about 39.5 years in 1970 to about 35.6 years anticipated in 1980), the median age of workers with 8 years education or less rises slowly to about 50.4 years, while that of workers with at least 4 years of college falls below 35 years. The steady decline in the number of less educated workers is largely attributable to their growing concentration in the older age groups, whose labor force participation rates have been dropping steadily.

Changes in the 1980's

The anticipated slowdown in the growth rate of the labor force during the 1980's (1.0 percent a year, as compared with 2.2 percent during the 1970's). will be accompanied by an accelerated rate of decline in the number of less educated workers (8 years of school or less), and a more moderate rate of growth among the more highly educated workers (table 2). The differences between men and women workers with respect to these projected rates of change are primarily attributable to differences in

Chart 1. Educational attainment of the civilian labor force 25 years old and over, 1957–59 average, 1970–72 average, and projected 1980 and 1990



their projected rates of labor force participation, and the effect of the changing age distribution of workers with different amounts of schooling.

By 1990, 4 out of 5 workers are projected to have completed at least 4 years of high school, with a range from just over 60 percent among workers 65 years and over to nearly 90 percent among workers 25 to 34 years old. A somewhat wider range is evident in the 1990 projection for those with at least 4 years of college: they are expected to make up over 20 percent of the labor force, ranging from about 16 percent among those 65 years old and over to nearly 30 percent among workers 25 to 34 years old (chart 2). It is also evident that the differences between working men and women with respect to high school graduation are expected to narrow somewhat over the projection period. The percentage of high school graduates is projected to increase somewhat faster among working men than among working women but the reverse is true as regards college graduates: except for workers 55 years old and over, the percent of women with college degrees is expected to rise somewhat faster than that of men. By 1990, the gap between the educational levels of both sexes will be considerably smaller than it is today.

A major feature of the projected educational attainment of workers over the next 17 years is the growing educational attainment of the several age groups of the labor force (table 3). For example, the percentage of workers with at least 4 years of

Table 2. Civilian labor force 16 years old and over, by sex and years of school completed, 1950, 1960, and 1970 censuses, projected to 1980 and 1990

Sex and year	Years of school completed					
	Total	8 or less[1]	9 to 11	12	13 to 15	16 or more
BOTH SEXES						
1950 census	57,141	23,671	11,222	13,593	4,545	4,110
1960 census	67,545	20,832	15,016	18,623	6,855	6,219
1970 census	80,393	14,431	17,157	28,168	10,556	10,081
Projected 1980	99,809	10,002	17,262	40,302	15,844	16,399
Projected 1990	110,576	6,139	15,683	44,771	19,960	24,023
MEN						
1950 census	41,051	18,607	8,049	8,584	2,950	2,861
1960 census	45,339	15,315	10,044	11,161	4,373	4,446
1970 census	49,634	10,034	10,688	15,647	6,424	6,841
Projected 1980	60,630	6,933	10,301	22,568	9,895	10,933
Projected 1990	66,947	4,316	8,955	25,468	12,615	15,593
WOMEN						
1950 census	16,090	5,064	3,173	5,009	1,595	1,249
1960 census	22,206	5,517	4,972	7,462	2,482	1,773
1970 census	30,759	4,397	6,469	12,521	4,132	3,240
Projected 1980	39,179	3,069	6,961	17,734	5,949	5,466
Projected 1990	43,629	1,823	6,728	19,303	7,345	8,430
	Average annual percent change					
BOTH SEXES						
1950–60	1.7	−1.3	2.9	3.1	4.1	4.1
1960–70	1.7	−3.7	1.3	4.1	4.3	4.8
1970–80	2.2	−3.7	.1	3.6	4.1	4.9
1980–90	1.0	−4.9	−1.0	1.0	2.3	3.8
MEN						
1950–60	1.0	−1.9	2.2	2.6	3.9	4.4
1960–70	.9	−4.2	.6	3.4	3.8	4.3
1970–80	2.0	−3.7	−.4	3.7	4.3	4.7
1980–90	1.0	−4.7	−1.4	1.2	2.4	3.6
WOMEN						
1950–60	3.2	.8	4.5	4.0	4.4	3.5
1960–70	3.2	−2.3	2.6	5.2	5.1	6.0
1970–80	2.4	−3.6	.7	3.5	3.6	5.2
1980–90	1.1	−5.2	−.3	.8	2.1	4.3

[1] Includes persons reporting no formal education.

Table 3. Projected educational attainment of persons 16 years old and over in the civilian labor force, by age and sex, 1980, 1985, and 1990

[Percent distribution]

Age and years of school completed	1980			1985			1990		
	Both sexes	Men	Women	Both sexes	Men	Women	Both sexes	Men	Women
16 YEARS AND OVER									
Total: Number (in thousands)	99,809	60,630	39,179	105,716	64,057	41,659	110,576	66,947	43,629
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	27.3	28.4	25.6	23.0	23.5	22.2	19.8	19.8	19.6
4 years of high school or more	72.7	71.6	74.4	77.0	76.5	77.8	80.2	80.1	80.3
Elementary: Less than 5 years [1]	1.3	1.6	.9	.9	1.1	.6	.6	.7	.4
5 to 7 years	3.3	3.8	2.6	2.4	2.8	1.9	1.8	2.0	1.3
8 years	5.4	6.1	4.4	4.2	4.7	3.3	3.2	3.7	2.5
High school: 1 to 3 years	17.3	17.0	17.8	15.5	14.9	16.4	14.2	13.4	15.4
4 years	40.4	37.2	45.3	40.7	37.9	45.0	40.5	38.0	44.2
College: 1 to 3 years	15.9	16.3	15.2	17.1	17.8	16.2	18.0	18.8	16.8
4 years or more	16.4	18.1	14.0	19.2	20.8	16.7	21.7	23.3	19.3
4 years	9.7	9.8	9.6	11.0	10.8	11.3	12.0	11.6	12.7
5 years or more	6.7	8.3	4.4	8.2	10.0	5.4	9.7	11.7	6.6
16 AND 17 YEARS									
Total: Number (in thousands)	3,295	1,868	1,427	2,831	1,584	1,247	2,716	1,511	1,205
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	97.9	98.7	96.9	98.0	98.9	97.0	98.0	98.8	97.0
4 years of high school or more	2.1	1.3	3.1	2.0	1.2	3.1	2.0	1.2	3.0
Elementary: Less than 5 years [1]	.5	.5	.5	.4	.4	.4	.3	.3	.3
5 to 7 years	1.4	1.6	1.2	1.1	1.3	.9	.8	.9	.7
8 years	4.0	5.0	2.6	3.5	4.6	2.2	3.1	4.0	1.8
High school: 1 to 3 years	92.0	91.6	92.6	93.0	92.6	93.5	93.8	93.6	94.2
4 years	2.0	1.2	3.0	1.9	1.1	3.0	1.9	1.1	2.9
College: 1 to 3 years	.1	.1	.1	.1	.1	.1	.1	.1	.1
4 years or more									
18 AND 19 YEARS									
Total: Number (in thousands)	4,803	2,569	2,234	4,095	2,147	1,948	4,134	2,159	1,975
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	31.0	37.3	23.7	29.5	35.6	22.6	27.9	33.7	21.6
4 years or high school or more	69.0	62.6	76.3	70.5	64.3	77.5	72.0	66.3	78.4
Elementary: Less than 5 years [1]	.8	.8	.7	.6	.6	.5	.4	.5	.4
5 to 7 years	1.3	1.7	.9	1.1	1.4	.7	.9	1.2	.5
8 years	1.7	2.1	1.1	1.4	1.8	.9	1.1	1.4	.7
High school: 1 to 3 years	27.2	32.7	21.0	26.4	31.8	20.5	25.5	30.6	20.0
4 years	55.5	49.3	62.6	56.8	50.7	63.6	57.9	52.2	64.2
College: 1 to 3 years	13.4	13.2	13.6	13.6	13.5	13.8	14.0	14.0	14.1
4 years or more	.1	.1	.1	.1	.1	.1	.1	.1	.1
20 TO 24 YEARS									
Total: Number (in thousands)	14,484	7,910	6,574	14,059	7,554	6,505	12,270	6,462	5,808
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	12.6	15.3	9.4	10.4	12.8	7.5	8.0	10.1	5.6
4 years of high school or more	87.4	84.7	90.6	89.7	87.3	92.5	92.0	89.8	94.5
Elementary: Less than 5 years [1]	.6	.7	.6	.5	.6	.4	.4	.5	.3
5 to 7 years	1.5	1.9	1.0	1.3	1.7	.8	1.0	1.4	.6
8 years	1.9	2.3	1.3	1.6	2.0	1.1	1.3	1.6	.9
High school: 1 to 3 years	8.6	10.4	6.5	7.0	8.5	5.2	5.3	6.6	3.8
4 years	42.3	40.2	44.7	40.1	38.4	42.1	38.0	36.6	39.6
College: 1 to 3 years	30.5	31.0	30.0	33.1	33.6	32.5	35.7	36.2	35.1
4 years or more	14.6	13.5	15.9	16.5	15.3	17.9	18.3	17.0	19.8
4 years	11.5	10.0	13.3	12.8	11.2	14.7	14.1	12.4	16.0
5 years or more	3.1	3.5	2.6	3.7	4.1	3.2	4.2	4.6	3.8
25 TO 34 YEARS									
Total: Number (in thousands)	26,299	17,052	9,247	29,259	18,929	10,330	30,051	19,382	10,669
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	16.0	15.9	16.7	13.3	12.7	14.2	10.8	10.1	12.1
4 years of high school or more	83.9	84.2	83.4	86.9	87.5	85.8	89.2	89.9	87.9
Elementary: Less than 5 years [1]	.3	.4	.2	.2	.2	.1	.2	.2	.1
5 to 7 years	1.2	1.4	1.0	.8	.9	.6	.4	.5	.3
8 years	2.6	3.1	1.8	2.0	2.4	1.3	1.4	1.8	.8
High school: 1 to 3 years	11.9	11.0	13.7	10.3	9.2	12.2	8.8	7.6	10.9
4 years	42.2	40.7	44.9	41.0	40.1	42.8	39.8	39.2	40.8
College: 1 to 3 years	17.6	18.5	15.9	18.8	20.0	16.5	19.7	21.2	17.0
4 years or more	24.1	25.0	22.6	27.1	27.4	26.5	29.7	29.5	30.1
4 years	13.4	12.5	15.1	14.5	13.0	17.2	15.3	13.3	18.8
5 years or more	10.7	12.5	7.5	12.6	14.4	9.3	14.4	16.2	11.3

See footnotes at end of table.

Table 3. Continued—Projected educational attainment of persons 16 years old and over in the civilian labor force

[Percent distribution]

Age and years of school completed	1980			1985			1990		
	Both sexes	Men	Women	Both sexes	Men	Women	Both sexes	Men	Women
35 TO 44 YEARS									
Total: Number (in thousands)	18,450	11,584	6,866	22,907	14,350	8,557	27,347	17,131	10,216
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	24.4	24.4	24.5	19.6	19.0	20.8	16.1	15.1	18.0
4 years of high school or more	75.6	75.7	75.5	80.3	81.1	79.1	83.7	84.9	82.0
Elementary: Less than 5 years [1]	.9	1.1	.5	.4	.5	.2	.2	.2	.1
5 to 7 years	3.0	3.5	2.3	1.7	2.0	1.3	1.0	1.2	.7
8 years	4.5	4.8	3.9	3.4	3.8	2.8	2.5	2.9	2.0
High school: 1 to 3 years	16.0	15.0	17.8	14.1	12.7	16.5	12.4	10.8	15.2
4 years	42.9	39.3	48.9	42.5	39.6	47.5	41.8	39.4	45.9
College: 1 to 3 years	13.9	14.8	12.4	15.7	16.8	13.9	17.0	18.3	14.9
4 years or more	18.8	21.6	14.2	22.2	24.7	17.7	24.9	27.2	21.2
4 years	10.7	11.4	9.6	12.2	12.4	11.7	13.2	13.0	13.6
5 years or more	8.1	10.2	4.6	10.0	12.3	6.0	11.7	14.2	7.6
45 TO 54 YEARS									
Total: Number (in thousands)	16,397	9,862	6,535	16,238	9,698	6,540	18,225	10,863	7,362
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	33.4	35.5	30.4	28.5	30.2	26.3	23.3	23.9	22.2
4 years of high school or more	66.5	64.6	69.6	71.5	69.9	73.8	76.7	76.0	77.8
Elementary: Less than 5 years [1]	2.4	3.2	1.1	1.6	2.2	.7	.9	1.3	.4
5 to 7 years	5.3	6.2	4.0	4.0	4.9	2.9	2.6	3.1	1.7
8 years	8.2	9.3	6.6	5.9	6.6	4.9	4.2	4.6	3.5
High school: 1 to 3 years	17.5	16.8	18.7	17.0	16.5	17.8	15.6	14.9	16.6
4 years	40.1	34.9	48.1	42.7	37.7	50.1	43.5	39.4	49.6
College: 1 to 3 years	11.3	11.8	10.6	12.4	13.0	11.6	14.2	14.9	13.2
4 years or more	15.1	17.9	10.9	16.4	19.2	12.1	19.0	21.7	15.0
4 years	8.5	9.7	6.8	9.4	10.4	7.9	10.8	11.4	10.0
5 years or more	6.6	8.2	4.1	7.0	8.8	4.2	8.2	10.3	5.0
55 TO 64 YEARS									
Total: Number (in thousands)	12,784	7,727	5,057	12,926	7,713	5,213	12,307	7,304	5,003
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	37.4	39.9	33.8	34.0	36.2	30.8	30.5	32.5	27.7
4 years of high school or more	62.6	60.2	66.2	66.1	63.9	69.2	69.6	67.5	72.3
Elementary: Less than 5 years [1]	2.5	3.0	1.8	2.0	2.5	1.4	1.6	2.0	1.0
5 to 7 years	6.4	7.1	5.5	5.6	6.2	4.6	4.7	5.4	3.8
8 years	11.1	12.1	9.6	9.4	10.6	7.7	7.7	8.9	6.0
High school 1 to 3 years	17.4	17.7	16.9	17.0	16.9	17.1	16.5	16.2	16.9
4 years	39.4	34.8	46.3	40.5	35.4	48.0	41.6	36.4	49.2
College: 1 to 3 years	11.1	11.7	10.3	11.5	12.1	10.6	11.9	12.4	11.1
4 years or more	12.1	13.7	9.6	14.1	16.4	10.6	16.1	18.7	12.0
4 years	7.0	7.5	6.0	8.0	8.9	6.6	9.1	10.0	7.6
5 years or more	5.1	6.2	3.6	6.1	7.5	4.0	7.0	8.7	4.4
65 YEARS AND OVER									
Total: Number (in thousands)	3,297	2,058	1,239	3,401	2,082	1,319	3,526	2,135	1,391
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 4 years of high school [1]	51.9	54.9	47.0	43.9	45.9	40.8	38.3	40.1	35.2
4 years of high school or more	48.1	45.1	53.0	56.0	54.1	59.0	61.8	59.9	64.8
Elementary: Less than 5 years [1]	5.4	5.8	4.8	4.3	4.7	3.6	3.0	3.1	2.7
5 to 7 years	12.8	14.1	10.6	9.4	9.8	8.8	7.9	8.5	6.8
8 years	19.2	20.4	17.2	15.3	15.9	14.4	12.4	13.2	11.3
High school: 1 to 3 years	14.5	14.6	14.4	14.9	15.5	14.0	15.0	15.3	14.4
4 years	25.6	23.3	29.4	31.4	29.4	34.6	34.8	31.8	39.4
College: 1 to 3 years	9.0	8.0	10.7	9.7	8.8	11.1	10.6	10.1	11.4
4 years or more	13.5	13.8	12.9	14.9	15.9	13.3	16.4	18.0	14.0
4 years	6.7	6.5	7.0	7.3	7.4	7.2	8.0	8.4	7.5
5 years or more	6.8	7.3	5.9	7.6	8.5	6.1	8.4	9.6	6.5

[1] Includes persons reporting no formal education.

NOTE: Because of rounding, percentages may not add to exactly 100.

high school in March 1972 ranged from 78.6 percent among workers 25 to 34 years old to 41.5 percent among those 65 years old and over. By 1980, the corresponding percentages are projected at 83.9 and 48.1 percent, respectively, and by 1990, at 89.2 and 61.8 percent, respectively. Thus the range narrows from 37.1 percentage points in 1972 to 27.4 percentage points in 1990. However, the gap widens

between the projected percentages of college graduates in the two age groups. In March 1972, the range was from 20.1 percent among workers 25 to 34 years old to 12.4 percent among those aged 65 years and over. By 1980, the corresponding percentages are projected at 24.1 and 13.5 percent, respectively, and by 1990, at 29.7 and 16.4 percent, respectively—a range increase from 7.7 to 13.3 percentage points.

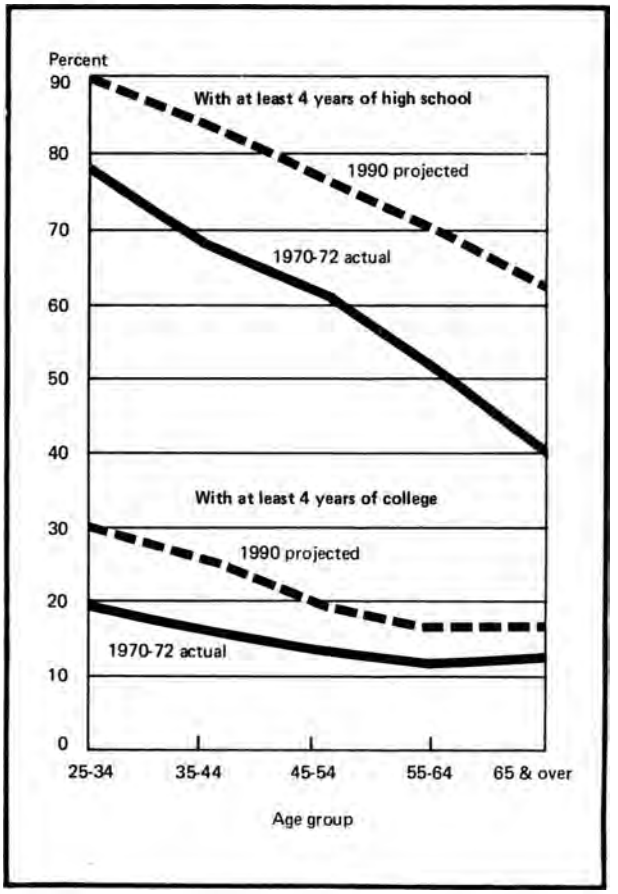
These trends suggest that while the projected labor force at all ages will tend increasingly to have achieved at least a high school education, the younger workers will enjoy a growing advantage over their elders with respect to the completion of college studies.

The new projection also reveals the highly significant proportion of the college graduates who will have pursued some form of graduate education in the future. Among the nearly 16.4 million college graduates projected to be in the labor force in 1980, about 6.7 million (41 percent) are expected to have completed at least 1 year of graduate work. By 1990, the number of workers with at least 5 years of college education rises to 10.7 million, or 45 percent of the college graduates in the labor force. The corresponding proportions among working men are 46 percent in 1980 and 50 percent in 1990; among working women, 31 percent in 1980 and 34 percent in 1990. Here also, the disparity between the younger and older workers is pronounced. By 1980, 10.7 percent of the workers 25 to 34 years old are estimated to have completed at least 5 years of college, compared with 6.8 percent of the workers 65 years and over; by 1990, the corresponding proportions are 14.4 and 8.4 percent, respectively.

The educationally disadvantaged

In recognizing the growing preponderance in the civilian labor force of persons with higher education, one may overlook the plight of the less educated ones, whose competitive disadvantage grows apace with the rising educational attainment of the majority. Their problems are exacerbated by their growing concentration in the older age groups of the work force. As previously noted, the median age of workers with 8 years of formal education or less increases over the projection period, while that of the more highly educated declines. In March 1972, about 38 percent of the workers with 8 years or less of formal schooling were aged 55 years and

Chart 2. Percent of civilian labor force with at least 4 years of high school and at least 4 years of college, by age, 1970–72 actual and 1990 projected



over. By 1980, this proportion is expected to remain unchanged, despite the decline in the median age of all workers; and by 1990, it rises to 41 percent. Thus, the employment and retraining problems to be overcome in fitting the educationally disadvantaged into our increasingly sophisticated economy will be complicated by the relatively advanced age of these less educated workers.

Workers who have attended, but failed to complete, high school have experienced particularly severe employment problems during the past 20 years. If workers under age 18 (most of whom are still enrolled in high school) are excluded, the number of workers with 1 to 3 years of high school is projected to rise slightly, from 13.7 million in March 1972 to 14.2 million in 1980. It declines steadily thereafter, reaching 13.2 million by 1990. The proportion of younger workers (18 to 24 years old) among these high school dropouts has apparently reached a peak and is expected to decline in the fu-

ture. In March 1962, 15.6 percent of workers 18 and over with 1 to 3 years of high school completed were in the group 18 to 24 years old. By March 1972, the corresponding percentage had risen to 18.5 percent, reflecting the large inflow of new young workers which has occurred since the mid-1960's. By 1980, the corresponding proportion is projected at 17.9 percent, and by 1990, it is projected to have declined sharply to 13.0 percent. In numerical terms, these young high school dropouts increased from about 2 million in 1962 to 2.5 million in 1972. They are projected to remain about constant in number to 1980, and to decline to about 1.7 million by 1990. Thus, the demand for manpower programs designed to assist these young but educationally disadvantaged workers to improve their employment qualifications will remain steady throughout the 1970's, but will decline thereafter.

The college graduates: supply and demand

The performance of the U.S. economy in absorbing the growing number of college graduates during the past two decades warrants some optimism with respect to the employment prospects of highly educated workers in the future. Between 1950 and 1970, the number of employed men 25 years and over increased by 19 percent—0.9 percent a year, on average—while that of the college graduates among them rose by 134 percent, or an average of 4.3 percent a year. Over the same 20-year period, the number of employed women workers in the same age group increased by 89 percent—an average gain of 3.2 percent a year—while the number of college graduates among them increased by 147 percent, or 4.5 percent a year, on average.

However, the recent employment experience of new college graduates suggests that their short-term employment prospects may be quite sensitive to cyclical changes in the economy and to the changing mix of demand for highly trained professional and technical workers in particular fields.[3] In particular, a note of caution should be expressed in regard to the employment needs of women college graduates whose numbers are projected to grow so rapidly. This growth must be considered in relation to the limited job opportunities expected in primary and secondary education, where a large proportion of these women have been employed in the past. The absorption of these women into the labor force may, therefore, require a movement by these women in unprecedented numbers into traditionally male-dominated professional and technical occupations.[4]

These highly qualified workers may also displace increasing numbers of less educated workers in occupations which have formerly been the preserve of those without college education, particularly if the kinds of jobs which typically have been held by college graduates do not increase fast enough to absorb the prospective growth of college graduate jobseekers. The upgrading of job requirements already observed suggests that the employers' expectations with respect to the educational qualifications of their prospective employees tend to rise with increases in such qualifications of the jobseekers themselves. Thus, if college graduates are forced to seek jobs which have not traditionally attracted them, they are likely to be hired in preference to the less educated, quite apart from the actual education needed to perform such jobs adequately. Should such displacement take place on a large scale, the potential consequences could be damaging both to the college-educated workers and to the less educated workers they displace. For the former, limited opportunity to utilize and develop the skills and perspectives acquired in college could give rise to alienation, frustration, and other problems associated with this type of underemployment. For the latter, the prospect of competition with the educationally advantaged for jobs and promotions could also give rise to serious strains.[5] But it is also possible to envision more favorable consequences, such as the improved job performance which may be expected to accompany the educational upgrading of workers in different occupations. In addition, increased competition between workers with different amounts of formal education might eventually lead to less exclusive reliance upon academic credentials in hiring and promotion, and the supplementing of such criteria with more valid indicators of work-related ability and potential.[6]

Comparison with earlier projection

In comparison with the 1970 projection it supersedes, the current projection of the male civilian labor force 25 years old and over is smaller by about 400,000 for 1980 and about 500,000 for 1985.[7] As for the female civilian labor force of the same age span, the current projection is larger by about 1.3 million for 1980 and 1.6 million for

1985. In the aggregate, the current projection yields an adult civilian labor force that is larger than the earlier projection by about 900,000 for 1980 and 1.1 million for 1985 (table 4). In general, the current projection shows a more rapid advance in the educational attainment of the adult civilian labor force than was indicated earlier. This advance is more pronounced among men than among women for both 1980 and 1985. It is also more pronounced for 1985, for each sex, than for 1980.

The differences between the current and the previous projection in the size of the adult civilian labor force are largely those resulting from changes in the projected rates of labor force participation. The recent changes in the size of the projected population 25 years old and over are generally minor. The more rapid rate of increase in the projected educational attainment of the labor force, on the other hand, reflects primarily the higher levels of educational attainment projected for the adult population as a whole by the Bureau of the Census, since the projected educational attainment of the labor force has been linked to that of the population. (See explanation of the linkage in the following section.)

Table 4. Comparison of current projection of educational attainment of adult workers 25 years and over with previous BLS projection, 1980 and 1985

Sex and years of school completed	1980			1985		
	Current projection (1)	Report 122[1] (2)	Difference (1)–(2) (3)	Current projection (4)	Report 122[1] (5)	Difference (4)–(5) (6)
MEN						
Civilian labor force:						
Number (in thousands)	48,283	48,665	−382	52,772	53,282	−510
Percent	100.0	100.0		100.0	100.0	
Less than 8 years[2]	6.1	6.4	−.3	4.2	4.7	−.5
8 to 11 years	21.3	23.2	−1.9	18.1	19.9	−1.8
12 years	37.5	39.7	−2.2	38.4	42.3	−3.2
13 to 15 years	14.7	12.1	2.6	16.2	12.6	3.6
16 years or more	20.4	18.6	1.8	23.1	20.5	2.6
WOMEN						
Civilian labor force:						
Number (in thousands)	28,944	27,662	1,282	31,959	30,362	1,597
Percent	100.0	100.0		100.0	100.0	
Less than 8 years[2]	4.2	4.5	−.3	2.8	3.1	−.3
8 to 11 years	21.8	22.5	−.7	19.4	19.8	−.4
12 years	46.1	47.2	−1.1	46.1	48.2	−2.1
13 to 15 years	12.7	12.0	.7	13.6	12.9	.7
16 years or more	15.3	14.0	1.3	18.1	16.0	2.1

[1] Denis F. Johnston, "Education of adult workers: projections to 1985," Monthly Labor Review, August 1970, pp. 43–56, reprinted as Special Labor Force Report 122.
[2] Includes persons reporting no formal education.

Assumptions and methodology

These projections were developed by a method which provides a systematic linkage with the latest available projections of educational attainment of the population, by age and sex, prepared by the Bureau of the Census.[8] The projections were developed in the following steps:

A. Civilian labor force 25 years old and over

Step 1. Percentage distributions by educational attainment categories were obtained for men and women in the population and the civilian labor force for age groups 25 to 34, 35 to 44, 45 to 54, 55 to 64, and 65 and over. The following educational attainment categories were used: less than 5 years of schooling (including no school years completed), 5 to 7 years, 8 years, 9 to 11 years, 12 years, 13 to 15 years (that is, 1 to 3 years of college), 16 years, and 17 years or more. These data were obtained from the March Current Population Surveys for four periods—an average of 1957 and 1959; an average of 1964, 1965, and 1966; an average of 1967, 1968, and 1969; and an average of 1970, 1971, and 1972.[9]

Step 2. The observed differences in the educational distribution of the population and civilian labor force (by age and sex) were projected to 1990. These differences reflect observed trends over the period 1957–59 to 1970–72, either toward increasing or decreasing differences. Otherwise, the differences were assumed to remain constant.

Step 3. The differences—positive or negative—were applied to the projected educational distributions of the population to obtain a first approximation of the educational attainment of the labor force in 1980, 1985, and 1990.

Step 4. These educational distributions (in percentage terms) were then applied to the previously projected civilian labor force totals for each age-sex group. The resultant numbers were then divided by the corresponding population to obtain a labor force participation rate for the population in each age, sex, and educational attainment category for the target dates.

Step 5. The labor force participation rates obtained in step 4 were then compared with observed trends in these rates over the period 1957–59 to 1970–72. Relatively minor adjustments in these rates were then introduced wherever necessary to maintain consistency with the observed trends, while also preserving consistency with the previous projection of the civilian labor force in each age-sex group.

Step 6. The adjusted rates of labor force participation were then applied to the projected population

to obtain the projected labor force by age, sex, and years of school completed for 1980, 1985, and 1990.

B. Civilian labor force 16 to 24 years old

For some planning purposes, it is useful to have a projection of the educational attainment of workers under the age of 25 even though many of these workers have not yet completed their formal schooling. The Bureau of the Census does not develop projections of the educational attainment of the population under 25; therefore, it was decided to develop a projection of the educational attainment of both the population and the civilian labor force 16 to 24 years old by means of a direct extrapolation of trends in their reported educational attainment. The reported educational attainment distribution of the population and labor force 16 and 17 years old (by sex) was obtained from the 1950, 1960, and 1970 censuses and from the March 1972 Current Population Survey. Corresponding data for the population and labor force age groups of 18 and 19 and 20 to 24 (by sex) were obtained from the published Current Population Survey reports for the years 1957, 1959, and 1964–72.

For each of these groups, observed trends in the percentage distribution of their educational attainment were extrapolated to 1990, and the resultant projections were applied directly to the projected population and civilian labor force of each group to obtain the numbers by years of school completed. The labor force participation rates implicit in these projections, by age, sex, and years of school completed were then computed for 1980, 1985, and 1990 by dividing the projected civilian labor force by the projected population. These rates were then compared and adjusted, as necessary, to ensure consistency with trends in the reported participation rates over the period for which actual data were available. The adjusted rates were then applied to the projected population to obtain the final projected labor force in each educational attainment category. □

FOOTNOTES

[1] These projections supersede those presented in Denis F. Johnston, "Education of adult workers: projections to 1985," *Monthly Labor Review*, August 1970, pp. 43–56, reprinted as Special Labor Force Report 122. Information by color or race, which was provided in the earlier report, is not yet available. The size and age-sex composition of the civilian labor force in this report are consistent with those of the total labor force as projected in Denis F. Johnston, "The U.S. labor force: projections to 1990," *Monthly Labor Review*, July 1973, pp. 3–13. In addition, the projected educational attainment of the adult civilian labor force (25 years and over) is consistent with the latest projection of the educational attainment of the adult population published by the Bureau of the Census. For a description of the assumptions and methodology of these projections, see *Demographic Projections for the United States, Current Population Reports*, Series P-25, No. 476 (Bureau of the Census, February 1972).

[2] Unless otherwise specified, the projections in this article relate to the entire civilian labor force, 16 years old and over. The projected years of school completed refer to the workers' estimated attainment at the time they are in the labor force, and not to their ultimate attainment upon completion of their formal education. Where data for 1972 are used for discussion of emerging changes during the current decade, the 1972 data are taken from William V. Deutermann, "Educational attainment of workers, March 1972," *Monthly Labor Review*, November 1972, pp. 38–42, reprinted as Special Labor Force Report 148.

[3] Information on the employment experience of recent college graduates is provided in Vera C. Perrella, "Employment of recent college graduates," *Monthly Labor Review*, February 1973, pp. 41–50, reprinted as Special Labor Force Report 151. Also see Michael F. Crowley, "Professional manpower: the job market turnaround," *Monthly Labor Review*, October 1972, pp. 9–15; and *Persons in Engineering, Scientific, and Technical Occupations: 1970 and 1972, Current Population Reports, Special Studies*, Series P-23, No. 45 (Bureau of the Census, July 1973).

[4] For additional perspective on the employment of college-educated women, see Pamela Roby, "Women and American Higher Education," *The Annals of the American Academy of Political and Social Science*, November 1972, pp. 118–39, and Alan L. Sorkin, "Occupational Status of Women, 1870–1970," *The American Journal of Economics and Sociology*, July 1973, pp. 235–43.

[5] For additional information on the prospective occupational distribution of college-educated workers, see the forthcoming article by Neal H. Rosenthal in the December 1973 issue of the *Monthly Labor Review*.

[6] "Years of school completed" is obviously a crude criterion of either ability to perform well in a given job or of potential for further training and development; exclusive or even primary reliance upon such a criteron for purposes of job placement, promotion, or training is unlikely to provide an adequate screening of the more capable individuals in most work situations. Among the factors which are not necessarily reflected by educational attainment are the quality of schooling received, the possible loss of knowledge and skills learned in the past, learning and experience acquired outside of school, and such personal attributes as discipline, interest, and motivation. On this general issue, see Thomas F. Green, *Work, Leisure, and the American*

Schools (New York, Random House, 1968), and *Credentials and Common Sense: Jobs for People Without Diplomas* (U.S. Department of Labor, Manpower Administration, December 1968), Manpower Report 13.

[7] These comparisons are restricted to the civilian labor force 25 years old and over in 1980 and 1985 because the 1970 projection was limited to that age group and those dates.

[8] *Demographic Projections for the United States, Current Population Reports,* Series P-25, No. 476 (Bureau of the Census, February 1972), table 5. These projections relate to persons 25 years old and over, by age and sex. For the age groups where two series of educational distributions were developed (persons 25 to 34 years old in 1980 and persons 25 to 44 years old in 1985 and 1990), an arithmetic average of the two series was adopted.

[9] Current Population Survey data on the educational attainment of the population for the mentioned years are published by the Bureau of the Census in *Current Population Reports,* Series P-20, Numbers 77, 99, 138, 158, 169, 182, 194, 207, 229, and 243. Corresponding data for the civilian labor force for these years are published by the Bureau of Census in *Current Population Reports,* Series P-50, No. 78 (for 1957) and by the Bureau of Labor Statistics in its Special Labor Force Reports, 1, 53, 65, 83, 92, 103, 125, 140, and 148 (covering March 1959 through March 1972). The latter reports were reprinted, with additional tables, from the *Monthly Labor Review.*

Chapter III. Special Groups in the Labor Force

The economic status of families headed by women

Nearly 5.6 million families in the United States are headed by women; despite employment growth of the 1960's about 2 million of these families remain in poverty

ROBERT L. STEIN

ONE OF THE IMPORTANT domestic problems facing the Nation in the 1970's is how to improve the economic status of families headed by women. According to the latest estimates—for March 1970—5.6 million families in the United States are headed by women, or more than 1 family in 10.

The number has been increasing more rapidly than the total of all families. Between 1960 and 1970, for example, it rose by 24 percent, whereas total families increased by 14 percent.

Historically the employment and income situation of such families has generally been bleak. Most of the women are ill-equipped to earn an adequate living. Many suffer from one handicap or more to successful competition in the labor market—lack of sufficient education or training, irregular and unstable work histories, sex or racial discrimination in hiring, ill health, and the difficulty of arranging for satisfactory child care. As a result, these women have not been able to share fully in the Nation's economic growth, with its associated expansion in jobs and advances in earnings. During the 1960's, the income of families headed by men remained more than double the income of families headed by women. While the number of families headed by men with incomes below the poverty line ($3,700 for a family of four in 1969) was reduced by one-half between 1959 and 1969, the number of poor families headed by women remained virtually unchanged at about 1.8 million. Employment growth, the most powerful weapon in the antipoverty arsenal, has not significantly reduced the number of poor families headed by women.

Robert L. Stein is an economist in the Office of Economic and Social Research, Bureau of Labor Statistics. Carol Milner of the same office assisted in the preparation of the article.

Public assistance, a primary source of income for many of the families headed by women, has been expanding in coverage and in benefit levels, but payments are still generally very low—in most States below the poverty line.

The welfare system has been caught in a crossfire of public criticism. The target for most of the hostility is the AFDC program—Aid to Families with Dependent Children—designed to provide income assistance to the families of children whose fathers have died or deserted or are absent for a variety of other reasons. On the one hand, welfare programs are criticized because their payment levels are considered too low to provide economic security to families in need. On the other hand, the programs are criticized on the grounds that work, as well as need, should be a requirement for eligibility. The welfare system has also been faulted because of the widely disparate State benefit levels, because it may discourage some women from seeking employment, and because it may induce some families to break up.

The attacks have become sharper in recent years because of steady growth in the welfare population during a period of rapid economic growth and very low unemployment. By March 1970, about three-fifths of the 3.4 million families with children headed by women were already on welfare and the rolls were still rising. These developments were placing a growing burden on the already hardpressed taxpayer. One result of the resistance to the rising welfare bill has been a heightened interest in the possibility of employment for welfare mothers. One important aspect of welfare reform involves the development of training and job placement programs for able-bodied adult welfare recipients. The manpower provisions of the Administration's proposed Family Assistance Act of 1970 include a training and work requirement for mothers of school-age children.

Scope of the problem

In March 1970, 5.6 million women were heads of families (table 1); 2.4 million of these women (43 percent) were widows and 2.6 million (46 percent) were divorced or separated from their husbands. The remaining 600,000 had never been married. About a third of these single women had children under 18.

From the standpoint of society, foremost concern is centered on the status of those families with dependent children. The environment in which these children are growing up is inevitably affected by the stresses and strains on the mother who must take over the responsibility for the discipline, training, and guidance of the young as well as their financial support. In March 1970, there were 3.4 million such families, comprising 8 million children under 18 years of age (an average of 2.4 per family) and 13 million persons altogether.

The remaining 2.2 million—women without children under 18—were nearly all past the age of 45. Two-thirds were widows, and all but a few were heads of small families consisting of only two or three persons. These older family heads were not without employment and income problems. By and large, however, their situation was less serious than that of younger families with children since they had more freedom to accept employment, they had more income from other sources, and they had fewer dependents. Half had fully grown children in the household who could contribute to the family's income. In 1969, the median income of families headed by women 45 to 64 years of age who had no children under 18 in the household was $7,000, whereas the income of families headed by women 24 to 44 years of age who did have children was only $4,000.

Table 1. Selected characteristics of families headed by women

Characteristic	Thousands of families		Percent of families in each category	
	March 1970	March 1960	March 1970	March 1960
ALL RACES				
Total, all families	5,580	4,494	11	10
With children	3,363	2,542	11	9
Below the poverty line	1,803	1,916	36	23
With children	1,488	1,525	47	28
In central cities of metropolitan areas	2,269	1,764	15	12
Below the poverty level	738	585	50	29
WHITE				
Total, all families	4,185	3,545	9	9
With children	2,255	1,834	9	8
Below the poverty line	1,063	1,233	30	20
With children	831	948	40	25
In central cities of metropolitan areas	1,418	1,240	12	10
Below the poverty line	337	303	39	24
NEGRO AND OTHER RACES				
Total, all families	1,395	949	27	22
With children	1,108	708	31	25
Below the poverty line	739	683	53	32
With children	657	577	59	35
In central cities of metropolitan areas	851	524	29	23
Below the poverty line	402	282	66	28

Between 1960 and 1970, the number of women heading families with children rose by 800,000. Roughly one-third of this increase could be attributed to general population growth. There has been considerable speculation that rising welfare benefits in the large industrial States of the North have contributed to the breaking up of poor families. However, it would be extremely difficult to isolate this factor from the entire complex of forces that leads to family disorganization. (One-third lived in the South where welfare payments are still comparatively low.)

The proportion of families headed by women is highest among poorly educated and low income groups, among minority groups, and among city residents. On the other hand, the group is also more heterogeneous than might be supposed. Among women 25 and over, most of whom have completed their formal schooling, one-third of the family heads have no more than an elementary school education (compared with one-fourth of other women), but 13 percent have some college education. Although one-third have incomes below the poverty line, a small minority (nearly 300,000) have incomes of $15,000 or more. These are mainly older white families without children.

Among the black urban poor, the proportion of families headed by women was 66 percent in March 1970. Here, as in the Nation as a whole, the proportion has been increasing; the trend is much more pronounced among the urban poor.

Even among the 3.4 million families with children, the situation is uneven. About 65 percent have only one or two children and their incomes are somewhat higher than the incomes of larger families. However, those with few or no children tend to be at the extremes of the age scale. Among women family heads age 25 to 44, presumably the prime candidates for training and employment, nearly half had three children or more. The prob-

lems confronting women with many children are compounded by the fact that they are also the least educated and therefore the least equipped to find employment.

Family income

The relationship between income and family stability is complex. When a breadwinner dies or leaves his family, the loss or reduction of financial support may be only partly offset by the wife's earnings and Social Security, private pensions or insurance, welfare payments or other benefits. Poverty or low income may itself create tensions leading to family breakup. Or the fact that a man does not have a steady job at good pay may induce him to leave so that his family can obtain public assistance. These situations are not easily quantified. In any case, the data show a very strong correlation between income and the presence or absence of fathers.

As table 2 shows, the percentage of families headed by women moves down steadily as family income rises. The proportion starts out at 63 per 100 families with incomes under $2,000, and then moves down progressively to reach 2 per 100 families with incomes of $10,000 and over.

Negro families with children are much more likely than white families to be headed by a woman—1 in every 3 Negro families is in this category, compared with 1 in every 10 white families. The difference in family structure is one reason for the lower average income of Negro families. Although the proportion of black families without husbands and fathers is higher than for whites at every income level, it moves down sharply and continuously from about 3 in 4 among the lowest income families to about 1 in 20 among the higher income families.

The median income of the families of 8 million children who were being brought up by their mothers—or other female relatives—was $4,000 in 1969. This contrasts with a median family income of $11,600 for the 61 million children living with both parents.

Only 38 percent of the families headed by women had incomes over $5,000 and only 9 percent had incomes over $10,000. By contrast, 55 percent of the husband-wife-children families had incomes over $10,000. Although husband-wife families tend to be larger than families headed by women, the differences in income between the two types of families far exceed any differences in need.

Table 2. Income in 1969 of families with children, headed by women

Family income	All races	White	Negro and other races
Total: Number (in thousands)	3,363	2,255	1,108
Percent	100	100	100
Under $2,000	21	18	26
$2,000 to $2,999	15	13	18
$3,000 to $3,999	14	12	18
$4,000 to $4,999	12	12	11
$5,000 and over	38	45	27
$5,000 to $5,999	10	10	10
$6,000 to $6,999	8	9	6
$7,000 to $7,999	5	6	3
$8,000 to $8,999	3	4	3
$9,000 to $9,999	3	5	1
$10,000 and over	9	11	4
Median income	$4,008	$4,523	$3,327
Families headed by women as percent of all families with children	11	9	31
Under $2,000	63	57	74
$2,000 to $2,999	54	48	67
$3,000 to $3,999	40	33	56
$4,000 to $4,999	28	26	36
$5,000 to $5,999	20	17	31
$6,000 to $6,999	14	12	22
$7,000 to $7,999	8	7	12
$8,000 to $8,999	5	4	14
$9,000 to $9,999	5	5	6
$10,000 and over	2	2	5

Families headed by women account for a large and growing proportion of the remaining poverty in the United States. In 1969, 47 of every 100 poor families with children were headed by women. In 1959, the proportion was 28 out of 100.

The poverty line takes account of both family income and family size. In 1969, the line was set at $3,700 for a nonfarm family of four headed by a woman. It goes up (or down) by roughly $700 for each additional person (or each person less) in the family.

The poverty thresholds as used in this discussion [1] are not intended to provide a measure of income adequacy; that is, it should not be inferred that those with incomes above the poverty line have necessarily achieved a minimally adequate level of living. The cutoffs do provide a useful device for measuring the prevalence of, and trends in, very low income levels among various family-type and family-size groups, and are more realistic than are fixed dollar amounts of income (for example, families with incomes under $3,000) because they are graduated by family size. They are varied over time to reflect annual changes in the average price level as measured by the Consumer Price Index.

The poverty statistics point up the importance of family size. If a family headed by a woman has only one or two children, it has about a 2 out of 3 chance of staying above the poverty line. However, as the number of children increases, the probability that the family's income is under the poverty line rises sharply. Among those families with four children or more, over two-thirds are poor.

Additional children might have been economically helpful to poor families in an earlier era. But in modern urban society with its complex technology and its unrelenting emphasis on education and skill, each additional child diminishes the woman's prospects for economic independence and security through employment. The bearing and rearing of children may interfere with the completion of her education, and most certainly will interfere with the continuity of her employment. Unless a woman can acquire at least a high school education or can acquire meaningful job training and job experience, and unless she can work full time most of the year, it is unlikely that her annual earnings alone would be sufficient to lift the income of a family of four above the poverty line. Additional children tend to reduce her earning power, while raising family expenses. The extra welfare allowance for each additional family member is too small to prevent the gap from widening. The situation is illustrated statistically in table 3. On the average, poor families headed by women had total incomes in 1969 which were $1,200 below the poverty threshold, but this income deficit increased with each child added to the family. The median difference between income level and the poverty line (the "poverty gap") was $1,100 for those with one child, $1,500 for those with three children, and $2,400 for those with five children or more.

Table 3. Extent of poverty in 1969 among families headed by women, by number of children

(Numbers in thousands)

Race and number of children under 18 [1]	Total number of families	Poor families		
		Number	Percent of total	Median deficit between total income and poverty line [2]
ALL RACES				
Total	5,580	1,803	32	$1,200
No children under 18	2,218	315	14	700
One child	1,211	360	30	1,100
Two children	960	386	40	1,200
Three children	545	279	51	1,500
Four children	303	202	67	1,700
Five children or more	344	262	76	2,400
WHITE				
Total	4,185	1,063	25	1,200
No children under 18	1,931	232	12	700
One child	906	227	25	1,100
Two children	702	258	37	1,300
Three children	353	163	46	1,700
Four children	163	97	60	1,700
Five children or more	130	86	66	2,400
NEGRO AND OTHER RACES				
Total	1,395	739	53	1,400
No children under 18	286	83	29	700
One child	306	133	43	1,100
Two children	258	128	50	1,100
Three children	191	116	61	1,500
Four children	140	105	75	1,600
Five children or more	214	174	81	2,400

[1] Own or related.
[2] Based on data for 1968.

One-quarter of all families headed by a woman are black. For these families, the rate of poverty is greater than for white families irrespective of the number of children. Moreover, large families are more common among blacks; one-third of the Negro families headed by women has four children or more compared with only one-eighth of the white families.

Among families with children, nearly two-thirds had only one child or two children. But when the children themselves are considered by family size, a different picture emerges—three-fifths lived in families with three children or more. These are the families where the poverty rate ranged from 51 to 76 percent and the poverty gap averaged from $1,500 to $2,400.

Extent of employment

The proportion of women holding paid jobs outside the home has been climbing steadily for 25 years and by March 1970, 43 of every 100 women 16 years of age and over were in the labor force (that is, either employed or seeking work).

The typical pattern has been for a woman to enter the labor force after completion of her education and prior to marriage, to leave after starting a family, and to reenter the labor force as family responsibilities diminish. During the last 10 years, however, there has been some modification of this pattern with the increasing entry into the labor force of mothers with young children. Their participation rate, although still comparatively low, has increased much faster

than the rate for other mothers. From 1960 to 1969, the rate for mothers with children under 6 years of age increased from 20 percent to 30 percent, while for mothers with children 6 to 17 years of age it increased from 43 to 51 percent.

The data indicate that the labor force participation of mothers responds to economic need. In March 1969, divorced, separated, or widowed women with young children under 6 had a participation rate of 47 percent, compared with 29 percent for married women with children under 6. The higher rate for women without husbands reflects in part an insufficiency of income from sources other than employment (alimony, child support, welfare, and Social Security).

From the standpoint of developing programs geared to assist women to earn their way off welfare, these labor force trends appear somewhat encouraging. However, the statistics on labor force participation of women can be misleading because they reveal nothing about the duration of employment. It is readily apparent that there is a high rate of turnover in the female work force. During 1968, an average of 28 million were employed, but 37 million different women were employed at some time during the year. For insight into the duration of employment, it is necessary to turn to data on work experience during the entire calendar year rather than in an average survey week. Because of concern with the capacity of women not merely to hold jobs but to support their families on the basis of their earnings, it is particularly important to examine the extent of full-time and part-time labor force activity, and the extent of year-round work compared with seasonal or temporary work.

Special tabulations of data on work experience in 1967, compiled for the Manpower Administration of the U.S. Department of Labor, were summarized for female heads of families age 16 to 44 years. These are women who still have many years of potential working life remaining and for whom job training is a realistic possibility. They are also the ones, however, who are most likely to be prevented from working steadily by the presence of children. Altogether, 70 percent worked at some time during the year, but only 38 percent worked throughout the year at full-time jobs.

As table 4 shows, working only part of the year is not enough to enable many female family heads to support their families at a level of living above the poverty line. Of the families headed by women who were employed only part time or part year, about half were poor. On the one hand, where the mother was employed year round full time, only 16 percent were poor. Of course, supplementary income was a factor in some cases, but the mother's earnings were clearly the most decisive factor. On the other hand, three-fourths of the families headed by nonworkers were poor.

If a woman can hold a professional, managerial, or clerical job, her chances of keeping her family above the poverty line are very good (table 5); only 16 percent of these families were poor. Over two-fifths of the mothers who worked at all had a job in one of these white-collar occupations.

Half of all female heads of poor families did not work at all during the year so that any skills or experience they might have were not being used. Of those who did work, nearly half had low-paid service jobs such as kitchen helpers, maids, hospital attendants and aides, and laundry workers. A fifth held semiskilled factory jobs. Only one-fifth of those with any employment experience (one-tenth of the overall total) worked

Table 4. Work experience of women[1] heading families and extent of poverty among these families in 1967

[Numbers in thousands]

Work experience and race	Total number of families	Poor families		Percent distribution	
		Number	Percent of total	Total	Poor
ALL RACES					
Total	2,263	1,029	45	100	100
Year round full time	862	135	16	38	13
All other workers	728	373	51	32	36
Part year full time	439	217	49	19	21
Part time	289	156	54	13	15
No work at all	673	521	77	30	51
WHITE					
Total	1,509	557	37	100	100
Year round full time	599	53	9	40	10
All other workers	498	215	43	33	39
Part year full time	305	131	43	20	24
Part time	193	84	44	13	15
No work at all	413	289	70	27	52
NEGRO AND OTHER RACES					
Total	752	470	63	100	100
Year round full time	262	82	31	35	17
All other workers	231	157	68	31	33
Part year full time	134	85	63	18	18
Part time	97	72	74	13	15
No work at all	260	232	89	35	49

[1] 16 to 44 years of age.

at some time during the year in the better-paid white-collar occupations.

Weekly earnings of women

Data on the usual weekly earnings of wage and salary workers in full-time jobs reveal that in general the median earnings of women full-time workers are not very high. (See table 6.) The overall median weekly earnings for all women full-time workers in May 1969 were $87. Even among white women with high school diplomas, who were employed mainly in clerical jobs, usual weekly earnings were only $88.

The data by educational attainment (years of formal schooling completed) and occupation from the May 1969 earnings survey are instructive. They reveal that only among the college-educated professional and managerial groups did a majority of women working full time earn over $100 a week. Among those with no college attendance (three-fourths of the total), only 3 out of every 10 white women and 2 out of every 10 black women earned $100 a week or more.

Table 5. Occupation of women heads[1] of families, by poverty status in 1967

[Numbers in thousands]

Occupation, according to longest job held	Total number of family heads	Poor family heads		Percent distribution	
		Number	Percent of total	Total	Poor
ALL RACES					
Total with work experience	1,584	504	32	100	100
Professional and managerial	185	21	11	12	5
Clerical	483	84	17	30	17
Sales	77	32	42	5	6
Operatives and other blue collar	354	106	30	22	21
Private household	109	73	67	7	14
Other service workers	331	159	48	21	32
Farm workers	45	29	[2]	3	6
WHITE					
Total with work experience	1,091	268	25	100	100
Professional and managerial	145	17	12	13	6
Clerical and sales	470	83	18	43	31
Operatives and other blue collar	231	53	23	21	20
Private household and other services	217	101	47	20	38
Farm workers	28	14	[2]	3	5
NEGRO AND OTHER RACES					
Total with work experience	490	234	48	100	100
Professional and managerial	39	5	[2]	8	2
Clerical and sales	89	33	37	18	14
Operatives and other blue collar	123	52	42	25	22
Private household and other services	222	130	59	45	56
Farm workers	17	14	[2]	3	6

[1] 16 to 44 years of age.
[2] Percent not shown where base is less than 75,000.

Table 6. Educational attainment of women heads[1] of poor families and usual weekly earnings of full-time women workers in May 1969

[Numbers in thousands]

Educational attainment by race	Heads of poor families[2]		Usual weekly earnings of full-time workers (median)
	Number	Percent	
Total	1,025	100	$87
White	556	54	88
8 years or less	140	14	70
9–11 years	188	18	76
12 years	163	16	88
13–15 years	53	5	100
16 years or more	12	1	138
Negro and other races	469	46	74
8 years or less	147	14	54
9–11 years	212	21	66
12 years	97	9	80
13 years or more	13	1	115

[1] 16 to 44 years of age.
[2] Poverty status as of 1967.

The earnings potential of women heading poor families is even more restricted because of limited formal education. Nearly 70 percent of the 1 million in the 16- to 44-year age bracket never completed high school; 300,000 never went beyond elementary school. More than half of the least educated are black. Negro women with less than a high school education were earning only $60 a week in the spring of 1969, even working at full-time jobs. Many were working in domestic and other service activities not covered by minimum wage legislation and where hourly pay scales are still comparatively low.

If all women heading poor families were to become employed at jobs with weekly earnings commensurate with their education levels, and assuming that they would be subject to prevailing practices of racial and sex discrimination in hiring and pay scales, they would earn an average of about $74 per week (as of the spring of 1969). Data from the Work Incentive Program show that the average WIN graduate in a followup sample was earning about $2 an hour or roughly $80 a week. A woman who earned that much, and who worked every week of the year, would make enough to support herself and her family above the poverty standard if she had no more than three children.

Women who can be trained to fill clerical, technical, and lower grade professional jobs, and who stay on those jobs on a regular year-round basis, could expect to earn between $5,000 and

$7,500 a year, on the average. On the other hand, average earnings are much lower in semiskilled manual occupation and in service (excluding domestic) occupations, where about two-fifths of the female heads age 16 to 44 who work at all are clustered. Year-round work in these occupations would yield annual earnings of about $4,500 and $3,500, respectively.

Programs to upgrade employability

Paid work would appear to be a logical solution to the income problems of many welfare mothers. However, the data point up several constraints operating against any employment strategy. If employment is to be effective in raising family standards, it must be full time and year round. Even for the mother of a small or average-sized family, the cost and difficulty of finding adequate child care, and the lack of sufficient education and job training, are formidable barriers to steady work at good wages.[2] For mothers of large families, these problems are compounded because their family responsibilities are greater, and their income needs are larger.

In an effort to overcome these barriers to employment, Federal programs such as the Work Incentive Program (WIN) and the proposed Family Assistance Act (FAP) have been developed in recent years.[3] Both of these programs have training, job placement, and child care provisions which are designed to enable employable adult members of poor families to find jobs and gain economic independence.

The benefit and tax rate schedules under FAP provide some idea of how much a mother would have to earn to get off welfare completely. If a four-person family received $3,920 or more in earned income, its Federal income supplement would be eliminated entirely. The earnings equivalent of that annual income would be roughly $2 an hour for 2,000 hours of work, or $80 a week for at least 50 weeks. The head of a six-person family would have to earn more than $2.50 an hour or over $100 a week all year long before the income supplement would phase out completely. In many northern States (Connecticut, Massachusetts, New Jersey, New York, Pennsylvania, Minnesota, in particular), where AFDC payments are relatively high, the woman's earnings would have to be considerably higher to equal welfare payments, since State welfare benefits would not be reduced under the proposal.

Of course, any increase in a woman's earning power would at least reduce her welfare subsidy. It would be important, therefore, to take account of trends in the average payment per family, in addition to the total number of beneficiaries, if an integrated income support and employability program were to go into effect.

The main issue in any employment strategy is whether the incentives can be made strong enough to induce welfare recipients to accept training and jobs. In the recent controversy over the Family Assistance Program, proponents of the bill pointed to the provisions for child care, training, job counseling, and job placement, and to the flexibility in program design to meet the individual needs of each beneficiary. They stressed that the poor in this country are imbued with a strong work ethic, needing only the opportunity to exercise it. They emphasized that the act was so designed that the tax and benefit provisions would always make it more profitable for a recipient to work than not to work. For the small minority who might otherwise reject the opportunity, the act includes a provision requiring adults to register with the U.S. Employment Service unless exempted because of illness, age, or in the case of female family heads, the presence of children under 6. Opponents of the act raised a number of questions about the appropriateness and effectiveness of the work requirement in the case of mothers. Skepticism was voiced about the availability of jobs; about the cost-effectiveness of child care and training; and, above all, as to whether the monetary incentives would be strong enough to offset the loss of welfare payments and in-kind benefits (food stamps, medicaid, etc.) associated with increased earnings.

Perhaps some answers will be forthcoming from experimentation with income maintenance programs which is now under way in several communities. In the meantime, the data available on the work experience, occupational and educational backgrounds, and, particularly, the earnings of women family heads do give some useful perspective on the feasibility of providing employment as a substitute for welfare. □

FOOTNOTES

The data in the tables and much of the data underlying the text for this article were obtained from the Current Population Survey (CPS) which is conducted by the Bureau of the Census, in part for the Bureau of Labor Statistics. The three principal sources of information were the supplementary inquiries on family income, on work experience, and on weekly earnings. Detailed tabulations on these subjects were made available by the Population Division, Bureau of the Census; the Office of Manpower and Employment Statistics, Bureau of Labor Statistics; and the Office of Research, Manpower Administration, Department of Labor. For a description of the Current Population Survey, see BLS Report 313, "Concepts and Methods used in Manpower Statistics from the Current Population Survey." An explanation of the income and poverty concepts and a discussion of the reliability of the data are contained in Current Population Reports Series P–60, published by the Bureau of the Census.

[1] For a discussion of the uses and limitations of poverty statistics, see Mollie Orshansky, "How Poverty is Measured," *Monthly Labor Review*, February 1969, pp. 37–41.

[2] See Genevieve W. Carter, "The Employment Potential of AFDC Mothers," *Welfare in Review*, July–August 1968, pp. 1–11.

[3] For a description of these programs, see the *Work Incentive Program*, First Annual Report of the U.S. Department of Labor on Training and Employment, 1970. Also see The Family Assistance Act of 1970, now pending in Congress.

Women find jobs in the fastest growing industries, but remain clustered in fewer occupation groups than men

ELIZABETH WALDMAN AND
BEVERLY J. McEADDY

Where women work—an analysis by industry and occupation

THE LAST THREE DECADES have been years of extraordinary economic and social change in the status of women—the tremendous response of married women to labor market demand; an increasingly service-oriented economy, accompanied by an increased need for white-collar workers; changing attitudes toward careers for women outside the home; the trend toward smaller families; the increase in the number of households headed by women; and landmark legislation prohibiting employment discrimination based on sex.

Despite these changes, today's figures on the employment of women in American industry bear a striking resemblance to those of yesterday. In 1970, just as in the three previous census years—1940, 1950, and 1960—the service industry ranked first in the employment of women. Over this 30-year span, about 60 percent of all employees in the service industry were women—some 60 percent of the workers in educational services; around 75 percent in the medical-health industry; and about 75 percent in personal services, including those in hotels and private homes. Within other major industrial categories, such as manufacturing and trade, certain subgroups remain as female-intensive today as they were yesterday. Examples are the manufacture of clothing and general merchandising, where at least 50 percent of all employees are women. (See table 1.)

The recordbreaking growth achieved by American industry since 1940 was made possible, in part, by the phenomenal increase in the number and proportion of women, especially married women, who were able and willing to join the work force. From 1940 to 1970, nonagricultural employment of all persons expanded from 32.1 million to 69.1 million, with women nearly half of the increase (18 million). In 1940, women were 31 percent of all workers in nonagricultural industries; by 1970, 40 percent, as their numbers almost tripled to 27½ million. In 1940, almost half the women in the labor force were single and only 30 percent were married; in 1970, about 20 percent were single and 60 percent were married. Over these three decades, the labor force participation rate of married women rose from 15 to 41 percent and the rate of mothers with children under age 6 from 9 to 30 percent.

The enormous expansion in the labor force participation of women has sometimes been referred to as the response of married women to the tidal wave of paperwork that occurred in the industrial world of the 1950's and 1960's. The population explosion of post-World War II contributed to the need for expanding all types of services—among them, medical, educational, personal, and recreational—thus generating more jobs of the types considered to be traditionally female. Many jobs in the service industry can be described as extensions of what women do as homemakers—teach children and young adults, nurse the sick, prepare food.

Another factor contributing to the concentration of women in the service industries is that part-time employment is more readily available there than in other major industry categories (with the exception of retail trade). In recent years, about one-fourth of all employed women held part-time jobs. Also, many service industries employ full-time workers but operate at other than the standard 9-to-5 schedule—for example, hospitals, schools, libraries, and hotels. Shift work or other atypical hours of employment may be more attractive to women who have children.

The following sections discuss in greater detail the trends in women's employment by industry and occupation, and are based on (a) establishment data from the monthly nationwide sample

Elizabeth Waldman is an economist and Beverly J. McEaddy a social science research analyst in the Division of Labor Force Studies, Bureau of Labor Statistics.

survey of nonagricultural payrolls; (b) the Current Population Survey (CPS), a monthly nationwide sample survey of households; and (c) the U.S. Decennial Census of Population. The establishment series provides a count of jobs; the CPS and Census provide a count of individuals. Despite these differences, data on the industrial employment of women from one series complements and confirms the trends indicated by the others.[1]

Establishment data

Payroll statistics from establishments in nonagricultural industries provide one of the most detailed, up-to-date appraisals of the employment of women in American industry. These data also permit more precise industry identification than that obtained through the household interviews of either the decennial censuses or the monthly

Table 1. Women employed as wage and salary workers in nonagricultural industries, 1940–70

[Numbers in thousands]

Industry	1940			1950			1960			1970		
	Total employed	Women		Total employed	Women		Total employed	Women		Total employed	Women	
		Number	Percent of total		Number	Percent of total		Number	Percent of total		Number	Percent of total
Total nonagricultural industries	32,058	9,794	31	43,478	14,113	32	54,579	19,449	36	69,115	27,496	40
Mining	869	12	1	880	22	2	626	30	5	616	50	8
Construction	1,603	33	2	2,752	86	3	3,062	130	4	3,976	244	6
Manufacturing	10,317	2,323	23	14,053	3,594	26	17,142	4,354	25	19,566	5,623	29
Durable goods	5,162	604	12	7,460	1,219	16	9,621	1,707	18	11,596	2,483	21
Nondurable	5,155	1,719	33	6,478	2,337	36	7,464	2,627	35	7,970	3,140	39
Knitting mills	217	130	60	189	119	63	195	132	68	962	445	46
Apparel, etc	768	522	68	1,036	754	73	1,131	858	76	1,201	939	78
Leather and leather products	363	139	38	371	167	45	345	173	50	282	160	57
Food and kindred products	1,054	197	19	1,328	311	23	1,757	417	24	1,364	356	26
Meat products	207	32	15	267	55	21	311	76	24	(1)	(1)	(1)
Canned and preserved food and seafood	89	32	36	140	57	41	202	85	42	(1)	(1)	(1)
Confectionary and related products	70	36	51	73	37	51	75	38	51	(1)	(1)	(1)
Chemicals and allied products	433	76	18	642	129	20	850	163	19	980	222	23
Transportation and public utilities	2,911	345	12	4,138	666	16	4,268	757	18	5,039	1,106	22
Telecommunications	392	210	54	637	389	61	818	426	52	1,071	522	49
Radio and TV	23	5	22	(1)	----------	------	87	22	25	131	33	25
Trucking and warehouse	330	17	5	545	42	8	776	61	8	992	106	11
Wholesale and retail trade	5,522	1,669	30	8,122	3,013	37	9,653	3,835	40	13,810	5,871	43
Wholesale	1,009	174	17	1,687	362	21	1,943	422	22	2,907	699	24
Retail	4,514	1,495	33	6,434	2,651	41	7,710	3,413	44	10,903	5,172	47
General merchandise	718	468	65	873	595	68	1,211	821	68	2,005	1,392	69
Eating and drinking	817	385	47	1,266	719	57	1,429	912	64	2,061	1,271	62
Apparel and accessory stores	356	181	51	408	266	65	442	317	72	667	437	66
Finance, insurance and real estate	1,294	435	34	1,670	739	44	2,417	1,181	49	3,610	1,870	52
Services	6,984	4,321	62	8,584	5,007	58	11,668	7,241	62	18,282	11,436	63
Personal, including private household and hotels	3,268	2,449	75	2,930	2,097	72	3,247	2,464	76	3,010	2,256	75
Private households	2,196	1,931	88	1,598	1,405	88	1,880	1,701	90	(1)	(1,124)	(1)
Business and repair	583	64	11	999	155	16	1,181	287	24	2,006	624	31
Professional service	2,796	1,736	62	4,166	2,623	63	6,803	4,352	64	12,707	8,352	66
Medical and health	745	543	73	1,365	1,006	74	2,223	1,710	77	3,907	3,096	79
Medical and health, except hospitals	(1)	(1)	------	393	302	77	544	448	82	1,249	1,039	83
Hospitals	(1)	(1)	------	972	704	72	1,679	1,262	75	2,658	2,057	77
Education	1,514	976	64	2,019	1,283	64	3,292	2,062	63	6,080	3,788	62
Private	(1)	(1)	------	470	281	60	762	464	61	1,550	957	62
Government	(1)	(1)	------	1,549	1,002	65	2,530	1,598	63	4,530	2,831	62
Legal [2]	156	85	54	120	81	68	144	109	76	386	178	46
Other services, including recreation and amusement	338	72	21	489	131	27	437	138	32	559	204	36
Public administration [3]	1,758	350	20	2,471	648	26	3,194	909	28	4,216	1,297	31
Postal service	309	36	12	451	52	12	551	65	12	719	144	20
Federal public administration	299	104	35	1,003	339	34	1,266	444	35	1,528	546	36
State and local	848	203	24	1,017	258	25	1,377	400	29	1,824	557	31
State	(1)	----------	------	264	100	38	396	152	38	538	202	38
Local	(1)	----------	------	753	158	21	981	248	25	1,286	355	28
Industry not elsewhere reported	800	305	38	809	338	42	2,548	1,013	40	----------	----------	------

[1] Data not available.

[2] 1940 figures include engineers and miscellaneous professionals.

[3] 1940 figures are for government instead of public administration.

NOTE: Because some industries are not included in this table, subgroups do not always add to total for major industrial division.

SOURCE: Census of Population, Industrial Characteristics, 1940 (Vol. III), 1950 (P-E No. 1D), 1960 (PC(2) 7F), 1970 (PC(2) 7C); (Bureau of the Census).

Current Population Surveys. Payroll data were first collected in 1919, but until 1964 information on women was available on a regular basis for only a few selected industries. Today, detailed tables on the employment of women in more than 400 industrial categories are published quarterly by the Bureau of Labor Statistics.[2]

The following discussion uses establishment data to review recent changes for women in major industry divisions, with an eye on prospective trends, and describes changes in the occupational mix within industries.

From January 1964 to January 1973, the number of women on payrolls in nonagricultural industries expanded from 19.1 to 27.9 million. (See table 2.) Married or formerly married women, many responsible for school-age or younger children, accounted for the largest share of the increase in payroll employment of women. Most of the 8.8 million labor force entrants or reentrants found jobs in the four major industry divisions that were the fastest growing:

	Millions of workers
Services	2.5
Government	2.4
Wholesale and retail trade	1.9
Manufacturing	1.1

In the late 1960's, the *service industry* maintained its position as a principal employer of women, and by 1973 had more female workers (6.8 million) than any other industry. Of the several industries within the service sector that recorded a robust expansion, the most spectacular was health care services. The forces that contributed to this industry's growth—gains in the size of the population, a rising affluence that enabled more persons to afford health care and to demand improved services, and increases in the roles of special programs covering medical and health services, such as medicare and medicaid—are expected to continue and to bring similar rapid employment increases in the near future. It seems likely that this industry, in which 8 out of 10 employees are women, can continue to be a source of jobs for women.

In January 1973, the *trade industry* was the second largest employer of women (6.3 million), most of whom held jobs in retail stores. Women were only one-fourth (900,000) of the employees in wholesale trade, but nearly half (5.4 million) in retail trade. Within retail trade, women made up two-thirds of the employees in department stores, clothing and accessory shops, and drugstores, and over half in restaurants and other eating and drinking establishments. New job openings in trade during the rest of the 1970–80 decade are expected to be little more than half what they were in the 1960's, because of the greater use of such laborsavers as computers, automated equipment, self-service stores, and vending machines.[3]

Manufacturing still employs the largest share of the male work force, but since the mid-1960's has dropped to fourth place for women. In part, this reflects the fact that in some nondurable goods industries employing relatively larger proportions of women—textile mill products, apparel and related items, and food and kindred items—increased automation and other improved plant processes have boosted output without any great increase in employment. During the 1970's, the need for additional workers in manufacturing is expected to be largest in such durable goods industries as machinery, rubber and plastic products, and instruments, all currently male-dominated.

In the same way that the phenomenal growth of the service industry in the private sector made jobs available for women, services provided by *government agencies* were responsible for the soaring employment of women on government payrolls, especially at the local and State levels. Nearly half (1.1 million) of the entire 1964–73 increase in women's jobs in government occurred at the local level in one industry—education. Two-thirds of all employees in schools and related educational activities supported by city, county, and other local tax jurisdictions were women. In January 1973, the local and State education industry accounted for nearly 60 percent of the 6.1 million women on government payrolls. Demand for workers in the education field is expected to taper off considerably as a result of the decline in birth rates that began in the late 1950's. In contrast, government health and welfare services, industries in which women are also prominent, are expected to increase at a rapid pace through the remainder of the 1970's.

The industry division encompassing *finance, insurance, and real estate* became predominantly female during the 1960's, and by January 1973 women were 52 percent of the employees (the 1940 and 1950 censuses reported much smaller proportions, 34 and 44 percent, respectively). The

Table 2. Women employees on nonagricultural payrolls, by selected industries, January 1964 and January 1973

[Numbers in thousands]

Industry group	1964		1973	
	Number of women	Percent of total employed	Number of women	Percent of total employed
Total nonagricultural industries	19,096	34	27,920	38
Private	15,421	33	21,854	37
Mining	34	6	37	6
Construction	143	6	193	6
Manufacturing	4,385	26	5,464	28
Durable goods	1,717	18	2,357	21
Fabricated metal products	192	17	264	19
Machinery, except electrical	201	13	297	15
Electrical equipment and supplies	571	37	781	41
Transportation equipment	168	10	199	11
Instruments and related products	123	34	183	38
Miscellaneous manufacturing	145	40	179	43
Nondurable goods	2,668	37	3,107	39
Food and kindred products	387	23	420	25
Meat products	79	25	94	28
Poultry dressing plants	35	53	52	55
Canned, cured, and frozen foods	85	42	89	39
Canned, cured, and frozen seafoods	20	58	21	56
Confectionary and related products	39	51	41	51
Tobacco manufacturers	40	46	30	42
Textile mill products	373	43	467	46
Knitting mills	134	67	174	65
Apparel and other textile products	994	79	1,062	81
Printing and publishing	270	29	366	34
Periodicals	33	48	34	50
Blankbooks and bookbinding	21	45	29	51
Chemicals and allied products	160	19	208	21
Leather and leather products	179	53	175	60
Transportation and public utilities	706	18	949	21
Communications	410	50	542	47
Telephone communication	380	56	493	51
Radio and television broadcasting	22	22	34	25
Wholesale and retail trade	4,404	37	6,338	40
Wholesale trade	686	22	912	23
Retail trade	3,718	43	5,426	46
Retail general merchandise	1,163	70	1,708	68
Food stores	451	32	694	37
Apparel and accessory stores	387	65	505	66
Eating and drinking places	969	56	1,431	55
Miscellaneous retail stores	427	42	620	46
Drug stores and proprietary stores	222	58	295	62
Finance, insurance, and real estate	1,445	50	2,070	52
Banking	454	60	721	64
Credit agencies other than banks	167	54	234	57
Security, commodity brokers, and services	38	31	68	35
Insurance carriers	435	49	578	52
Insurance agents, brokers, and service	124	56	172	59
Real estate	190	36	250	34
Services	4,304	51	6,803	55
Hotels, tourist courts, and motels	245	48	346	52
Personal services	553	60	555	62
Miscellaneous business services	333	34	600	35
Advertising	40	37	50	43
Credit reporting and collection	43	70	57	71
Services to buildings	42	27	119	35
Medical and other health services	1,474	78	2,850	80
Hospitals	1,029	82	1,641	80
Legal services	105	62	171	63
Educational services	398	44	593	49
Elementary and secondary schools	175	58	255	61
Colleges and universities	197	37	272	42
Government	3,675	39	6,066	45
Federal	520	22	767	29
State	692	38	1,248	43
State education	245	40	535	43
Other State government	448	37	713	43
Local	2,463	46	4,050	50
Local education	1,831	63	2,956	63
Other local government	633	26	1,095	32

NOTE: Because some industries are not included in this table, subgroups do not always add to total for major industrial division.

SOURCE: Bureau of Labor Statistics.

1964–73 expansion in this industry's jobs for women occurred primarily in banking and insurance. These industries and credit agencies are expected to continue to expand through the remainder of this decade, providing new opportunities for women.

Occupation by industry

Women, like men, find jobs in the fastest growing industries. However, no matter what industry women are in, they remain clustered in fewer occupation groups than men. (See table 3.)

Service. As pointed out earlier, the service industry employs the largest number of working women and ranks third in the employment of men. In 1970 as in 1940, most women in this industry were employed in the same three occupation groups: professional-technical, services, and clerical-sales (chart 1). Yet there was a striking redistribution which stemmed from the extraordinary demands for clerical support made by the education and health service industries.

In the 30-year span, the proportion of women in the service industry who perform service jobs increased from 20 to 28 percent. Examples of occupations still dominated by women are food services, practical nurses, and dental assistants.

In professional-technical occupations, 2 million women are teachers in elementary and high school. Women also predominate in registered nursing, social work, libraries, dietetics, physical therapy, and dental hygiene.

The 1940–70 redistribution shifted men into the more prestigious, better paying professional-technical group. In the education industry, about 70 percent of the teachers in colleges and universities are men; about 70 percent of the teachers in elementary and high schools are women. Doctors, lawyers, engineers, and many other professional-

Table 3. Occupation group of employed wage and salary workers in nonagricultural industries, by sex, 1970

Industry and sex	Total [1]		Percentage in each occupation group								
	Number (in thousands)	Percent	Professional, technical and kindred workers	Managers and administrators	Sales workers	Clerical and kindred workers	Craft and kindred workers	Operatives, except transport	Transport equipment operatives	Laborers, except farm	Service workers, except private household [1]
Total: Women	26,373	100.0	16.6	3.2	7.4	37.5	1.8	15.0	0.5	0.9	17.1
Men	41,619	100.0	14.6	10.5	6.9	8.6	22.2	15.2	6.4	7.0	8.8
Mining and construction: Women	294	100.0	5.1	3.4	1.0	72.1	8.5	3.7	.7	2.7	2.4
Men	4,297	100.0	5.9	7.2	.7	2.8	53.2	9.8	5.0	14.4	1.1
Manufacturing: Durable goods: Women	2,483	100.0	3.8	1.1	.5	33.7	4.8	52.6	.2	1.9	1.3
Men	9,113	100.0	14.0	5.8	1.9	6.4	26.7	34.0	3.3	5.5	2.4
Nondurable goods: Women	3,140	100.0	3.9	1.0	1.3	22.5	4.4	63.9	.2	1.7	1.0
Men	4,831	100.0	10.0	7.8	5.9	6.8	23.8	30.8	5.9	5.7	3.3
Transportation and public utilities: Women	1,106	100.0	4.2	3.2	1.3	74.6	2.0	1.1	7.7	.8	5.2
Men	3,934	100.0	8.8	8.1	1.3	11.0	28.6	3.9	25.3	10.2	2.8
Wholesale trade: Women	699	100.0	2.7	4.1	5.3	67.0	2.3	13.7	.7	2.6	1.6
Men	2,208	100.0	5.0	16.9	24.6	10.0	12.5	7.3	14.2	7.9	1.5
Retail trade: Women	5,171	100.0	1.3	4.8	31.8	29.2	1.6	3.6	.2	1.3	26.2
Men	5,732	100.0	2.8	17.0	19.3	6.8	14.4	11.3	5.5	9.3	13.5
Finance, insurance, and real estate: Women	1,870	100.0	2.9	6.2	7.3	79.7	.3	.3	----------	.2	3.2
Men	1,740	100.0	7.9	26.1	32.4	19.6	3.4	.5	.5	2.3	7.5
Services: Women	10,312	100.0	36.9	2.5	.7	28.0	.6	3.1	.1	.4	27.7
Men	6,845	100.0	40.4	9.6	1.4	6.0	11.8	3.9	2.3	3.8	20.8
Medical and other health services: Women	3,096	100.0	33.1	1.5	.2	20.4	.4	1.6	(2)	.3	42.6
Men	811	100.0	34.5	7.2	.2	5.4	10.0	3.0	1.4	1.8	36.4
Educational services: Women	3,788	100.0	59.0	2.6	.2	22.7	.4	.4	.2	.1	14.5
Men	2,292	100.0	60.0	9.2	.3	5.2	4.4	1.0	.7	1.8	17.5
Public administration: Women	1,297	100.0	11.3	6.3	.3	72.6	.8	.8	.1	.6	7.2
Men	2,919	100.0	18.9	12.5	.2	25.3	9.7	2.0	2.0	4.0	25.5

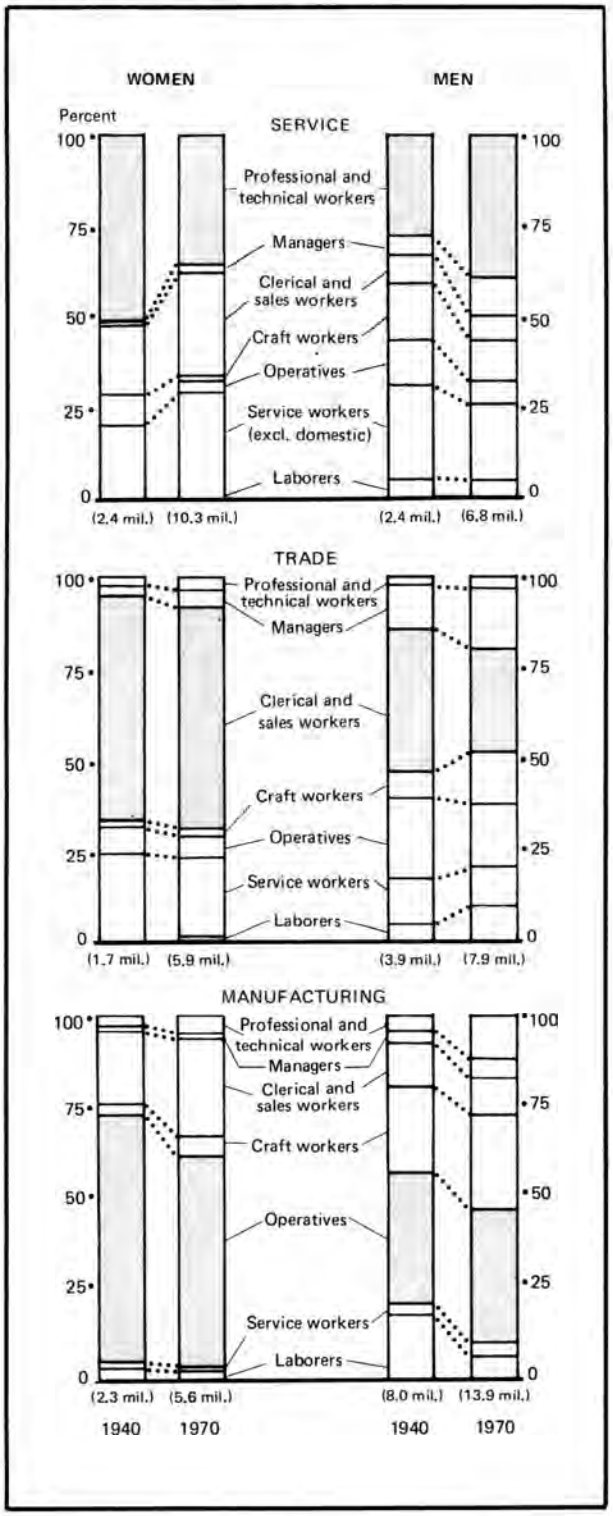
[1] Excludes all women, but includes a few men, who were private household workers.
[2] Less than 0.05 percent.

SOURCE: Census of Population, 1970: Occupation by Industry, Report (PC(2) 7C), (Bureau of the Census).

NOTE: Because of rounding, sums of individual items may not equal totals.

technical occupations have remained substantially male-intensive.

Chart 1. Occupational distribution of wage and salary workers, selected industries, 1940 and 1970



Trade. Since 1940, very little occupational change has taken place for women in trade. Nearly 9 out of 10 women in this industry were in retail trade, where sales, clerical, and service jobs predominated, in that order.

In general merchandising, women held the greatest proportion of sales jobs, as well as such clerical positions as bookkeepers, cashiers, office machine operators, secretaries, and typists. A few more were in managerial and administrative jobs as buyers and sales managers, and a relatively small number were in the operative group as dressmakers and seamstresses. Women working in eating and drinking establishments were mostly waitresses, cooks, and clerical workers.

A smaller proportion of men (7 out of 10) were in retail trade. Changes from 1940 to 1970 in their occupational pattern reflect mainly the relative increase in the need for managers and skilled craft workers (carpenters, electricians, mechanics, and repairers) and a decrease in the need for clerical and sales workers.

Manufacturing. In both 1940 and 1970, approximately 9 out of 10 women working in the manufacturing industry held semiskilled operative or white-collar clerical jobs. Nearly three-fifths were engaged in the production of nondurable goods. In this sector, most women work in the production end as operatives (for example, assemblers), as checkers, examiners, and inspectors, and as sewers and stitchers. About 11 percent of all professionals in nondurable goods were women.

Government. About 22 percent of women on nonfarm payrolls are government employees, mostly (86 percent) in State and local governments working as teachers, administrators, clerical workers, maintenance workers, librarians, nurses, and counselors.

According to a survey by the U.S. Civil Service Commission[4] of women employed by the Federal Government in 1970, most worked in nonprofessional administrative, clerical, and office service jobs. Roughly 77 out of 100 (compared with 44 of 100 men) were in grades GS–1 through –6 in 1970. Another 20 out of 100 women employees (compared with 32 of 100 men) were in grades GS–7 through –11, and only 3 out of 100 women (but 23 out of 100 men) were in the highest paying grades, GS–12 and above.

Women's share of full-time white-collar Federal employment by individual grade reveals even

more dramatically their concentration in the nonprofessional grade series. (See table 4.) Grades in which women predominated, GS–1 to –4, are entry-level clerical and support positions in the nonprofessional job series. GS–5 is the entry grade for professional employment. Positions in GS–5, –7, –9, and –11 are primarily professional, technical, or administrative jobs, requiring a baccalaureate or higher degree or equivalent professional, technical, or administrative experience.

Other industries. Most of the occupations women hold in the finance, insurance, and real estate industry are clerical—about 80 percent. Approximately 9 out of 10 bank clerks and tellers are women, but very few bank officers are. In the transportation and public utilities industry, about 20 percent of the employees are women; over half of these women work in communications, where 9 out of 10 are telephone operators. Of women employed in the construction and mining industries, most are in clerical occupations.

Occupational shifts

Overall, the 1940–70 changes in the occupational pattern of women, as well as of men, mirror the shift from the predominantly goods-producing economy prior to World War II to the service-producing economy of the 1970's. For women, the occupational pattern changed from half blue, half white collar to one that is decidedly white collar. Today, over 60 percent of women and 40 percent of men employed in nonagricultural industries are in white-collar work. (See chart 2.)

In 1940, women working in nonagricultural industries were concentrated in three broad occupational groups. Roughly half held service and blue-collar operative jobs (30 and 21 percent), and a third were in the white-collar clerical-sales group. For those in services, prominent occupations were waitress, hairdresser, cook, and practical nurse. Operatives were mostly engaged in the manufacture of clothing (sewing machine operators). The clerical-sales group were mainly stenographers, typists, secretaries, bookkeepers, cashiers, and retail saleswomen. Of the 14 percent in white-collar professional-technical jobs, 2 out of 4 were teachers and 1 out of 4 were nurses.

Thirty years later, working women were still highly concentrated in the same three broad occupational groups, but a much larger share were in the clerical-sales field, the professional-technical proportion had edged up, and the service and operative proportions had declined.

Do the changes represent an improvement in the lot of employed women? The shift out of service jobs as domestics and into white-collar jobs is a profound improvement, especially among Negro women. And women now are a larger share of employees in a few of the more prestigious, better paying occupations. In 1940 women were only 1 out of 20 physicians, compared with 1 of 8 today (1973 average). From 1940 to 1973, the proportion of real estate agents and brokers who were women grew from 9 to 36 percent.

In the area of job discrimination by sex, there are a few "breakthroughs" into typically masculine jobs. For example, today 30 percent of all bartenders are women, compared with 2½ percent in 1940, and about 37 percent of the busdrivers are women, a rarity in 1940 when they were less than 1 percent. However, many of today's female busdrivers may operate school buses part time, part of the year, and for low pay. Thus, what appears to some persons to be an occupational improvement—the movement of women out of their homes with its unpaid housework and into the paid labor force—to others represents no gain.

Self-employed women

Women have made considerable inroads into the traditionally male-intensive province of self-

Table 4. Women as full-time white-collar employees in Federal Government agencies,[1] October 31, 1970

General schedule (GS) grade	Salary [2]	Number of employed women	Women as percent of total employed
1	$4,125	2,913	68
2	4,621	18,576	76
3	5,212	86,274	78
4	5,853	139,664	63
5	6,548	191,678	32
6	7,294	65,089	48
7	8,098	54,037	38
8	8,956	12,431	26
9	9,881	43,441	24
10	10,869	3,890	12
11	11,905	19,325	12
12	14,192	9,870	7
13	16,760	4,622	5
14	19,643	1,817	4
15	22,885	942	3
16 and higher	26,547+	158	2

[1] Excludes employees of Central Intelligence Agency, National Security Agency, Board of Governors of Federal Reserve System, and foreign nationals overseas.

[2] The rate for basic pay for employees is step 1 of the grade.

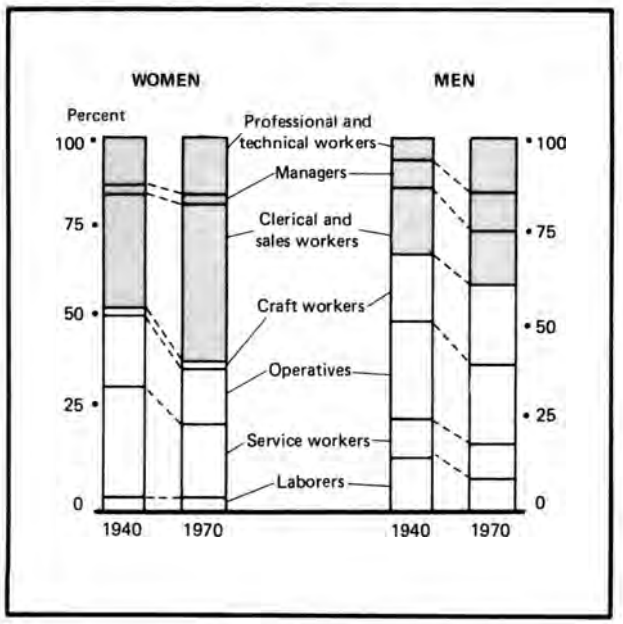
SOURCE: "Study of Employment of Women in the Federal Government, 1970," (Washington, U.S. Civil Service Commission, Bureau of Manpower Information Systems, 1971), pp. 17, 235.

employment, where their share rose from 17 percent in 1940 to 26 percent in 1973. A total of 1.4 million women were self-employed in nonagricultural industries in 1973, nearly 600,000 more than in 1940. Over this period, the number of self-employed men rose only slightly to 4 million—a minor increase, especially when compared with the doubled employment of men in nonfarm wage and salary work. The shift from small owner-operated businesses to corporate ownership contributed to the lack of increase for men. Increased demands in the more female-intensive service and trade industries drew more women into entrepreneurship.

Nearly all of the self-employed women in nonagricultural industries in 1973 were in service and retail trade. In the service industry, over 6 out of 10 were in personal services (operating beauty shops, laundries, dressmaking shops, and child care facilities) and 3 out of 10 in professional services (medical enterprises, such as nursing homes, and educational services).

The occupational distribution of self-employed women differs from that of women in wage and salary jobs. Proportionately more of the self-employed were managers or proprietors (24 versus 4 percent) and fewer were in clerical-sales (18 versus 43 percent), where self-employed women are found in such fields as court stenography or real estate sales. Self-employed women are generally older than wage and salary women, in part a reflection of the greater experience and maturity necessary to run their own businesses or careers. Median ages in 1973 were about 46 and 36 years.

Chart 2. Occupational distribution of wage and salary workers, nonagricultural industries, 1940 and 1970



Earnings

Further evidence that women have not yet penetrated the high-skill, high-paying jobs is found in the payroll data on weekly and hourly earnings in nonagricultural industries. In January 1973, most industries paying average weekly earnings of less than $100 were female-intensive. Several were paying under $90 a week, while the weekly paycheck for all industries averaged $138.[5] Figures on hourly earnings, which exclude the effect of part-time and overtime work, support conclusions based on weekly earnings. (See table 5.)

In 1972, women were 28 percent (or 5½ million) of the total workers in the manufacturing industry, yet most of these women were concentrated in the lower paid and less-skilled jobs. The average salary for all manufacturing workers was $159 a week in January 1973. For those in manufacturing industries that were female-intensive, the average was much lower—for example, the apparel industry, in which 81 percent of employees were women, paid average weekly salaries of only $93.

The service industry—the most female-intensive of the major industry groups, with 55 percent of its workers women—employed 6.8 million women in January 1973; earnings averaged $111 a week. About 1.6 million women worked in hospitals, where weekly earnings averaged $108. Another 600,000 women worked in hotels and laundries-drycleaners, where average weekly wages were $76 and $87, respectively.

Another low-paying female-intensive industry is retail general merchandise, with an average weekly wage of $82. Although part-time work undoubtedly accounts for some of the low earnings, most jobs in department stores and restaurants are known to be low paying.

Male-intensive industries are on the higher rungs of the wage ladder: *Construction*—6 percent female, paying $223 average a week; *transportation and public utilities*—21 percent female, paying an average of $196 a week (switchboard operators averaged $126, line construction employees $228); *manufacturing*—here the list is extremely long. In transportation equipment, 10

percent female, average earnings were $210 a week; in food products, the malt liquor industry employed 7 percent women and the average worker earned $229 a week. Among retail trade industries, the most female intensive were the lowest paying. Yet employees on the payrolls of motor vehicle dealers, only 11 percent of whom were women, were among the highest paid workers in retail trade—$152 a week.

Male-female earnings differentials have always existed, but in recent years with the increase in women's labor force activity these differentials have become the focus of great concern. One form of discrimination was the barring of women from the type of jobs men held, such as skilled workers and executives. A typical example was cited in a standard college-level economics text:

> . . . in a large electrical-goods plant, job evaluation experts divide all factory work into two parts: women's jobs and men's jobs. The lowest pay of the men begins about where the women's highest pay leaves off; yet both management and the union will admit, off the record, that in many borderline jobs the productivity of the women is greater than that of the men.[6]

Many researchers believe the earnings differential results partially from the role that society has traditionally arrogated to women. In a study on wage differentials by sex, using 1959 and 1960 Census of Population and Housing data, Victor Fuchs suggested that the percentage point difference in male-female wages "can be explained by the different roles assigned to men and women. Role differentiation, which begins in the cradle, affects the choice of occupation, labor force attachment, location of work, postschool investment, hours of work, and other variables that influence earnings." [7] He believes a reduction in this role discrimination would eventually result in a narrowing of the male-female differential in earnings. Professor Fuchs also stated that consumer discrimination (such as the preference of customers in expensive restaurants for waiters rather than waitresses) may be more significant than employer discrimination.

Area wage surveys covering six industry divisions recently published by the Bureau of Labor Statistics indicate that on a nationwide basis, pay levels were consistently higher for men than for women working in the same occupation.[8] In a study of pay differences between men and women in the same job, John Buckley—while neither denying nor confirming that wage discrimination by sex existed—acknowledged that "experience in implementing the Equal Pay Act indicates that some discriminatory practices do exist." [9]

Differences in female-male earnings in the Federal Government occur in part because women remain clustered in the lowest paid grades.

Table 5. Gross hours and earnings of production or nonsupervisory workers [1] on private nonagricultural payrolls, selected industries, January 1973

Industry	Average earnings		Average hours	
	Weekly	Hourly	Weekly	Overtime
Total private	$138	$3.77	36.6	—
Mining	190	4.60	41.3	—
Contract construction	223	6.42	34.8	—
Manufacturing	159	3.98	40.0	3.6
Durable goods	173	4.23	41.0	3.9
Fabricated metal products	169	4.13	41.0	3.9
Machinery, except electrical	188	4.44	42.4	4.5
Electrical equipment and supplies	153	3.80	40.3	3.0
Transportation equipment	210	5.00	41.9	4.8
Miscellaneous manufacturing	124	3.24	38.4	2.4
Nondurable goods	140	3.61	38.7	3.2
Food and kindred products	149	3.75	39.8	3.8
Canned, cured, and frozen foods	119	3.15	37.8	3.0
Confectionery and related products	125	3.29	37.9	2.2
Textile mill products	112	2.87	39.1	3.9
Knitting mills	99	2.76	35.7	2.4
Apparel and other textile products	93	2.72	34.1	1.2
Chemical and allied products	181	4.36	41.5	3.5
Leather and leather products	103	2.77	37.2	1.9
Transportation and public utilities	196	4.87	40.2	—
Telephone communication	175	4.47	39.1	—
Switchboard operating employees [2]	126	3.65	34.4	—
Line construction employees [3]	228	5.23	43.6	—
Wholesale and retail trade	107	3.11	34.5	—
Wholesale trade	158	3.99	39.5	—
Retail trade	91	2.78	32.9	—
Retail general merchandise	82	2.61	31.3	—
Food stores	102	3.20	32.0	—
Apparel and accessory stores	78	2.54	30.6	—
Eating and drinking places [4]	62	2.08	29.7	—
Motor vehicle dealers	152	3.77	40.2	—
Drug stores and proprietary stores	82	2.67	30.7	—
Finance, insurance, and real estate	131	3.54	37.0	—
Banking	114	3.07	37.0	—
Services	111	3.27	33.9	—
Hotels, tourist courts, and motels [4]	76	2.35	32.3	—
Laundries and drycleaning plants	87	2.50	34.7	—
Hospitals	108	3.15	34.3	—

[1] Data relate to production workers in mining and manufacturing; to construction workers in contract construction; and to nonsupervisory workers in wholesale and retail trade; finance, insurance, and real estate; transportation and public utilities; and services.

[2] Data relate to employees in such occupations in the telephone industry as switchboard operators; service assistants; operating room instructors; and pay station attendants. In 1971, such employees made up 29 percent of the total number of nonsupervisory employees in establishments reporting hours and earnings data.

[3] Data relate to employees in such occupations in the telephone industry as central office craft workers; installation and exchange repair craft workers; line, cable, and conduit craft workers; and laborers.

[4] Money payments only; tips not included.

SOURCE: Bureau of Labor Statistics.

It is not within the scope of this article to explore in depth the various reasons for male-female differentials in pay, but research has continued in this area.[10] Data presented here takes the differential into account as an important factor in women's industrial characteristics.

Education

For today's working woman to achieve professional status in the higher paying, traditionally male-intensive occupations in many industries, she must acquire more years of formal higher education. To illustrate, doctors, dentists, airline pilots, metallurgists, architects, and certified public accountants must have more years of schooling than are needed for most occupations. For men, the returns on the investment in education are usually high in terms of money and prestige. Women, even with the required years of schooling, often do not obtain returns equal to men's.

The 1972 amendments to the Equal Pay Act and the Civil Rights Act have outlawed many barriers to employment, among them job quotas by sex and unequal male-female wage scales for the same job. While educational attainment alone is not a cure-all for working women (legislation helps), the statistics on women's education and labor force participation indicate that more years of formal schooling would assist in equalizing women's position with that of men.

Table 6. Women and men employed in nonagricultural industries, by educational attainment, March 1973

[Percent distribution]

Sex and Industry	Total	Years of school completed					
		Less than 8	8	9 to 11	12	13 to 15	16 or more
WOMEN							
Total: Number (thousands)	29,968	1,153	1,547	4,987	13,995	4,376	3,910
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mining and construction	1.2	0.4	0.8	0.5	1.4	2.0	0.6
Manufacturing	19.4	41.1	35.0	28.3	19.9	9.7	4.1
Transportation and public utilities	3.7	1.0	1.0	2.3	4.9	4.2	2.1
Trade	22.9	21.9	27.1	33.7	24.6	19.1	6.0
Finance, insurance, and real estate	7.5	2.2	2.3	3.3	10.3	10.3	3.5
Service, except private household	40.9	31.5	32.2	29.5	33.2	48.8	80.2
Public administration	4.4	2.0	1.6	2.3	5.6	5.8	3.5
MEN							
Total: Number (thousands)	48,152	3,344	3,399	8,575	17,585	7,223	8,026
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mining and construction	11.2	17.4	18.3	13.9	11.9	7.9	4.0
Manufacturing	30.3	37.2	36.1	32.5	33.6	25.5	19.4
Transportation and public utilities	9.0	10.3	9.5	8.8	10.7	9.7	3.9
Trade	20.7	15.5	18.4	25.6	21.7	24.7	12.8
Finance, insurance, and real estate	4.4	2.5	2.0	1.8	3.5	7.1	8.7
Service	18.2	14.0	13.0	13.3	11.2	16.8	43.6
Public administration	6.3	3.1	2.8	4.1	7.4	8.3	7.6

SOURCE: Bureau of Labor Statistics.

Annual surveys on educational attainment show that, for both men and women, participation in the labor force is lowest and unemployment rates highest for those who complete the fewest years of school. The March 1973 survey shows:

Years of school completed	*Unemployment rate*	*Labor force rate*
11 years or less	32	8.6
12 years	51	5.3
4 years of college or more	61	2.7

Women who have graduated from college earn over twice as much annually as women at the lowest end of the education scale. For women employed year round in full-time jobs, median earnings in 1972 were $8,925 for the college graduates, $5,770 for high school graduates, and $4,305 for those who did not complete elementary school. A similar education-earnings relationship was evident for employed men, but their year-round, full-time earnings were substantially above women's—$14,660, $10,075, and $7,575, respectively, for the corresponding groups.

Earnings in the different educational categories are also a reflection of the differences in the industrial distributions of employment. Of the women in nonagricultural jobs who were college graduates, 8 out of 10 were in service industries, mostly professional services, in March 1973.[11] (See table 6.) Women who were high school graduates, but had no college education, were more widely distributed: (1) one-third in the service industry, largely professional services; (2) one-fourth in trade, largely retail stores; and (3) one-fifth in manufacturing. Among working women at the bottom of the educational scale, mostly older women who had either not completed or never attended elementary school, two-fifths were in manufacturing, largely semiskilled employees.

Toward tomorrow

Today's working women are in the throes of obtaining equal consideration with men in the job market through the legislation that prohibits dis-

crimination in employment. Tomorrow's working women will be affected not only by the measure of success achieved today, but also by economic conditions, changes in lifestyle (for example, smaller families), the mode of enforcement of legislation prohibiting discrimination, provision of child care services for mothers on industry payrolls, and the extent of formal education or technical training of women for traditionally male occupations. □

——FOOTNOTES——

[1] *Establishment data* are based on payroll records compiled monthly from mail questionnaires by the Bureau of Labor Statistics in cooperation with State agencies. The payroll surveys provide detailed industry information on wage and salary employees in nonagricultural establishments. The *Current Population Survey* (CPS) is conducted each month for the Bureau of Labor Statistics by the Bureau of the Census. It is based on household interviews obtained from a sample of the population 16 years old and over

The CPS definition of nonagricultural employment comprises persons in nonagricultural industries who were wage and salary workers (including domestics and other private household workers), self-employed, or unpaid and working 15 hours or more during the survey week in family-operated enterprises. The payroll survey covers only wage and salary employees on the payrolls of nonagricultural establishments.

In the household approach, employed persons holding more than one job are counted only once and are classified according to the job at which they worked the greatest number of hours during the survey week. In the payroll series, persons who worked in more than one establishment during the reporting period are counted each time their names appear on payrolls. For example, workers may be counted more than once if they hold two jobs concurrently or leave one job for another during the same reference period and thus appear on the payrolls of both employers.

The household survey includes among the employed all persons who had jobs but were not at work during the survey week—that is, were not working but had jobs from which they were temporarily absent because of illness, bad weather, vacation, labor-management dispute, or because they were taking time off for various other reasons, even if they were not paid by their employers for the time off. In the payroll series, persons on leave paid for by the company are included, but not those on leave without pay for the entire payroll period.

For a detailed description of these series and differences between them, the following publications are available from the Bureau of Labor Statistics: *Concepts and Methods Used in Manpower Statistics from the Current Population Survey*, Report 313 (Bureau of Labor Statistics, 1967); *Handbook of Methods for Surveys and Studies*, Bulletin 1711 (Bureau of Labor Statistics, 1971), ch. 2; and Gloria P. Green, "Comparing employment estimates from household and payroll surveys," *Monthly Labor Review*, December 1969, pp. 9–20, reprinted as BLS Reprint 2651.

The *Decennial Census of Population* is conducted by the Bureau of the Census to obtain a house-to-house enumeration of each person by questionnaire. For an employed person, 1970 census information pertains to one specific job held during the reference week. If employed at two jobs or more, the job at which the person worked the greatest number of hours during the reference week was to be represented. Census reports on specific subjects, such as occupation by industry, are frequently based on representative samples of the total population. The intercensal statistics provided by the *Current Population Survey* are generally designed to be comparable to decennial census statistics. For a detailed description of the 1970 decennial census and comparability with earlier censuses and other data, see *Census of Population: 1970, General, Social and Economic Characteristics, Final Report PC(1)–C1, U.S. Summary* (Bureau of the Census).

[2] Detailed establishment data on women employees were first published in the May 1963 *Employment and Earnings*. Since 1967, the data have been published in *Employment and Earnings* once each quarter (February, May, August, and November) as table B–3, "Women Employees on Nonagricultural Payrolls, by Industry." In addition, annual and monthly data appear in *Employment and Earnings, United States, 1909–72*, Bulletin 1312–9 (Bureau of Labor Statistics, 1973), and the *Handbook of Labor Statistics, 1973*, Bulletin 1790 (Bureau of Labor Statistics, 1974).

[3] See *Occupational Outlook Handbook, 1972–73 Edition*, Bulletin 1700 (Bureau of Labor Statistics, 1973).

[4] See *Study of Employment of Women in the Federal Government, 1970*, Pamphlet SM 62–06 (Washington, U.S. Civil Service Commission, Bureau of Manpower Information Systems, 1971), table B.

[5] See *Employment and Earnings*, May 1973, table B–3, "Women Employees on Nonagricultural Payrolls, by Industry," and *Employment and Earnings*, April 1973, table C–2, "Gross Hours and Earnings of Production or Nonsupervisory Workers on Private Nonagricultural Payrolls, by Industry."

[6] Paul R. Samuelson, *Economics* (New York, McGraw-Hill Book Co., 1967), p. 120.

[7] Victor R. Fuchs, "Differences in hourly earnings between men and women," *Monthly Labor Review*, May 1971, pp. 9–15. See also pp. 23–26, this issue.

[8] *Area Wage Surveys: Metropolitan Areas, United States and Regional Summaries, 1969–70*, Bulletin 1660–92 (Bureau of Labor Statistics, 1971).

[9] John E. Buckley, "Pay differences between men and women in the same job," *Monthly Labor Review*, November 1971, pp. 36–39.

[10] See, for example, Paul O. Flaim and Nicholas I. Peters, "Usual weekly earnings of American workers," *Monthly Labor Review*, March 1972, pp. 28–38. Reprinted as Special Labor Force Report 143.

[11] See William V. Deutermann, "Educational attainment of workers, March 1973," *Monthly Labor Review*, January 1974, pp. 58–62. Reprinted as Special Labor Force Report 161.

The employment situation of Vietnam Era veterans

Special Labor Force Report reviews employment gains of veterans during the year ending in June 1972, and new data on occupations, industry, and residence

KOPP MICHELOTTI AND KATHRYN R. GOVER

JOB PROSPECTS brightened for veterans during the year ending in June 1972, as young, newly separated servicemen returned to an economy in which employment was generally on the rise while unemployment remained stable. The number of veterans with jobs increased steadily during this period, and the unemployment rate for Vietnam Era veterans[1] in ages 20 to 29 dropped a full percentage point to 8.0 percent (seasonally adjusted) in the second quarter of 1972. Subsequently, the rate fell even further to 7.2 percent in the third quarter.

The civilian economy had to absorb fewer new veterans, as military discharges declined. In fiscal 1972, discharges numbered 880,000, down from an average of one million in each of the 3 preceding years, reflecting in part the drop in Armed Forces inductions that began about 3 years earlier.

At the close of fiscal 1972, the United States had been engaged in the war in Southeast Asia for 8 years, and 5.7 million men were Vietnam Era veterans. About 80 percent of the veterans were in their twenties and another 12 percent were 30 to 34 years old. The older group has been increasing in size as the men separated several years ago move out of their twenties. In the second quarter of 1972, there were about 660,000 in this age group compared with 420,000 a year earlier. About 97 percent were in the labor force and their unemployment rate (not seasonally adjusted) was 2.7 percent, not materially different from the 3.0 percent rate for nonveterans 30 to 34 years old.

The number of veterans in ages 30 to 34 is still too small to permit either reliable adjustment for recurring seasonal patterns in their employment or detailed tabulations for such basic characteristics as race and duration of unemployment. Since the job-finding problems of veterans 30 to 34 years old are much less serious than for the group under age 30, this analysis will continue to focus on those 20 to 29 years old.

This annual review of the employment situation of male Vietnam era veterans includes, for the first time, information on occupation and industry of employment, residence, household relationship, and reasons for being unemployed or out of the labor force.

Kopp Michelotti and Kathryn R. Gover are Social Science Research Analysts in the Division of Labor Force Studies, Bureau of Labor Statistics.

Employment

During fiscal 1972 all of the net growth in the veterans' labor force was in employment, as the number of 20- to 29-year-old veterans with jobs rose by 550,000 to average 3.9 million. Similar patterns of increase occurred with respect to the nonveteran labor force and employment levels. (See table 1.) A year earlier employment had accounted for only three-fourths of the labor force increase for veterans and two-thirds for nonveterans.

Occupation. The occupational distribution of employed veterans and nonveterans 20 to 29 years old is generally the same, with the exception of professional and technical workers and craftsmen. (See table 2.) In the second quarter of 1972, about one-fourth of the veterans were craftsmen (such as skilled construction workers and mechanics), compared with one-fifth of the nonveterans. A smaller proportion of veterans than nonveterans were in professional and technical jobs (11 and 17 percent, respectively). For the 20- to 24-year-olds, the proportion of veterans in these occupations was less than half that of nonveterans. This gap reflects the lower percentage of college graduates among the veterans.

Younger veterans (age 20–24) were more concentrated in jobs which generally require less education, training, and experience. In the second quarter of 1972, about two-thirds of the employed younger veterans but only half of the veterans 25 to 29 years old were blue-collar workers—craftsmen, operatives,

From the *Review* of December 1972

and nonfarm laborers. On the other hand, less than a third of the younger veterans were in white-collar jobs, compared with 40 percent of the older veterans. Only 6 percent of the younger group but 14 percent of the older were in professional and technical occupations.

Negro[2] veterans were more heavily concentrated than white veterans in the less skilled laborer and service occupations. (See chart 1.) These differences result from a combination of several factors, such as job discrimination and the somewhat larger proportion of employed Negro veterans who were in the less experienced age group 20 to 24 years—50 percent, compared with 41 percent of the young whites.

Table 1. Employment status of male Vietnam Era veterans and nonveterans 20 to 29 years old, quarterly averages, 1971 and 1972

[Numbers in thousands]

Veteran status and employment status	1971				1972		Seasonally adjusted					
							1971				1972	
	I	II	III	IV	I	II	I	II	III	IV	I	II
VETERANS[1]												
Total, 20 to 29 years:												
Civilian noninstitutional population[2]	3,809	3,981	4,145	4,293	4,429	4,515	3,809	3,981	4,145	4,293	4,429	4,515
Civilian labor force	3,459	3,623	3,844	3,931	4,058	4,174	3,470	3,632	3,814	3,951	4,076	4,180
Percent of population	90.8	91.0	92.7	91.6	91.6	92.4	91.1	91.2	92.0	92.0	92.0	92.6
Employed	3,087	3,314	3,525	3,626	3,658	3,862	3,160	3,302	3,463	3,623	3,743	3,848
Unemployed	372	309	319	304	400	312	310	330	351	328	332	332
Unemployment rate	10.8	8.5	8.3	7.8	9.8	7.5	8.9	9.1	9.2	8.3	8.2	8.0
20 to 24 years:												
Civilian noninstitutional population[2]	1,902	1,947	1,974	1,990	2,000	1,967	1,902	1,947	1,974	1,990	2,000	1,967
Civilian labor force	1,668	1,711	1,782	1,782	1,788	1,788	1,676	1,719	1,768	1,783	1,801	1,792
Percent of population	87.7	87.9	90.3	89.5	89.4	90.9	88.1	88.3	89.6	89.6	90.0	91.1
Employed	1,424	1,499	1,583	1,587	1,544	1,606	1,471	1,490	1,551	1,579	1,596	1,596
Unemployed	244	212	199	195	244	182	205	229	217	204	206	196
Unemployment rate	14.6	12.4	11.2	11.0	13.6	10.2	12.2	13.3	12.3	11.4	11.4	10.9
25 to 29 years:												
Civilian noninstitutional population[2]	1,907	2,035	2,171	2,303	2,429	2,549	1,907	2,035	2,171	2,303	2,429	2,549
Civilian labor force	1,791	1,912	2,062	2,149	2,270	2,387	1,794	1,912	2,046	2,168	2,274	2,388
Percent of population	93.9	94.0	95.0	93.3	93.5	93.6	94.1	94.0	94.2	94.1	93.6	93.7
Employed	1,663	1,815	1,942	2,039	2,114	2,256	1,689	1,811	1,912	2,044	2,148	2,251
Unemployed	128	97	120	109	156	130	105	101	134	124	127	136
Unemployment rate	7.2	5.1	5.8	5.1	6.9	5.5	5.8	5.3	6.5	5.7	5.6	5.7
NONVETERANS												
Total, 20 to 29 years:												
Civilian noninstitutional population[2]	9,209	9,334	9,454	9,567	9,716	9,930	9,209	9,334	9,454	9,567	9,716	9,930
Civilian labor force	7,844	8,093	8,436	8,200	8,264	8,604	7,997	8,076	8,136	8,371	8,435	8,586
Percent of population	85.2	86.7	89.2	85.7	85.1	86.6	86.8	86.5	86.1	87.5	86.8	86.5
Employed	7,188	7,524	7,852	7,633	7,566	8,006	7,419	7,502	7,544	7,727	7,816	7,978
Unemployed	656	569	584	567	698	598	578	574	592	644	619	608
Unemployment rate	8.4	7.0	6.9	6.9	8.4	7.0	7.2	7.1	7.3	7.7	7.3	7.1
20 to 24 years:												
Civilian noninstitutional population[2]	5,327	5,468	5,582	5,620	5,825	5,980	5,327	5,468	5,582	5,620	5,825	5,980
Civilian labor force	4,158	4,439	4,741	4,456	4,573	4,860	4,321	4,421	4,448	4,610	4,753	4,842
Percent of population	78.1	81.2	84.9	79.3	78.5	81.3	81.1	80.9	79.7	82.0	81.6	81.0
Employed	3,709	4,016	4,321	4,061	4,072	4,421	3,911	4,004	4,028	4,162	4,293	4,404
Unemployed	449	423	420	394	501	439	410	417	420	448	460	437
Unemployment rate	10.8	9.5	8.9	8.8	10.9	9.0	9.5	9.4	9.4	9.7	9.7	9.0
25 to 29 years:												
Civilian noninstitutional population[2]	3,882	3,866	3,872	3,947	3,891	3,950	3,882	3,866	3,872	3,947	3,891	3,950
Civilian labor force	3,686	3,654	3,695	3,744	3,691	3,744	3,676	3,654	3,687	3,762	3,682	3,745
Percent of population	95.0	94.5	95.4	94.9	94.9	94.8	94.7	94.5	95.2	95.3	94.6	94.8
Employed	3,479	3,508	3,531	3,572	3,494	3,585	3,508	3,497	3,516	3,566	3,523	3,574
Unemployed	207	146	164	172	197	159	168	157	171	196	159	171
Unemployment rate	5.6	4.0	4.4	4.6	5.3	4.2	4.6	4.3	4.6	5.2	4.3	4.6

[1] Vietnam Era veterans are those who served after August 4, 1964; they are all classified as war veterans. About 80 percent of the Vietnam Era veterans of all ages are 20 to 29 years old. Post-Korean peacetime veterans are not included in this table.

[2] Since seasonal variations are not present in the population figures, identical numbers appear in the unadjusted and seasonally adjusted columns.

NOTE: Because of rounding, sums of individual items may not equal totals. Rates are based on unrounded numbers. Data are subject to sampling variability which may be relatively large in cases where numbers are small. Therefore, differences between numbers or percents based on them may not be significant. For a detailed explanation of the reliability of estimates, including standard error tables, see the Technical Note in the October 1972 issue of **Employment and Earnings.**

Industry. The distribution by industry of employed veterans 20 to 29 years old was virtually the same as that of employed nonveterans the same ages—nearly a third held jobs in manufacturing, primarily in the durable goods industries, and a fifth were in trade, mostly in retail trade.

Among the veterans, Negro men, to a greater extent than white men, seem to take advantage of preferential hiring programs in the public sector. In the second quarter of 1972, 20 percent of the employed Negro veterans 20 to 29 years old worked for Federal, State, or local governments, compared with 12 percent of the white veterans. (See chart 2.)

Table 2. Major occupation and industry group of employed male Vietnam Era veterans and nonveterans 20 to 29 years old, second quarter averages, 1972

[Percent distribution]

Major occupation and industry group	Veterans			Nonveterans		
	20 to 29 years	20 to 24 years	25 to 29 years	20 to 29 years	20 to 24 years	25 to 29 years
Total employed (in thousands)	3,862	1,606	2,256	8,006	4,421	3,585
OCCUPATION						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Professional and technical workers	10.6	5.7	14.1	17.4	13.0	22.8
Managers and administrators, except farm	7.8	6.2	8.9	8.3	5.8	11.0
Clerical workers	9.7	10.0	9.6	7.4	8.6	5.8
Sales workers	6.7	5.7	7.4	5.6	5.5	5.9
Craftsmen and kindred workers	23.5	22.7	24.1	18.5	17.8	19.4
Operatives and kindred workers	23.6	27.9	20.5	21.8	23.4	19.8
Service workers	7.7	7.5	7.9	7.6	9.4	5.4
Farmers and farm laborers, foremen	1.9	2.6	1.4	3.8	4.0	3.5
Laborers, excluding farm and mine	8.4	11.5	6.1	9.8	12.5	6.5
INDUSTRY						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture	2.4	3.3	1.8	4.6	5.1	4.1
Nonagricultural industries	97.6	96.7	98.2	95.4	94.9	95.9
Wage and salary workers	94.8	94.4	95.0	91.9	92.6	91.0
Construction	9.2	10.6	8.1	8.5	9.1	7.8
Manufacturing	31.6	31.6	31.5	28.1	27.4	28.9
Durable goods	20.1	19.9	20.3	18.0	17.2	18.9
Nondurable goods	11.5	11.8	11.2	10.1	10.2	10.9
Transportation, communication, and public utilities	9.0	8.0	9.7	6.0	5.7	6.3
Trade	19.1	21.1	17.7	19.0	21.9	15.6
Finance, insurance, and real estate	3.8	3.2	4.3	3.8	3.4	4.4
Service	8.1	8.3	8.0	11.4	11.7	11.1
Government	12.8	10.0	14.8	14.0	12.4	15.9
Self-employed and unpaid family workers	2.8	2.3	3.1	3.5	2.4	4.8

NOTE: For definitions and notes on data limitations, see table 1.

Unemployment

The unemployment rate of veterans 20 to 29 fell from 9.1 percent to 8.0 percent (seasonally adjusted) in the year ended in the second quarter 1972, while the rate of nonveterans remained the same at 7.1 percent (seasonally adjusted). All of the improvement in the veterans' unemployment rate occurred among the veterans in ages 20 to 24, whose average rate dropped to 10.9 percent in second quarter 1972 from 13.3 percent a year earlier. At 5.7 percent, the unemployment rate of veterans 25 to 29 was roughly the same as in second quarter 1971.

The gap between the unemployment rate of veterans and nonveterans narrowed substantially between mid-1971 and 1972. For the second quarter of 1972, the difference was 0.9 percentage points compared with 2.0 percentage points a year before. Although most of the narrowing reflects an improved job situation for veterans, some reflects a shift in the age composition of the veterans compared to the nonveterans. Very little of the increase in the 20- to 29-year-old veteran population and labor force was in ages 20 to 24, where unemployment problems are more severe than for older veterans. With fewer men going into military service (draft calls fell from 152,000 in fiscal 1971 to 25,000 in fiscal 1972), the nonveteran population and labor force increased primarily in ages 20 to 24. Regardless of veteran status, the jobless rate for men 25 to 29 is lower than that for men 20 to 24, for such reasons as greater work experience, more familiarity with the job market, and higher seniority.

By the third quarter of 1972, the unemployment rate for veterans 20 to 29 years old had dropped to 7.2 percent, and in October the veterans' rate of 6.4 percent was little different from the 6.6 percent rate for nonveterans the same ages.

Duration. Following the economic downturn of 1970, the duration of unemployment for both veterans and nonveterans lengthened. The percentage of unemployed veterans looking for work for 15 weeks or more increased from an annual average of 9 percent in 1969 to 15 percent in 1970 to 25 percent in 1971. The comparable statistic for nonveterans has increased in a similar fashion. In the second quarter of 1972, about 30 percent of the jobless veterans and nonveterans had been unemployed for at least 15 weeks, the same proportions as in the second quarter a year earlier. (See table 3.)

Reasons for unemployment. Some persons become unemployed by losing or quitting a job, while others are unemployed as a consequence of coming into the labor force and starting to look for work. As the following percentages for the second quarter of 1972 indicate, veterans and nonveterans differed slightly in their reasons for unemployment:

	Veterans	*Nonveterans*
Total unemployed (in thousands)	312	598
Percent	100.0	100.0
Job losers	45.2	50.2
On layoff	11.5	9.4
Other job losers	33.7	40.8
Job leavers	12.5	14.2
Labor force entrants	42.3	35.6
Reentrants	34.6	30.1
New workers	7.7	5.5

In the second quarter of 1972, veterans and nonveterans were about equally likely to be on layoff, but the veterans were less likely to have lost their jobs for such reasons as dismissal, expiration of a temporary job, or plant closing. A somewhat greater percentage of the veterans than of the nonveterans were either reentrants to the labor force or had never worked before.

Younger veterans were more likely than older veterans to be labor force entrants, because more of them had only recently left the Armed Forces. Job-finding problems for newcomers to the labor force, whether veterans or nonveterans, tend to be exacerbated by the fact that they may not be as familiar with the intricacies of the job market as those who left or lost a job.

Chart 1. Occupational distribution of male Vietnam Era veterans 20 to 29 years old, by race, 2d quarter averages, 1972

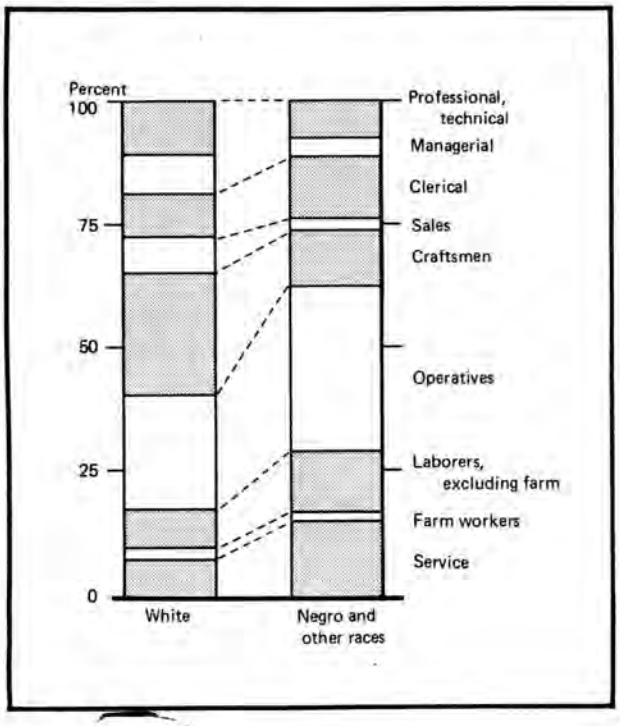


Table 3. Duration of unemployment of male Vietnam Era veterans and nonveterans 20 to 29 years old, quarterly averages, 1971 and 1972

[Percent distribution]

Veteran status and duration of unemployment	1971				1972	
	I	II	III	IV	I	II
VETERANS						
Total unemployed:						
Number (in thousands)	372	309	319	304	400	312
Percent	100.0	100.0	100.0	100.0	100.0	100.0
Less than 5 weeks	38.4	40.8	42.9	42.6	41.1	40.6
5 to 14 weeks	37.9	29.8	33.5	33.6	33.9	28.6
15 weeks or more	23.7	29.4	23.5	23.9	25.0	30.8
NONVETERANS						
Total unemployed:						
Number (in thousands)	656	569	584	567	698	598
Percent	100.0	100.0	100.0	100.0	100.0	100.0
Less than 5 weeks	39.3	45.1	44.0	39.8	35.7	46.0
5 to 14 weeks	38.9	25.2	35.3	36.4	34.7	24.7
15 weeks or more	21.8	29.8	20.7	23.9	29.6	29.3

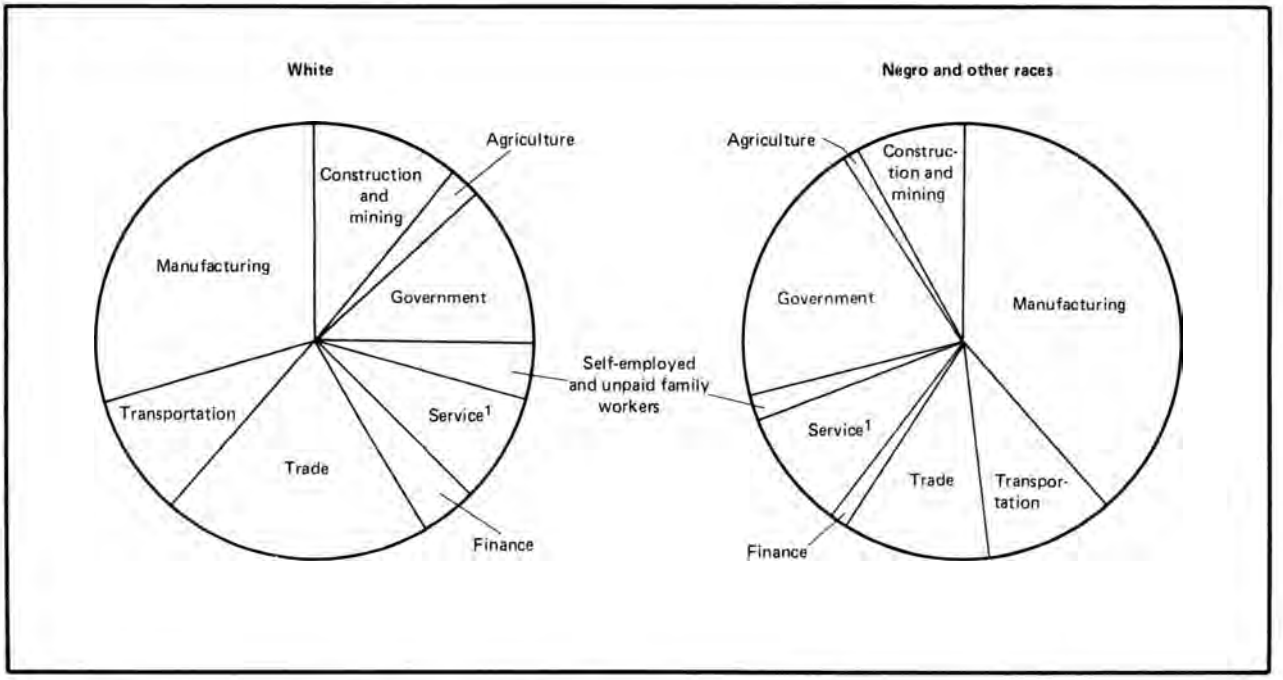
NOTE: For definitions and notes on data limitations, see table 1.

Men not in the labor force

In the second quarter of 1972, about 8 percent (340,000) of the veterans were neither working nor looking for work, compared with 13 percent (1.3 million) of the nonveterans. The proportion not in the labor force was smaller for veterans because of a combination of demographic and social factors. Among these is the larger proportion of veterans in their late twenties, an age group in which the labor force participation rate is higher than for those 20 to 24 years old. Another factor is the larger proportion of veterans than nonveterans who head households. In the April-June quarter of 1972, about two-thirds of the veterans but only half of the nonveterans were household heads, with a wife and, perhaps, young children to support. All of this difference was accounted for by the 20- to 24-year-old men, among whom about half of the veterans compared with about a third of the nonveterans had these family responsibilities.

Attendance at school was by far the most impor-

Chart 2. Employment of male Vietnam Era veterans 20 to 29 years old, by race and major industry group, 2d quarter 1972



[1] Excluding government.

tant reason given for not being in the labor force. In the second quarter of 1972, about two-thirds of the veterans and three-fourths of the nonveterans not in the labor force gave school as their reason for nonparticipation. The next most frequently given reason was not wanting a job. (See chart 3.)

On an annual average basis for 1971, veterans 20 to 24 years old and those 25 to 29 years old differed little in their reasons for nonparticipation in the labor force. In contrast, nonveterans exhibited large differences by age. Younger nonveterans were almost twice as likely as older nonveterans to be in school, while they were less likely than older nonveterans to mention ill health or disability as a reason for nonparticipation. Few of the veterans in either their early or late twenties gave this reason. Relatively few (2 to 3 percent) of the veterans and nonveterans not in the labor force in the first half of 1972 gave as their reason the belief that they could not find a job.

Education

Vietnam Era veterans are better educated when they leave the service than were World War II or Korean Conflict veterans at the time of their separation from military service, reflecting in part a general increase in the educational attainment of the population. For all the servicemen discharged from August 1964 through the end of 1971, the median years of schooling completed at time of separation was 12.5 years. This compares with 12.3 years for Korean Conflict veterans and 11.5 years for World War II veterans. Educational attainment at separation was highest for Vietnam Era veterans 25 to 29 years old (12.9 years). Nearly half (46 percent) of the men in this age group had completed at least 1 year of college.[3]

Since the midsixties, the median educational attainment of veterans at time of separation has increased gradually from 12.4 to 12.6 years. In fiscal 1965 through 1967, about 17 percent of the separatees had completed a year of college or more. This proportion reached 27 percent in the first half of fiscal 1972, including 13 percent who had graduated from college.[4]

Roughly 10 percent of the veteran population 20 to 24 years old in the year ending in June 1972, reported school as their major activity.[5] The proportion for nonveterans of the same age was twice as high. Among 25- to 29-year-olds, about 6 percent of the veterans and 3 percent of the nonveterans were in school.

Students generally have a much lower labor force participation rate than those whose major activity is something else. In the second quarter of 1972, 30 percent of the veterans 20 to 29 years old in school were in the labor force in contrast to 97 percent of the veterans out of school. The labor force participation rate of students was the same for veterans and nonveterans, but among nonstudents veterans had a slightly higher rate.

About a tenth of the unemployed veterans and nonveterans were students, and most of these were seeking part-time work. In the second quarter of the year, however, the proportion seeking part-time jobs usually decreases, probably because students begin working or looking for full-time summer jobs before the end of the school year, as shown by the following tabulation for veterans in the first and second quarters of 1972:

	I	II
Total unemployed (in thousands)	400	312
Percent	100.0	100.0
Major activity: school	13.0	9.0
Looking for full-time work	4.3	4.8
Looking for part-time work	8.7	4.2
Majority activity: other	87.0	91.0
Looking for full-time work	84.3	88.8
Looking for part-time work	2.7	2.2

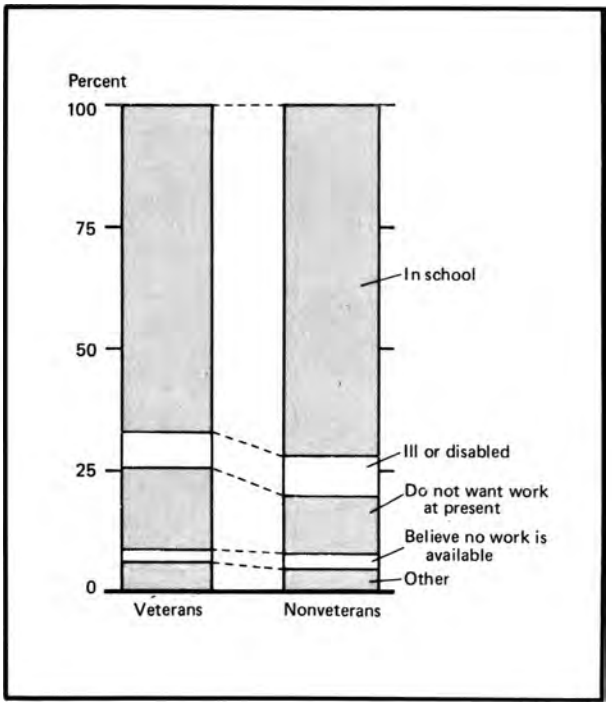
In contrast, the overwhelming majority of unemployed nonstudents look for full-time jobs the year round.

The unemployment rate of men 20 to 29 years old in school is far higher than that of those not in school. For veterans, in the second quarter of 1972, the unemployment rate was 29 percent for students in contrast to 7 percent for nonstudents. The corresponding unemployment rates for nonveterans were 13 percent for students and 7 percent for nonstudents.

Race and residence

Race. Negroes constitute a smaller proportion of Vietnam Era veterans than of nonveterans. In the first half of 1972, they made up about 9 percent of the 20- to 29-year-old veteran population and labor force but almost 13 percent of the nonveteran population and labor force. The smaller proportion of Negroes among veterans is primarily due to two reasons. Relatively more Negroes than whites are disqualified from entering the Armed Forces,[6] and relatively more eligible Negroes than whites reenlist when their enlistments expire.[7]

Chart 3. Reasons for nonparticipation in the labor force of male Vietnam Era veterans and nonveterans 20 to 29 years old, 2d quarter averages, 1972



The employment situation of veterans of Negro and other minority races can be discussed only in general terms because the data are based on small numbers of sample cases and sampling variability is high. The unemployment rates of Negro veterans have not been significantly different statistically from those of Negro nonveterans, but have been substantially higher than the unemployment rates of white veterans. (See table 4.) During 1971 and the first half of 1972, the quarterly average unemployment rate of Negro veterans was in the range of 12 to 15 percent, compared with 7 to 10 percent for white veterans.

Residence. Following the national pattern,[8] more Vietnam Era veterans and nonveterans 20 to 29 years old reside in the Southern and North Central regions of the United States than in the Northeast and West. The unemployment rates for veterans and nonveterans in the Southern and North Central regions are considerably lower than comparable rates the Northeast and West. (See table 5.) In the second quarter of 1972, the jobless rates for veterans 20 to

29 years old were 5.6 and 6.7 percent, respectively, in the Southern and North Central regions, compared with 8.9 and 9.9 percent in the West and Northeast.

About half the Negro veterans 20 to 29 years old live in the South, in contrast to about one-quarter of the white veterans; this is comparable to the distribution of the total population by race. The unemployment rate for the Negro veterans in the South, at 13.8 percent, was about three times as high as for white veterans, though not significantly higher than for Negro veterans living elsewhere (11.7 percent). Outside the South, the unemployment rate of Negro veterans was only one and a half times as high as for white veterans.

Special programs

Among the continuing programs and benefits for veterans are the longstanding GI Bill administered by the Veterans Administration, Project Transition,

Table 4. Employment status of male Vietnam Era veterans and nonveterans 20 to 29 years old, by race, quarterly averages, 1971 and 1972

[Numbers in thousands]

Employment status	White						Negro and other races					
	1971				1972		1971				1972	
	I	II	III	IV	I	II	I	II	III	IV	I	II
VETERANS												
Total, 20 to 29 years:												
Civilian noninstitutional population	3,446	3,596	3,721	3,878	4,028	4,102	363	386	425	415	401	413
Civilian labor force	3,135	3,274	3,456	3,558	3,708	3,799	324	350	388	373	350	375
Percent of population	91.0	91.0	92.9	91.7	92.1	92.6	89.3	90.7	91.3	89.9	87.3	90.8
Employed	2,812	3,008	3,191	3,306	3,361	3,535	275	308	334	322	297	327
Unemployed	323	266	265	252	347	264	49	42	54	52	53	48
Unemployment rate	10.3	8.1	7.7	7.1	9.3	7.0	15.1	12.1	14.0	13.8	15.3	12.7
20 to 24 years:												
Civilian noninstitutional population	1,699	1,737	1,761	1,798	1,800	1,748	203	210	214	192	200	219
Civilian labor force	1,489	1,527	1,593	1,615	1,617	1,595	179	184	189	167	171	193
Percent of population	87.6	87.9	90.5	89.8	89.8	91.2	88.2	87.6	88.3	87.0	85.5	88.1
Employed	1,282	1,347	1,424	1,447	1,411	1,442	142	153	159	140	133	164
Unemployed	207	180	169	168	206	153	37	31	30	27	38	2.9
Unemployment rate	13.9	11.8	10.6	10.4	12.7	9.6	20.9	17.0	16.0	15.9	22.4	15.1
25 to 29 years:												
Civilian noninstitutional population	1,747	1,859	1,961	2,080	2,228	2,354	160	176	211	223	201	195
Civilian labor force	1,646	1,747	1,863	1,943	2,091	2,205	145	165	199	206	179	182
Percent of population	94.2	94.0	95.0	93.4	93.8	93.7	90.6	93.8	94.3	92.4	89.1	93.3
Employed	1,529	1,661	1,767	1,859	1,950	2,093	133	154	175	181	164	164
Unemployed	117	86	96	84	141	112	12	11	24	25	15	2.9
Unemployment rate	7.1	4.9	5.2	4.3	6.7	5.1	8.0	6.7	12.0	12.0	8.6	10.2
NONVETERANS												
Total, 20 to 29 years:												
Civilian noninstitutional population	7,964	8,072	8,183	8,260	8,463	8,652	1,245	1,262	1,271	1,307	1,253	1,278
Civilian labor force	6,798	7,020	7,338	7,116	7,232	7,539	1,045	1,073	1,098	1,084	1,032	1,065
Percent of population	85.4	87.0	89.7	86.2	85.5	87.1	83.9	85.0	86.4	82.9	82.4	83.3
Employed	6,277	6,567	6,888	6,679	6,678	7,053	910	958	963	955	888	953
Unemployed	521	453	450	437	553	486	135	115	135	129	145	112
Unemployment rate	7.7	6.5	6.1	6.1	7.6	6.4	12.9	10.7	12.3	11.9	14.0	10.5
20 to 24 years:												
Civilian noninstitutional population	4,616	4,739	4,834	4,838	5,066	5,220	711	729	748	782	759	761
Civilian labor force	3,604	3,850	4,119	3,853	3,994	4,263	554	589	621	603	579	597
Percent of population	78.1	81.2	85.2	79.6	78.8	81.7	77.9	80.8	83.0	77.1	76.3	78.4
Employed	3,252	3,519	3,795	3,549	3,596	3,913	457	497	525	513	476	508
Unemployed	352	331	324	304	397	350	97	92	96	90	104	89
Unemployment rate	9.8	8.6	7.9	7.9	9.9	8.2	17.4	15.6	15.5	15.0	17.9	14.9
20 to 29 years:												
Civilian noninstitutional population	3,348	3,333	3,349	3,422	3,397	3,433	534	533	523	525	494	517
Civilian labor force	3,195	3,170	3,219	3,263	3,238	3,277	491	484	477	481	453	467
Percent of population	95.4	95.1	96.1	95.4	95.3	95.5	91.9	90.8	91.2	91.6	91.7	90.3
Employed	3,026	3,048	3,093	3,130	3,082	3,140	453	460	438	442	412	444
Unemployed	169	122	126	133	156	136	38	24	39	39	41	23
Unemployment rate	5.3	3.8	3.9	4.1	4.8	4.2	7.8	4.9	8.1	8.0	9.0	4.9

NOTE: For definitions and notes on data limitations, see table 1.

Table 5. Employment status of male Vietnam Era veterans and nonveterans 20 to 29 years old, by region and race, second quarter averages, 1972

[Numbers in thousands]

Labor force status and race	Veterans					Nonveterans				
	Total	North-east	North Central	South	West	Total	North-east	North Central	South	West
ALL MEN										
Civilian noninstitutional population	4,515	997	1,293	1,344	881	9,931	2,427	2,675	3,091	1,738
Civilian labor force	4,174	921	1,209	1,242	802	8,603	2,034	2,370	2,699	1,500
Percent of population	92.4	92.4	93.5	92.4	91.0	86.6	83.8	88.6	87.3	86.3
Employed	3,862	830	1,128	1,173	731	8,005	1,856	2,210	2,570	1,369
Unemployed	312	91	81	69	71	599	178	161	129	131
Unemployment rate	7.5	9.9	6.7	5.6	8.9	7.0	8.8	6.8	4.8	8.7
Not in labor force	341	76	84	102	79	1,328	393	305	392	238
WHITE										
Civilian noninstitutional population	4,102	927	1,214	1,139	822	8,653	2,190	2,429	2,466	1,568
Civilian labor force	3,799	859	1,134	1,055	751	7,539	1,851	2,164	2,162	1,362
Percent of population	92.6	92.7	93.4	92.6	91.4	87.1	84.5	89.1	87.8	86.9
Employed	3,535	775	1,061	1,012	687	7,054	1,697	2,034	2,072	1,251
Unemployed	264	84	73	43	64	486	154	131	90	111
Unemployment rate	6.9	9.8	6.4	4.1	8.5	6.4	8.3	6.1	4.2	8.1
Not in labor force	303	68	80	84	71	1,114	339	265	304	206
NEGRO AND OTHER RACES										
Civilian noninstitutional population	413	70	79	205	59	1,278	237	246	625	170
Civilian labor force	375	62	75	187	51	1,064	183	206	537	138
Percent of population	91.8	(1)	95.0	91.2	(1)	83.3	77.2	83.7	85.9	81.2
Employed	327	55	67	161	44	951	159	176	498	118
Unemployed	48	7	8	26	7	113	24	30	39	20
Unemployment rate	12.8	(1)	10.7	13.8	(1)	10.6	13.1	14.6	7.3	14.5
Not in labor force	38	8	4	18	8	214	54	40	88	32

[1] Percent not shown where base is less than 75,000.

NOTE: For definitions and notes on data limitations, see table 1.

under the Department of Defense, and Employment Services, Unemployment Compensation for Ex-Servicemen, and Reemployment Rights, all under the Department of Labor. In the past year, many of these programs have been expanded and new ones added. The President's 6-point veterans program spurred substantial increases in veterans' job counseling, placement, and training benefits, and also prompted increased job opportunities in private industry through such organizations as the National Alliance of Businessmen.

Through June 1972, 41 percent of all Vietnam Era veterans have participated in educational programs under the current GI Bill (effective June 1966). The comparable proportions of veterans participating under previous GI Bills after a similar length of time were 40 percent of Korean Conflict servicemen and 46 percent of World War II veterans. On October 24, 1972, amendments were signed into law raising the amount of the current GI Bill educational benefits for full-time students from the $175 per month for a single veteran to $220, with corresponding increases for veterans with dependents.

By the end of June 1972, about 1.5 million servicemen had received some type of job counseling for civilian jobs under Project Transition which began in January 1968. In addition, some 258,000 had participated in a job-training program, frequently run on or near military bases by private industry. Although Project Transition is primarily for those servicemen most in need of vocational training and education for civilian life, it recently incorporated many other special programs. One such program is Military Experience Directed Into Health Careers (MEDIHC), a joint program of the Departments of Defense and Health, Education, and Welfare, in which servicemen who received military training in the health or medical fields are assisted in obtaining jobs in the civilian health fields. The placement rate in mid-1972 ranged from 40 to 70 percent depending upon the State. A companion program, the Veterans Construction Jobs Clearinghouse, assists servicemen who have been trained as construction mechanics. The program is supported by Department of Labor funds and manned by representatives of the construction industry.

Other examples of new or amplified benefits for

Vietnam Era veterans were additional payments to eligible veterans (as well as others) under the Temporary Unemployment Compensation Program and the employment of veterans (and others) under the Public Employment Program.

These are only a few examples of the nationwide efforts which helped Vietnam Era veterans get educational and vocational training and contributed to the improvement in their employment situation during fiscal year 1972. □

FOOTNOTES

[1] About 83,000 women veterans of the Vietnam Era are not included in this report because employment data are not available for them. In this report, Vietnam Era veterans are those who served in the Armed Forces after Aug. 4, 1964, have been separated from active duty, and are now in the civilian noninstitutional population. Korean Conflict veterans served during the period June 27, 1950, to Jan. 31, 1955. World War II veterans served at any time from Sept. 16, 1940, to July 25, 1947. Nonveterans include those who have never served in the Armed Forces or who served only in peacetime prior to June 27, 1950. Post-Korean Conflict veterans—men who served between Feb. 1, 1955, and Aug. 4, 1964—are not included in this report.

Unless otherwise indicated, data on the civilian noninstitutional population, labor force, employment status, and educational attainment are derived from the nationwide Current Population Survey (CPS) sample of about 50,000 households. The CPS, conducted each month by the Bureau of the Census for the Bureau of Labor Statistics (BLS), is the source of special tabulation by veteran status prepared for the Veterans Administration and BLS. The data are subject to sampling variability, which may be relatively large for the smaller figures and for small differences between figures. Standard errors of monthly sample estimates are published by BLS in *Employment and Earnings*. These standard errors must be reduced by a factor of .7070 for quarterly averages, and .4472 for annual averages. Details about basic labor force concepts, sample design, and estimating methods are decribed in *Concepts and Methods Used in Manpower Statistics From the Current Population Survey* (BLS Report 313, 1967).

The latest in this series of annual reports on the employment situation of Vietnam Era veterans was published in the *Monthly Labor Review*, September 1971, pp. 3–11, and reprinted as Special Labor Force Report 137.

[2] Data for all persons other than white are used in this report to represent data for Negroes, since the latter constitute about 92 percent of all persons other than white persons in the United States.

[3] See *Data on Vietnam Era Veterans, December 1971* (Veterans Administration, 1972), p. 8.

[4] *Ibid.*, p. 7.

[5] Respondents in the Current Population Survey were asked, "What were you doing most of last week?" On the basis of their replies, persons were classified into two groups —Major activity: going to school and Major activity: other. In this report, those whose major activity was going to school are referred to as "students" and those whose major activity was something else are classified as "not in school."

[6] Data on disqualifications on the basis of medical, mental, and trainability tests were provided by the Medical Statistics Agency, Office of the Surgeon General, Department of the Army. In these data, statistics for Negroes refer to Negroes only and statistics for whites refer to all others (non-Negro).

[7] Data on reenlistment rates and ineligibility to reenlist were provided by the Director of Procurement Policy, Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs. In these data, statistics for Negroes refer to Negroes only and statistics for whites refer to whites only.

[8] See *Geographic Profile of Employment and Unemployment, 1971* (BLS Report 402, 1972).

Occupational characteristics of urban workers

Special Labor Force Report shows workers in metropolitan areas to be highly skilled, but with substantial differences between residents of the central cities and those living in the suburbs

CHRISTOPHER G. GELLNER

TWO-THIRDS OF ALL WORKERS in the United States now reside in metropolitan areas—the centers of economic activity and growth for the Nation.[1] The economic importance of these areas is reflected in the high proportion of highly skilled workers within their populations. Professional, technical, and managerial occupations are more common in such areas (particularly the 20 largest) than in the Nation as a whole.

This article is based on occupational data for Standard Metropolitan Statistical Areas (SMSA's) that have recently become available on an annual average basis from the Current Population Survey (CPS). It explores the major differences in the occupational distribution of employment among our large metropolitan areas and between their central cities and suburban rings. It also attempts to determine whether such skill differences have any direct bearing on the disparity between central city and suburban unemployment rates.

Data on the occupational distribution of the labor force are essential in order to study the purported skill gap between central city workers and suburban workers.[2] In the absence of such information, it has been widely assumed that the great majority of central city workers are concentrated in semiskilled and low skilled jobs and that when unemployed they seek work in similar fields.

Skill pattern by nature of area

As table 1 shows, over one-half of all workers residing in metropolitan areas are employed in white-collar work and 16 percent are in professional and managerial occupations. In nonmetropolitan areas, slightly less than two-fifths of the workers are in white-collar work and 11 percent in professional and managerial occupations. Nonmetropolitan area workers are more likely to be employed in blue-collar work. The proportion of workers in the service occupations is roughly the same in metropolitan and nonmetropolitan areas.

The higher skill level of the metropolitan area labor force is apparent among both Negro and white workers. One-third of the Negro workers residing in metropolitan areas were engaged in white-collar work in 1970, with 14 percent working as skilled professionals and managers. Outside these areas, only 14 percent were in white-collar work and 8 percent in the professional and managerial occupations. Among whites, the percentage employed in white-collar occupations is also significantly higher in metropolitan areas (56 percent) than in nonmetropolitan areas (41 percent). Moreover, the proportion of whites employed in the professional and managerial occupations in metropolitan areas, at 28 percent, is also significantly higher than the 22 percent in nonmetropolitan areas. Outside metropolitan areas, about one-tenth of the whites and one-eighth of the Negroes were in farming occupations in 1970.

Generally speaking, the larger a metropolitan area, the larger its proportion of higher skilled workers. This is confirmed by data on the 20 largest SMSA's, which contain about half of the workers of all metropolitan areas.[3] Approximately 56 percent of the workers residing in these areas are in white-collar occupations, a slightly greater proportion than in all metropolitan areas. Moreover, these large urban areas have a slightly larger proportion of professional and technical workers than do all metropolitan areas. Conversely, the proportion of workers in both blue-collar and service occupations is somewhat lower in these large SMSA's than in smaller urban areas.

Differences in occupational distribution between the labor force in the 20 SMSA's and that for all metropolitan areas are evident both for Negroes and for whites. In the 20 largest areas, approximately

Christopher G. Gellner is a labor economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

From the *Review* of October 1971

37 percent of Negro employment and 59 percent of white was in white-collar fields—both larger percentages than for all SMA's combined. The relatively large proportion of white-collar workers in the Negro labor force of the 20 largest areas compared with that of all SMSA's, however, results almost entirely from a greater representation in clerical jobs, generally occupied by women. White employment, on the other hand, stems from a greater representation in professional and technical as well as clerical occupations. In blue-collar and service occupations, the percentages of both Negro and white workers are slightly lower in the 20 largest areas than in all metropolitan areas combined. The smaller proportion of Negro workers in these two occupational groups in the 20 areas is due chiefly to the fact that a smaller proportion hold nonfarm laborer and private household jobs in the large urban areas than in smaller areas.

Central city versus suburb

As metropolitan areas have grown in size and importance, the socioeconomic dichotomy between the central city and its surrounding surburban ring has increased. Each component of the SMSA is dependent upon the other for economic survival. Central cities, however, have experienced a disproportionate amount of the economic hardship in metropolitan areas, as reflected by their higher unemployment rates and less skilled work forces.

Today, the central cities of the Nation's metropolitan areas contain approximately three-tenths of all U.S. employment. This is less than half, however, of total metropolitan employment. Over the past two decades, the net number of employed persons living in central cities has remained almost the same, and occupational upgrading has proceeded slowly. In contrast, in the surrounding suburban rings the resident labor force has grown rapidly in size and has experienced substantial occupational upgrading. The relative change in the skill levels of the suburban and central city residents has occurred principally because higher skilled workers have moved to the suburbs, while the central cities have received large numbers of less skilled workers from smaller towns and rural areas.

Half the workers living in the central cities were employed in white-collar jobs in 1970. This is slightly lower than the suburban proportion. However, the highly skilled professional and technical fields accounted for 14 percent of all central city workers—the same as the U.S. average, but over 2 percentage points below the suburban average. (See table 2.) In comparison to their suburban counterparts, central city residents were generally less represented in all of the skilled white-collar occupations and in the craftsmen trades, but were more represented in the lower skilled occupations (operative, nonfarm laborer, and service).

Among central city residents, about one-third of the employed Negroes were working in white-collar jobs. The same proportion was found among Negroes living in the suburbs. While about one-half the

Table 1. Employed persons in the United States, by major occupation group and color, 1970 annual averages

[Percent distribution]

Occupation group	Total				White				Negro and other races			
	United States	All nonmetropolitan areas	All metropolitan areas	20 largest metropolitan areas	United States	All nonmetropolitan areas	All metropolitan areas	20 largest metropolitan areas	United States	All nonmetropolitan areas	All metropolitan areas	20 largest metropolitan areas
Total employed (thousands)	78,627	27,011	51,616	26,180	70,182	24,798	45,384	22,643	8,445	2,213	6,232	3,537
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	48.3	38.8	53.3	55.7	50.8	41.1	56.1	58.6	27.9	13.6	33.0	37.2
Professional and technical	14.2	11.4	15.6	16.5	14.8	11.9	16.4	17.4	9.1	5.6	10.3	10.6
Managers, officials, and proprietors	10.5	9.7	11.0	11.1	11.4	10.3	12.0	12.1	3.5	2.3	3.9	4.3
Clerical workers	17.4	12.8	19.9	21.4	18.0	13.5	20.4	21.7	13.2	4.4	16.3	19.7
Sales workers	6.2	5.0	6.8	6.7	6.7	5.4	7.4	7.4	2.1	1.3	2.4	2.6
Blue-collar workers	35.3	38.4	33.7	32.3	34.5	37.7	32.8	31.2	42.2	45.9	40.8	39.4
Craftsmen and foremen	12.9	13.0	12.9	12.5	13.5	13.5	13.5	13.1	8.2	7.0	8.6	8.3
Operatives	17.7	20.0	16.5	15.8	17.0	19.5	15.6	14.8	23.7	26.2	22.9	22.5
Nonfarm laborers	4.7	5.4	4.4	4.0	4.1	4.8	3.7	3.4	10.3	12.9	9.3	8.1
Service workers	12.4	12.8	12.1	11.7	10.7	11.5	10.3	9.9	26.0	27.7	25.4	23.1
Private household workers	2.0	2.4	1.8	1.5	1.3	1.6	1.1	1.0	7.7	11.5	6.4	4.8
Other service workers	10.4	10.4	10.3	10.2	9.4	9.9	9.2	8.9	18.3	16.2	19.0	18.3
Farm workers	4.0	9.9	.9	.4	4.0	9.7	.9	.4	3.9	12.7	.7	.3

Table 2. Employed persons in the central cities and suburban rings of all SMSA's and the 20 largest SMSA's, by major occupation group and color, 1970 annual averages

[Percent distribution]

Occupation group	Total		White		Negro and other races	
	Central city	Suburban ring	Central city	Suburban ring	Central city	Suburban ring
ALL METROPOLITAN AREAS						
Total employed (thousands)	23,234	28,382	18,471	26,913	4,764	1,469
Percent	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	51.6	54.7	56.4	55.9	32.8	33.6
Professional and technical	14.4	16.6	15.6	16.9	19.7	12.3
Managers, officials, and proprietors	9.6	12.1	11.2	12.5	3.7	4.8
Clerical workers	21.2	18.8	22.3	9.1	17.1	13.8
Sales workers	6.3	7.2	7.3	7.4	2.3	2.7
Blue-collar workers	34.0	33.5	32.1	33.2	41.3	39.2
Craftsmen and foremen	17.6	14.0	13.2	14.4	8.9	7.8
Operatives	11.5	15.6	16.1	15.2	23.2	21.9
Nonfarm laborers	4.9	3.9	3.8	3.6	9.3	9.5
Service workers	14.2	10.4	11.2	9.6	25.7	24.6
Private household workers	2.1	1.5	1.0	1.2	6.3	6.5
Other service workers	12.1	8.9	10.2	8.4	19.4	18.1
Farm workers	.2	1.4	.2	1.3	.2	2.6
20 LARGEST METROPOLITAN AREAS						
Total employed (thousands)	11,223	14,957	8,399	14,244	2,823	714
Percent	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	52.8	57.9	58.3	58.7	36.3	40.7
Professional and technical	14.4	18.0	16.0	18.2	9.6	14.9
Managers, officials, and proprietors	9.2	12.5	11.0	12.8	4.0	5.8
Clerical workers	23.4	19.9	24.4	20.0	20.3	17.0
Salesworkers	5.7	7.5	6.8	7.7	2.4	3.0
Blue-collar workers	33.3	31.5	31.1	31.2	39.9	37.1
Craftsmen and foremen	11.0	13.7	11.6	13.9	9.0	8.2
Operatives	17.8	14.3	16.1	14.0	22.8	21.4
Nonfarm laborers	4.6	3.5	3.4	3.3	8.2	7.5
Service workers	13.8	10.1	10.5	9.5	23.6	21.1
Private household workers	1.8	1.3	.8	1.1	4.8	5.1
Other service workers	12.0	8.8	9.7	8.4	18.8	16.0
Farm workers	.1	.6	.1	.6	.2	1.0

white-collar Negro suburbanites were in professional, technical, managerial, or official jobs, less than half the Negro white-collar workers living in central cities were in this highly skilled group. This indicates that a considerable proportion of Negroes with high skilled—and thus high paying—jobs have moved to the suburbs. Such a selective process does not appear to have been at work among Negroes outside the white-collar sector, however, as the skill distribution of Negro blue-collar and service workers living in the suburbs is not measurably different from that of central city Negroes. In contrast, white workers living in the suburbs are in higher skilled jobs than their central city counterparts, within both the white-collar and blue-collar categories. The proportion of suburban Negroes working in farm jobs (2.6 percent) is twice as large as the proportion of suburban whites.

Workers living in the central cities of the 20 largest metropolitan areas have essentially the same array of jobs as those in the central city of all SMSA's combined. The suburbanites in the largest areas, on the other hand, hold higher skilled jobs than suburbanites in general. Especially, they are more concentrated in professional and technical occupations. As a result, the skill gap between central city and suburban residents is wider in the 20 largest areas than in all SMSA's combined.

The relatively wide skill gap is evident among both whites and Negroes. In the 20 largest metropolitan areas, suburban workers—both white and Negro—hold a relatively larger proportion of professional, managerial, and sales jobs than do their city counterparts (table 2). In addition, a larger proportion of the white suburban labor force than of the white central city labor force are skilled craftsmen. The proportion of professional and technical workers is 1½ times as large among Negroes living in the suburban rings of the 20 largest SMSA's as among Negroes in the central cities of the same areas, and equals the proportion of these highly skilled workers in the total U.S. labor force.

The majority of Negro white-collar workers living in the central cities of these areas are in clerical occupations.

Reason for the skill gap

General differences in occupational levels between residents of central cities and those of suburbs are explained in part by the differences in the racial composition of the labor force in the central cities and the suburbs. Negroes hold a disproportionate share of the lower skilled, less desirable jobs, and their dense concentration in central cities tends to skew the occupational distribution of city workers in the low skilled direction. This is especially the case in the 20 largest SMSA's, where four-fifths of the Negro labor force resides in the central cities.

The nature and geographic location of the industrial growth within or in the vicinity of a metropolitan area may have some effect on the occupational distribution of its central city and suburban labor forces. For years most new metropolitan industry and business has been placed in the suburbs. The majority of building permits for office buildings and stores issued in the early 1960's were for suburban sites.[4] If the new higher skilled better paying jobs are available only in one section of the metropolitan area—that is, the suburban ring—workers with the appropriate qualifications for these jobs may prefer to live in this section in order to be close to the expanding employment opportunities.

The nature and location of industry growth, however, has probably had a greater effect on the differences in occupational distribution among the labor forces of individual SMSA's than on the differences in occupational distribution between the labor forces of a particular city and its surrounding suburb.

Another factor that has affected the occupational gap between the central cities and suburbs is patterns of population growth and migration. From 1950 to 1970, there has been virtually no growth in the number of workers residing in the central cities, if annexations are excluded. Extensive growth in the number of workers residing in the suburban rings has, in the meantime, pushed the number of suburban workers past the number of city workers. Many workers, when they attain a sufficient level of education and skill to obtain a more remunerative job, move to the suburbs. Continuance of this trend is a serious obstacle to closing the gap between the suburban labor force and that in the cities.

There has, however, been a great deal of worker movement into and from the city over the past two decades. Occupational upgrading of the city labor force has been hindered not only by outmigration of highly skilled workers (largely whites) to the more affluent suburbs, but also by a substantial inmigration of unskilled, untrained Negroes (many of them coming from rural areas). Because it is mainly the younger whites who have been moving to the suburbs, white workers in the city tend to be older than white workers in the suburbs. In contrast, Negro workers in the city are relatively young. However, they often lack appropriate skills or edu-

A note concerning data

The labor force data discussed in this article were collected and tabulated for the Bureau of Labor Statistics by the Bureau of the Census as part of the Current Population Survey (CPS) program. The CPS is a national survey conducted monthly in about 50,000 households. The data for Standard Metropolitan Statistical Areas and their central cities and suburban rings have larger sampling errors than national data collected through the CPS, even when averaged over 12 months. For this and other reasons, the metropolitan area estimates in this article may differ somewhat from 1970 Census estimates that are scheduled to be released in 1972. This should be taken into account when making further use of the data.

Standard Metropolitan Statistical Areas as defined by the Office of Management and Budget consist of large cities and their adjacent suburban counties. Central cities include the corporate limits of the city or cities named in the SMSA title, while the suburban rings include all SMSA territory outside the central city or cities.

The metropolitan areas used in the report refer to the 212 SMSA's as defined and ranked in 1960. This means that for the purposes of this report the geographic boundaries of the 212 SMSA's are those which were in effect in 1960 even though, subsequently, the boundaries of some of these areas have been redefined to include additional counties or exclude counties. Since 1960, the number of areas defined to be metropolitan in character has been expanded to over 240. SMSA's added since 1960 are not included in the data in this report.

It should also be noted that the data in this report have been tabulated according to the place of residence of workers rather than their place of work.

Table 3. Employed persons in the 20 largest SMSA's, their central cities, and their suburban rings, by occupation, 1960 [1] and 1970 [2]

(Percent distribution)

Occupation group	20 largest SMSA's		Central cities of 20 largest SMSA's		Suburban rings of 20 largest SMSA's	
	1960	1970	1960	1970	1960	1970
Total employed (thousands)	22,287	26,180	11,628	11,223	10,659	14,957
Percent [3]	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	50.4	55.7	48.6	52.8	52.4	57.9
Professional and technical	13.6	16.5	11.9	14.4	15.4	18.0
Managers, officials, and proprietors	9.2	11.1	8.0	9.2	10.5	12.5
Clerical workers	19.3	21.4	21.0	23.4	17.5	19.9
Sales workers	8.3	6.7	7.6	5.7	9.0	7.5
Blue-collar workers	37.6	32.3	37.9	33.3	37.2	31.5
Craftsmen and foremen	14.5	12.5	12.7	11.0	16.5	13.7
Operatives	18.7	15.8	20.4	17.8	16.9	14.3
Nonfarm laborers	4.3	4.0	4.8	4.6	3.8	3.5
Service workers	11.3	11.7	13.4	13.8	9.1	10.1
Private household	2.2	1.5	2.5	1.8	1.9	1.3
Other service workers	9.1	10.2	10.9	12.0	7.2	8.8
Farm workers	.7	.4	.2	.1	1.2	.6

[1] 1960 Decennial Census data, collected in April 1960. Persons 14 and 15 years old are included (unlike the 1970 data collected by the CPS). However, the number of employed 14- and 15-year-olds is small and should have only minor effect on the distribution of employment.

[2] 1970 annual averages collected by the Current Population Survey.

[3] Percentage distribution of 1960 Census data is the distribution of those persons who reported an occupation.

cation for the many available jobs that call for managerial, professional, or technical personnel.

1960–70 changes in 20 SMSA's

Since 1960, the work force in our 20 largest metropolitan areas has grown numerically. Its quality, measured by its occupational distribution, has also increased. A decade ago, just half the employed in these areas were working in white-collar occupations; today, 56 percent of employment in these areas is white collar.

Within the white-collar sector, there has been a marked increase in the proportion of professional and managerial workers. The proportion of clerical workers has also increased, while the proportion of sales workers has decreased. This decline does not stem from a lack of proportionate growth in the number of sales jobs relative to other jobs. Instead, the decline can probably be attributed to the greater use by retail establishments of part-time sales personnel whose primary job is in another field.

While the percentage of white-collar workers increased during this period, there was a commensurate decline in the percentage of workers in the blue-collar sector. The proportion of service workers remained the same. (See table 3.)

Workers residing in the suburbs accounted for all the employment growth shown by the 20 largest SMSA's during the 1960's. Their number increased by about two-fifths and was accompanied by a general occupational upgrading of the labor force. Today, workers residing in the suburbs have a much higher representation in the major white-collar occupations (except as sales personnel) than they did in 1960. Today's suburban workers also have a smaller representation in all blue-collar jobs (particularly as craftsmen and operatives) than they had a decade ago. The proportion of private household workers and the proportion of farm workers have also declined in the suburbs since 1960.

Over the same period, the central city labor force declined slightly in size and exhibited a somewhat slower rate of occupational upgrading. The number of employed persons residing in the central cities of the 20 largest SMSA's declined by 400,000 (or nearly 4 percent) between 1960 and 1970. Although these workers have achieved a higher representation in professional, technical, and managerial occupations, the disparity in skill level between city and suburban residents is slightly greater today than a decade ago.

Occupation and joblessness

For several years, the unemployment rates in the central cities of metropolitan areas have been significantly higher than the jobless rates in suburban rings.[5] In 1970, for example, the jobless rate in all central cities combined was 5.6 percent, in all suburban rings combined 4.7 percent. Several hypotheses have been offered to explain the central city v. suburban differences in joblessness—a mismatch between skills and jobs, life style, and differential occupational status.

The mismatch hypothesis argues that the main cause of the urban unemployment problem is not a shortage of jobs, but a mismatch between the skill requirements of the jobs available in the central city and the actual skills of the resident labor force.[6] It argues that jobs in the central cities have been growing very slowly and those jobs that have been created are of a highly skilled, white-collar, "professional" character, for which central city residents do not have the training to compete successfully. It further maintains that jobs in the suburbs

have been growing extensively because of the relocation of manufacturing, retail trade, and services outside the city, and that many of these suburban jobs require the low skilled or semiskilled labor which city residents could provide.

A test of the validity of this hypothesis requires reliable data both on the skills of city workers and on the location and quality of job growth. A recent study undertaken with limited data concluded that a so-called job-worker mismatch in the city is largely imaginary.[7] It found that low skilled jobs had continued to grow in the central cities, though not as fast as in the suburbs. According to this study, based on data for 1965–67, almost enough jobs were being created in the cities studied to eliminate all unemployment even if all the jobless were semiskilled or low skilled workers. In light of this fact, the persistence of an unemployment gap between the central city and the suburbs was attributed largely to discriminatory employment practices.

The life style hypothesis is in direct opposition to the mismatch hypothesis. It argues that there is an abundance of unfilled low skilled job vacancies in or near city areas. It also holds, however, that most of these job vacancies are for jobs with low wages or bad working conditions. The availability of a large number of unfilled low skilled jobs has allegedly created excess labor demand and tends to make workers very independent of their employers, thus creating a high rate of voluntary termination.[8] This hypothesis also argues that many of the jobs that are concentrated in the cities (warehouses, maintenance services, and so on) are compatible with a high rate of worker turnover, which, in turn, is considered a norm in city slum areas.

According to this rationale, high unemployment in the inner city has been caused not only by the low skill level of the workers who live there, but mainly by their cultural norms and life style. As with the mismatch hypothesis, adequate testing of this argument cannot begin until data on the quality of the central city job growth become available.

Under the occupational hypothesis, the higher jobless rates in the city compared with the suburbs stem from the fact that the city has greater proportions of workers in those occupations with traditionally high unemployment rates (operative, nonfarm laborer, service, and so forth). Even when comparisons are made by broad occupational categories, central city unemployment rates are higher than suburban unemployment rates. (See table 4.)

The disparity between city and suburban unemployment rates by occupation must be attributed at least partly to the higher proportion of Negroes in the city labor force. This can be seen if we look at the central city and suburban occupational jobless rates by race. The absolute differences between city and suburban unemployment rates by race for most occupations are smaller than the differences for all races combined. Since Negroes generally have substantially higher unemployment rates than whites for the same occupation, their concentration in the city tends to increase the overall gap between the city and suburban occupational jobless rates.

Table 4. Unemployment rates by occupation for all SMSA's, their central cities, and their suburban rings, by occupation and color, 1970 annual averages

Occupational group	Total			White			Negro and other races		
	All SMSA's	All central cities	All suburban rings	All SMSA's	All central cities	All suburban rings	All SMSA's	All central cities	All suburban rings
1970									
All workers	5.1	5.6	4.7	4.7	4.9	4.5	8.1	8.3	7.4
White-collar workers	3.0	3.4	2.7	2.8	3.1	2.7	5.0	5.3	4.2
Professional and technical	2.2	2.5	1.9	2.2	2.5	1.9	2.1	2.4	[1]
Managers and officials	1.5	1.9	1.3	1.5	1.9	1.3	2.0	[1]	[1]
Clerical workers	4.1	4.3	3.9	3.8	3.8	3.8	6.9	7.0	6.3
Sales workers	4.0	4.5	3.6	3.7	4.0	3.5	8.9	9.5	[1]
Blue-collar workers	6.4	6.9	5.9	6.0	6.3	5.7	8.7	8.8	8.5
Craftsmen and foremen	3.8	4.4	3.5	3.7	4.3	3.4	5.2	4.8	6.8
Operatives	7.3	7.4	7.1	6.9	6.8	6.9	9.0	9.0	8.9
Nonfarm laborers	10.2	10.8	9.5	9.9	10.3	9.6	11.0	11.6	9.0
Service workers	5.4	5.6	5.2	5.0	4.9	5.1	6.7	6.8	6.6
Farm workers	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]

[1] Not shown where unemployment estimate is less than 5,000 or where labor force is less than 50,000.

[2] Rates for farm workers are not shown since these workers constitute a very minute percent of metropolitan employment.

This effect can most clearly be seen in the clerical, operative, and service occupations where Negroes are most concentrated.

A factor which may be influencing the disparity between central city and suburban jobless rates for the same occupation is that central city and suburban workers of the same broad occupational grouping may not have the same level of skills. Within the same broad occupational grouping the city workers may be in lower skilled suboccupations, with relatively higher unemployment rates, than suburban workers. This effect cannot be quantified with the limited occupational data available.

Notwithstanding that, for the same occupation, urban residents have higher unemployment rates than suburban residents, the occupational hypothesis seems to be supported by the data in tables 2 and 4. It would be spurious reasoning, nevertheless, to conclude that the central city-suburban jobless differential is attributable entirely to differences in the occupational levels of the respective labor forces.

Individual area highlights

Different political, social, and economic circumstances have contributed to the nature of the occupational distribution within each metropolitan area. Among these are:

1. The racial composition of the area's labor force. If the area (specifically the central city) houses a large proportion of minority workers, the occupational distribution of the labor force will gravitate toward the low skilled occupations.
2. The nature of the industries most important to the area's economy. Workers living in or near an area will generally be in occupations associated with the industries that dominate its economy.
3. The rate of labor force growth. In a period when the number of workers living in a particular area is expanding rapidly, the labor force tends to be relatively skilled, because usually only workers with high paying jobs can afford the housing and other economic amenities common to areas of this nature.
4. Delineation of the areas in question. Boundaries between central city and suburbs are drawn according to political criteria and not according to economic differentiation. Some central cities may be so defined as to contain large neighborhoods of "suburban" character, while the suburban rings of some SMSA's (especially the older ones on the Eastern seaboard and in the Midwest) may contain relatively large cities that share most of the problems of the urban cores.

The boundaries of the metropolitan areas listed in table 5 correspond to 1960 definitions. Since then, approximately half of these SMSA's have been redefined either to include additional suburban counties or to exclude counties. However, the effect on most areas is probably very slight. Table 6 shows the additions and deletions of territory since 1960 to the areas affected and the proportion of the 1970 SMSA population attributed to the change in definition.

Areas where white collars predominate

As table 5 shows, in eight metropolitan areas (New York, Los Angeles-Long Beach, San Francisco-Oakland, Washington, D.C., Minneapolis-St. Paul, Boston, Cincinnati, and Dallas), relatively large proportions of the work force—over 56 percent—are employed in white-collar jobs. In virtually all, no more than 30 percent of the workers are employed in blue-collar occupations.

New York. Because of the local concentration of corporate headquarters and other public and private offices in New York, both central city and suburban workers are primarily white collar. However, nearly half the central city white-collar workers are in clerical jobs, while two-thirds of the white-collar suburbanites are in professional, managerial, and sales occupations.

Since 1960, the number of workers living in New York's suburbs has grown extensively, by about 30 percent, while the number living in the city has not increased. However, work forces in both the central city and the suburbs have been occupationally upgraded during this period, at a fairly even rate, thus maintaining the relative skill relationships between residents of the two areas.

Los Angeles–Long Beach and San Francisco–Oakland. The relatively high proportion of professional, technical, and managerial workers in the Los Angeles and San Francisco SMSA's is a reflection of the industrial mix in the two areas. Los Angeles has many aerospace and research-related industries, while San Francisco has a heavy concentration of service-producing industries (transportation and public utilities, trade, finance, insurance,

and real estate, and government) that require white-collar workers. Both areas also have relatively large educational institutions, which employ large numbers of professional workers.

Los Angeles–Long Beach is an anomaly in that workers living in the city hold proportionately more highly skilled jobs than workers living in the suburbs.[9] This can be attributed in part to the fact that the suburban ring contains areas and cities[10] of an urban nature.

In both California metropolitan areas, suburban and central city workers have been occupationally upgraded fairly evenly since 1960. In San Francisco–Oakland, about the same proportion of city workers are in professional and technical occupations (19 percent) as in the suburbs. However, proportions of

Table 5. Total employment by occupation for the 20 largest SMSA's, their central cities, and their suburban rings, 1970 annual averages

[Percent distribution]

Occupation group	SMSA	Central city	Suburban ring	SMSA	Central city	Suburban ring	SMSA	Central city	Suburban ring	SMSA	Central city	Suburban ring
	NEW YORK			LOS ANGELES–LONG BEACH			CHICAGO			PHILADELPHIA		
Total employed (thousands)	4,517	3,132	1,385	3,364	1,281	2,083	2,865	1,366	1,499	1,876	777	1,099
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	60.1	59.1	62.3	56.1	59.0	54.3	53.9	48.9	58.6	52.6	46.8	56.6
Professional and technical	16.7	15.2	20.0	17.0	18.4	16.1	15.9	13.5	18.2	15.7	10.8	19.1
Managers, officials, and proprietors	11.9	10.8	14.6	12.4	12.9	12.1	10.5	7.2	13.5	9.8	7.1	11.8
Clerical workers	25.2	27.7	19.5	19.5	20.6	18.7	21.2	23.2	19.2	19.9	23.1	17.5
Sales workers	6.3	5.5	8.2	7.3	7.1	7.4	6.3	4.9	7.7	7.2	5.7	8.3
Blue-collar workers	27.5	28.0	26.5	32.3	29.3	34.2	35.5	39.8	31.4	36.0	39.8	33.4
Craftsmen and foremen	10.7	9.5	13.4	12.5	10.7	13.6	13.2	12.8	13.6	13.1	12.3	13.6
Operatives	13.9	15.6	10.1	16.1	15.1	16.7	18.0	21.5	14.8	18.9	22.2	16.6
Nonfarm laborers	2.9	2.9	3.0	3.8	3.6	3.8	4.2	5.5	3.0	4.1	5.3	3.2
Service workers	12.3	12.9	10.8	11.0	11.3	10.8	10.3	11.2	9.4	10.8	13.4	9.0
Private household workers	1.3	1.3	1.2	2.0	2.3	1.8	.8	.7	.9	1.5	1.7	1.5
Other service workers	11.0	11.6	9.6	9.0	9.0	9.1	9.5	10.5	8.4	9.3	11.7	7.5
Farm workers	.1	(1)	.3	.6	.4	.7	.3	(1)	.6	.6	(1)	1.0
	DETROIT			SAN FRANCISCO–OAKLAND			BOSTON			PITTSBURGH		
Total employed (thousands)	1,571	582	989	1,371	451	920	1,165	239	926	876	174	702
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	47.4	39.8	52.0	60.9	60.6	61.0	59.9	58.1	60.4	48.0	47.8	48.2
Professional and technical	13.5	10.2	15.5	19.1	19.7	18.9	18.3	15.5	19.1	15.5	13.5	16.1
Managers, officials, and proprietors	8.2	4.6	10.3	12.2	10.9	12.8	10.8	7.7	11.6	8.7	8.0	8.9
Clerical workers	20.1	20.4	19.9	22.9	24.3	22.3	23.6	30.0	21.9	16.8	21.1	15.6
Sales workers	5.6	4.5	6.3	6.7	5.8	7.1	7.1	4.9	7.6	7.0	5.2	7.5
Blue-collar workers	40.5	45.4	37.5	26.4	25.6	26.7	28.0	28.7	27.8	38.7	33.1	40.1
Craftsmen and foremen	14.7	12.7	15.9	11.2	8.7	12.4	11.5	10.8	11.7	16.8	13.0	17.8
Operatives	21.8	28.0	18.1	10.9	12.0	10.3	12.7	12.2	12.9	15.3	12.7	15.9
Nonfarm laborers	4.0	4.7	3.5	4.2	4.8	4.0	3.7	5.7	3.2	6.6	7.4	6.3
Service workers	12.0	14.9	10.2	12.0	13.7	11.2	11.9	13.1	11.6	12.7	19.0	11.1
Private household workers	1.6	1.8	1.5	1.9	2.5	1.6	.9	(1)	.8	1.6	(1)	1.6
Other service workers	10.4	13.1	8.7	10.1	11.2	9.6	11.0	(2)	10.8	11.1	(2)	9.6
Farm workers	(1)	(1)	(1)	.7	(1)	1.1	(1)	(1)	(1)	.6	(1)	.9
	ST. LOUIS			WASHINGTON, D.C.			CLEVELAND			BALTIMORE		
Total employed (thousands)	909	228	681	1,140	343	797	770	203	567	766	348	418
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	52.2	41.0	55.9	69.5	54.0	76.3	53.2	35.2	59.6	49.8	37.9	59.6
Professional and technical	14.1	8.0	16.2	25.3	15.0	29.7	12.8	7.9	14.4	15.0	10.1	19.1
Managers, officials, and proprietors	10.5	6.6	11.9	11.4	5.9	13.8	12.3	5.1	14.9	8.8	5.8	11.5
Clerical workers	19.6	21.1	19.1	26.9	28.7	26.2	21.4	17.3	22.8	20.2	18.0	21.8
Sales workers	8.0	5.4	9.0	5.9	4.3	6.5	6.8	4.9	7.6	5.8	4.1	7.4
Blue-collar workers	35.2	39.9	33.6	17.8	23.8	15.2	35.5	47.7	31.1	36.6	43.8	30.5
Craftsmen and foremen	13.1	10.9	13.8	8.6	7.0	9.3	14.0	13.7	14.1	13.9	13.2	14.4
Operatives	17.7	23.3	15.9	5.6	9.5	4.0	17.5	26.7	14.2	16.1	21.1	12.0
Nonfarm laborers	4.4	5.7	4.0	3.6	7.3	2.0	4.0	7.3	2.8	6.5	9.5	4.1
Service workers	12.2	19.1	9.8	12.5	22.1	8.4	11.2	17.1	9.2	13.4	18.3	9.2
Private household workers	1.5	3.3	1.0	2.4	4.5	1.5	.7	(1)	(1)	2.2	3.3	1.2
Other service workers	10.7	15.8	8.8	10.1	17.6	6.9	10.5	(2)	(2)	11.2	15.0	7.9
Farm workers	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

Table 5. Continued—Total employment by occupation for the 20 largest SMSA's, their central cities, and their suburban rings, 1970 annual averages

Percent distribution]

Occupation group	SMSA	Central city	Suburban ring	SMSA	Central city	Suburban ring	SMSA	Central city	Suburban ring	SMSA	Central city	Suburban ring
	NEWARK			MINNEAPOLIS–ST. PAUL			BUFFALO			HOUSTON		
Total employed (thousands)	752	92	660	759	291	468	509	167	342	758	550	208
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	52.0	27.4	55.6	56.3	52.5	58.7	53.7	48.0	56.0	50.2	54.8	38.8
Professional and technical	16.0	4.7	17.7	18.1	16.6	19.2	18.0	15.4	19.2	12.5	14.3	7.9
Managers, officials, and proprietors	11.6	(1)	13.0	11.0	6.9	13.6	9.8	5.6	11.7	11.0	12.3	7.5
Clerical workers	18.7	15.0	19.2	20.8	24.3	18.6	18.0	20.4	17.0	19.2	20.2	16.8
Sales workers	5.6	(1)	5.8	6.4	4.7	7.3	7.8	6.7	8.4	7.5	8.0	6.5
Blue-collar workers	38.1	55.9	35.6	28.9	30.0	28.1	34.5	36.8	33.6	36.0	30.7	49.5
Craftsmen and foremen	13.0	13.1	13.0	10.9	10.8	11.0	13.7	11.8	14.5	14.7	11.8	22.0
Operatives	21.1	34.3	19.2	14.0	14.6	13.6	16.1	19.1	14.8	16.3	13.5	23.4
Nonfarm laborers	4.0	8.5	3.4	4.0	4.5	3.7	4.8	5.9	4.2	5.0	5.4	4.2
Service workers	9.8	16.6	8.9	13.7	17.5	11.2	11.4	15.2	9.7	13.6	14.3	11.7
Private household	1.4	(1)	1.4	1.5	(1)	1.7	.9	(1)	(1)	2.7	3.3	(1)
Other service workers	8.4	(2)	7.6	12.2	(2)	9.5	10.5	(2)	(2)	10.9	11.0	(2)
Farm workers	(1)	(1)	(1)	1.0	(1)	1.7	(1)	(1)	(1)	(1)	(1)	(1)
	MILWAUKEE			PATERSON–CLIFTON–PASSAIC			CINCINNATI			DALLAS		
Total employed (thousands)	526	285	241	556	132	424	435	197	238	696	385	311
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White-collar workers	49.4	43.9	56.2	53.5	39.2	58.2	56.7	58.8	55.3	59.3	59.1	59.6
Professional and technical	13.4	12.1	15.0	13.9	12.8	14.4	18.7	22.6	15.4	16.0	14.7	18.2
Managers, officials, and proprietors	11.8	8.8	15.5	11.3	7.2	12.5	11.5	9.7	13.0	13.1	13.1	13.0
Clerical workers	16.8	16.7	16.7	20.9	14.4	22.9	19.3	20.4	18.3	21.7	22.0	21.2
Sales workers	7.5	6.3	8.6	7.3	4.7	8.3	7.2	6.2	7.7	8.4	9.2	7.4
Blue-collar workers	36.6	40.4	32.2	37.1	46.6	34.2	32.7	29.4	35.0	28.6	27.2	30.9
Craftsmen and foremen	14.0	14.8	12.9	14.2	11.8	14.9	12.3	10.2	13.8	11.4	8.8	15.2
Operatives	18.7	21.7	14.6	19.0	29.4	15.8	16.6	15.7	17.1	13.3	13.6	13.0
Nonfarm laborers	3.9	3.9	4.3	3.9	5.4	3.5	3.8	3.5	4.1	3.9	4.8	2.6
Service workers	13.9	15.7	11.6	9.4	14.2	7.8	9.5	11.8	8.1	11.5	13.5	8.2
Private household	1.4	(1)	(1)	1.3	(1)	1.2	2.0	2.7	(1)	1.9	2.0	(1)
Other service workers	12.5	(2)	(2)	8.1	(2)	6.6	7.5	9.1	(2)	9.6	11.5	(2)
Farm workers	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

[1] Percent not shown where employment estimate is less than 5,000.

[2] Percent not shown where private household employment estimate is less than 5,000.

managers, salesmen, and craftsmen are larger in the suburbs, as was the case in 1960.

Boston, Minneapolis–St. Paul, and Dallas. The high proportion of white-collar workers in Boston, Minneapolis-St. Paul, and Dallas is also attributable largely to the relative importance of the service-producing industries—especially trade and finance, insurance, and real estate. The high proportion of white-collar workers in these three areas (particularly in Minneapolis–St. Paul) may be explained in part by the great majority of workers residing in the central city being white. However, central city-suburban skill gaps of average magnitude are still evident in Boston and Minneapolis–St. Paul.

In Dallas, the number of workers has increased substantially in both the city and suburbs over the decade. The central city and suburban ring of the metropolitan area have also experienced nearly equal occupational upgrading during this period.

Cincinnati. The occupational distribution in the central city and the suburbs of Cincinnati is atypical, in that the proportion of workers in the professional and technical field is one-third larger in the city than in the suburban ring [11]. However, larger proportions of managers and craftsmen live in the suburbs. In both the city and suburbs, workers have been occupationally upgraded extensively since 1960, and the number of workers has also increased.

Washington, D.C. In the metropolitan area that includes the Nation's capital, seven-tenths of all workers are white-collar, with one-fourth in professional and technical occupations. This is, of course, a reflection of the dominant position of the

Federal Government in the area. The skill level of workers living in the Washington, D.C., suburban ring is the highest of all 20 suburbs: three-fifths of the workers are either professionals, technicians, managers, officials, or craftsmen.

Central city residents, though holding more skilled jobs in comparison with workers in many central cities, have a relatively small share of the higher skilled jobs available in the metropolitan area. In the District of Columbia itself (the central city), seven-tenths of the resident workers are Negro. Because of extensive migration during the past decade, both in and out, the present city residents show virtually no occupational upgrading over the 1960 residents.

Moderate proportions of both blue and white

Chicago, Philadelphia, St. Louis, Cleveland, Buffalo, and Houston have relatively moderate proportions of both blue-collar workers (around 35 percent) and white-collar workers (between 50 and 54 percent). No particular industry predominates in these areas, although, with the exception of Houston, manufacturing is relatively strong.

Chicago, Philadelphia, and Buffalo. In these three areas, about 55 percent of the workers living in the suburbs are employed in professional and technical, managerial, sales, and craftsmen occupations. In comparison, only about 37 percent of the workers who live in the central cities are in these occupations.

In all three areas, the number of workers living in the central city has not grown since 1960. In Philadelphia and Chicago, occupational upgrading of the work force has been slight; in Buffalo, more substantial. In comparison, the suburban work force in these areas has grown, both numerically and in terms of the proportion of higher skilled jobs.

Cleveland. Here the difference in occupational array between those living in the central city and in the suburbs is wide. Three-tenths of suburban workers are in professional and managerial occupations, but only one-eighth of all city workers. The majority of city workers (about two-thirds) are employed in blue-collar and service jobs.

St. Louis. The central city-suburban occupational gap is also wide in St. Louis. Suburban residents hold a disproportionate number of the skilled jobs available in the metropolitan area. The central city labor force has decreased both numerically and in terms of the proportion of skilled jobs since 1960. Migration of workers helps to explain the slight occupational downgrading of the inner city. A large

Table 6. Definitional changes in the 20 largest Standard Metropolitan Statistical Areas, 1960–70

SMSA	No change	Additions	Deletions	Percent to which use of 1960 boundary definitions overestimate (underestimate) 1970 population [1]	
				SMSA	Suburban ring
New York	No change				
Los Angeles–Long Beach			Orange Co.	+20	+37
Chicago	No change				
Philadelphia	No change				
Detroit	No change				
San Francisco–Oakland			Solano Co.	+ 5	+ 8
Boston		Sherborn Town, Middlesex Co. Millis Town, Norfolk Co.		−less than 1	−less than 1
Washington, D.C.		Loudoun Co., Va., Prince William Co., Va.		− 5	− 7
Pittsburgh	No change				
St. Louis		Franklin Co., Mo.		− 2	− 3
Newark	No change				
Cleveland		Geauga Co., Medina Co.		− 7	−11
Baltimore		Hartford Co.		− 6	−10
Minneapolis–St. Paul	No change				
Houston		Brazoria Co., Fort Bend Co., Liberty Co., Montgomery Co.		−12	−32
Dallas		Kaufman Co., Rockwall Co.		− 3	− 6
Paterson–Clifton–Passaic	No change				
Buffalo	No change				
Milwaukee		Ozaukee Co., Washington, Co.		− 8	−17
Cincinnati		Clermont Co., Ohio, Warren Co. Ohio, Dearborn Co., Ind. Boone Co., Ky.		−18	−26

[1] Positive percent denotes an overestimation and a negative percent denotes an underestimation.

SOURCE: 1970 Census of Population, Preliminary Report PC (P3)–3 (U.S. Department of Commerce, Bureau of the Census, 1971).

outmigration of white workers decreased the city labor force by one-fifth. Consequently, the city labor force became increasingly Negro, due both to the shift of white workers and inmigration of Negroes. Today, two-fifths of the city's workers are black.

Houston. Today, one-half of Houston's metropolitan work force is white collar. Workers living in the city are in white-collar and service jobs. About one-half of the workers in the suburban ring (as defined in 1960 [12]) are blue collar—the converse of the situation in most metropolitan areas. One reason for the high proportion of craftsmen and operatives in the suburban ring may be that over the last decade employment in contract construction and the oil industry has grown extensively in the Houston metropolitan area.

Newark and Paterson–Clifton–Passaic. In New Jersey's two largest metropolitan areas—Newark and Paterson–Clifton–Passaic—the occupational gap between the city and suburban work forces is wide. In both areas, employment is moderately heavy in both durable and nondurable goods manufacturing. The suburbs of both areas have fairly high proportions of professional and managerial workers, while the central cities are peopled mainly by blue-collar workers, especially operatives.

In the Paterson area, workers residing in either the city and suburbs have been occupationally upgraded only slightly since a decade ago. Most of the occupational change has been in movement of workers among the lower skilled occupations.

Workers in the Newark and Paterson metropolitan areas (especially in the city of Newark) are strongly represented in operative occupations. Moreover, about seven-tenths of the workers living in Newark are employed in blue-collar and service occupations, a slightly larger proportion than a decade ago. The relatively low skill level of workers in Newark's central city results in part from the inmigration of untrained Negroes and Puerto Ricans.

Areas with strong blue-collar orientation

In Detroit, Pittsburgh, Baltimore, and Milwaukee, one-half or less of the work force is employed in white-collar occupations. Stated conversely, at least half of the workers in these areas are in blue-collar and service occupations. In all of these SMSA's except Baltimore, employment is very heavy in the durable goods industries.

Detroit and Pittsburgh. About two-fifths of all metropolitan workers in Detroit and Pittsburgh are in blue-collar jobs. The influence of the automobile industry is strong in Detroit, with about 22 percent of the labor force being operatives. Close to one-half of the workers who live in Detroit's central city are in blue-collar jobs (mostly as operatives), and 15 percent are in service occupations.

Over half the workers living in Pittsburgh's central city and the same proportion in its surrounding suburban ring are in blue-collar and service occupations. Service workers living in the city account for one-fifth of total city employment. Pittsburgh has a higher proportion of blue-collar workers in the suburbs (40 percent) than in the city (33 percent). The suburban blue-collar workers, however, are more likely to be craftsmen and foremen and less likely to be nonfarm laborers.

Baltimore. In the Baltimore metropolitan area, one-half the labor force is in white-collar occupations. In the central city, this proportion is 38 percent and in the suburban ring 60 percent. About 30 percent of the suburban work force is in professional and managerial occupations—twice as large a proportion as that for the central city work force.

Since 1960, the labor force living in the Baltimore suburbs has grown extensively (passing the number of city workers) and has become increasingly white collar. On the other hand, the labor force living in the city has not grown nor shown any significant upgrading. Today, half the workers who live in Baltimore city are Negroes.

Milwaukee. In the Milwaukee SMSA, one-half of the labor force is in white-collar occupations. Its central city-suburban skill gap is not of the magnitude of Baltimore's, however. Because of the importance of durable goods manufacturing in this area, approximately one-third of the workers are employed as craftsmen and operatives.

Conclusions

Reflecting their important and growing role in the Nation's economy, metropolitan areas have larger proportions of professional and technical, managerial and official, and clerical workers than

other areas of the country. These areas (especially the 20 largest) are the Nation's centers of industrial and business activity, and their labor forces can be expected to lead the path of occupational evolution in the future as they have in the past.

So long as workers tend to move from the central city as their occupational level rises, the central city labor force will remain below that of the suburbs in terms of skill levels. This situation is unlikely to change until there are substantial changes in housing patterns and in socioeconomic conditions.

Earlier, it was concluded that in the 20 largest SMSA's the gap in skills between central city residents and those in the suburbs is only slightly larger today than a decade ago, notwithstanding significant upgrading in both SMSA components. However, in many individual SMSA's the gap has substantially increased over the decade.

The same factors that have affected the occupational gap in the past will probably continue to do so. Two interrelated factors—the racial composition of the city labor force and the rate of city-to-suburb migration—may have the most effect on the future occupational distribution of city workers and the chance of closing the gap in skills between them and their suburban counterparts. At present, the proportion of Negro workers in the central cities of the 20 largest metropolitan areas is about one-fourth. If the central city-suburban skill gap is to be narrowed, greater effort must be made to make city living attractive to skilled workers, to equip relatively unskilled city residents with sufficient skills to enable them to compete for good jobs, and to remove discriminatory hiring and housing practices. □

FOOTNOTES

[1] Data in this article on metropolitan areas refer to the 212 Standard Metropolitan Statistical Areas as defined in 1960. It should be noted that the data in this report represent the place of residence of workers rather than their place of work.

[2] Until recently, data on the occupational distribution of metropolitan workers have been available only from the decennial census and to a limited extent from the Urban Employment Survey (UES), which obtained some industry and occupational data on residents living in Concentrated Employment Program (CEP) areas of six major U.S. cities between July 1968–June 1969. See BLS Report 370, October 1969.

[3] These are the 20 largest SMSA's as defined and ranked in 1960. Data from the 1970 decennial census show that during the 1960's three SMSA's moved out of the top 20 (Cincinnati, Paterson–Clifton–Passaic, and Buffalo) and were replaced by Anaheim–Santa Ana–Garden Grove, Seattle–Everett, and Atlanta.

[4] See Dorothy K. Newman, "Decentralization of Jobs," *Monthly Labor Review*, May 1968, table 1, p. 8.

[5] See Paul O. Flaim, "Jobless Trends in 20 Large Metropolitan Areas," *Monthly Labor Review*, May 1968, pp. 16–28.

[6] Newman, op. cit.

[7] Study by Charlotte Fremon, "The Occupational Patterns in Urban Employment Change, 1965–67" (working paper) The Urban Institute, Washington, D.C., January 1970.

[8] See Peter B. Doeringer, "Labor Market Report from the Boston Ghetto," *Monthly Labor Review*, March 1969, pp. 55–56.

[9] Data from the 1960 Census show that this relationship was also true a decade ago.

[10] The suburban ring of the Los Angeles–Long Beach SMSA as defined in 1960 contained cities in Orange County, such as Anaheim, Fullerton, Garden Grove, Santa Ana, and so forth, with some urban characteristics. In 1963, Orange County was deleted from the Los Angeles SMSA and made a separate SMSA (Anaheim–Santa Ana–Garden Grove). Since the data in this article are based on 1960 definitions, these urban areas are included in the Los Angeles–Long Beach suburban boundaries.

[11] One reason for this may be the fact that the four counties added to the Cincinnati SMSA since 1960 are not included in the data in this article. These counties in 1970 housed one-fourth of the Cincinnati suburban population (table 6). Because of the absence of these counties from the suburban figures, the suburban proportion of professional and technical workers is no doubt understated.

[12] The Houston suburban ring as defined in 1960 did not contain four counties subsequently added to the SMSA. These counties in 1970 contained three-tenths of the Houston suburban population (table 6). The absence of these counties from the suburban figures shown here has no doubt affected the occupational distribution of the Houston suburban work force.

Employment and unemployment among Americans of Spanish origin

Quarterly publication of new series begins this month; data for 1973 show persons of Spanish origin had an unemployment rate of 7.5 percent, and were more likely to be jobless than white workers

ROBERTA V. McKAY

OF THE 6 MILLION Americans age 16 and over who identified themselves as being of Spanish origin or descent in 1973, an average of 3.6 million were in the labor force, and they had an unemployment rate of 7.5 percent. These are summary findings of a new Bureau of Labor Statistics data series on the employment status of Americans of Spanish origin, now available for the first time on a regular basis.

In the recent past, data on Americans of Spanish origin have been collected only once a year. Moreover, very little detail had been available on a consistent and continuous basis. Since March 1973, monthly information on labor force characteristics of the civilian noninstitutional population of Spanish origin 16 years of age and over have been tabulated separately by the Bureau of the Census as a part of the ongoing monthly survey of the Nation's labor force.[1] Under a program sponsored by the U.S. Department of Labor's Manpower Administration, these data will be published quarterly by the Bureau of Labor Statistics, beginning in April 1974.

This article introduces the continuous labor force data series for Americans of Spanish origin. It first traces the evolution of the self-identification method for classifying persons of Spanish origin and discusses a few of the major technical caveats. Its main focus, however, is on analyzing initial findings from the survey based on 1973 annual averages.[2]

Data comparability

Before 1973, the two major sources of published data on the labor force characteristics of persons of Spanish origin have been the decennial censuses and once-a-year supplements to the Current Population Survey (CPS) in 1969, 1971, and 1972.[3] In addition to labor force data, both the census and Current Population Survey supplemental series included data on a wide range of characteristics of the population.

The socioeconomic data collected during the decennial census were derived from a population universe based on a changing characterization of Spanish background and ethnicity. The earliest published social and economic data on Spanish ethnicity from decennial censuses were derived from questions on the country of birth of the individual (1850) and subsequently, birthplace of parents (1890). Still later, when the first direct question on Spanish ethnicity was introduced (1930), Mexican Americans were identified from a "race" question (a one-time question in which Mexican Americans were considered to be a racial group). In subsequent decennial years, the characterization of Spanish Americans was progressively expanded by including questions on Spanish mother tongue (1940) and (1950) classification by Spanish surname in the five Southwestern States where many Americans of Spanish origin reside. In 1970, Spanish Americans were identified by use of four identifiers: origin or descent, mother tongue, surname, and place of birth or parent's birth. Three of these definitions are utilized in defining Spanish heritage, a term used in many 1970 census reports.[4] The Spanish origin or descent definitions, used in many of the Census of Population Subject Reports, relies on self-identification of Spanish ethnicity.

In the annual ethnic origin supplement to the Current Population Survey, initiated in November 1969 and then conducted in March of 1971 and 1972, estimates have been based on the respondent's identifying himself as of Spanish origin or descent. Self-identification essentially consists of

Roberta V. McKay is an economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

From the *Review* of April 1974

asking all survey respondents, "What is . . .'s origin or descent?", with the enumerator coding according to seven Spanish categories.[5]

With changing terms and differing collection methods, the population counts resulting from the 1970 census and the estimates from the annual ethnic supplements to the Current Population Survey have varied widely. A lack of comparability between the census and the Current Population Survey and, over the past 5 years, within the Current Population Survey series has therefore emerged. The Current Population Survey estimates were found to yield differing population growth counts because of technical factors such as sample redesign (in 1972–73), reclassification of the origin of children under age 14, revision of Mexican-origin categories, and sampling variability.[6]

The new series

The new Spanish origin labor force estimates are derived from the ongoing monthly Current Population Survey, which collects information on labor force activities of all persons age 16 and over in the United States. The data on persons of Spanish origin in this article are somewhat limited in detail. The relatively small size of this group—less than 5 percent of the total population—particularly subjects these estimates to a high degree of sampling variability, that is, the variation that might occur by chance because only a sample of the population has been surveyed. Consequently, only the larger estimates can be reliably reported. However, the availability and use of annual averages serve to enhance data reliability, thus permitting a number of comparisons between the labor force experience of Spanish origin workers and other workers.[7]

Persons classified as of Spanish origin also are counted as white or black. For purposes of labor force analysis, persons of Spanish origin are tabulated separately, without regard to race. According to the 1970 census, approximately 98 percent of the population group is white. The size of the Spanish ethnicity component within each color group is not large enough to either affect the movement of the entire group or substantially bias any one estimate.[8]

(The comparisons in this article also introduce specially tabulated data for black workers from the Current Population Survey. Previously, only the "Negro and other races" classification, of which blacks comprise 89 percent, has been used in racial comparisons.)

Population and labor force

The 6 million persons 16 years and over of Spanish origin in 1973 accounted for 4 percent of the Nation's civilian noninstitutional population of this age group. The sex composition of the population was about the same as that of both racial groups, but persons of Spanish origin, like blacks, had a lower median age than the white population. Teenagers of Spanish origin comprised a proportion of their working age population nearly 1½ times that of their white counterparts.

Table 1. Employment status of persons of Spanish origin, whites, and blacks, by sex and age, annual averages, 1973
(In thousands)

Employment status	Total	Spanish origin	White	Black
TOTAL, 16 YEARS OLD AND OVER				
Civilian noninstitutional population	145,936	5,997	129,302	14,788
Civilian labor force	88,714	3,603	78,689	8,890
Percent of population	60.8	60.1	60.9	60.1
Employment	84,409	3,333	75,278	8,061
Agriculture	3,452	222	3,144	258
Nonagricultural industries	80,957	3,111	72,134	7,803
Unemployment	4,304	280	3,411	829
Unemployment rate	4.9	7.5	4.3	9.3
Not in the labor force	57,222	2,394	50,613	5,898
MALES, 20 YEARS OLD AND OVER				
Civilian noninstitutional population	60,943	2,425	54,503	5,662
Civilian labor force	49,539	2,084	44,490	4,430
Percent of population	81.3	85.9	81.6	78.2
Employment	47,946	1,973	43,183	4,170
Agriculture	2,500	167	2,269	193
Nonagricultural industries	45,445	1,806	40,915	3,977
Unemployment	1,594	111	1,307	260
Unemployment rate	3.2	5.3	2.9	5.9
Not in the labor force	11,404	341	10,013	1,232
FEMALES, 20 YEARS OLD AND OVER				
Civilian noninstitutional population	69,249	2,718	61,319	7,050
Civilian labor force	30,713	1,118	26,647	3,635
Percent of population	44.4	41.1	43.5	51.6
Employment	29,228	1,038	25,494	3,325
Agriculture	550	28	506	37
Nonagricultural industries	28,678	1,010	24,988	3,288
Unemployment	1,485	81	1,153	310
Unemployment rate	4.8	7.2	4.3	8.5
Not in the labor force	38,536	1,599	34,672	3,415
BOTH SEXES, 16 TO 19 YEARS OLD				
Civilian noninstitutional population	15,744	855	13,481	2,076
Civilian labor force	8,461	401	7,552	824
Percent of population	53.7	46.9	56.0	39.7
Employment	7,236	321	6,602	566
Agriculture	402	27	370	28
Nonagricultural industries	6,834	294	6,232	537
Unemployment	1,225	79	950	259
Unemployment rate	14.5	19.8	12.6	31.4
Not in the labor force	7,283	454	5,929	1,251

NOTE: Since persons of Spanish origin are also counted as white or black, 3 groups shown will not sum to total.

The Spanish origin civilian labor force averaged 3.6 million persons in 1973, composed of 2.1 million adult men, 1.1 million adult women, and 400,000 teenagers (table 1). In percentage terms, this age-sex distribution of the labor force was similar to that for whites. Compared with blacks, however, the work force of Spanish origin had a larger proportion of adult men and a smaller proportion of adult women.

On an overall basis, the labor force participation rates—the civilian labor force as a percent of population—of Spanish origin persons did not differ much from those of their white and black counterparts. In 1973, 60.1 percent of the Spanish origin were in the labor force, identical with the black proportion but slightly lower than that of white workers.

The major activity of persons in the three groups who were not participating in the labor force were likewise similar. (See table 2.) At least 7 out of 10 workers in each of the population groups cited home responsibilities or school as reasons for not working or looking for work.

The labor force participation rate of adult men of Spanish origin, at 85.9 percent in 1973, was above the 81.6-percent rate for white men and considerably higher than the 78.2 percent for black men. (See table 3.) At every age level, except for those age 65 and over, adult Spanish men were considerably more likely to participate in the labor force than black adult men. However, adult Spanish men participated at a higher rate than white men *only* in the age group 20 to 24 years—88.5 compared to 85.8 percent—reflecting the fact that a smaller proportion of Spanish men are still in school at that age.[9] The dominant influence on the differing overall labor force participation rates of adult men, Spanish versus white, has been the dissimilar age distributions of their populations and labor forces. Young adult men, who have higher participation rates than those age 55 years and over, comprise a relatively greater proportion of the Spanish origin than white population and labor force groups. The proportionately older age of white men serves to lower their overall participation rate.

The small proportion of adult men of Spanish origin who did not work or look for work was similar to that of whites and blacks. The main reasons were inability to work and voluntary idleness, retirement, waiting to enter school or Armed Forces, and discouragement over job prospects.

The labor force participation rate of Spanish teenage boys was 55.2 percent, less than that for whites but greater than that for blacks. When not in the labor force, Spanish teenage boys were as likely to be in school as other teenage boys.

Table 2. Major activity of persons not in the labor force, Spanish origin, whites, and blacks, by age and sex, annual average, 1973

Major activity	Spanish origin		White		Black	
	Age 16 to 19	Age 20 and over	Age 16 to 19	Age 20 and over	Age 16 to 19	Age 20 and over
TOTAL						
Not in the labor force (in thousands)	454	1,940	5,929	44,685	1,251	4,647
Percent distribution	100.0	100.0	100.0	100.0	100.0	100.0
Home responsibilities	19.6	76.1	12.7	69.9	13.5	61.9
School	62.9	3.9	71.6	3.8	70.4	5.3
Unable to work	2	6.0	5	5.0	5	11.5
Other	17.3	14.1	15.2	21.3	15.7	21.2
MALES						
Not in the labor force (in thousands)	185	341	2,551	10,013	542	1,232
Percent distribution	100.0	100.0	100.0	100.0	100.0	100.0
Home responsibilities	1.1	2.3	.6	1.8	.9	3.2
School	76.8	11.7	81.3	9.8	78.8	9.6
Unable to work	------	23.8	.7	14.1	.6	25.2
Other	22.1	62.2	17.4	74.3	19.7	62.0
FEMALES						
Not in the labor force (in thousands)	269	1,599	3,377	34,672	709	3,415
Percent distribution	100.0	100.0	100.0	100.0	100.0	100.0
Home responsibilities	32.1	91.9	21.8	89.6	23.0	83.1
School	53.7	2.2	64.3	2.0	64.0	3.8
Unable to work	.4	2.2	.4	2.4	.4	6.6
Other	13.8	3.8	13.5	6.0	12.6	6.5

Table 3. Civilian labor force participation rates of persons of Spanish origin, whites, and blacks, by age and sex, annual average, 1973

Age	Spanish origin		White		Black	
	Males	Females	Males	Females	Males	Females
Total, 16 years old and over	81.5	40.9	79.5	44.1	73.3	49.3
Both sexes, 16 to 19 years old	55.2	39.1	62.0	50.1	45.6	34.2
20 years old and over	85.9	41.1	81.6	43.5	78.2	51.5
20 to 24 years old	88.5	48.6	85.8	61.6	83.6	58.0
25 to 34 years old	94.3	44.0	96.3	48.5	91.8	62.7
35 to 44 years old	94.6	45.6	96.8	52.2	90.9	61.6
45 to 54 years old	91.5	45.2	93.5	53.4	87.5	56.1
55 to 64 years old	74.8	29.4	79.0	40.8	69.4	44.7
65 years old and over	21.5	7.1	22.8	8.7	22.4	11.4

At 41 percent, the labor force participation rate of adult women of Spanish origin was slightly lower than the participation rate of white women and considerably lower than that of black women. It was even below that of white teenage girls, a group whose participation has been among the lowest of all race-sex groups. The high degree of nonparticipation of Spanish women undoubtedly reflects the traditional role of women in the Spanish home.[10] Household responsibilities were the reason 92 percent of these women not in the labor force were neither working nor looking for work.

Although the major reason that teenage girls of Spanish origin were not in the labor force was "school," the proportion citing school was lower than that for white or black teenage females. Moreover, they were more likely to cite household responsibilities as keeping them from working or looking for work than did other teenage girls.

Employment

An average of 3.3 million persons of Spanish origin were employed in 1973. Adult men accounted for nearly 2.0 million of this number, adult women, 1.0 million, and teenagers, 320,000.

The occupational distribution of employed persons of Spanish origin was essentially similar to that of blacks, except that a smaller proportion of Americans of Spanish origin were employed in service occupations and slightly larger proportions were blue-collar and farm workers. The differences between the occupational distribution of white and Spanish workers are striking. Whereas two-thirds of Spanish workers were employed in blue-collar and service occupations and fewer than one-third held jobs in white-collar occupations, half of the whites held jobs in white-collar occupations. The proportion of Spanish workers in the professional and managerial occupations was less than half the proportion for white workers in such occupations. (See table 4.)

Underlying the occupational distribution of employed persons of Spanish origin were some important sex differences. Six out of 10 men of Spanish origin held jobs in blue-collar occupations, a proportion comparable to that of blacks but higher than the 46-percent figure for white men. White-collar employment among Spanish males was again roughly the same as for black men, but less than half the proportion of white men.

Women of Spanish origin were employed in blue-collar occupations to a greater extent than either white or black women. Thirty-five percent of women of Spanish origin compared with 16 percent of white and 19 percent of black women were so employed. A lesser proportion held jobs in white-collar occupations than white women. Forty percent of women of Spanish origin had white-collar jobs; 63 percent of white women did. But Spanish women were only half as likely as black women to work in service occupations, including domestic jobs. These sex differences help to explain the more than proportional concentration of Spanish workers in blue-collar occupations, white workers in white-collar occupations, and black workers in service occupations.

Unemployment

Unemployment is a severe problem for persons of Spanish origin. In 1973, an average of 270,000 were jobless. At 7.5 percent, their unemployment rate was more than halfway between the 4.3-percent rate for white workers and the 9.3 percentage for blacks. Workers of Spanish origin accounted for over 6 percent of total unemployment but only 4 percent of the labor force.

Table 4. Employment and unemployment rates, experienced workers only of Spanish origin, whites, and blacks, by occupation, annual average, 1973

Occupation	Employment (Numbers in thousands)			Unemployment rate (Percent of labor force)		
	Spanish origin	White	Black	Spanish origin	White	Black
Total experienced workers	3,333	75,278	8,061	6.6	3.7	7.8
Percent distribution	100.0	100.0	100.0			
White-collar workers	28.9	49.8	28.6	4.3	2.7	6.7
Professional and technical	6.5	14.4	8.5	3.3	2.0	4.5
Managers and administrators, except farm	5.5	10.0	3.5	1.4	1.4	2.2
Sales workers	3.7	6.9	2.1	5.9	3.4	11.5
Clerical workers	13.2	17.5	14.5	5.5	3.8	8.2
Blue-collar workers	49.8	34.7	42.3	7.7	5.0	8.0
Crafts and kindred workers	13.0	13.9	8.8	6.4	3.6	5.3
Operative, except transport	24.3	12.5	17.5	8.3	5.6	9.4
Transport equipment operatives	4.5	3.7	5.8	4.4	3.9	5.1
Nonfarm laborers	8.0	4.6	10.2	9.5	8.1	9.5
Service workers	15.8	11.7	26.4	6.2	5.0	8.7
Private household	1.8	1.1	6.3	3.2	2.9	6.8
Other service workers	14.0	10.6	20.1	6.6	5.2	9.2
Farm workers	5.6	3.7	2.7	8.7	2.2	6.0

As with the total population, men, women, and teenagers of Spanish origin are not equally affected by unemployment. The jobless rate for adult men averaged 5.3 percent, while the rates were 7.2 percent for adult women and 19.8 percent for teenagers. These unemployment rates were higher than those for whites for each age-sex group, but lower than those for blacks (table 5).

The burden of joblessness among persons of Spanish origin can also be demonstrated by the use of a Spanish-white unemployment rate ratio, similar to that commonly used to examine the relationship between black and white unemployment. The ratio of Spanish to white unemployment rates of 1.7:1 indicates that relative to the sizes of their respective labor forces, for every 10 white workers unemployed there were 17 unemployed workers of Spanish origin. This was considerably less than the 2.2:1 black-white ratio in 1973. However, for adult men in prime working years—ages 25 to 54—Spanish-white ratio was 2.0:1, about the same as the black-white ratio.

Table 5. Unemployment rates and ratios, persons of Spanish origin, whites and blacks, by age and sex, annual average, 1973

Age and sex	Unemployment rate			Ratio	
	Spanish origin	White	Black	Spanish-white	Black-white
Total, 16 years and over	7.5	4.3	9.3	1.7:1	2.2:1
Both sexes, 16 to 19 years	19.8	12.6	31.4	1.6:1	2.5:1
Males, 20 years and over	5.3	2.9	5.9	1.8:1	2.0:1
20 to 24 years	8.2	6.5	12.8	1.3:1	2.0:1
25 to 54 years	4.6	2.3	4.6	2.0:1	2.0:1
55 years and over	5.2	2.5	3.2	2.1:1	1.3:1
Females, 20 years and over	7.2	4.3	8.5	1.7:1	2.0:1
20 to 24 years	9.0	7.0	18.3	1.3:1	2.6:1
25 to 54 years	7.0	4.0	7.0	1.8:1	1.8:1
55 years and over	4.5	2.7	3.4	1.7:1	1.3:1

The new current labor force data available for 1973 tend to confirm the results of earlier surveys on the labor force characteristics of workers of Spanish origin. Joblessness affects a significantly higher proportion of Spanish than white workers, but their unemployment rates are lower than those for black workers. Adult men of Spanish origin are more likely than black men to participate in the labor force, but with the exception of those 20 to 24 years old, their labor force participation rates are lower than those of their white counterparts in every age group. Moreover, adult Spanish women participate to a lesser degree than both black and white workers. □

FOOTNOTES

[1] For a detailed description of the Current Population Survey, see *Concepts and Methods Used in Manpower Statistics from the Current Population Survey*, Report 313 (Bureau of Labor Statistics, 1967). This report is available from the Bureau on request.

[2] Although collection of the data began in March of 1973, a 12-month series is provided which includes estimated levels for January and February.

[3] See *Persons of Spanish Origin in the United States: November 1969, Current Population Reports, Population Characteristics*. Series P-20, No. 213 and No. 249 (Bureau of the Census, 1971). See also *Census of Population: 1970, Subject Reports, Persons of Spanish Origin*, Series PC(2)-1C (Bureau of the Census, 1973).

[4] Spanish heritage includes persons with the following characteristics: persons of Spanish language (Spanish mother tongue and all other persons in families in which the head or the wife reported Spanish spoken in the home as a child) and persons of Spanish surname in the five Southwestern States of Arizona, California, Colorado, New Mexico, and Texas; persons of Puerto Rican birth or parentage in the three Middle Atlantic States of New Jersey, New York, and Pennsylvania; persons of Spanish language in the remaining 42 States and the District of Columbia.

[5] The seven Spanish origin categories are Mexican American, Chicano, Mexican (Mexicano), Puerto Rican, Cuban, Central or South American, and "Other Spanish."

[6] The most significant of these technical adjustments took place between March 1972 and March 1973, resulting in a gross population increase of 1.4 million. The basis for these changes and their impact on the population estimates have been detailed in a recent Census Bureau report. See *Persons of Spanish Origin in the United States: March 1973* (Advance report), *Current Population Reports, Population Characteristics*, Series P-20, No. 259 (Bureau of the Census, 1974).

[7] Sampling errors for Spanish estimates may be obtained from the author upon request.

[8] In the 1970 Decennial Census of Population, it was found that the proportion of Negroes among persons of Spanish origin at the national level is probably in the range of 1½ to 2 percent. See *Census of Population: 1970, Subject Reports, Persons of Spanish Origin, Series* PC(2)-1C (Bureau of the Census, 1973) and its addendum issued August 1973.

[9] See Anne M. Young, "The high school class of 1972: more at work, fewer in college" *Monthly Labor Review*, June 1973, pp. 26-32.

[10] For a discussion of labor force participation rates of American women of Spanish origin in terms of number of children, see Paul M. Ryscavage and Earl F. Mellor, "The economic situation of Spanish Americans," *Monthly Labor Review*, April 1973, pp.3-9.

Multiple jobholding in 1970 and 1971

Special Labor Force Report, based on May 1971 survey, shows moonlighters earned an average of $30 a week on second jobs

HOWARD V. HAYGHE AND KOPP MICHELOTTI

THE NUMBER AND PROPORTION of American workers who held two jobs or more in May 1971 were virtually unchanged from May of 1969 and 1970, even though the unemployment rate increased sharply over that period. In May 1971, 4 million or 5.1 percent of all employed workers had two jobs or more.

The multiple jobholding rate for men has remained more than double that for women and the rate for whites continues to be higher than for workers of Negro and other races. Between May of 1970 and 1971, the number with two wage or salary jobs in the nonagricultural sector was unchanged. A small decline in the number with one job in agriculture was offset by an increase in the number combining wage or salary jobs with self-employment. (See box.)

This report on multiple jobholders, frequently called moonlighters, includes a discussion of the relationship between the unemployment rate and multiple jobholding, earnings of multiple jobholders on their second jobs, and seasonality and trends in multiple jobholding.[1]

Unemployment and moonlighting

The increase in unemployment during the past 2 years again has focused interest on the relationship between unemployment and multiple jobholding rates. The unemployment rate increased from 2.9 percent in May 1969 to 4.1 percent a year later and reached 5.3 percent in May 1971. In each of these months, however, the multiple jobholding rate was either 5.1 or 5.2 percent.

Based on the limited number of over-the-year comparisons available for the same month and one comparison over a 3-year period, changes in multiple jobholding rates appear to be unrelated to changes in unemployment rates. (See chart 1.) Of the 10 pairs of observations covering a span of 15 years, in only three periods did significant changes in the same direction occur in both multiple jobholding and unemployment rates (in years ending in 1963, 1964, and 1966). In two periods (ending

Survey definitions

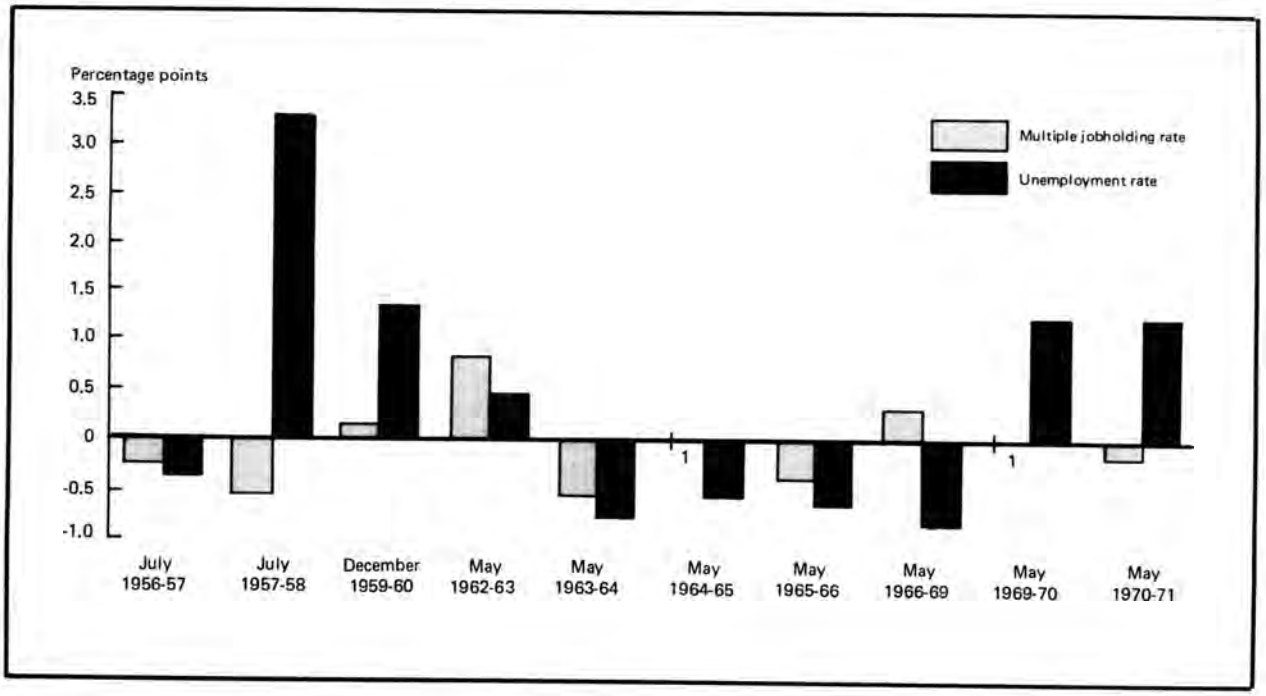
For purposes of this survey, multiple jobholders are defined as those employed persons who, during the survey week, (1) had jobs as wage or salary workers with two employers or more, (2) were self-employed and also held wage or salary jobs, or (3) worked as unpaid family workers but also had secondary wage or salary jobs. The primary job is the one at which the greatest number of hours were worked. Also included as multiple jobholders are persons who had two jobs during the survey week only because they were changing from one job to another. This group is very small—only 1 percent of all multiple jobholders in May 1969.

Persons employed only in private households (as a maid, laundress, gardener, babysitter, and so on) who worked for two employers or more during the survey week were not counted as multiple jobholders. Working for several employers was considered an inherent characteristic of private household work rather than an indication of multiple jobholding. Also excluded were self-employed persons with additional farms or businesses, and persons with second jobs as unpaid family workers.

Howard V. Hayghe and Kopp Michelotti are economists in the Division of Labor Force Studies, Bureau of Labor Statistics.

From the *Review* of October 1971

Chart 1. Comparison of changes in multiple jobholding and unemployment rates



in 1958 and 1969), the unemployment rates and multiple jobholding rates moved in opposite directions. In the remaining five periods, in which the unemployment rate increased in three and decreased in two, the multiple jobholding rates remained essentially unchanged.

Personal characteristics

Multiple jobholding is almost entirely a male phenomenon. In May 1971, only 765,000 out of a total of 4 million multiple jobholders were women. Although there was no overall change in the number of multiple jobholders between May 1970 and May 1971, the number of women with two jobs or more rose by about 130,000 while the number of men with two jobs declined correspondingly. The multiple jobholding rate for women, at 2.6 percent, was higher than in May 1970, as shown in table 1. The rate for men, on the other hand, decreased slightly over the year to 6.7 percent from 7.0 percent.

Multiple jobholding was most prevalent among employed men 25 to 44 years old; 7.9 percent of these men, representing over half of all male multiple jobholders, held more than one job in May 1971. It is not surprising that the rate for men in these ages is higher than for older or younger men. Almost 9 out of 10 of all employed men in the central age group were married and most had children under age 18. Thus, for many, the need for additional income was strong enough to induce them to seek second jobs. A recent survey showed that half the male moonlighters gave meeting household needs or paying off debts as reasons for holding more than one job.[2]

Married women who work generally have family responsibilities which preclude holding more than one job. Thus, the multiple jobholding rate for married women was lower than that for other women. Also, a smaller proportion of female than male moonlighters, about 50 and 90 percent respectively, were married, reflecting in part the household responsibilities of married female workers.

The likelihood of the husband working at two jobs does not appear to be affected by the presence of the wife in the labor force. The multiple jobholding rate for married men whose wives were in the work force was about the same as for those whose wives were not.

There is a sharp difference in the proportions of male and female multiple jobholders who combine a full-time job with a part-time job. The following tabulation shows that in May 1971 the largest proportion of men who moonlighted worked full time

on their first job and part time on their second:

	Men	*Women*
Total	100	100
Worked at two part-time jobs	19	52
Worked full time on first job and part time on second	75	47
Worked at two full-time jobs	6	1

It should be noted that, among the women, about the same proportions worked at two part-time jobs or combined a full-time with a part-time job.

Industry and occupation

One-half of all multiple jobholders worked in manufacturing or in service and finance on their first jobs. This reflected the fact that more persons work in these two industries than in any others, rather than high proportions of the workers in these industries holding second jobs. (Multiple jobholding rates in these two industries were about average.) Rates significantly above average are found among workers whose first jobs are in public administration, and in transportation and public utilities.

The multiple jobholding rate of men was highest in May 1971 for those whose primary jobs were in State and local government, 15 percent. The multiple jobholding rates of postal service workers and those in educational services were about as high. In comparison, those who worked in mining had a rate of only 4 percent.

By occupation, men who were employed on their primary jobs as teachers or as protective service workers (guards, policemen, and firemen) had the highest multiple jobholding rates—18 and 16 percent, respectively. Laborers and waiters, cooks, or bartenders had the lowest multiple jobholding rates, at about 4 percent.

The opportunity to work at a second job may be just as important a factor in multiple jobholding as the need for extra income. Many of the workers in the industries and occupations where multiple jobholding rates are high have flexible hours on their principal jobs as among farmers, or working hours are different from the usual ones, as for many postal and protective service workers.

About one-third of the multiple jobholders worked at wage or salary jobs in service and finance on their second jobs. An additional 15 percent took second jobs in retail trade. It is not surprising that large proportions found jobs in these industries, because they typically provide the part-time or off-hours jobs that multiple jobholders seek. About one-third of the multiple jobholders were self-employed in farm and nonfarm industries on their second jobs. Between May 1970 and 1971, the number of self-employed in nonagricultural industries rose by 166,000 to 728,000 (table 2). Almost all of the increase was among those who had their own businesses in trade and service industries. It may be that some persons who wanted but could not find a second

Table 1. Employed persons with two jobs or more, by sex, race, and unemployment rates, 1955–70

[In percent]

Date	Number (thousands)	Multiple jobholding rate [1]					Unemployed as percent of civilian labor force [2]
		Both sexes	Men	Women	White	Negro and other races	
July 1956	3,653	5.5	6.9	2.5	([3])	([3])	4.4
July 1957	3,570	5.3	6.6	2.5	([3])	([3])	4.1
July 1958	3,099	4.8	6.0	2.2	([3])	([3])	7.4
December 1959	2,966	4.5	5.8	2.0	4.6	4.2	5.1
December 1960 [4]	3,012	4.6	5.9	2.0	4.6	4.1	6.4
May 1962	3,342	4.9	6.4	2.0	4.9	4.6	5.1
May 1963	3,921	5.7	7.4	2.4	5.7	5.2	5.5
May 1964	3,726	5.2	6.9	2.1	5.3	4.7	4.8
May 1965	3,756	5.2	6.7	2.3	5.3	4.0	4.3
May 1966	3,636	4.9	6.4	2.2	5.0	4.3	3.7
May 1969	4,008	5.2	6.9	2.3	5.3	4.5	2.9
May 1970	4,048	5.2	7.0	2.2	5.3	4.4	4.1
November 1970	3,832	4.9	6.3	2.5	5.0	3.4	5.5
May 1971	4,035	5.1	6.7	2.6	5.3	3.8	5.3

[1] Multiple jobholders as percent of all employed persons.
[2] Not seasonally adjusted.
[3] Data not available.
[4] Data for Alaska and Hawaii included beginning 1960.

Table 2. Type of industry and class of worker of primary and secondary jobs for persons holding two jobs or more, May and November 1970 and May 1971

[Numbers in thousands]

Date, type of industry, and class of worker of primary job	Total employed	Persons holding two jobs or more		Type of industry and class of worker of secondary job					
				Agriculture			Nonagricultural industries		
		Number	Percent of total employed	Total	Wage and salary workers	Self-employed workers	Total	Wage and salary workers	Self-employed workers
MAY 1970									
Total	78,358	4,048	5.2	738	122	616	3,310	2,748	562
Agriculture	3,725	276	7.4	71	47	24	205	196	9
Wage and salary workers	1,200	89	7.4	44	20	24	45	36	9
Self-employed workers	1,927	154	8.0	27	27	[1]	127	127	[1]
Unpaid family workers	598	33	5.5	----	----	[2]	33	33	[2]
Nonagricultural industries	74,633	3,772	5.1	667	75	592	3,105	2,552	553
Wage and salary workers	68,905	3,570	5.2	661	69	592	2,909	2,356	553
Self-employed workers	5,226	194	3.7	6	6	[1]	188	188	[1]
Unpaid family workers	502	8	1.6	----	----	[2]	8	8	[2]
NOVEMBER 1970									
Total	78,740	3,832	4.9	614	88	526	3,218	2,648	570
Agriculture	3,228	198	6.1	44	26	18	154	149	5
Wage and salary workers	1,042	51	4.9	26	8	18	25	20	5
Self-employed workers	1,762	129	7.3	18	18	[1]	111	111	[1]
Unpaid family workers	424	18	4.2	----	----	[2]	18	18	[2]
Nonagricultural industries	75,512	3,634	4.8	570	62	508	3,064	2,499	565
Wage and salary workers	69,613	3,443	4.9	563	55	508	2,880	2,315	565
Self-employed workers	5,355	180	3.4	7	7	[1]	173	173	[1]
Unpaid family workers	544	11	2.0	----	----	[2]	11	11	[2]
MAY 1971									
Total	78,708	4,035	5.1	700	96	604	3,335	2,607	728
Agriculture	3,598	217	6.0	66	41	25	151	147	4
Wage and salary workers	1,245	65	5.2	38	13	25	27	23	4
Self-employed workers	1,812	129	7.1	20	20	[1]	109	109	[1]
Unpaid family workers	541	23	4.2	8	8	[2]	15	15	[2]
Nonagricultural industries	75,110	3,818	5.1	634	55	579	3,184	2,460	724
Wage and salary workers	69,150	3,641	5.3	629	50	579	3,012	2,288	724
Self-employed workers	5,429	167	3.1	4	4	[1]	163	163	[1]
Unpaid family workers	531	10	1.9	1	1	[2]	9	9	[2]

[1] Self-employed persons with a secondary business or farm, but no wage or salary job, were not counted as multiple jobholders.

[2] Persons whose primary job was as an unpaid family worker were counted as multiple jobholders only if they also held a wage or salary job.

wage or salary job turned to self-employment in order to earn additional income.

Half the women who were multiple jobholders were employed in service and finance on their secondary jobs, compared with a quarter of the men, and a much larger proportion of women than men worked in trade. In contrast to the men, about a fifth of whom were employed in agriculture on their secondary jobs, nearly all of the women had second jobs in nonagricultural industries.

Greater proportions of Negro [3] than white moonlighters have second jobs in service industries, and smaller proportions are self-employed. In May 1971, 39 percent of the Negroes, but about 29 percent of the white multiple jobholders worked in the service industries. Only 24 percent of the Negroes were self-employed on the second job, compared with 34 percent of the whites.

Multiple jobholders do not tend to work in the same major occupational groups on their secondary jobs as on their primary jobs, with one exception. A majority of the professional and technical workers who held at least two jobs were employed in the same occupational group on both jobs. About a third of the service workers (except private household) worked in the same occupational groups on their second jobs. In none of the other occupation groups did more than one-fourth of the workers do the same kind of work on both jobs.

Blue-collar workers on their first jobs were more often farmers or farm managers on their second jobs than persons in other occupations. Nearly a quarter

of the blue-collar workers—compared with fewer than 10 percent of the professional, clerical, and service workers—operated farms on their secondary jobs. Similarly, 35 percent of those who were farmers and farm managers on their first jobs worked as craftsmen or operatives on their second jobs. Many of the construction and maintenance skills that are needed on the farm can be used off the farm as well.

The difference by race in the occupational distribution of multiple jobholders on their second jobs corresponds roughly to the differences in occupations by race of all workers. Thus, white dual jobholders are considerably more likely to work in white-collar occupations, especially as managers, than their Negro counterparts. About 46 percent of the whites worked at white-collar jobs on their second jobs, compared to 31 percent of the Negroes.

At the same time, proportionately over twice as many Negroes as whites worked in service occupations on their second jobs. The same proportions of whites and Negroes were blue-collar workers on their second jobs.

Earnings on secondary jobs

Before the May 1970 survey, there was no information on a nationwide basis on how much moonlighters earned on their second jobs. Data obtained in May of 1970 and 1971 indicate that multiple jobholders who were wage or salary workers on their second jobs had median earnings of $30 on those jobs during the survey week. (See table 3.)

On average, men earn more than women in their primary jobs; this tendency also prevailed among multiple jobholders. Thirty-four percent of the men, but only 10 percent of the women, added at last $50 to their weekly income through moonlighting in May 1971. Earnings of under $20 were reported by one-fourth of the men and one-half of the women. Median earnings on the second job were $35 for men and $19 for women. These sharp differences reflect the variation in the distributions of occupations and industries in which men and women find secondary jobs, and the difference in the number of hours they work at these jobs.

Earnings depend not only on the rate of pay but also on the number of hours worked. During the May 1971 survey week, men worked a median of 13 hours on their second wage or salary jobs, in contrast to 9 hours for women. Only 7 percent of the women worked as many as 22 hours, while one-fifth of the men worked at least this long at secondary wage or salary jobs.

For both men and women, secondary job earnings increased as hours worked increased. The following tabulation shows that median weekly earnings for persons who worked 22 to 34 hours on their second jobs were about four times as high as earnings of those who worked 1 to 7 hours.

	Both sexes	*Men*	*Women*
1 to 7 hours	$15	$17	$12
8 to 14 hours	26	28	20
15 to 21 hours	43	46	34
22 to 34 hours	61	62	(1)

[1] Median not shown where base is less than 75,000.

By age and marital status. Wage or salary earnings on the second jobs of men in the central age groups tended to be higher than those of younger men. About 24 percent of the men 25 to 44 years old earned $70 or more on their second jobs during the survey week, and a similar proportion of men 45 to 64 years old earned as much (table 3). On the other hand, much smaller proportions of the men 20 to 24 years old and of male teenagers earned as much as $70. About three-fourths of the teenagers earned under $20, reflecting the relatively small number of hours that they worked on their second jobs.

Married men earned twice as much as single men—$37 and $18, respectively. This is not surprising since men in the central age groups had the highest earnings and most of these men were married.

By industry and occupation. Men with secondary jobs in educational services and in manufacturing earned substantially more than the average moonlighter. One-third of the men working in these industries earned $70 or more on their second jobs during the survey week, compared with only one-fifth of those in service (other than educational) and one-tenth of those in trade. The longer-than-average hours worked by men in manufacturing help to account for their higher than average weekly earnings. On the other hand, the high earnings of men in educational services, many of them teachers, reflect high hourly rates of pay since they worked fewer hours than average. Men with secondary jobs in finance and in agriculture had the lowest earnings. Almost half of those in finance and two-thirds of those in agriculture earned less than $20 during the survey week.

Relatively high earnings were most frequent among men who were professional and managerial workers on the second job. A third of each earned at least

Table 3. Wage or salary earnings on second job for persons holding two jobs or more, by age, sex, and marital status, May 1971

[Percent distribution]

Age, sex, and marital status	Total	Weekly earnings on second job						Median earnings
		Under $20	$20 to $29	$30 to $39	$40 to $49	$50 to $69	$70 or more	
BOTH SEXES								
Total	100.0	32.0	17.7	13.0	8.7	12.7	15.9	$30
MEN								
Total, 16 years old and over	100.0	25.6	17.2	13.6	9.1	15.0	19.5	$35
16 to 19 years	100.0	74.0	15.9	3.1	1.3	4.0	1.7	$14
20 to 24 years	100.0	32.1	20.6	13.4	10.1	11.9	11.9	$28
25 to 44 years	100.0	21.8	17.0	13.1	9.3	14.7	24.1	$38
45 to 54 years	100.0	14.8	13.5	18.2	13.7	18.9	20.9	$42
55 to 64 years	100.0	19.4	19.0	14.9	4.4	23.8	18.5	$37
65 years and over	(1)							(1)
Single	100.0	53.9	16.5	6.8	5.0	6.8	11.0	$18
Married, spouse present	100.0	21.5	17.1	14.9	9.7	16.0	20.8	$37
Other marital status	(1)							(1)
WOMEN								
Total, 16 years old and over	100.0	52.2	19.5	11.1	7.4	5.3	4.5	$19
16 to 24 years	100.0	64.5	22.7	5.7	2.8	3.5	.7	$15
25 to 44 years	100.0	42.1	15.7	10.3	14.4	9.2	8.3	$25
45 to 64 years	100.0	51.7	22.1	16.8	3.4	2.7	3.4	$19
65 years and over	(1)							(1)
Single	100.0	62.2	18.9	6.7	2.9	5.6	3.7	$16
Married, spouse present	100.0	48.0	20.2	11.9	9.3	5.6	4.9	$20
Other marital status	100.0	46.9	19.0	15.4	9.8	4.0	4.9	$21

[1] Percent and median not shown where base is less than 75,000.

NOTE: Because of rounding, sums of individual items may not equal totals.

$70 on their extra jobs during the survey week. The high earnings of the professionals reflect their high wage rates since they worked fewer hours than average. In contrast, only one-fifth of the sales workers earned as much as $50; the median number of hours worked by sales workers was about equal to the average on the second job for all workers.

By earnings on primary job. The multiple jobholders with the highest weekly wage or salary earnings on the primary job tended to have the highest earnings on their second jobs. Median weekly earnings on the second job in May 1971 increased from $14 for men who earned under $60 a week on their first job to $52 for those who earned $200 or more, as shown in the following tabulation:

Weekly earnings on primary job	*Median weekly earnings on secondary job*	*Percent of earnings on primary job*
Less than $60	$14	50
$60–$99	33	40
$100–$124	27	24
$125–$149	36	26
$150–$199	38	22
$200 or more	52	23

Among the men earning $200 a week or more on their primary jobs, 22 percent made at least $100 on their second job, in contrast to only 6 percent of those who primary jobs were less remunerative.

The tendency for the high earners on first job also to earn the most on the second job is to be expected since they may be assumed to have highly valued skills. They are also less likely than others to be moonlighting to meet regular household expenses and therefore may be more selective in their choices of secondary jobs.

Although low earners on the first job also earned comparatively little on the second job, the supplemental earnings were a much larger proportion of their basic earnings than they were for the much better paid men. Men who earned between $60 and $99 on their primary jobs averaged an additional 40 percent on their second jobs; for those who earned $150 or more, the average earnings on the second job were less than one fourth of their primary job earnings.

Trends

In most of the years since 1962, data on multiple jobholding have been obtained for the month of May. Over this period, the number of moonlighters gen-

erally fluctuated within a narrow range. It reached the decade's high of 4 million in May 1969 and remained at that level in May 1970 and May 1971, about 700,000 more than in 1962. During this period, the multiple jobholding rates remained relatively constant, at about 5 percent.

Most of the increase in the total number of multiple jobholders between May 1962 and May 1971 was among persons who were wage and salary workers in nonfarm industries on both their first and second jobs (table 4). Nearly 2.3 million multiple jobholders held two such jobs in May 1971; they represented 57 percent of all multiple jobholders, up from 52 percent in May 1962.

About 900,000 workers combine a wage or salary job with self-employment in nonfarm industries. Examples of persons in this group are policemen, firemen, postal workers, and teachers who on their second jobs drive their own taxis, do home maintenance or repair, or are free lance writers or artists. That number was relatively stable between 1962 and 1970 but in 1971, as previously indicated, it increased because of the rise in the number self-employed on one job. About four-fifths of all who combine a nonfarm wage or salary job with self-employment are self-employed on the second job.

A third group of moonlighters, about 850,000 or roughly one-fifth of the total (somewhat lower than in May 1970), have one or both jobs in agriculture. It is remarkable that this number has not changed materially over the decade, since the total number of persons employed in agriculture declined by a third between 1962 and 1971.

Most of the persons who hold at least one job in agriculture are self-employed farmers on the second job. Typically, they are wage and salary workers in nonagricultural industries on their first jobs who work the family farm in their free time. Many of these persons may have taken nonfarm jobs in nearby towns because they could not earn an adequate living on their marginal or submarginal farms.

Table 4. Agricultural and nonagricultural employment of persons holding two jobs or more, 1955–70

[Numbers in thousands]

Date	At least one job in agriculture			Two jobs in nonagricultural industries		
	Total	Number	Percent of dual jobholders	Total	Two wage and salary jobs	Wage and salary job and self-employment
July 1956	3,653	1,503	41.1	2,150	1,611	539
July 1957	3,570	1,414	39.6	2,156	1,558	598
July 1958	3,099	1,122	36.2	1,977	1,427	550
December 1959	2,996	829	28.0	2,137	1,533	604
December 1960 [1]	3,012	781	25.9	2,231	1,647	584
May 1962	3,342	868	26.0	2,474	1,749	725
May 1963	3,921	1,071	27.3	2,850	2,073	777
May 1964	3,726	1,069	28.7	2,657	1,928	729
May 1965	3,756	1,065	28.4	2,691	1,914	777
May 1966	3,636	936	25.7	2,700	1,934	766
May 1969	4,008	939	23.4	3,069	2,326	743
May 1970	4,048	943	23.3	3,105	2,356	749
November 1970	3,832	768	20.0	3,064	2,315	749
May 1971	4,035	851	21.1	3,184	2,288	896

[1] Data for Alaska and Hawaii included beginning 1960.

Seasonality and multiple jobholding

In an effort to ascertain whether multiple jobholding varies from one season to another, information on multiple jobholding was obtained in November 1970 as well as in May of 1970 and 1971. Both the number and rate of multiple jobholding in November were somewhat lower than in either spring month. (See table 2.) About 3.8 million persons had two jobs or more in November 1970—200,000 fewer than in May 1970—and the multiple jobholding rate, at 4.9 percent, was also somewhat below the May 1970 level of 5.2 percent. By May 1971, both the number of moonlighters and the rate had returned to their prior levels. The drop from May to November 1970 appeared to be in line with the seasonal decline in agriculture: the number of multiple job holders with at least one job in agriculture fell by 175,000 to 770,000. However, the upswing in this group between November 1970 and the following May was not as large as the decline had been, so that it is difficult to assess how much of either the drop or increase was seasonal, although it is reasonable to assume that a substantial part was seasonal.

As indicated earlier, the multiple jobholding rate for Negroes generally has been slightly lower than for whites in the past decade. Between May and November of 1970 the difference widened because the rate for Negroes declined more sharply than for whites. The reduction for Negro multiple jobholders occurred in both agricultural and nonagricultural industries, but for whites the decline was only among those in agriculture.

Although the overall multiple jobholding rates declined between May and November, the changes in rates by industry and by occupation were generally not significant. Also, the median number of hours worked in May of each year and in November 1970 was the same (13), with little variation by industry.

The last time a multiple jobholding survey was made during a winter month was in December 1960. Between that time and November 1970, the number of multiple jobholders with two nonfarm jobs has increased by 800,000 or nearly 40 percent, but the number who had at least one job in agriculture has remained about the same.

The stability over the decade in the number of persons with at least one job in agriculture in a winter month is the balancing off of two divergent trends. Over this period, the number of farm workers holding a second job in a winter month decreased, primarily because of a decline in the total number employed in agriculture, rather than a material change in the multiple jobholding rate. On the other hand, the number of nonfarm workers holding a second job in agriculture increased. □

FOOTNOTES

[1] Data in this report are based primarily on information from supplementary questions to monthly survey of the labor force, conducted for the Bureau of Labor Statistics by the Bureau of the Census through its Current Population Survey. The data for the three surveys relate to the weeks of May 11–17 and November 15–21, 1970, and May 16–22, 1971. The most recent report in this series was published in the *Monthly Labor Review*, August 1970, pp. 57–64, and reprinted with additional tabular data and explanatory notes as Special Labor Force Report No. 123.

[2] See Vera C. Perrella, "Multiple jobholders in May 1969," *Monthly Labor Review*, August 1970, pp. 58–59.

[3] Data for all persons other than white persons are used in this report to represent data for Negroes, since the latter constitute about 92 percent of all persons other than white persons in the United States.

Chapter IV. Price Measurement and Price Trends

Toward comprehensive measurement of prices

How a general price index could be constructed, what it should accomplish, and virtues and limitations of various approaches

ALLAN D. SEARLE

THERE is no adequate comprehensive measure of price change in the U.S. economy. Such a system is needed. It would measure price change at intermediate steps of production and at the level of final distribution would lend itself to a variety of analytical and statistical uses. It would provide a check on what is happening to prices in any important segment of the economy and, at the same time, gage price movement for the economy as a whole.

This article's principal purpose is to discuss a number of possible general price indexes and an underlying system of price indexes for primary and intermediate production and distribution which would be consistent with the general indexes. An attempt will be made to show how interindustry (input-output) measures and industrial sector measures could be fitted into a total structure, which itself would be consistent with National Accounting (Gross National Product) concepts.[1]

Available price measures

In the absence of a comprehensive measure, analysts turn to a number of important but limited sources of information about price trends. These are the Consumer Price Index (CPI) of the Bureau of Labor Statistics, which measures price change in goods and services purchased by urban wage earner and clerical workers' families; the Wholesale Price Index (WPI) of the BLS, which measures price changes for commodities sold on primary markets; the Indexes of Prices Paid and Received by Farmers of the U.S. Department of Agriculture; and the Implicit Price Deflator (IPD) of the Office of Business Economics of the U.S. Department of Commerce, which measures price change in the Gross National Product.

Allan D. Searle is an economist in the Office of Prices and Living Conditions, Bureau of Labor Statistics.

All of these sources have drawbacks as general measures of price change. The CPI is not intended as a measure of price change for the goods and services bought by consumers other than wage earners and clerical workers and omits purchases by Government and business. While the WPI covers many industrial commodities, it does not cover construction, transportation, communications, Government purchases and financing, or industrial services. (However, individual commodity series in both indexes would be used in constructing comprehensive indexes.) The agricultural indexes are confined to price changes that affect farmers. The IPD depends for its coverage of prices very largely upon the detailed price information collected in the WPI and CPI programs and is similarly limited.[2] Moreover, the IPD's weighting scheme causes it to reflect changes in composition of goods and services as well as changes in prices. In 1969, the Office of Business Economics began publishing a fixed-weight index quarterly starting with 1965. This index has the same limitations as to commodity coverage as the IPD.

An adequate, timely measure of price change, broad enough to assess accurately inflationary and deflationary forces and detailed enough to provide insight into the interplay of economic forces in the economy, should do at least two things: It should provide measures of price change for all goods and services purchased by consumers, business, Government, and separately for foreign countries, and it should provide sufficient detail by industry to promote understanding of price behavior at intermediate levels of demand (both for transactions that enter final demand and those that do not).

The measures of price change described in this article, as well as the underlying industry sector structure, are consistent with an industrial classification scheme rather than a commodity group-

From the *Review* of March 1971

ing, such as that used in the Bureau's Wholesale Price Index. The general indexes are designed to deal with current price developments in terms of analysis of increasing and decreasing price trends. Thus, the pricing of existing capital assets is not discussed, although this would be particularly important if a census of wealth were undertaken. For the present, however, it is considered more urgent to move pricing concepts and development toward a comprehensive system generally consistent with the framework of the current accounts portion of the National Accounts (consumer purchases, business investment, Government purchases, and net foreign sales), modified only to the extent necessary for current price analysis.

The first part of the article will deal with approaches to a general price index and the remainder, with approaches to price indexes for industrial sectors, concluding with a detailed consideration of problems involved and the relationship among the indexes.

A general price index

One way to visualize a general price index is as the end product of all interindustry purchases and sales, unduplicated and totaled at the level of final demand. Such an index would measure the average price change of goods and services entering final markets in proportion to their values.

A general index can be constructed in two principal ways: (1) indirectly through the concept of "Gross Product Originating in Industry"; that is, the aggregation of indexes developed industry by industry for the value added per unit at each stage of production, or (2) directly by pricing the goods and services in final demand. The latter scheme can, in turn, rely on one of two routes: producers' prices or purchasers' prices. Each approach—value added or final demand—has its own virtues and limitations.

Gross output method

Construction of a general price index by the gross-product-originating route emphasizes industrial classification of the Nation's sales or production. Price indexes would be developed for the output of each industry (similar to those BLS publishes for about 100 for manufacturing and mining industries). In addition, price indexes of purchases made by producers (inputs) would be developed for each industry. These two sets of indexes would be applied to data on the dollar value of output and input to derive constant-dollar output and input, and constant-dollar value added (the difference between output and input), as described in the section on double deflation (p.15)

These three sets of indexes are especially valuable in industrial economic analysis, permitting consistency in comparisons with series of wage rates, productivity, unit labor cost, employment, average weekly hours, and hourly earnings in a particular industry. However, these indexes do not provide for a complete assessment of the impact of changes in prices of materials purchased and in the prices of the output of the industry.

Final demand

The other approach to constructing a general price index—directly pricing goods and services in final markets—can be accomplished by following the interindustry framework (with its advantages of an industry classification scheme) in such a way that the spreads between prices at producers' and purchasers' levels are evident industry by industry at each point in final demand.

The general outline of the approach can be developed within the limits of the concepts currently used in constructing the Gross National Product, or the national income concepts can (for this purpose) be modified in order to present a price index more responsive to measuring price changes as they occur in actual markets.

STANDARD AND MODIFIED GNP. Adherence to GNP concepts is desirable because the GNP is a production-oriented measure and a system of price measurement consistent with production values, input values, employment, man-hours, and so on, is essential to the understanding of output, inputs (in real and monetary terms), and productivity. However, it may be advantageous to make certain modifications in those concepts in order to restrict measurement to those price changes which are continually occurring in the market place:

1. Because the general price index would focus on the prices at which goods are sold in domestic markets, the measure would differ from the GNP deflator by eliminating prices related to inventory change which OBE must take into account so that GNP measures the total quantity and price

of production. Also, export sales would be beyond the modified domestic-market scope of the general price index conceived here, and the foreign trade part of final demand would require different handling.

2. The GNP deflator includes prices imputed to nonmarket transactions, such as use by homeowners of their own dwellings and the consumption of homegrown food. A General Price Index would measure only prices of goods and services actually sold.

3. The production concept underlying the GNP requires that used cars and resale of homes be measured to include only that production which is involved in their resale. Assigning proper weights and pricing such items in a General Price Index would reflect the total transaction viewed from the purchaser's point of view.

If a general price measure is viewed as the end product of the multitude of interindustry transactions (many of which are not passed on except as components or constituent parts of final sales), then the interindustry structure can be made to serve as a reference framework for the development of a generalized price measure.[3]

Table 1 shows how the structure of the Bureau's currently published Stage of Processing Indexes relate to the interindustry structure. The significance of these indexes in price analysis is set forth in a later section.

Input-output data show the dollar value of transactions among the various industries (including sales among establishments within the same industry) for the reference year. Each row in the table would show how the output of goods and services of each industry would be distributed among other industries, and to final users. For example, part of the output of agriculture is sold to agriculture (for example, livestock feeds) with some output going to manufacturers for further processing and the re nainder going to consumers as unprocessed foods. Were numerical values shown, the columns would show the value of each industry's intake (input) of raw materials,

Table 1. Input-output flows, classified by the codes used in the Stage of Processing Indexes, showing coverage gaps

Industry	Industry										Final demand			
	Agriculture	Mining	Construction	Manufacturing	Transportation, other public utilities	Trade	Finance	Services	Government	Other	Personal consumption expenditures	Gross private capital formation	Net exports	Government purchases (Federal, State, and local)
Agriculture	2622			1100							3111			
Mining			1220	1210 1310	1320									
Construction														
Manufacturing	2621 2622	2500	2200 2420	1210 2110 2120 2130 2140 2410 2500 2610	2420 2622	2500 2622					3112 3120 3130	3210 3220		
Transportation, other public utilities.														
Trade				1210										
Finances														
Services														
Government														
Other														

NOTE: The codes in the BLS Stage of Processing Price Indexes are as follows:

1000 Crude materials for further processing
- 1100 Crude foodstuffs and feedstuffs
- 1200 Crude nonfood materials except fuel
  - 1210 Crude nonfood materials except fuel, for manufacturing
  - 1220 Crude nonfood materials except fuel, for construction
- 1300 Crude fuel
  - 1310 Crude fuel for manufacturing industries
  - 1320 Crude fuel for nonmanufacturing industries

2000 Intermediate materials, supplies and components
- 2100 Intermediate materials and components for manufacturing
  - 2110 Intermediate materials for food manufacturing
  - 2120 Intermediate materials for nondurable manufacturing
  - 2130 Intermediate materials for durable manufacturing
  - 2140 Components for manufacturing
- 2200 Materials and components for construction
- 2400 Processed fuels and lubricants
  - 2410 Processed fuels and lubricants for manufacturing
  - 2420 Processed fuels and lubricants for nonmanufacturing
- 2500 Containers
- 2600 Supplies
  - 2610 Supplies for manufacturing industries
  - 2620 Supplies for nonmanufacturing industries
    - 2621 Manufactured animal feeds
    - 2622 Other supplies

3000 Finished goods
- 3100 Consumer finished goods
  - 3110 Consumer foods
    - 3111 Consumer crude foods
    - 3112 Consumer processed foods
  - 3120 Consumer other nondurable goods
  - 3130 Consumer durable goods
- 3200 Producer finished goods
  - 3210 Producer finished goods for manufacturing industries
  - 3220 Producer finished goods for nonmanufacturing industries

semifinished products and services used in producing output for final sale.

Pricing for this part of the input-output table calls for development of price indexes for each cell of the table (or at least to represent each cell) in order to promote understanding of how price changes of supplying industries are related to price indexes of the recipients. The prices which enter this part of the table would be producers' (sellers') prices.

The final demand part of table 1 is aggregated by consumers' purchases (personal consumption expenditures), business capital purchases (gross private capital formation and net inventory change), foreign purchases (net exports), government purchases (Federal, State, and local), and total. In this approach to a general index, the indexes would be presented at two levels of pricing: producers' and purchasers'.

The spread between the two price indexes would represent the "margin" added to values of crude and intermediate goods exchanged and channeled from the producers' segment of industry by wholesale and retail trade. The General Price Index would be the index representing the all-industry average in both the producers' and purchasers' columns of total final demand.

While indexes of producers' and purchasers' prices for goods and services entering final demand would generally differ at the industry level, the indexes for producers' and purchasers' prices should be equal at the total level and are in essence indexes of price change for the Gross National Product regardless of how GNP is structured. (However, indexes based upon the traditional GNP structure would differ from those based on the modified GNP structure described in this article.) The reason for this equality in the totals (but inequality elsewhere) lies in the fact that the same totals for the transportation and trade margins are treated as separate purchases in the producers' price column and as part of the value of each good in the purchasers' price column. That is, the purchasers' price column would include only that part of transportation (either passenger or freight) in personal consumption expenditures which is purchased by the consumer. (A third portion of transportation values are intermediate sales and do not appear in either the producers' or purchasers' price columns.)

In reality, the bulk of transactions of industries in the producing sector are made with wholesale trade and to a lesser extent with retailers. The developers of the interindustry tables, however, felt that much more economic insight could be gained if the system of input-output accounts could be set up to show the flow of product from producer directly to final purchasers by industry of origin. Consequently, each sector of final demand is viewed as purchasing most goods and services directly from producers, purchasing from trade only "the margin"—operating expense and profit. In the concept outlined here, then, the total final demand at producers' prices would include separately a substantial value for trade. The total at purchasers' prices, however, would include no value for trade because the remainder would have been distributed among the various other segments.

Relation to broad price indicators

A General Price Index represents only one approach to measuring general price trends. Another avenue is the Implicit Price Deflator of the Office of Business Economics. This series is a measure of price change for final demand, but differs from the measure described in at least two (and possibly three) principal respects: (1) The OBE measure is built upon a system of classification which varies from category to category of final demand and does not conform to an industry or commodity group structure, so that it is not possible to trace effects of price change by industry. (2) The OBE measure is of the Paasche type; that is, the weighting of prices changes as the composition of output changes or, more precisely, the weights for each year or quarter are used to average the relative price change between that year or quarter and the base year. The index proposed in this article would be of the fixed-weight, Laspeyres type,[4] organized along industrial lines. A General Price Index would deal only with market sales, excluding the imputations in the Implicit Price Deflator. (3) It would also be useful to construct an index corresponding identically with GNP concepts.

The price deflator implied by another OBE program (GNP by Major Industries) has an industrial structure but again the index is of the Paasche type. The industrial breakdown at present goes to no further detail than the 2-digit SIC level and is presented as a value-added price measure as described in the section on "Standard and modified GNP."

In comparison, a General Price Index would have the following attributes:

1. The industrial structure of the index permits interindustry analysis of price change and provides insight into the effect on prices of the flow of goods and services among industries at stages of production prior to final sale.

2. The index's industrial structure will allow analyses of price trends at the individual industry level for both outputs and (ultimately) inputs of materials, adding to the store of understanding of the functioning of the economy.

3. Basing the index on an industrial structure of price measures will enhance the construction and understanding of the Inter-Industry Program by providing the means for interim extension of the input-output data and contributing to improvement of the constant-value data themselves.

4. Because the index would be prepared with fixed weights, its form will be comparable to that of other leading price indicators, such as the Consumer Price Index, the Wholesale Price Index, and the U.S. Department of Agriculture's indexes of Prices Paid and Received by Farmers.

5. In one version, a modification of the GNP concept would permit a better tie-in with other price indexes and with market sales.

6. In another version, a more conventional form, the tie-in with GNP (in common with other implicit deflators) could unify the concept of the entire price structure into a cohesive whole.

Another measure sometimes used in place of a general price measure is the Wholesale Price Index. The WPI, however, is limited in scope compared with the proposed general index and is classified along different lines. The WPI is aimed at measuring price change of commodities at the first level of transactions (primary markets); the general index would include prices of both commodities and services at the level of final sale (final demand) with detail by industry representing all interindustry transactions. The classification structure of the WPI is principally based on groupings of competitive commodities; the industrial portion of the structure underlying the general index would be based on an industry structure. The WPI excludes from coverage retail and wholesale trade while the general index includes these sectors. Other areas included in the industrial substructure of the general index, which are excluded from the WPI, are interplant transfers and sales of military items to the Government.

The structure and coverage of the Consumer Price Index is even further removed from an industrial concept. While much of the data used in its construction are obtained from retail outlets, the index is not a retail trade index. It is a purchase price index for a broadly defined but specific group of consumers—urban wage earners and clerical workers. Hence, it excludes some sales at retail (for example, qualities and types of goods and services purchased by higher income or lower income consumers) and is classified in line with consumption categories (for example, housing, medical care) rather than by industry. Because pricing for the CPI has been oriented toward the urban wage earner and clerical purchaser, pricing for retailing as a whole needs to be augmented to include higher- and lower-priced stores, farm and nonfarm, and types of business not covered or only lightly covered.[5] Also, the CPI provides only spotty coverage for certain types of stores (examples: lumber yards, retail bakeries, hardware stores, and farm equipment dealers). Furthermore, even where a given product is represented, it does not represent price differences for the same product sold in particular types of retail industry—shoes for example, are purchased in shoe stores and in department stores.

Industrial sector price indexes

Where a prime purpose of a General Price Index is to measure price change of goods entering final demand, the purpose of a set of industrial sector price indexes is to measure, separately, price change of products and services moving between industries at all stages of production, processing, and distribution including final demand. Thus, industrial sector price indexes can provide increased insight into the interrelationships of costs and prices at all stages of the productive process and add to the understanding of the resultant general price index.

In this context, the General Price Index may be viewed as a summary indicator of price movements within the entire industry structure (including imports). Properly formulated, price changes in intermediate industries could be traced through the structure to final demand and price change effected by demand changes could be traced back through the structure in instances when "demand pull" is the dominant force upon prices.

An Industrial Sector Price Index (ISPI) is, essentially, a composite index made up from several series of prices that closely match the economic activity of a defined industry or industry sector. Industrial sector price indexes may be subdivided into indexes of output or input prices based upon either the products and services sold or the products and services purchased by an industry sector. For example, an output price index for a given industry represents a set of individual price indexes for all the important products of the industry, averaged together according to the relative importance of each product to the industry. An input price index for an industry consists of an aggregation of price indexes for the commodities and services purchased by the industry, weighted together according to the relative magnitude of the purchases.

HISTORY. Early work in the field of industrial price measurement was devoted largely to supplying data for specific statistical purposes (deflation) but a consistent, continuous program was not developed. In the early 1950's, a set of annual industry sector price indexes covering the years 1947–53 was prepared as part of a Bureau of Labor Statistics project on interindustry economics. These indexes were designed to revalue industry outputs. Later, in 1959, a similar set of indexes was compiled in connection with the need of the Bureau of the Census to construct the 1958 production index benchmark. Then, in 1961, the Price Statistics Review Committee of the National Bureau of Economic Research recommended to the Bureau of the Budget that BLS begin a permanent program to develop price indexes organized along an industrial structure, and in 1962 the Bureau initiated its present modest program.

At present, the program consists of monthly output price indexes for about 100 manufacturing, mining, and agricultural industries (at the 4-digit SIC level of detail). Price indexes for commodities primary to an industry are weighted with values covering only the production within the industry (that is, excluding the portion which constitutes secondary production in other industries). Secondary production values of the industry are used to weight the price movements of items of types primarily made elsewhere but made as secondary output of the industry. Thus, a given price index for a commodity may be used in several places in the ISPI system: where output is primary and in the industry or industries where it is secondary. The inclusion of price series for secondary output represents a departure from the methodology of the earlier indexes, which represented primary output only. Ultimately, input indexes (pricing industry purchases) will also be constructed.[6]

THE ISPI IN DEFLATION. Price measures may be used as deflators to estimate change in physical quantities. Among the most noteworthy government statistical programs using price indexes for deflation are those connected with the National Accounts: Gross National Product in constant dollars, the final demand accounts and gross product originating in industry. Other programs include the BLS productivity measures where value data are deflated to obtain constant dollar output per man-hour, and the Federal Reserve Board's production index which uses price data to supplement physical output data, as does the Census Bureau every 5 years.

MEANING OF QUANTITY MEASURE. One of the primary purposes of the ISPI is for use in deflation of value figures in order to estimate changes in physical volume—value or value-added in "constant dollars." The deflator which is developed for this purpose must be constructed (at least in concept) in such a way that the price index is comparable in all respects with the value data being deflated—or at least with the value concept which the compilers of the value data had in mind. For example, pricing must be timed to coincide with the value data. Timing may be crucial where there are large inventory holdings or sudden large changes in inventory so that shipments and production may have to be valued at different price levels and in situations where the production cycle is very long (for example, shipbuilding or construction).

The price index also must be constructed according to a concept which will lead to a quantity ("constant dollar") figure which carries the meaning which the user requires. For example, a price index in which a quality adjustment for a new machine is based on the measurable improved performance of the machine results in a deflated index in which quantity is measured in units of performance. This is a different measure from one in which the quality adjustment is made on the basis of additional resources required to provide

the additional performance, except for the one (unlikely) situation in which the resources used are proportional to the added performance. Another measure would result if the quality adjustment is based on the additional amount buyers are willing to pay for the added performance. This matter is treated further, later in the paper. The important point here is that it is essential not only that the price measure represent the same scope or coverage as the dollar values to be deflated, but also that the meaning of the quantity measure be constantly borne in mind, for any change in the definition of price automatically changes the definition of quantity.

REAL OUTPUT. Real output can be viewed as either the value of production at constant prices (gross output) or as "value-added at constant values-added-per unit." The first approach is akin to physical output measures in which output is expressed in tons, car-miles, dozens, and so on. It can also be represented in index form as value at constant prices,

$$\Sigma P_o Q_i / \Sigma P_o Q_o, \qquad \text{or} \qquad \Sigma P_i Q_i / \Sigma P_i Q_o$$

The first expression results from deflating a value series by the Paasche-style formula for an index of prices; the second, from use of a Laspeyres-style (fixed market basket) price index.[7]

The second approach has no counterpart in physical terms (for example, a quantum of value-added is not readily visualized) but nonetheless has an economic meaning as the utility added to the materials and other purchased inputs in the course of production. Deflated value-added can be represented in index form as value added at constant output and input prices:

$$\frac{\Sigma P_o Q_i - \Sigma p_o q_i}{\Sigma P_o Q_o - \Sigma p_o q_o} \qquad \text{or} \qquad \frac{\Sigma P_i Q_i - \Sigma p_i q_i}{\Sigma P_i Q_o - \Sigma p_i q_o}$$

where "P" and "Q" are output price and quantity, "p" and "q" input price and quantity, respectively, and "o" and "i" signify data in the base and current periods. In practice, however, the values of output and input are deflated separately by indexes of output prices and of input prices, respectively, of either the current-weight or fixed-weight form.

Gross output values (current or deflated)—and the weights for the corresponding price indexes—are not additive from industry to industry. For example, the value of steel in automobiles would be counted in the automobile data and again in the steel data. In contrast, the value-added data derived in the value-added approach are additive, industry-to-industry without duplication.

DOUBLE DEFLATION. Because direct measurement of value added per unit (value-added pricing) is not feasible, the deflation of value-added data to obtain the real net value of output must be done in stages. The output price indexes and the input price indexes are used to deflate total value of production and of purchases, respectively. The difference between the undeflated output and input values (value added), when divided by the difference between deflated output and input (real value added), yields an implicit index of value-added price or of unit value-added.

NET SECTOR MEASUREMENT. Another approach to price measurement is that suggested by the Price Statistics Review Committee.[8] In this proposal, at each stage of aggregation, the weights assigned represent only sales or output, which moves to buyers outside that sector or stage of aggregation. For example, as indexes are prepared for progressively larger industry groupings (3-digit, 2-digit, total industry division) in the Standard Industrial Classification system, intrasector values and prices are discarded as the sector definition becomes broader. Weights are not additive to the total, as they are in the double deflation approach. However, this alternate method provides a concept similar to that resulting from the double deflation process. Furthermore, at the level of final demand the results are consistent with other general price indexes, but this system does not provide for tracing and analyzing price movements as readily as the ISPI system.

The ISPI and price analysis

Price indexes constructed by industry have an important use in economic analysis. They would complement indexes which are classified by market structure or similarity of use, such as the WPI. Industry Sector Price Indexes allow comparison of price trends for an industry with other comparable economic series for the industry.

For example, a consistent set of measures for the basic steel industry under the industrial price structure would cover price change of steel pro-

duced and sold, price change for goods and services purchased and, through the technique of double deflation, a value-added price index summarizing or netting out the input- and output-steel price changes, so that an assessment of changing industrial price spreads can be made. These trends could then be assessed in relation to changes in production, average hourly earnings, productivity, and unit labor cost, all of which are also compiled by industry.

Price indexes developed according to an industrial structure can also serve as tools in the analysis of relationships between prices and wages, materials costs, other costs, and profits. Experimental work in this field is now underway to test the feasibility of relating various aspects of changing costs and profits to price change in selected industries.

While development and analysis of indexes along industrial lines are proceeding, the improvement of data and analysis of price trends according to stages of the production process must not be neglected. The Bureau's currently published Stage of Processing (SOP) indexes show price movements for commodities at various stages of production: crude, intermediate, and finished. In this set of indexes each product is classified according to the amount of processing, manufacturing, or assembling it undergoes before entering the market. Commodities may fall into more than one category. For example, some fresh fruit is sold as a crude material for further processing by canneries and some directly to final demand. Because the SOP indexes are currently tied into the WPI structure, with its incomplete universe, the attempt to reconcile the SOP and ISPI has results similar to that of Procrustes and his bed. (See table 1.)

One of the principal limitations of the SOP indexes is failure actually to price the various different markets for the same product. This should be largely corrected as a concomitant of increased pricing for the ISPI.

In the long run, improvement of these indexes will provide an additional facet to price analysis. The SOP indexes will provide the connections between prices at farm and mine through manufacturing and trade to the final consumer, to supplement the industrial analyses provided by the ISPI and the analysis of final demand price movements provided by the general price indexes. Table 1 not only shows the relationship of the SOP structure to the ISPI, but also presents some of the gaps which must be filled.

A family of indexes

The ISPI should be viewed, not as a single index, as the WPI or CPI is, but as a system, or family, of indexes which are flexible enough to serve as deflators for a number of the more important sets of economic statistics that relate to the National Accounts as well as for assessment of the inflationary and deflationary forces at work in the economy. The dual organization of the General Price Index by producers' and purchasers' prices for final demand is but one example of the utility of alternate sets of price indexes. To meet a variety of needs, the ISPI component series must be collected in sufficient detail to permit regrouping (for example, imports and domestic prices should be in separate series so that price changes for the domestic industry can be separately analyzed). Also, the ISPI components should be shown both with and without taxes and possibly with and without transport charges as discussed under the sections on taxes and transportation.

All sets of alternative indexes will have certain attributes in common. Comprehensive industry coverage (or at least representation) would be required. The ISPI should represent all industries in the economy including importers and exporters. The indexes should represent price movement for goods not only as produced by the primary industry (where the product takes its final form) but also as exchanged, transported, marketed, and further processed by the intermediate industries (wholesalers and jobbers) through which the product passes and as sold at retail.[9] In addition, pricing for an industry would have to cover not only the industry's primary output but price movements of its secondary products—goods of a type normally made in other industries. Thus, a product might be represented in the ISPI system at any one stage of production in the industry where it is produced as a primary product and as many times as it appears as secondary output in other industries, or as it moves through channels of distribution. Pricing is thus multidimensional—horizontal throughout industries and vertical along the lines of progress from raw materials to retail or other final distribution.

Not only must industrial coverage be compre-

hensive but all *activities* of the industries must be represented—not simply the price movements for commodities sold in the marketplace, as in the WPI. Specifically, pricing should encompass production and distribution of commodities, provision of industrial services, interplant transfers between establishments owned by the same company, production of items for direct sale to "ultimate consumers," military items (which are excluded from WPI coverage) sold to the Government, and purchase of commodities and services by industry, including imports.

If the pricing system is comprehensive, the variety of price data collected at the most detailed level would be suitable to combine in a variety of classification structures to meet most major needs. Price data could then be classified and group indexes computed for the *Standard Industrial Classification System* covering agriculture, forestry, and fisheries; mining; construction; manufacturing; transportation, communication, electric, gas, and sanitary services; wholesale and retail trade; finance, insurance, and real estate; services; and Government; the interindustry (*input-output*) structure; and the *National Income and Product Accounts*.

PRODUCT ACCOUNTS. These consist of purchases of (or sales to) individual consumers, Government, business investors, and foreign countries and the net "sales" to business inventory. Price indexes developed for this set of data should be set at the purchaser's level rather than at the producers' level, because that is the level at which the accounts presently are aggregated. Separate indexes would be compiled to show price change for personal consumption expenditures, gross private domestic investment, net exports, and Government purchases of goods and services.

Pricing of inputs in the government sector is important for a number of reasons. Federal, State, and local purchases amounted to about one-fifth of GNP in 1969. The largest single consumer was the Federal Government. Because Federal spending is used as a fiscal counterbalance to inflationary and deflationary forces in the economy, information on price trends of Government purchases complement the price picture in the private sector.

Indexes of Government purchase prices would serve a number of budgetary purposes. Such indexes could provide (through their use as deflators) estimates of actual quantity purchased (deflated value), and by this means answer the question whether additional expenditure results from increased quantity or higher prices. As an example of detailed application, they could also permit more accurate escalator clauses to be written into government purchase agreements.

INCOME ACCOUNTS. The income account side of the national accounts consists of the returns to the factors of production (wages, profits, rent, and so on) plus nonfactor charges, such as direct business taxes and depreciation. The gross product of an industry measured from the income side is not convertible to constant dollars according to the same concept as measured from the product side. This difference arises because of the definition of quantity. The quantities implied in constant-dollar product are the usual "final" outputs or inputs measured in terms of tons, cubic feet, or service rendered. The quantities implied in constant-dollar income (when current-dollar income is deflated by indexes of wage rates, rents, and so on) are measured in such "physical" units as man-hours, use of a building for a year, and so forth. The two approaches should be reconcilable in terms of the total if suitable weights or input-output ratios (productivity ratios) could be developed. In the foreseeable future, however, deflation will be confined to the product accounts and to Gross Product Originating in industry to which we now turn.

GROSS PRODUCT ORIGINATING. This approach focuses on the industrial origin of gross product. While in the *product account* approach GNP is the total of all final purchases, and in the *income* approach the total of all factor incomes, plus nonfactor charges such as indirect business taxes and depreciation, in the gross product originating approach GNP is the sum of the gross product of all industries, representing each industry's contribution to the total output of goods and services.

Price indexes required for the constant-dollar estimate of Gross Product Originating in each industry consist of industrial output prices for each industry and purchase price indexes. Output price indexes should measure not only the primary products but also the secondary products of industry. The "double-deflation" method described

earlier is used to obtain implicit "value-added-price" indexes for the industry. Output prices for this approach are *at the producers' level rather than at the purchasers' level*, in contrast to pricing in the Product Accounts of the GNP. Since excise taxes are included in the output data, the price indexes should include them. Also, purchase of services should be included in the input index.

Pricing and concepts

Pricing for the various systems of Industry Sector Price Indexes must be consistent with the precepts of pricing—that the object priced be standardized with respect to some highly specified set of attributes—but within the general concept of quantity (output or input) relating to the structure of the index of which the price series is a part. If the price series is to be used as a deflator to convert current-dollar data to constant-dollar data, every conscious decision which is made concerning the price series automatically results in an implicit decision concerning deflated value, and, as a result, production, quantity, and the unit of quantity. Through its effect on quantity, the pricing decision may, in turn, influence the measure of productivity. For this reason, it is essential that all decisions concerning the commodity or service to be priced, the specification, level of pricing, and the unit be determined with the specific purpose in mind. After pricing is established, it is essential that decisions concerning adjustments for quality, timing of discounts, changes in industrial vertical integration, treatment of transportation charges, and taxes should be made with the larger goal in mind.

Sometimes several different or alternate decisions might be required concerning particular problems of pricing, because of the various uses to which the ISPI would be put. For example, the question whether the transportation charge for a commodity should be included in the purchase price would be answered in the affirmative in the case of a deflator for materials inputs in a manufacturing industry whose input values, as reported in the Census of Manufactures, include transportation implicitly. It would be answered in the negative for the interindustry chart, where transportation is treated as a separately purchased input and materials are priced F.O.B.

Some problems that might be encountered in constructing an Industrial Sector Price Index and possible decisions regarding them are presented in the following sections:

INTERPLANT TRANSFERS. Transfers to other plants of the same company can be either included or excluded from industry data on value of production. (Census data carry the totals both ways.) In the currently published industry price indexes of the BLS, the decision was made to include the interplant transfers in the concept because they are part of total output. Their inclusion makes the value and price data consistent with data on man-hours, employment, and payrolls, all of which implicitly include them. (In practice, however, only the weights are included because price movements of interplant transfers are assumed to parallel those of marketed products.) Moreover, value added, excluding transfers, would be difficult to estimate because data on cost of materials are not collected according to whether the finished product will be an interplant transfer. (In contrast, such indexes as the WPI, which is market-oriented, exclude interplant transfers.)

QUALITY CHANGE. It is not our purpose to deal exhaustively with the quality change problem, but only to indicate how decisions on this question relate to the production measurement problem. Unfortunately, there has never been agreement among the various agencies of Government as to the purpose to be served by any particular type of quality adjustments—a statement which implies that output itself has not been clearly defined. Two aspects of the subject warrant attention in particular: the nature of the measured quality change and its incidence.

It is apparent that not all changes in products or services will be greeted by purchasers as quality improvements. Some will find new styling appealing; others will object or at least be unmoved. These are the subjective features of quality change with which the psychologist, not the economist, might deal. However, there are a great number of changes in product which receive a consensus—improved safety, contribution to better health, performance, or economy of operation represent improvements while moves in the opposite direction represent deterioration.

The nature of a change may be generally accepted, but the nature of the measurement may not be, largely because the question is approached from opposite ends of the production-consump-

tion cycle. The production-oriented view would recognize as quality changes only those specific additions or deletions which require the use (or removal) of productive resources in their creation. The consumer-oriented view accepts changes which contribute (positively or negatively) to the utility, enjoyment, and so on of products or services without regard to resource use. These divergent attitudes lead to different types of measures or adjustments for quality change, *even when there is agreement that quality has in fact changed in a specific manner.*

Some examples may serve to illustrate the choices. Should adjustment for an improvement in electric light bulbs, which extends the length of life, be made on the basis of the additional lumens provided or on the basis of the costed-price of the added feature which made the improved performance possible? Should an improvement in the ability of earthmoving equipment be based on the additional tonnage-per-hour of earth moved or on the cost-price of the improvement? Should changes in motors be measured by changes in horsepower ratings or by cost? Should quality change of a new type, thinner, tin plate which allows more beer cans to be produced per ton be measured by the additional cans which may be produced or by the incremental cost of the improvement? [10]

The criterion used will determine the method employed in the quality adjustment, which, in turn, affects the magnitude of the measure because the increment in resource inputs is rarely proportional to the increment of usefulness or of performance.

A third method—"let the consumer decide"—shifts the decision to the market place. When the product before improvement (or debasement) and the original product are selling on the same market at the same time, the price differential is taken as the measure of quality change. This has considerable appeal, especially where subjective matters, such as style, are involved, in that consumer taste dictates and willingness to pay provides the key to the adjustment. In some technical areas, however, the universal application of this principle may be less satisfactory because it assumes a high degree of consumer sophistication. Rather than an adjustment based on the increased tire miles provided by an improved tire (consumer-oriented) or the cost of providing more miles (producer-oriented), the decision is based on the consumers' belief or faith that the product performs better. It is perhaps valid to observe that even some sophisticated consumers may not be willing to pay for increased safety either on the basis of the amount of safety or the cost of it but may value risk, dash, and adventure more. In this case, the third method would be better. In any case, this approach does not seem to match either the consumer-oriented or market-oriented approach, but may lie closer to the former.

Economists of the Office of Business Economics have expressed the view that the appropriate quality-change measure should be based on the resource-use approach for their purpose.[11] The reason is that this method of measurement provides a production measure which can be used to gage capital productivity change. In the earthmoving equipment example previously cited, the percentage increase in performance would exceed the cost increase and the difference would represent capital productivity gain. If the price index were adjusted by the full amount of the performance increase (using the consumer-oriented method) the quantity-of-machinery purchased or used (input) would show a larger increase and offset the increase in work done (output), in the numerator of the productivity measure. For the General Price Indexes and the ISPI, it seems that the appropriate type of quality adjustment would be cost-oriented.

For the CPI (an index outside the ISPI system) it appears that the consumer-utility or performance adjustment has some merit. This method would, however, recognize the CPI as primarily a consumer welfare-type index. On the other hand, adoption of this approach for the CPI would limit that measure's usefulness as a contributor of building blocks for the retail-trade-industry segment of the ISPI system, and would limit the usefulness of comparisons between industrial prices and their CPI counterparts.

A cost of living index would go even further than the CPI in the direction of a consumer-oriented approach to the quality problem. This index would "take into account the fact that, for most commodities, there is a rate at which the consumer could substitute one for the other in response to changes in relative prices and still remain on the same plane or level of satisfaction," and a forced substitution—replacement by producers of a low-priced item with one of higher quality and price—would be treated as a price increase.[12]

In connection with the Federal requirement that smog-control devices be installed on new automobiles, an interesting question has arisen: Should the price indexes be adjusted at all for these devices? The argument against adjustment (and thus for treating the list price increase upon introduction as a genuine price increase) holds that the buyer does not benefit from the device—others do. Also, the argument runs, acceptance of such devices as improvement in quality (and not price increases) overcompensates because of failure to penalize for the environmental deterioration which necessitated the device in the first place. The opposing view is that the buyer does benefit in a social sense. His payment "in consideration of the payment by others" is of value to him, hence a quality improvement. In addition, this view states that the antismog device does represent additional production and a car with a device represents more than one without (as does one with a radio or heater), and failure to adjust ignores the additional output—a consideration important for price series used in deflation. This view of the index as a deflator results in attaching a production-oriented definition to the CPI, and the resulting index measures social cost by the market cost of the device.

If environmental improvement (or cessation of deterioration) is paid for by price increases rather than by taxes, this question will arise more frequently in the future. The problems of quality change associated with environmental improvement illustrate what has been said earlier concerning pricing to meet concept requirements: that all decisions on pricing, unit of measure, quality adjustments, and so on, should be made with the particular goal of measurement in mind and, in case of deflators, with the particular effect on the production measure in mind. Owing to the variety of needs for price data, it seems reasonable to assume that many questions of this kind will be solved by the construction of alternate measures, each for a specific purpose.

Turning to the problem of the incidence of quality change, it is obvious that a change in quality of the product of a given industry may affect the performance and quality of goods and services produced by other industries. In an example already cited, the steel industry developed a better electrolytic tin plate that boosted the number of cans manufacturers could produce per ton. A decision to adjust the price index for steel quality improvements by the full amount of the increased performance "credits" the producing industry with the full amount of the improvement. Use of the cost-price adjustment, on the other hand, can be shown to result in a sharing of the effect between the producing and using industries. This comes about because the cost-price adjustment is usually of smaller magnitude than the full-performance adjustment, and the price of steel falls less and steel production rises less than in the performance approach. This in turn credits the using industry with less steel consumption per can, and both industries show a gain in productiveness.

TAXES. If taxes are viewed as payment to government for either specific or general service, then it follows that they should be converted into some sort of price paid for the general or specific service and used in deflating government output. As a consequence of considering taxes payment for government service, value figures and price indexes for the private sector would exclude taxes to avoid double counting. In addition, price series needed for analysis of the interrelationship of price, production, and productivity trends must be comparable—hence, with taxes excluded.

However, there are practical necessities to consider. Value-of-output-data used by OBE in deflation, for example, often contain the excise tax both on the items in the output total and the hidden taxes in the materials and components. In this instance, the deflator should include excise and sales taxes. The preference for inclusion of taxes because of their inclusion in the value data is based on the view that a tax increase should be reflected as a price increase so that the deflated value series will remain constant. This throws any concomitant production increase which may flow from the tax increase (new schools, roads, and so on) into the government sector.

Because of variations in the value data with respect to inclusion or exclusion of excise and sales taxes, it seems likely that series should be available with and without taxes in both the retail and nonretail price programs.

Income taxes and other taxes which are not directly applicable to the transaction (sale or purchase) or use of a good or service should be con-

sidered as payment to government and converted to price indexes for the government output price index, at least in concept.

TRANSPORT CHARGES. As in the case of taxes, the decision whether to include these charges is based partly on the concept used, partly on the nature of the data to be deflated. Values for purchased materials reported to the Census of Manufactures include the transportation charges, so purchase price indexes would include transport. As indicated, the interindustry concept views purchasers as purchasing transportation separately, so purchase prices of goods would exclude transportation charges for this purpose. Transport would be separately deflated by indexes of freight or passenger rates, as appropriate.

At this point, it is important to note that the different treatments do not lead to the same results. When transportation is included in the price, the series implicitly prices the transport charge per unit of product; when separately priced, transport charge is standardized and expressed as the charge for a given product hauled a given distance, or a fixed number of ton-miles. Thus, a change in the distance hauled (change in the amount of transportation purchased) becomes an integral part of price when transportation is included—a situation which does not apply when transport is treated as a separate item. The handling of transportation data is a special case of the general problem of reconciling input pricing with output pricing. Both types of pricing are affected by productivity changes or, in other terms, changes in input-output ratios.

Several other categories of pricing may have to be covered to meet various needs. Inventory pricing and goods in process pricing, while perhaps not generally necessary, would be important in industries such as shipbuilding where production cycles are long or varying, and where it is essential to adjust real value of shipments to represent real output. Changes in vertical integration would have to be watched carefully in dynamic situations to assure continuous sample adjustment, as today's onsite production (for example, housing) becomes tomorrow's purchased component. Pricing of large scale output (the purchase of the entire crop by a cannery, for instance), and of long-term purchase contracts are all part of the total picture and must be taken into account.

Present program coverage

At present, the Bureau's Industry Sector Price Indexes are published for only 100 4-digit manufacturing and mining industries out of a total of

Table 2. Coverage of Gross National Product (by sector) and of industries by available price indexes

Sector	GNP accounted for [1] (percent)	Percent of sector GNP (value of shipments) covered [2]				Number of 4-digit industries covered [3]			
		Total	Information published	Information not published		Total	Information published	Information not published	
				Good coverage	No to fair coverage			Good coverage	No to fair coverage
Total	100.0	100	13	16	[4] 59	882	101	79	702
Agriculture, forestry, fisheries	3.8	100	0	88	12	37	0	10	27
Mining	2.4	100	74	0	26	50	10	1	39
Contract construction	3.5	100	0	37	63	22	0	0	22
Manufacturing	30.7	100	28	13	59	421	91	33	297
Transportation, communication, electric, gas, and sanitary	10.1	100	0	100	0	72	0	4	68
Wholesale trade	7.2	100	0	0	100	48	0	0	48
Retail trade	9.7	100	0	55	45	67	0	16	51
Finance, insurance, and real estate	13.4	100	0	----------	----------	79	0	0	79
Services	9.3	100	0	----------	----------	86	0	15	71
Government	9.9	100	0	----------	----------	------	0	----------	----------

[1] The Office of Business Economics of the U.S. Department of Commerce is the source of these data.

[2] Percent of shipments values covered is derived from the following: For agricultural sectors, from unpublished material of the U.S. Department of Agriculture; for mining and manufacturing, the Censuses of Minerals Industries, and Manufactures, 1963; contract construction estimated from residential construction as proportion of all construction; for transportation and warehousing, communications, and so forth, and parts of services, from unpublished data of the Office of Business Economics; and for retail trade from the 1963 Census of Business.

[3] These industries are defined in the **Standard Industrial Classification Manual, 1967** (Bureau of the Budget, Office of Statistical Standards).

[4] The remaining 12 percent is accounted for by industries for which detail on value coverage does not permit adequate evaluation.

NOTE: Dashes indicate information on availability of data is not known.

about 500 in these two divisions and of a total of about 900 in all divisions. These 100 industries cover about 13 percent of the total domestic value of U.S. output. Coverage accounted for by published indexes is highest for mining—about 75 percent—followed by manufacturing with 28 percent. For the latter, additional product-class (5-digit) indexes are available which would bring coverage to about 45 percent. (See table 2.)

Coverage in agriculture is reasonably good, although there is some question as to the level of pricing (whether close enough to the farm). There is fairly good coverage in some utilities and in retail trade (largely from the CPI), but insufficient for publication of industry indexes.

Some data are available for transportation from the Interstate Commerce Commission and other regulatory and ratemaking agencies, and the Bureau of the Census has published a price index for new single-family dwellings. Exploratory work in other aspects of construction is continuing in both BLS and the Census Bureau. Research on import and export pricing is also underway.

Table 2 shows in detail the coverage available in terms of the interindustry classification structure. It is evident that much remains to be done. Coverage is low as a whole. Even in manufacturing, the gaps are considerable and are characterized by nonhomogeneous or rapidly changing products, such as aircraft, electronics, and shipbuilding. □

FOOTNOTES

[1] See Jack Alterman and Martin L. Marimont, *Prices and Price Analysis in the Framework of the National Accounts*, a paper presented at the 11th General Conference of the International Association for Research in Income and Wealth, August 24–31, 1969, Nathanya, Israel.

[2] See *Inflation and the Price Indexes* (U.S. Congress, Joint Economic Committee, 89th Cong., 2d sess., 1966). In terms of base year weights the Implicit Price Deflator relies on the CPI for 46 percent of its coverage, the WPI for 12 percent, agriculture for 7 percent, and other prices and nonprice estimates for the remainder.

[3] See the statement by the Commissioner of Labor Statistics, Geoffrey H. Moore, before the Subcommittee on Economic Statistics of the Joint Economic Committee, Congress of the United States, May 15, 1969.

[4] The Implicit Price Deflator is derived by dividing total expenditures valued in current prices by total expenditures valued in base period prices. In constructing the Deflator, value data are deflated by appropriate price indexes (which may be fixed-weight group indexes) at the finest degree of detail feasible and summed to obtain the total constant-dollar figure. It can be shown that the total price index derived is of the Paasche form in so far as weights between the most detailed level of aggregation is concerned.

[5] For a more detailed analysis of the need for retail pricing, see Allan D. Searle and Mary E. Lawrence, "Retail Prices and the Consumer Price Index," February 1969, mimeographed.

[6] For a more complete description of the Bureau of Labor Statistics current program, see "Industry-Sector Indexes," *Handbook of Methods for Surveys and Studies* (BLS Bulletin 1458, 1966).

[7] $\frac{\Sigma P_o Q_i}{\Sigma P_o Q_o} = \frac{\Sigma P_i Q_i}{\Sigma P_o Q_o} \div \frac{\Sigma P_i Q_i}{\Sigma P_o Q_i}$ $\qquad$ $\frac{\Sigma P_i Q_i}{\Sigma P_i Q_o} = \frac{\Sigma P_i Q_i}{\Sigma P_o Q_o} \div \frac{\Sigma P_i Q_o}{\Sigma P_o Q_o}$

[8] *The Price Statistics of the Federal Government*, a report of the Price Statistics Review Committee of the National Bureau of Economic Research to the Bureau of the Budget, hearings before the Subcommittee on Economic Statistics of the Joint Economic Committee, January 24, 1961.

[9] See footnote 5.

[10] Discussion of these issues can be found in Edward F. Denison, Problems of Capital Formation, Studies in Income and Wealth, Volume 19 (New York, National Bureau of Economic Research, 1957), pp. 217–234; Milton Gilbert, "Quality Changes and Index Numbers," *Economic Development and Cultural Change*, April 1961, pp. 287–294; and Zvi Griliches, "Quality Change and Index Numbers: A Critique," and Milton Gilbert, "A Reply," both in *Monthly Labor Review*, May 1962, pp. 542–545, and in the minutes of the Committee on Consumer and Wholesale Prices, Business Research Advisory Council to the Bureau of Labor Statistics, February 18, 1964.

[11] See George Jaszi, Robert C. Wasson, and Lawrence Grose, "Expansion of Fixed Business Capital in the United States," *Survey of Current Business*, November 1962, p. 10; and Lawrence Grose, Irving Rottenberg, and Robert C. Wasson, "New Estimates of Fixed Business Capital in the United States, 1925–65," *Survey of Current Business*, December 1966, pp. 37–38.

[12] For a discussion of differences between a cost-of-living index and other consumer price indexes, see Joel Popkin "The Program for the 1975 Revision of the CPI," a paper presented before the National Planning Association, October 1970.

The place of the Consumer Price Index in today's economy and some of the problems in keeping it up to date

Updating the Consumer Price Index—an overview

JULIUS SHISKIN

THE MONTHLY Consumer Price Index is the only index compiled by the U.S. Government that is designed to measure changes in the purchasing power of the urban consumer's dollar. It serves two major functions:

- It is a yardstick for revising wages, salaries, and other income payments to keep in step with rising prices; and
- It is an indicator of the rate of inflation in the American economy.

Because of changes in consumer buying patterns, it is necessary to update and revise the Consumer Price Index periodically. The Bureau of Labor Statistics is now in the midst of a major revision, scheduled for completion in 1977. The index will be tested beginning in 1976. Starting in April 1977, BLS will publish two Consumer Price Indexes: an improved index for urban wage earners and clerical workers to meet the requirements of collective bargaining, and an index for all urban households, which will provide a new comprehensive measure of price change for the economy.

This article briefly describes uses of the Consumer Price Index, defines what it measures and describes its limitations as a cost-of-living index, reviews earlier revision programs,[1] reports on some of the problems encountered in the current revision, and describes the additional data that will be available after the revision has been completed and the new indexes are published in 1977.

Uses of the Consumer Price Index

Today, as in earlier years, the Consumer Price Index plays an important role in consumers' attempts to assess the degree to which their purchasing power is eroded by price increases, and serves as a major economic indicator.

As an escalator. It is estimated that there are more than 5.1 million workers covered by collective bargaining contracts which provide for increases in wage rates when the CPI rises. The number and application of these escalator clauses is increasing, and escalator clauses based on the index show signs of changing. In the spring 1974 settlements in the aluminum industry, for instance, a new step was taken when aluminum producers agreed to provide for annual automatic cost-of-living escalator adjustment in pension benefit levels, so that pension payments to retired workers will rise partially (65 percent) along with a rise in the Consumer Price Index.

In addition to workers whose wages or pensions are adjusted according to changes in the CPI, some 44 million persons now find their incomes affected by the index, largely as a result of statutory action: almost 29 million social security beneficiaries, about 2 million retired military and Federal Civil Service employees and survivors, 600,000 postal workers, and about 13 million food stamp recipients. When dependents are taken into account, the incomes of somewhere in the neighborhood of one-half the population already are or soon will be pegged to the Consumer Price Index.

Another group whose living standard is affected by changes in the Consumer Price Index are the 24 million children who eat lunch or breakfast at school, under the National School Lunch Act and the Child Nutrition Act of 1966. Under Public Law 93–150, national average rates for these lunches and breakfasts are adjusted semiannually by the Secretary of Agriculture on the basis of the change in the CPI series, "Food away from home."

Also, the poverty threshold estimate, which is the basis of eligibility in many health and welfare programs of both Federal and State and local govern-

Julius Shiskin is Commissioner of Labor Statistics.

ments, is updated periodically to keep in step with the Consumer Price Index. Under the Comprehensive Employment and Training Act of 1973, the "low income" standard specified as one of the criteria for distribution of manpower revenue-sharing funds is kept current by reference to the index.

In addition, escalator clauses in an increasing number of rental, royalty, and child support agreements automatically increase payments to an undetermined number of people. The CPI is also used as a guide in drawing up contracts and in wage negotiations.

As an economic indicator. Beyond its application to wages and other income payments to individual Americans, the index has direct impact on the formulation and evaluation of government economic policy that affects virtually everyone. The Consumer Price Index is, in fact, a major yardstick by which the success or failure of government economic policies is judged.

As an indicator of cyclical change in the economy, the index itself has typically lagged behind other measures of economic performance, such as real GNP (output) and unemployment. The Wholesale Price Index also tends to lead the CPI, although the leads are quite variable. On the other hand, the Consumer Price Index seems to lead the GNP implicit price deflator, although the lead is less clear when comparisons are made with the GNP price deflator computed with fixed weights.

In the light of these important issues involving the CPI, it is clear that an accurate Consumer Price Index is of the utmost importance. At present, a 1-percent change in the index triggers at least a $1 billion increase in income under escalation provisions. An error of only 0.1 percent can thus lead to the misallocation of over $100 million.

Furthermore, while it is difficult to estimate the effects of an error in the Consumer Price Index on economic policy decisions, it is also clear that—with inflation the major economic problem of the day—the stakes involved in an accurate Consumer Price Index are very great relative to the costs.

Changes in nomenclature

Never a static instrument, the Consumer Price Index has been responsive to changes in expenditures and earnings patterns, as well as in its uses and in the economy. Changes in use and in concept brought changes in nomenclature as well.

Between 1913 and 1945, the Bureau of Labor Statistics referred to *The Cost-of-Living Index for the United States.* In 1945, the name was changed to *Consumers' Price Index for Moderate Income Families in Large Cities.* In 1964, the current title, *Consumer Price Index for Urban Wage Earners and Clerical Workers,* was adopted.

Beginning in 1977, a new *Consumer Price Index for All Urban Households* will be published, in addition to an updated *Consumer Price Index for Urban Wage Earners and Clerical Workers.*

What the CPI measures—and doesn't

The Consumer Price Index compares what the "market basket" of goods and services cost this month against what it cost a month ago, or a year ago, or 10 years ago, or in 1967 (the base year for the current index). Say that in 1967 the prescribed market basket could have been purchased for $100. In February 1974 the CPI was 141.5 and in March 1974 it reached 143.1. That means that the same combination of goods and services that could have been obtained for $100 in 1967 cost $141.50 in February 1974 and $143.10 in March.

This does not necessarily mean the average consumer actually spent $143.10 in March 1974 as against $100 in 1967. Consumers tend to adjust their shopping practices to the prices they encounter in the marketplace and to substitute less costly items, or do without, in order to hold their spending within their means. For example, if the price of certain cuts of beef rises rapidly, the purchasers may shift to poultry or less expensive meat. If the charge for repair services increases more than the customer believes is acceptable, householders tend to postpone having the repairs made or to "do it themselves."

The index does not take this sort of substitution into account, but rather is predicated on the purchase of the same market basket, in the same proportions (or weight), month after month. This is one reason why it is called a price index and not a cost-of-living index—although the public often refers to it as a cost-of-living index, and it is often used in that way. There are other major differences between the two types of indexes. For instance, the CPI does not include income and social security taxes since (unlike sales taxes) these costs are not directly associated with retail prices of specific goods and services, whereas a true cost-of-living index would explicitly include them.

The CPI does not immediately reflect changes in expenditure patterns, nor can it immediately adjust to the introduction into the economy of new products or services. For example, the increased use of con-

venience foods as more and more women entered the labor market and the rise in "fast-food" eating places —these social and economic phenomena were in place for some time before they could be adequately reflected in the index. Similarly, a product which has fallen from public favor—either because its place is usurped by a better product, or simply because of a change in fashion or consumer preference—may continue for a time to carry a disproportionate weight in the index until it can appropriately be phased out. But even within the fixed market basket concept of the CPI, provision is made for some changes in products between the main decennial revisions.

The Consumer Price Index does not attempt to report these changes in the style of living. It simply measures the changes in prices for a scientifically selected market basket based on the average experience of certain population groups. Items in the market basket for which the CPI measures price changes run the gamut from bread and butter to television and bowling fees, from prenatal and obstetrics services to funeral expenditures, from popular paperbacks to college textbooks. The CPI never has been limited to price changes of so-called necessities.

Expenditures by a cross section of consumers living in a representative selection of urban places, as disclosed by Consumer Expenditure Surveys, provide the basis both for the selection of items to be priced and the importance of each of these items in the index structure. The relative importance (or weight) given to each item also is derived from the Consumer Expenditure Survey. The weights reflect the experience of renters and of homeowners; of car owners and of carless families and individuals; of families with many children, childless families, and single consumers.

Since the CPI is based on expenditures, it does not reflect noncash consumption, such as food grown at home, fringe benefits received as part of a job, services supplied by government agencies without payment of a special tax fee, and so on. When the relative importance of such an item changes over time—as with medical care, for which employers and the government have in recent years assumed an increased proportion of the expense—these changes must be taken into account in interpretation of the index.

Origin of the CPI

Although studies of prices and living conditions in the United States had been conducted by government agencies since the late 19th century,[2] the Bureau of Labor Statistics first consumer price index, called a cost-of-living index,[3] grew out of a decision by the Shipbuilding Labor Adjustment Board during World War I. In arriving at a "fair wage scale," the Board determined in November 1917 that readjustment of wages in the shipbuilding yards was warranted when there had been a general and material increase in the cost of living.[4] During 1918–19, in cooperation with the Board, the Bureau investigated the cost of living in a number of shipbuilding and other industrial centers. Details of expenditures on goods in the family market basket were obtained from each of 12,000 wage-earner families in 92 cities, and records of retail establishments in 32 cities provided prices for a large number of articles. Regular price collection was initiated after 1917 in these 32 cities, with price information collected 1 to 4 times a year for about 145 commodities and services. In 1919, the Bureau began the publication of complete "cost of living" indexes at semiannual intervals for 32 large shipbuilding and industrial centers, using a weighting structure based on expenditures of wage-earner and clerical-worker families in 1917–19.[5] In February 1921, regular, periodic publication of the U.S. index in roughly its present form was established. Although over the years there have been many changes in scope, coverage, frequency, and publication format, the index has remained a measure of change in the cost of a fixed market basket of goods and services. Quarterly indexes were initiated in 1935, and monthly indexes began in

Forthcoming articles on the CPI revision

Revision of the Consumer Price Index, as this article indicates, is a long and complex endeavor, involving the work of many staff members. The present article is an overview of the revision process, and interim progress report on some of the actions taken and plans underway. Additional articles are planned describing both methodology and survey results.

The principal BLS staff contributors to this overview article were Kenneth Dalton, Chief of the Division of Consumer Prices and Price Indexes, Office of Prices and Living Conditions and Robert Gillingham, Economist, CPI Revision Group. Georgena Potts of the Office of Publications assisted in bringing the materials for this article together and in writing the text. Much of the work described above on the current revision was carried out under the direction of Janet L. Norwood, now Deputy Commissioner of Labor Statistics.

October 1940 at the request of the National Defense Advisory Commission.[6]

First major revision—1940

In 1933 the Secretary of Labor requested that the American Statistical Association appoint a committee to advise the Department on its statistical programs. The Advisory Committee paid particular attention to cost-of-living indexes, and on its recommendation the Bureau of Labor Statistics initiated steps leading to a comprehensive revision of its indexes.

In 1934–36, the Bureau undertook a comprehensive survey of "Money Disbursements of Wage Earners and Clerical Workers," which covered 14,500 families of two persons or more in 42 cities with 50,000 inhabitants or more. Price collection procedures were altered and methodological changes in index calculation were made, modifying both the weights used in combining group indexes to obtain the "all-items" index and the population weights for combining cities.[7] The system of weights was revised,[8] with specific weights based on city food expenditure patterns replacing the regional weights formerly used. New commodities were added, and food indexes were constructed on the new basis back to March 1919. Also, the Bureau adopted the principle of imputation—that is, ascribing to a sample item that could not be priced the price change for groups of items presumed to have price movements similar to the sample item.

The comprehensive revision of the index was completed in 1940.[9] At the same time, the reference base period was shifted to 1935–39 = 100, on advice of the Central Statistical Board (predecessor of the present Statistical Policy Division of the Office of Management and Budget).

Post-World War II revision

During World War II, temporary adjustments in data collection procedures and in weights for foods, fuels, transportation, and other selected items had been made to take account of rationing and wartime shortages.[10] These adjustments were necessarily imperfect. In 1946, when wartime restrictions were removed, prewar weight patterns were restored, with adjustments to validate the actual change.

In 1946, also, a number of important changes were made in the calculation of food prices. Separate average prices were computed for chain and independent stores, and these averages were combined using fixed weights. Food outlet samples were

Publication of the Consumer Price Index

The national Consumer Price Index is compiled by the Bureau of Labor Statistics and published about 3 weeks following the month to which the data refer. The index refers to the entire month, not any specific day of the month. Prices are collected early in the month for foods, around mid-month for rents and utilities, and over the entire month for other goods and services. Approximately 15,000 retail stores and other retail outlets (bowling alleys, doctors' offices, and so on) are visited each month and approximately 400 items are priced. A press release contains a brief analysis of prices movements during the month, as well as the latest available indexes and percent changes over selected periods. A more detailed report is published subsequently in the *Monthly Labor Review* (table 25, pp. 103–08) and in a special periodical, *The Consumer Price Index*. U.S. average indexes are published monthly for "all items" and for groups, subgroups, and selected items.

Individual "city" indexes for Standard Metropolitan Statistical Areas, identified by the names of their central cities, are published in the monthly press release, in the *Monthly Labor Review* (table 27, p. 110) and in a detailed report for individual Standard Metropolitan Statistical Areas (SMSA's) having 1 million inhabitants or more in 1960, based on the pricing of full samples of items. These indexes are computed monthly for five areas: Chicago, Ill.–Northwestern Indiana; Detroit, Mich.; Los Angeles–Long Beach, Calif.; New York, N.Y.–Northeastern N.J., and the Philadelphia metropolitan area, and once every 3 months on a rotating cycle, for the other published "city" areas. Indexes are published monthly for the food component for published "city" areas.

Because many users misinterpret the city indexes as measures of intercity differences in prices, each report cautions the user of these indexes that comparisons of indexes for individual SMSA's show only that prices in one location changed more or less than in another. The metropolitan area indexes cannot be used to measure differences in price levels or in living costs between areas.

Besides publication of city indexes in a national press release, statements are issued from the Bureau's regional offices on the same day as the national release. These contain indexes and analyses of price movements in the individual areas.

Starting in 1973, indexes have been published for cities in five population-size groups, and in 1974 regional indexes were added.

revised, taking into account type of store, sales volume and location.

The 1953 revision

Expenditure surveys conducted in a few cities in 1947–49 showed significant post-war changes in consumption patterns of wage-earner and clerical-worker families, indicating a serious need for revision of the index weights used and the market basket items.[11] In 1949, the Congress authorized a large-scale 3-year program for modernization of the index. By this time, the postwar rise in prices, which followed elimination of price controls in mid-1946, appeared to have run its course; prices had begun to decline from their postwar peaks, and the period 1951–52 was expected to be characterized by relatively stable economic conditions.

The outbreak of hostilities in Korea, however, was accompanied by sharp and diverse price increases in the United States. These price changes, coupled with widespread use of the index in wage escalation clauses, made adjustment of the index weights to post-World War II spending patterns extremely urgent. In an interim revision,[12] using data from 1947–49 expenditure surveys in seven cities, group weights were adjusted, and 25 additional items were selected for pricing. Both the "old series" index and the adjusted index were published simultaneously from 1950 through 1952, when the old series was discontinued.

The comprehensive revision which was begun in 1949, was completed in 1953. Surveys of consumer expenditures were conducted in 91 cities, the index concepts were reexamined completely, and the index reference base was changed from 1935–39 to 1947–49. The general concept of the index as a measure of price change for a fixed market basket of goods and services was retained, but a major change was made by including the purchase of a home in the weighting pattern. The classification of goods and services into groups and subgroups was revised, and indexes were computed retroactively on the new base period (1947–49) for the new major groups. The revision introduced a new sample of 46 index cities out of the 91 cities in the Consumer Expenditure Survey, including for the first time small urban places (including areas with as few as 2,500 inhabitants) as well as large cities; revised weights reflected the 1950 spending pattern of wage-earner and clerical-worker families adjusted to 1952; and the list of items priced was expanded to include new products (such as television sets and frozen foods) and items that had not been previously covered, such as restaurant meals and owned homes.[13] The new index was linked to the adjusted index in December 1952 to form a continuous series.[14]

The 1964 revision

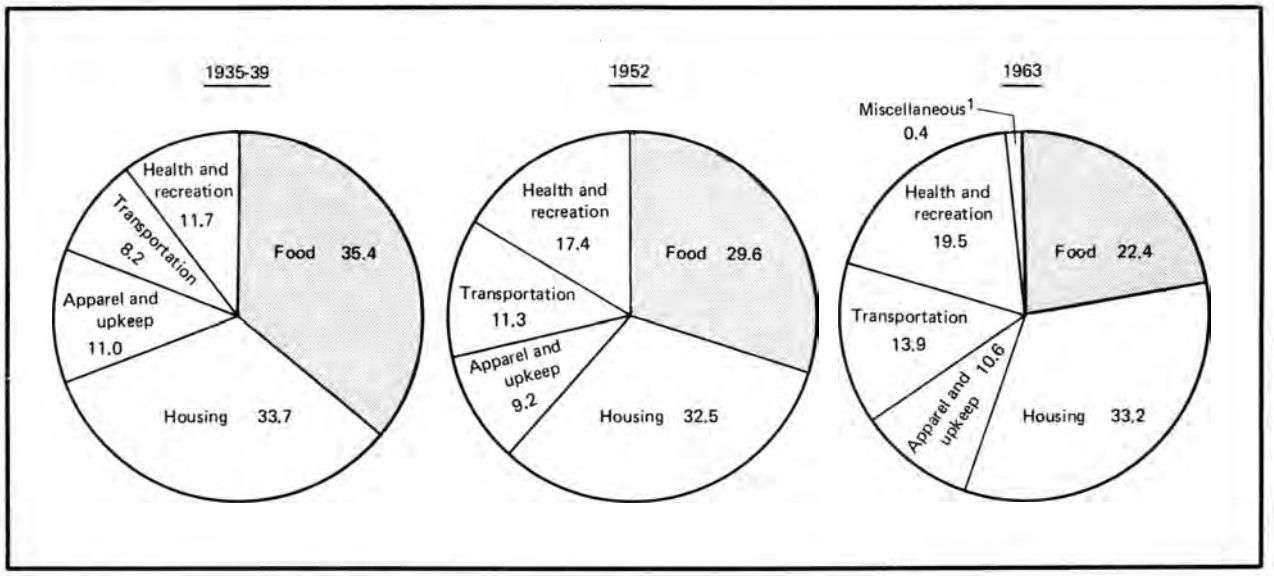
By the late 1950's, it became apparent that the index weights should not go unrevised for more than a decade. The Bureau of Labor Statistics asked for and received authorization for a revision program, to take 5 years, which was begun in 1959. It included a Consumer Expenditure Survey conducted in 1960–61 that provided information on the entire population. These data were basic in selecting a new market basket, new weights to reflect the distribution of consumers' expenditures, and a new and larger sample of cities and retail stores. Chart 1 indicates how the weighting pattern has changed over the years.

Since the 1950's the population had mushroomed, but, more important, it presented a composition markedly different from that in 1950. The proportion of persons at each end of the life cycle had increased. Major changes had occurred in its geographic distribution. About 1 in 5 family units was moving each year, many to the South and West, from farm to city, from the central city to the suburbs, and to peripheral areas in the process of urbanization.

Personal disposable income had moved upward since 1950—about 37 percent between 1950 and 1956—and more than two-thirds of the rise was reflected in increased real income. Shifts in consumer spending patterns were apparent. Further extension of credit on easy terms made the consumer less and less willing to defer purchasing a house, major appliances, an automobile, and other large-ticket items. Also, the decline of price maintenance laws and the rise of the discount house had altered retail distribution patterns. Many new products or qualities had come into being, ranging from deep freezers to new household items made of plastics. Greater use was being made of frozen foods, and there were important changes in housing, including a large number of new units and a continuing shift from rental to owner occupancy. Particularly significant was the increasing share of consumer services in the economy as a whole.

The basic objective of the index continued to be the measurement of change in the price of a fixed market basket of goods and services for urban wage earners and clerical workers. A number of

Chart 1. The consumer market basket, selected periods



[1] Includes personal finance charges other than automobile financing and mortgage interest. Imputed, not directly priced.

important changes were introduced, however: (1) the population coverage of the index was expanded to include persons living alone; (2) the definition of an urban wage-earner or clerical-worker family was modified, so that a family was considered within the scope of the survey if 50 percent or more of its income came from wage and clerical occupations and if at least one member of the family worked for a minimum of 37 weeks of the year (in the old series, this working member had to be the head of the household; the change was made because of the increasing importance of families with two workers or more and of family units whose household head was retired, but which had other working members); and (3) the income limitation was dropped.[15]

These changes raised the population coverage to about 55 percent of the urban population and under 45 percent of total population. At the time of the 1964 revision it was estimated that single workers living alone represented about 10 percent of all urban wage-earner and clerical-worker consumer units to which the index applied, and family units 90 percent. (On an expenditure weights basis, however, the importance of single consumer units is only 6 percent of the composite wage-earner and clerical-worker index.)

The average income of the population covered was $5,963 in 1960–61 on the basis of the revised definition, compared with $6,230 prior to revision. This decline resulted from inclusion of single workers, whose average income of $3,560 was considerably below that of the family groups.

A new and expanded sample of metropolitan areas and small urban places was introduced, based on the 1960 Census of Population, and pricing was extended to suburban areas. The sample of retail stores was also revised and expanded. Probability sampling techniques were used for the first time in the selection of items for pricing. A system for measuring sampling error was developed, and improvements were made in price collection methods.

The revision was completed in 1964. As before, the new series was linked to the old in order to maintain continuity. To provide an opportunity for examining differences in price movements and to allow persons using the index in contractual agreements (such as labor contracts) to shift to the revised index, both the old and new series indexes were published for the period January to June 1964. The two indexes did not diverge substantially.

Current revision program

The current revision of the Consumer Price Index has been a major project of the Bureau of Labor Statistics over the past 4 years. As in the past, the revision program involves the development of a greater amount of data and a review of the economic and statistical concepts and operational procedures used in constructing the index. Exhibit 1 shows the

progression of various steps in the process. Major elements of the current revision, simply stated, are:

- On the basis of a survey of consumer expenditures, to determine
  a. the proportion of spending for food, shelter, medical care, and so on (to be used in the index weights), and
  b. the specific goods and services to be included in the market basket.
- To obtain a new sample of stores where people buy, reflecting shifts in retail purchases, such as from central cities to suburbs and from retail stores to mail order houses;
- To modernize the conceptual framework to make the index more relevant to current and prospective economic conditions, and to improve statistical methodology, particularly sampling techniques.

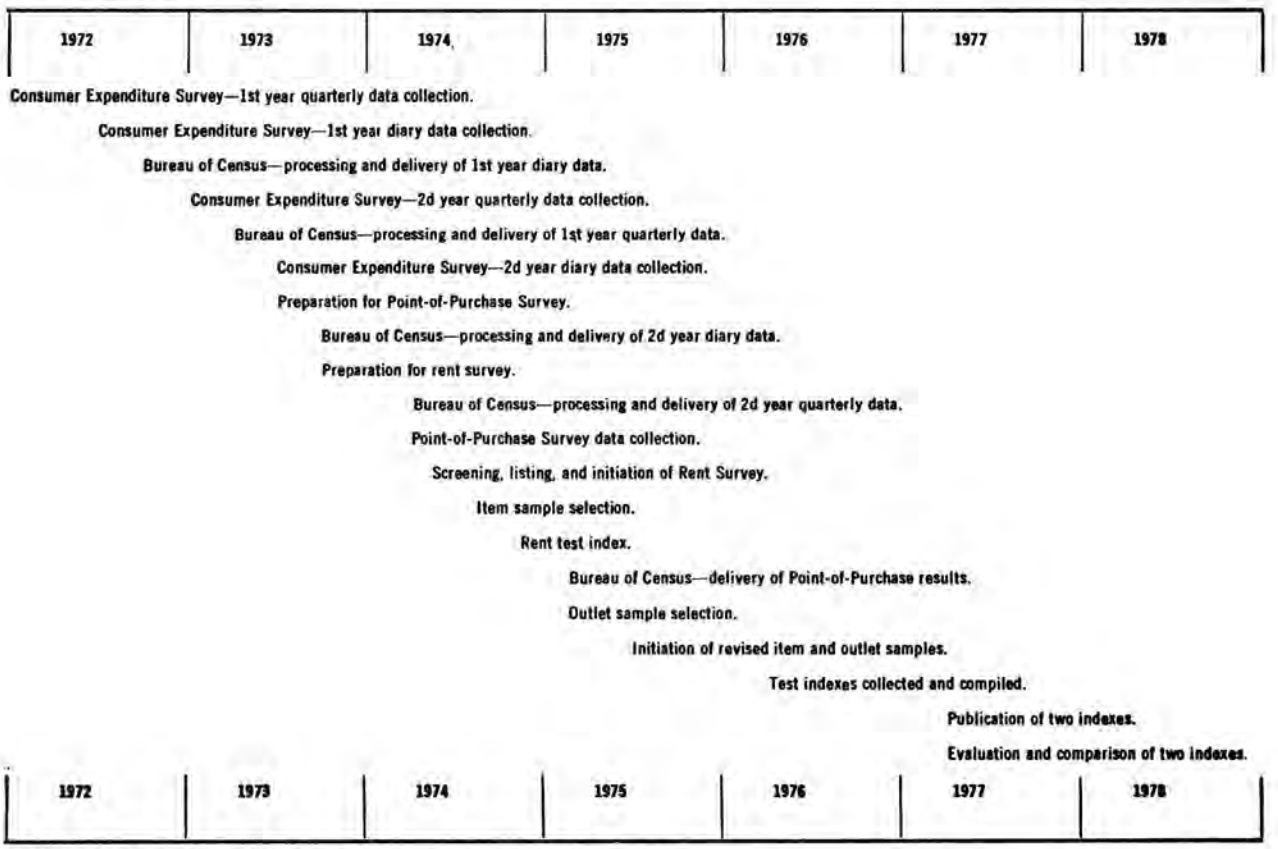
Present goals are that the revised CPI will have sampling errors that are substantially lower than those of the current CPI.

Surveys

Consumer Expenditure Survey—what people buy. Information for the decennial revision of the Consumer Price Index is collected from a series of sample surveys. The most important of these is the Consumer Expenditure Survey, which collects information on what people buy. The latest such survey, conducted for the current revision, covers the years 1972 and 1973. It differs from previous surveys in several aspects of design and collection methods, notably in combining the resources of the Nation's two major economic statistical agencies, the Bureau of the Census and the Bureau of Labor Statistics. BLS developed the questionnaire content and specified the output. Census selected the household sample, spread throughout 216 areas of the country, and conducted the interviews. Most of the information was obtained in a series of quarterly interviews involving about 20,000 families.

The remaining information was obtained from another sample of about 20,000 families, who were asked to complete a 2-week diary, in order to obtain data on small, frequent purchases, such as food and personal care items, which are typically difficult to recall. The diary collection program started and ended 6 months later than the quarterly survey.

Exhibit 1. CPI revision calendar



NOTE: Dates above refer to start of projects but not necessarily to their completion.

Substantial gains in the accuracy of the index should result from significant improvements in both the sample and survey design of the Consumer Expenditure Survey, such as improved stratification, lower nonresponse rate, reduced length of recall period, and improved estimating procedures. Also, a substantially larger sample of items will be selected for pricing. (Approximately 400 items are priced in compiling the CPI each month.)

The Consumer Expenditure Survey is expected to provide more accurate and more complete data than have previously been available, and thus a sounder basis for the selection and weighting of items in the market basket. As with the last revision, data from the Consumer Expenditure Survey will be used to select a stratified probability sample of items (the market basket) within the universe of items classified into expenditure classes.

Information on such items as clothing, utilities, and small household appliances is expected to be more accurate because of the shorter recall period resulting from the change to a quarterly survey. The diary survey will provide greater detail on items ordinarily purchased on a daily or weekly basis, such as food and beverages, and on personal care products, not otherwise covered in the survey.

Point-of-Purchase Survey—where people buy. Pricing of items included in the Consumer Price Index takes place in outlets selected to be as representative as feasible of types and sizes of places where urban wage earners and clerical workers shop. The Point-of-Purchase Survey, now underway, will provide additional data on the retail stores, mail order houses, bowling alleys, doctors' offices, and other places where goods and services are bought. Approximately 20,000 families are being asked where they purchased various types of goods and services. From the survey results, for the first time, a full probability sample of retail stores and other outlets to be used in collecting data for the monthly index will be developed. Optimization principles are being used to assure proper balance between the number of outlets and the number of price quotations collected in each. Here again the Bureau of the Census serves as collection agent, under contract with BLS.

Rent survey. Still another survey is underway, to provide more accurate and current data for the rent index. Under the present system, change in rents is measured from large samples of rental units which include the same units at successive periods. No substitution of nearby units is permitted. Six-month rent changes are obtained in each city by part-time agents every 2 or 3 months, by personal visit or telephone inquiry to tenants of specified units in different samples. The agent uses a detailed checklist covering fuels, gas, and electricity, telephone, garage, furniture, water, maid service, switchboard service, and so forth. In most cities, two subsamples of up to 500 rental units each are drawn, with each sample priced semiannually in different months. In the five largest cities, three subsamples of about 500 each are priced semiannually in different calendar months, providing data for one of the subsamples every 2 months.

In the 1974 survey, as a first step, BLS data collectors in specified areas first list housing unit addresses in the sample neighborhoods, including both single and multifamily dwelling units. In the second stage, the data collectors visit randomly selected dwelling units and interview the occupants to obtain information on whether the units are owner- or renter-occupied, the type and amount of rent, type of occupancy (year-round, transient, or seasonal), age and type of structure and whether the unit has complete kitchen facilities. In the final stage of the survey, respondents will be asked to provide information on the amount of rent paid and the kinds of equipment and services included in the rent. Thereafter, contact will be made semiannually with samples of those dwelling units which meet the specifications for inclusion in the Consumer Price Index. The samples will be rotated and information will be obtained each month on changes in the amount of rent paid and the services and facilities provided in the current and the previous month.

The new sample design will improve the timeliness of the rent index, as well as its accuracy. Rent for the current month will be compared with rent for the immediately preceding month, rather than at 6-month intervals as at present. The measurement of short-term changes is a critical requirement for the Consumer Price Index. The current rent system does not provide an adequate measure of monthly change, nor does it provide for time intervals of a few months between changes. The revised system will yield accurate short-term changes while allowing for close to a 50-percent reduction in sample size.

In addition, attention is being given to the development of better methods for adjusting for changes in the quality of the rental units priced. Current plans call for incorporating the new rent sample and collection techniques into the ongoing Con-

sumer Price Index some time before completion of the entire revision program.

Output of the surveys. In addition to its application to the expenditure weights and the market basket, information from the Consumer Expenditure Survey will be analyzed and published in a number of other formats. Comparisons of the changing expenditure, savings, and income patterns which have occurred since the last such survey (in 1960–61) will provide a wealth of material for sociologists, urban planners, and other economic and manpower policymakers. These will include analyses of the differences in levels of living among various demographic groups using characteristics such as family income, family size, age of family head, occupation of head, and so forth.

The quarterly Consumer Expenditure Survey will provide data similar to that obtained in previous such surveys, though in some cases in greater detail and of greater applicability. Information on clothing, for example, will be collected with great specificity—*Coats:* heavy-weight coats, light-weight coats, snow-ski suits, all-weather coats, plastic raincoats, and other coats—and will carry an age-sex code for purchases for members of the household as well as for gifts purchased for persons outside the household.

Major household equipment items will be identified as to whether they were purchased new or old, whether they were purchased for own use, received as a gift, included with dwelling, rented, or purchased as a gift to others. Purchases of this type will also carry a code to indicate whether the item was bought for cash, on 30-day credit, installment credit, or other credit.

The diary survey uses a complex system of more than 1,700 commodity codes. Examples of the level of detail provided by this coding structure are:

Milk—buttermilk, chocolate, condensed, evaporated, imitation, malted, powdered, or skim–whole;

Beefsteak—chuck, rib round, sirloin, T-bone, or other steak.

These food products will also include a net weight or volume per unit identification. (The quantity code may appear only on the tapes for public use and not in published data.)

In addition to BLS publication of these data, computerized data of extraordinary detail and specificity will be available on public use tapes to econometricians and other researchers from outside the Bureau of Labor Statistics for their individual study projects. These data are expected to be available beginning in 1976.

Sample of cities

Improvements are being planned for the sample of Standard Metropolitan Statistical Areas (designated by the names of their central cities). The present sample of "cities," which numbers 56, was selected on the basis of the 1960 Census of Population using probability methods. It was designed to represent the entire urban portion of the country.[16]

For the revised index, prices will be collected in 85 areas, with the area selection based on the 1970 Census of Population. The 85-area design lends itself to further expansion to at least 156 areas, if needed. Of the 85 areas, 28 are self-representing and 57 are representative of the balance of the SMSA's and the remainder of the urban population.

The increase in the number of areas to be sampled will make it possible not only to improve the reliability of the national Consumer Price Index and the indexes recently introduced for different regions of the country and for urban areas classified by size of population, but also to provide, for the first time, regional indexes for cities of different population-size classes. Monthly or quarterly indexes will be published for 28 cities in 1977, compared with 23 at present.

Population coverage

One of the major problems related to the current revision program has been to determine just who should make up the index population. Historically, the index has been oriented toward the urban worker. As the characteristics of the urban wage-earner family have changed over the years, this fact has been reflected both in the titles of the index and in the index structure.

In earlier periods, wage earners and clerical workers could be characterized realistically as being of "low income." Clerical and salesworkers were identified as "lower salaried" employees, and the index was referred to as one for "low and moderate income" families. These were renters primarily, living in the more densely populated city centers, and including relatively more of the older established households and larger families.

The large increase since World War II in the size of the middle-income group and population

movement to the suburbs reflected to a large degree the improving economic status of the "worker" included in the index population. Expenditures are by and large based on income, and the large increase in the number of two-earner families has raised many wage-earner and clerical-worker families into the middle-income group. Also, the shift toward a service economy and the increasing unionization of salaried white-collar employees has caused the occupational classification of "wage earner and clerical worker" to lose much of its significance, because of the similarity in the manner of living of this group and that of the total urban population in the middle-income range. As a result of these demographic and economic changes, questions were raised about the coverage of the index.

More than a decade ago, the Stigler Committee recommended that an index with broad population coverage be developed.[17]

> A more comprehensive index for the entire population, not only the wage and salary earners, should be made. . . .
>
> From the viewpoint of general public policy and scientific study, our basic need is for a comprehensive Consumer Price Index . . . that is appropriate to the measurement of the changes in welfare of the Nation and to the measurement of inflation (and hence the guidance of monetary and fiscal policy).[18]

Along with this recommendation, the committee stated that "a price index comparable to the present CPI, suitable to the current wage escalation clauses, should be maintained for several years even if an extensive revision of the scope of the index is undertaken by the Bureau of Labor Statistics."

During 1961 appropriations hearings, Ewan Clague, then Commissioner of Labor Statistics, made a point of the Bureau's plans for extending the scope of the price indexes to cover single-person families and "further extensions which may eventually expand the index to represent all nonfarm families." In May 1966, then Commissioner Arthur M. Ross, testifying before the Senate Subcommittee on Economic Statistics, indicated an urgent need to expand the Consumer Price Index to represent purchases by all consumers and all retail sales,[19] as well as the need for separate indexes to be compiled within this framework.

The idea of broadening the population coverage of the index was introduced early in the current revision program. In May 1970 the question was discussed with the Research Advisory Councils (from business and from labor) that regularly meet with the Bureau of Labor Statistics. In a *Review* article in March 1972, discussing Bureau programs, then Commissioner Geoffrey H. Moore wrote:

> In the past the index has reflected expenditures only for urban wage earners and clerical workers, but consideration is being given to broadening this base by expanding the coverage to include other types of workers or retired persons.[20]

Views on the coverage issue

In April 1974 the Bureau of Labor Statistics announced its intention to broaden the coverage of the Consumer Price Index to include all urban households beginning in April 1977. The index limited to urban wage earners and clerical workers would have to be discontinued because of time and cost constraints.[21] This announcement stirred up a lively debate and led to the surfacing of the many different points of view on this issue. To a large extent, the interest in the issue was prompted by the recent high rate of inflation and the great increase in the use of the index as an escalator for many different types of income payments.

In discussion of background papers prepared by the Bureau of Labor Statistics for its Research Advisory Councils, it became clear that there was general agreement among council members that broadening the population coverage of the Consumer Price Index would be acceptable. However, union spokesmen on the Labor Research Advisory Council urged that the Bureau reconsider its plans to discontinue the urban wage-earner index.

The controversy was brought to public attention by AFL-CIO President George Meany and United Auto Workers President Leonard Woodcock. Mr. Meany stated his opposition to the dropping of the wage-earner and clerical-worker index in a letter to Secretary of Labor Peter Brennan, which was widely reported in the press. Mr. Woodcock, in testimony before a subcommittee of the Joint Economic Committee, argued forcefully for continuation of the wage-earner index:

> Trade unions have a vital interest in the CPI as it currently stands. It is absolutely essential for effective, responsible, and rational collective bargaining that there be available a consistent and reliable index reflecting changes in the cost of living actually experienced by working people. . . .
>
> . . . We have had nearly 30 years of experience dealing with [the Consumer Price Index]; we understand its strengths and weaknesses; we are familiar with its behavior and we know how to incorporate it

responsibly into our contracts. . . . *In principle* we are totally opposed to the abolition of a CPI geared to workers in favor of one geared to nobody. . . . *In practice* neither we nor anyone else have any concrete experience as to how this new index would behave. However, there is a presumption that it would record lower rates of inflation than the current CPI, at least if prices continue to behave as they have done in the last decade. This is because items whose prices have generally been rising fast[er] are precisely those which figure most prominently in the budgets of lower income families.

The UAW, and the labor movement in general, clearly recognize that there are purposes for which the existing CPI is not suited. Certain macroeconomic analyses require more general indicators along the lines of the proposed All-Consumer Index. Other purposes (for example, setting the appropriate level for social security payments) require more specific measures covering groups currently excluded from the CPI. Such functions are legitimate and we would support the creation of indexes appropriate to them.[22]

In hearings before another Senate subcommittee, later in the month, union spokesmen stressed the need for continuity of statistical data, especially in an area such as labor-management negotiations where faith in the reliability of that data is basic to its acceptance as a tool in bargaining. Lazare Teper, Director of Research for the International Ladies' Garment Workers' Union, pointed out that "Neither workers nor management are likely to accept the new set of figures just because it covers other groups whose marketplace experience is different from that of wage and salaried workers."[23]

Cost-of-living adjustments are not generally considered by labor leaders to represent a real gain for the worker in terms of the labor share of expenditures. Escalator clauses—which in effect freeze real wages—are merely a defensive factor to prevent there being any loss in real income. Improvement in the workers' share must be negotiated in other forms (in some contracts the escalator clause is tied in with an annual improvement factor).[24] Thus, labor leaders felt it essential that this defensive tool not be weakened by changing its effective coverage.

Many users, however, spoke out in favor of the expansion of population coverage. For example, the Interagency Subcommittee on Economic Statistics (headed by Gary L. Seevers) of the Council on Economic Policy (then headed by George P. Shultz) expressed "general agreement that the family definition in the CPI should be as broad as possible. The Subcommittee encouraged the Bureau of Labor Statistics to take steps to enlarge the definition in the revised index."[25]

Senator William Proxmire, at appropriations hearings, noted the value of both the current wage-earner index and the comprehensive index with broader coverage:

> You know how very concerned some people are because their escalation clauses are tied to it [the present index for urban wage earners and clerical workers]. Fifty million people in this country, including 5 million in organized labor, and a very large number of government workers, and many others, have their

Population coverage in other countries

In other countries that publish consumer price indexes, the most common variables used to determine whether or not a family should be included in the weights of an index are (1) location—urban or rural; (2) source of income; (3) income level; and (4) family structure or size. The definitions used range from total population to quite narrow definitions, but in most industrial countries coverage is broader than it is in the United States at present.

Among the countries with complete coverage of all consumers are the Federal Republic of Germany, Belgium, Denmark, Norway, Sweden, Italy, and the Netherlands. The Federal Republic of Germany regularly publishes indexes for three subclasses in addition to its overall index. Italy and the Netherlands publish two indexes, one for the total population and one for nonfarm wage earners and salaried workers. Both countries utilize a maximum income cutoff.

Although the coverage is not complete, it is very broad scale in Austria, the United Kingdom, and Japan. Austria covers all urban households. The United Kingdom conducts a continuous expenditure survey of all households and publishes two indexes. One index excludes pensioners and upper level income earners; this refers to about nine-tenths of the population. The United Kingdom also publishes quarterly indexes for pensioner households. Japan excludes only agricultural and single-person households.

Canada's index includes urban, middle-income families ranging in size from two to six persons, living in metropolitan areas with over 30,000 inhabitants. Middle income is considered to be $4,000 to $12,000 as of the base year 1967.

France publishes a monthly index representing households headed by urban wage earners or non-supervisory salaried employees. Their index excludes upper-income salaried workers.

compensation directly tied to this index. They know it, they have faith in it, and they feel it relates to their actual income. And I think you are very wise, and the government is wise, in deciding that they should have this new index to make it more comprehensive, and cover 80 percent of the people—and have a much more representative index of the cost of living.[26]

At its April 24, 1974, meeting the BLS Business Research Advisory Council passed a resolution in "support [of] the efforts of the Commissioner to expand the population coverage of the revised Consumer Price Index," and laid the ground for further exploration of the desirability of maintaining more than one index.[27]

A family of indexes

The determination of the target population for the Consumer Price Index must recognize the major uses of the index—the traditional as well as the recent ones. In theory, one way of satisfying this need is through a family of indexes. In this approach, indexes would be developed that represent not only the price experience of all consumer units, but also the separate experience of particular subgroups of the population, such as wage earners and clerical workers, the aged, the poor, and the rural population. In practice, production of such a family of indexes does not appear feasible as part of the 1977 revision program, given current constraints of time and funds. BLS will be studying the prospects for such indexes as time and resources become available.

A family of CPI indexes would be roughly analogous to the complex of unemployment data published by the Bureau of Labor Statistics. There, in addition to the total unemployment rate, numerous components are shown—for example, the unemployment rates for household heads, for adult men, for women, for Negroes and other races, for veterans. In order to show this large variety of data, the total size of the sample must be large enough that the figures for each component are reliable. (The Current Population Survey sample used to obtain the unemployment data now includes 47,000 households monthly, compared with 15,000 retail outlets in the current CPI sample.) Technically and operationally, a similar program could be developed for the Consumer Price Index; it is a matter of time and money, on the one hand, and the usefulness of the additional output, on the other.

Even the urban wage-earner and clerical-worker segment of the population is not a completely homogeneous group; it is made up of many individuals, each with an individual way of life. If a price index were calculated for each of the individuals in this group, some of these indexes would rise more rapidly than others. So even under the current wage-earner and clerical-worker index, there are some covered individuals who gain when wages are escalated by the Consumer Price Index, and some who lose, in relation to their actual expenditures.[28]

New BLS plan—two indexes in 1977

On May 24, 1974, the Bureau of Labor Statistics announced a decision to issue two indexes starting in April 1977—an updated version of the current Consumer Price Index for Urban Wage Earners and Clerical Workers, and a broader Consumer Price Index for All Urban Households.

Both indexes will incorporate improvements being developed as part of the revision program—for instance, it is anticipated that both will be produced with smaller measurement errors than the present index, and that the full array of city and other detail will be included in both indexes.[29] In addition, an evaluation plan will be built into the program.

Both indexes will be calculated and published for at least 3 years, 1977–80. During that period, the comparative movements of these two indexes and their components will be studied. Results of these studies will be discussed periodically with the Research Advisory Councils, as well as with Administration officials, the Congress, and professional economic and statistical groups. Finally, a determination will be made as to whether one index is adequate, or whether both and perhaps an index representing the difference between them is needed, or whether a whole family of indexes best meets the demands placed upon the CPI index program.

The comprehensive index will cover all urban households in Standard Metropolitan Statistical Areas. Some of these include rural areas as well as cities and suburbs. Nonfarm families living in these rural areas within SMSA's will be included, but the index will exclude other rural families and the military and institutional population. The result will be to increase the population coverage to about 80 percent of the total noninstitutional population (from the past coverage of under 45 percent). Other rural families make up about 18 percent of the total and military personnel about 2 percent.

As in 1964, the change in population coverage will change the average annual income of the index

population. Rough estimates based on 1971 data from the Current Population Survey indicate that broadening the population coverage to all urban households would lower the mean income of the index population from about $10,500 to $10,100. Although the other workers (professional and self-employed, for instance) added to the covered population had 1971 average annual incomes higher than the wage-earner and clerical-worker group, incomes of the unemployed and those not in the labor force, who will also be included in the index, were markedly lower. The following tabulation shows total money income in 1971 for consumer units (families and unrelated individuals):

Consumer units headed by	*In 1960–61 dollars*	*In 1971 dollars*
Wage earners and clerical workers	$ 7,745	$10,539
Other salaried and self-employed workers	11,803	16,062
Unemployed persons	5,544	7,544
Persons not in the labor force	3,760	5,116
All of above groups	7,396	10,064

The difference in 1971 average annual income between the urban wage-earner and clerical-worker group and the all-urban-households group was $475 in 1971 dollars and $349 in 1960–61 dollars. As noted above, a similar effect (of lowering the average family income of the population group covered by the index) occurred in the previous revision, when inclusion of single urban wage earners and clerical workers lowered the income of the index population group during 1960 and 1961 by $267 (in 1960–61 dollars).

To produce separate indexes for wage earners and clerical workers and for all urban households will increase the costs in terms of both the revision program and the ongoing program after 1977. However, the increase should be relatively modest. The two indexes will be of high quality and both are planned to be as good as or better than the present index.

No one today can tell which components of the index—foods, fuels, services—are likely to be rising most rapidly in the future. Thus in the 1960's, food price increases averaged 2.7 percent a year, fuels and utilities 1.0 percent, and services 3.5 percent a year. From 1972 to 1973, foods rose 20.1 percent, fuels and utilities 11.5 percent, and services 6.2 percent. Nor can anyone say whether an all-urban-households index would rise more or less rapidly than an index for wage earners and clerical workers alone. Some students of the index speculate that movement of the comprehensive index would closely parallel that of the urban wage-earner index. But no one can speak authoritatively on this until there is empirical evidence.

The issue depends on more than just the weights assigned to various items—it depends also on the items priced and the kinds of outlets sampled. Some people have argued, for example, that the prices of lobster and imported caviar have risen much more rapidly than have the prices of other, more prosaic food items; others have noted that prices of some very low-cost items, not now priced, have also risen more than the average. This implies that prices of goods purchased by groups not covered by the present index—professional workers, the unemployed, retired persons—have risen more than average. But in fact we know very little about differences in the movements of price indexes which might be constructed for different population groups.

Other conceptual problems

A number of other basic conceptual issues remain, on which there is also considerable controversy. Two of the most vexatious are briefly described below.

Housing. The treatment of owner-occupied housing presents a two-tiered problem. At the first level, a decision must be made as to the concept under which housing is to be priced. After that decision is made, a second is required on the most accurate and most efficient way of measuring prices and price changes under that concept.

Up to the present time, the price of the house itself has been used. For other index items, a loaf of bread, for instance, purchase of the bread implies consumption of the bread within that month.

The problem with housing—and with all durable goods—is that the purchase of a house is not the same as consumption. In effect, the index treatment of housing has said that those individuals who purchase a house this year consume the total purchase price, as well as total financing costs, this year. And those individuals living in previously purchased houses spend nothing on housing in this year. In other words, the entire "consumption" of the purchase price plus financing costs is attributed to the year of purchase.

Another way of looking at it is that what is really being "consumed" by the owner living in a house are housing services—that is, shelter, and accommodation for food preparation and consumption, recreation, entertaining, laundry, and so forth. Obviously, the owner does not consume all these services in the year of purchase, but continues to consume them over the years of living in that house.

Some questions for BLS raised by the "indexing" proposal

The possibility of "indexing" the U.S. economy was recently brought to public attention by Milton Friedman of the University of Chicago. Under such a system—the most notable current example is the one in use in Brazil—when the CPI rises, so do not only salaries and wages, but also the tax structure, rents, interest rates, and other items. Thus the objective is to keep all or at least most of the economy in step, by reference to the Consumer Price Index.

The basic question is, of course, what effect would indexing have on inflation and, in turn, on unemployment, real economic growth, distribution of real income, and other economic conditions. The debate on this basic question is just getting under way.

Answers are lacking to some troublesome questions that arise from the increasing use of the Consumer Price Index as a basis for escalating income for an increasingly large proportion of the population. What is the effect if an inaccurate index is used, or if an index is used which represents a portion of the population whose costs are rising either slower or faster than the average for the country as a whole? What is the impact of escalation by a single index upon groups which experience changes in living costs different from the average? Upon those groups in the population whose incomes are not escalated? What additional requirements would indexing put upon the accuracy of price indexes?

Beyond the effect on income payments, what is the impact of an incorrect or inappropriate index on statistics on real economic growth—especially real personal consumption expenditures and real retail sales, which are deflated in part or in whole by the CPI? If an inappropriate or inaccurate index is used as a deflator, measures of real economic growth will be correspondingly off the mark. What distortions appear in income distribution data when the same CPI is used to deflate the incomes of all classes?

Let us consider some of the possible economic implications of a situation in which the economy is indexed and there is only one CPI, with coverage limited to a subgroup of the population. Let us assume that this price index rises more rapidly than an index which covered the other segments of the population. Under this assumption, these additional groups would be getting a CPI adjustment exceeding that which they would receive if their incomes were escalated by their own index. This would give them a greater than warranted increase in money income and, in this way, the measure of price change could become a source of inflation in itself.

On the other hand, suppose that the single index covered all consumer units, and suppose that prices for an important subgroup of the population were rising more rapidly than the broadly based index. Then tying wage escalation agreements for this subgroup to the all-consumers CPI would result in income payments for this group that are smaller than would be the case if their incomes were moved by their own index. This loss would be offset, in the aggregate, by the fact that the other groups would receive larger income increases than those which would be triggered by their own CPI, though this would provide little solace for the groups that lose. The loss by one group would be offset by the gains of the other, so use of a broadly based measure would result in the appropriate aggregate income adjustment—though it would also involve a shift in income shares. These hypothetical examples do not, of course, take into account the dynamic effects of the indexing which add to the complexities.

Thus far we have assumed that all income payments are escalated by the CPI. But what if some are and some are not, as is, in fact, the situation in the U.S. today. And, especially, how would those whose income payments are not pegged to the CPI fare in an economy where most income payments are pegged. The unescalated groups may very well be starting off with a handicap in obtaining their income share—unlike the others, they would not have any automatic increases nor a floor to their income payment increases.

Events may lead us to a statistical program in which indexes are developed that represent not only the price experience of all consumer units, but also the separate experience of many subgroups of the population. The existence of multiple indexes would create uncertainties in the minds of many groups regarding the particular index to which it would be most appropriate to tie their own income payments. Expansion in the number of CPI indexes would, however, only complicate problems that already exist because of the availability of city and commodity indexes. In a recent contract, the wages of New York transit workers were tied to the CPI for New York–Northeastern New Jersey area, rather than the national index. The Food Stamp Allotment program is escalated on the basis of average price data from the food-at-home component series of the CPI and the children's lunch program by the food-away-from-home component. A degree of familiarity with the statistical methods used in compiling the CPI far above what exists today will be required for effective use of a multiple index approach.

A single all-consumer-units index would probably be easiest to administer, but it will be hard to convince groups who think their cost of living will rise more rapidly than the average that this is the best route to take.

(In the same way, a renter consumes housing services during the time of residence in a rented house or apartment.)

If a decision is made to price the flow of housing services, the problem will be to develop a technique for estimating the price of owner-occupied housing. There are two methods which can be used. The first is to use a *rental equivalence* technique—in effect, measure what you would charge if you rented the house to yourself in an assumed arms-length transaction. The second is to establish a *user-cost function* for the provision of housing services—that is, to measure the major cost components that an owner incurs in providing himself housing. These would include mortgage and equity financing costs, maintenance costs, taxes, and the variety of other expenses that go into providing housing services.

Both approaches present considerable data problems. The rental equivalence approach requires the development of a sample of rental units which can provide an adequate measure of the changes in owner-occupied housing costs. Another aspect that must be considered is the increasing share of owner-occupied apartments and townhouses in condominium developments. It is difficult to construct a good sample for this purpose since housing units which are typically rented differ in various ways from those which are normally owner-occupied. For example, owner-occupied houses are often located in areas where there is very little rental housing such as, for instance, suburban developments.

Implementation of this pricing technique does not require that the *average* owner-occupied house be equal to the *average* rental house, but only that there is enough overlap to pick from the sample of rental housing the houses which are similar in their most important aspects to those that are owner-occupied. We must determine whether there is sufficient overlap between the distribution of rental single-family housing and the distribution of owner-occupied housing.

There are measurement problems associated with the user cost approach also. First of all, this approach requires a source of house prices. The current CPI obtains price data from the Federal Housing Administration on FHA-insured houses. But, these houses represent a small and unrepresentative segment of the market. Similarly, the user cost approach must take into account in some way the capital gains which arise from appreciating home values. In addition, since the same houses are not sold in successive periods, it would be necessary to develop methods for factoring quality change out of the house price data collected.

Some of these same problems of data collection also exist with the current method of pricing housing costs. The problem of quality change is a particularly difficult one. Also, as pointed out above, data from the Federal Housing Authority on prices for new and existing housing purchased under FHA commitment have serious limitations for use in the Consumer Price Index. These FHA-guaranteed purchases represented only about 6 percent of the home purchase market in 1973. In addition, there are considerable differences between the typical house financed under the FHA program and those financed under conventional mortgages and thus the FHA sample may not be representative of all houses sold.

In the current method, prices of houses, classified by age and size, are converted to price per square foot. This is reflected in the index by a 3-month moving average, to eliminate erratic fluctuations in each month's data.

Investigations have been made into the availability of data from other sources, such as lending institutions and real estate associations, as well as the census series on new housing prices. They have not, as yet, uncovered data that would be useful for the CPI.

Quality change. The Bureau of Labor Statistics is also investigating new methods to improve the han-

Comparison of costs and income effect

To put the costs of the revision program into perspective as they relate to the amounts affected by changes in the Consumer Price Index, let us assume that all escalators we know of today had been in effect at the beginning of 1974, when the index had risen by some 10 percent over the early part of 1973. Under that assumption, income payments would have been increased by at least $10 billion.

If that figure is used, the cost of preparing the monthly Consumer Price Index, *including* the authorized cost of updating and revising the index decennially, works out to something like 70 cents for each $1,000 increase in payments as a result of escalation alone. If two indexes (the present one plus the more comprehensive one covering all urban households) had been calculated during this period, the cost per $1,000 increase in escalated income payments would have been between 85 and 90 cents. Of course, if inflation rates are lower, as has usually been the case, these cost figures would be higher. However, they do not take into acount the important uses of the CPI as a measure of inflation.

dling of quality change. Quality change is one of the most difficult problems faced in compiling a price index, since both products and consumption patterns are constantly changing. An example familiar to many consumers is that of passenger automobiles, where—with each model change—the Bureau faces the problem of separating out the actual price rise from the changes in quality, some of the latter necessitated by statute (such as emission control and safety belt legislation)

Frequently a model currently being priced must be replaced, either because it is discontinued or because consumption patterns have changed to such an extent that the model no longer accurately reflects consumer spending patterns. The value of the quality change in the new model should not be reflected as a price change, since the goal of the index is to measure the cost to consumers of purchasing a constant market basket of goods and services of constant quality through time. Ideally, estimates would be obtained for the value of each change in quality that occurred as a result of a change in the model or item priced; and this estimate would be based on the consumers' valuation of a change in quality, rather than that of the producer.

At present, most changes in quality are handled in one of two ways:

1. The quality change is deemed to be minor, and any price change that occurred simultaneously is reflected in the index just as if there were no quality change—the prices are compared directly; or
2. The quality change is judged to be significant, and the simultaneous price change is assumed to be an accurate measure of the value of the quality change—no price change is reflected in the index.

Since in most cases a large number of different models are priced for each item (such as a console color television set), and since sales of these models are not discontinued at the same time in various stores, the problem created by the above procedure can easily be overemphasized. However, it is true that many times price changes do occur simultaneously with model changes and that in order to have an accurate measure of price change (holding quality constant), an estimate of the consumers' valuation of the quality change is needed to separate out the price and quality components of the price change. The problem is even more difficult when quality changes and there is no price change. For some important items in the index, producers' cost estimates of quality changes are being used for this purpose. Although this eliminates the "all or nothing" nature of the usual procedure, there is still no reason to assume that the producers' estimates will reflect accurately the consumers' valuation of the changes.

The Stigler Committee report recommended that the Bureau investigate another approach to quality measurement, one which does measure the consumers' valuation. For certain items such as houses, cars, and major household appliances, there are at any time a wide variety of models available, models which possess a large number of different characteristics. From cross-sections of data on retail prices and characteristics of models, taken over a period of several years, it is possible to estimate the consumers' marginal valuation of quality change—that is, what the consumer is willing to pay for the addition of a particular characteristic, such as a meat-keeper in a refrigerator. This is done using standard statistical techniques. These marginal prices for the characteristics can then be used as estimates in the current index of the value of changes in quality.

Research on using this approach to measuring quality change is currently underway in the Bureau. The technique has been applied to data for rental housing, automobiles, and refrigerator-freezers. However, results are preliminary and, as yet, new price indexes have not been computed using the implicit prices yielded from the research.

There is great interest in whether quality change results in any bias in the Consumer Price Index. A recent article in the *Monthly Labor Review* pointed out:

> Many economists believe that quality changes in goods and services are not adequately taken into account in the preparation of the Consumer Price Index (CPI). As a result, they believe, the CPI has a systematic and persistent upward drift which makes the index a questionable indicator of the course of inflationary price movements.
>
> To what extent is the belief that price indexes are biased upward borne out by existing evidence? No assessment of the quality error in the CPI as a whole has yet been made, but a number of investigations have produced estimates of quality error in individual index components. The present article is a survey of existing studies, which present contradictory evidence. Some investigators found upward bias, but others reported that quality error might be negative—that is, when the BLS failed to correct adequately for quality changes, it resulted in a price index that rose too slowly, rather than too rapidly.

After reviewing key studies in the field, the conclusion reached was that there is no conclusive evidence which indicates a particular bias in the

Consumer Price Index due to quality change: ". . . we have not proved that price indexes are biased either upward or downward; rather, they establish only that the proposition that indexes are systematically upward-biased is not conclusively confirmed by the available evidence."[30]

Future updating and revision programs

Perhaps even more significant than the immediate problems of this current index revision is the question of long-run improvement in the revision process. BLS records show that the 1950–52 revision took 3 years and cost $4 million; the 1960–64 revision took 5 years and cost $6.5 million; and present estimates are that the current revision will take 8 years and cost more than $40 million (after adding the cost of the second index). The endless delays in issuing the results and the ever-rising costs suggest that a better method of updating the CPI and making revisions must be found.

Over the past decade, statistical agencies over the world have been shifting away from large-scale decennial programs to smaller decennial or quinquennial programs supplemented by annual sample surveys. The President's budget for fiscal year 1975 includes funds to plan such a shift in the decennial revision of the Consumer Price Index. An ongoing quarterly Consumer Expenditure Survey would provide more timeliness and greater flexibility, at roughly the same cost over a 10-year period. The ongoing Consumer Expenditure Survey could also have the advantage that numerous analytical studies could be made on a current basis, including prompt information of the effect of the rise in food and fuel prices upon spending patterns. Further, a continuing consumer expenditure survey could, after a break-in period, be tabulated rapidly, so that shifts in spending patterns, market baskets, and retail stores samples could be analyzed and information could be provided on the need for more frequent updating of the Consumer Price Index. New market baskets and new retail store samples could be phased in more often, say once in 5 years rather than once in 10, but this would not be a necessary part of the new approach. □

FOOTNOTES

[1] For a more comprehensive history of the Consumer Price Index, along with a description of the 1964 revision and detailed description of techniques, see *The Consumer Price Index: History and Techniques*, Bulletin 1517 (Bureau of Labor Statistics, 1966). See also *Prices, Escalation, and Economic Stability* (Bureau of Labor Statistics, 1971).

[2] See, for example, studies of family expenditures covering the years 1888–90 in the *Annual Report of the Commissioner of Labor in* 1890 and 1891, and the imposing collection of wholesale price data included in the "Aldrich Reports" by the Senate Committee on Finance in 1892 and 1893.

[3] The term "cost of living" was used to describe the Bureau's index until its name was changed following controversy in the World War II period over the index's validity as a measure of cost of living. It has always been merely a measure of changes in prices for goods and services purchased for family living.

[4] "Labor and the War: Adjustment of Shipbuilding Disputes on the Pacific Coast," *Monthly Review of the U.S. Bureau of Labor Statistics*, March 1918, pp. 67–76.

[5] *Cost of living in the United States*, Bulletin 357 (Bureau of Labor Statistics, 1924).

[6] Changes in Cost of Living From September 15 to November 15, 1940," *Monthly Labor Review*, January 1941, p. 146.

[7] "Revision of Index of Cost of Goods Purchased by Wage Earners and Lower Salaried Workers," *Monthly Labor Review*, September 1935, pp. 819–37.

[8] *Retail Prices of Food, 1923–36*, Bulletin 635 (Bureau of Labor Statistics, 1938).

[9] *Changes in Cost of Living in Large Cities in the United States, 1913–41*, Bulletin 699 (Bureau of Labor Statistics, 1941).

[10] "BLS Cost of Living Index in Wartime," *Monthly Labor Review*, July 1943, pp. 82–95, and *Consumers' Prices in the United States*, 1942–48, Bulletin 966 (Bureau of Labor Statistics, 1949).

[11] "Revision of the Consumers' Price Index," *Monthly Labor Review*, July 1950, pp. 129–32.

[12] *Interim Adjustment of Consumers' Price Index*, Bulletin 1039 (Bureau of Labor Statistics, 1952).

[13] *Consumer Prices in the United States, Price Trends and Indexes, 1953–58*, Bulletin 1256 (Bureau of Labor Statistics, 1959).

[14] At the behest of certain labor groups, the old index was continued for an additional 6 months. This action prompted some parts of the professional community to charge that political judgment was being substituted for scientific decisionmaking in the statistical field. See, for example, the report of the Technical Committee of the American Statistical Association, appointed by ASA President Simon Kuznets in the summer of 1949 to advise the Bureau of Labor Statistics on Price Index Number Revisions. The committee, chaired by Bruce D. Mudgett, held its last meeting June 30, 1953. Other members were Dudley Cowden, Reavis Cox, and Solomon Fabricant.

The report stated:

> A governmental bureau can attract scientific personnel of the highest competence only if it creates working conditions that assure the unfettered pursuit of their work.

> By the same token any restriction upon their freedom arising from the pressures of special interests will destroy the very conditions that attract men of competence, and any bureau yielding to such pressures may lose not only its qualified workers but also its reputation for objectivity and for the maintenance of high standards of scientific workmanship. Should not the association always stand ready to support any bureau resisting these pressures?
>
> These thoughts were aroused by an incident which took place when it was announced in January that the revised Consumers' Price Index would displace the old index, and that the old index would be discontinued. At the urging of a number of groups which have collective bargaining agreements with wage escalator clauses based on the old index, the President asked the Department of Labor to resume compilation and publication of the old index through June 30 of 1953, and the Department acceded to this request. . . . That this matter could constitute a case of dangerous pressure was recognized by Secretary [of Labor] Durkin, who cautioned that no new contracts should be based upon the old index, and by Commissioner [of Labor Statistics] Clague, who urged that all users consider the revival of the old index as purely temporary. It will be recognized also by technical workers in this field, and it becomes their duty to support these warnings and to call attention to the possibility that this kind of step may be the first along the dangerous road toward partisan control of economic measurement.

[16] Aside from generally higher income levels for occupations within the scope of the index, an income limitation on families included (at a level of $10,000 after taxes in 1950) was discarded because of the higher income per family unit, resulting from the increased number of families with more than one worker, and greater precision in the occupational classification of the survey.

[17] Both the 1961–62 Consumer Expenditure Survey and subsequent data collection are based on a 56-area probability sample, of which 18 are self-representing areas. The balance are areas selected by a stratified controlled-selection probability procedure to represent the balance of urban areas, classified by region and size.

[18] A committee appointed in 1959 by the National Bureau of Economic Research, under contract with the Office of Statistical Standards of the Bureau of the Budget, and chaired by Professor George Stigler of the University of Chicago. See *The Price Statistics of the Federal Government: Review, Appraisal, and Recommendations*, Hearing Before the Subcommittee on Economic Statistics of the Joint Economic Committee, 87th Cong., 1st sess., 1961.

[19] *Hearings on Government Price Statistics*, Pt. I. See also Zvi Griliches, "Hedonic Price Indexes for Automobiles: An Econometric Analysis of Quality Change," in that volume.

[20] Harold S. Taylor, "What Price Data? Distortions Noted," *The New York Times*, Aug. 21, 1966.

[21] Geoffrey H. Moore and Maxine Stewart, "New developments in labor statistics," *Monthly Labor Review*, March 1972, pp. 3–13.

[22] Statement by Julius Shiskin, Commissioner of Labor Statistics, before the Senate Subcommittee on Production and Stabilization, Committee on Banking, Housing and Urban Affairs, Apr. 23, 1974.

[23] Statement of Leonard Woodcock, President, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW), before the Subcommittee on Priorities and Economy in Government of the Joint Economic Committee, Apr. 5, 1974.

[24] "The Need to Preserve the Current Coverage of the Consumer Price Index for Urban Wage Earners and Clerical Workers," statement by Lazare Teper, Director of Research, International Ladies' Garment Workers' Union, AFL–CIO, to the Senate Subcommittee on Production and Stabilization of the Committee on Banking, Housing and Urban Affairs, Apr. 23, 1974.

[25] For other discussions of the use of the escalator clause in collective bargaining, see Henry Lowenstern, "Adjusting wages to living costs: a historical note," and Jerome M. Staller and Loren M. Solnick, "Effect of escalators on wages in contracts expiring in 1974," pp. 21 and 27, in this issue.

[26] Report of meeting of Sept. 10, 1973. The subcommittee is chaired by Gary L. Seevers, member of the Council of Economic Advisers, and includes representatives of the Treasury Department, the Office of Management and Budget, the Federal Reserve Board, the Cost of Living Council, and the Departments of Agriculture, Commerce, and Labor.

[27] Statement by Sen. William Proxmire (D., Wis.) at Hearings of Senate Appropriations Committee, Apr. 25, 1974.

[28] Minutes of the Business Research Advisory Council, Apr. 24, 1974.

[29] Most escalator clauses are tied to the national CPI, but some attempt to make the relationship more directly applicable to the workers' own experience by using the index for the area in which they are located or another relevant "city." For example, in the spring of 1974, a new 2-year contract between the city of Salem, Oreg., and the Salem Police Association provided, in the contract's second year, a 5- to 9-percent increase depending on the increase in the January 1974 CPI for the Greater Portland area. (The Portland, Oreg.-Wash. SMSA is one of the areas priced each 3 month. See table 27, p. 110.)

[30] Since there will be two index populations (one of urban wage earners and clerical workers, and one of all urban households), items will be selected to be representative of each of these populations. Selected items may vary from region to region and between index populations, but probability sampling procedures will be used to maximize the overlap for efficiency in collection. Within selected items, in general, the goal is to use an objective probability process for the selection of goods "specified in detail," including proper representation of both big-volume and other goods.

[31] Jack E. Triplett, "Determining the effects of quality change on the CPI," *Monthly Labor Review*, May 1971, pp. 27–38.

Measuring changes in industrial prices

New study adds wealth of data on transaction prices for use in continuing BLS effort to improve wholesale indexes

JOSEPH A. CLORETY, JR.

"The reliability of an index number obviously depends upon the judgment and the accuracy with which the original price quotations were collected. This . . . work is not only fundamental, it is also laborious, expensive, and perplexing beyond any other part of the whole investigation. . . . To judge from the literature about index numbers, one would think that the difficult and important problems concern methods of weighting and averaging. But those who are practically concerned with the whole process of making an index number from start to finish rate this . . . work lightly in comparison with the . . . work of getting the original data."

Thus Wesley C. Mitchell in his classic *The Making and Using of Index Numbers*,[1] originally published in 1915 and with minor modifications republished in 1921, prefaced his discussion of price collection problems.

Concisely and incisively Mitchell limned all of the major and many of the minor problems: the multiplicity of prices for any important commodity; the difficulties in selecting a representative sample; the need for quality adjustments; the need to "guard against the pitfalls of cash discounts, premiums, rebates, deferred payments, and allowances of all sorts";[2] and maintenance of comparability. Mitchell wrote as a practical index maker; he was the principal architect of the Wholesale Price Index (WPI) in the general form it has since developed.

Publication of *The Behavior of Industrial Prices*[3] (reviewed in the October 1970 *Monthly Labor Review*) in substantial measure qualifies its authors, George J. Stigler and James K. Kindahl, as practical index makers. The minor caveat rises from the important distinction between problems involved in a one-time study and those which plague the makers of a monthly, continuing index. More important, Stigler and Kindahl no doubt will stimulate governmental, professional, and public interest in the major problem of transaction prices. Most important, the wealth of data presented provides a mine of no mean value for researchers in academic, private, and public circles. Indeed, the Bureau's commodity analysts responsible for commodities covered by Stigler and Kindahl are studying the data in detail primarily to initiate corrective action where indicated, feasible, and necessary.

In some instances, substantial progress in obtaining actual transaction prices has been made since 1966—the last year covered by Stigler and Kindahl. This reflects the virtually daily attention to the problems of price collection outlined by Mitchell, which largely characterizes not only the current BLS staff but their predecessors since Mitchell's day. Although personal qualities contribute, the Bureau's successes and failures are largely a function of the resources committed to a given index. For example, prior to World War II the entire staff producing the WPI were housed reasonably comfortably in one medium large office, with a very small cubicle for their chief.

The first major challenge

Considering the resources available, the quality of their work was remarkable. This was fortunate since the first major challenge to the reliability of the WPI as a measure of price changes in primary markets came in the late 1930's. That controversy rose from a series of studies by Gardiner C. Means

Joseph A. Clorety, Jr., is Chief of the Division of Industrial Prices and Price Indexes, Bureau of Labor Statistics.

developing his theory of administered prices, which relied heavily on use of individual commodity data from the WPI. Not only the theory but the validity and reliability of the data were challenged sharply. The gist of the charge was that the index data failed dismally to reflect either the frequency or the magnitude of actual changes in transaction prices. Both the major controversy and details of the accompanying charges are beyond the scope of this article, but representative articles are cited in the accompanying box for those interested.

Because the Means approach to use of WPI data was central to the chapter on price structure in the National Resources Committee's *The Structure of the American Economy*,[4] Saul Nelson was commissioned to investigate the validity of the WPI for the particular use made of it. Stigler and Kindahl note his conclusion, which substantiated the overall validity of the WPI data for "the statement and interpretation of such different [rigid and flexible] types of price behavior." [5] In his presentation of the supporting evidence (which probably was abstracted from a considerably greater body of data), Nelson commented on two points of some relevance to current problems. He noted that the Robinson-Patman Act had been in effect only part of the period covered and that presumably it would inhibit certain forms of secret concessions. (Interestingly, much current discussion assumes that that statute inhibits reporting to the Bureau actual concessions made. This implies a general willingness to violate the law, which seems unduly cynical. Actually, data reported to the Bureau by individual businesses—or individual households for the matter—are treated as absolutely confidential by the Bureau.)

Nelson was also concerned by the substantial number of commodities for which the reporting source was a trade publication. Then as now, of course, a distinction is necessary between those which report prices on an organized exchange (which obviously are clearly actual transaction prices) and certain others with various imperfections. Table 1 summarizes differences between reporting sources for the WPI in February 1937, which Nelson used, and January 1970, from a compilation made for purposes of this comparison. Data for January 1970 are also available by number of price series, which throw further light on coverage by reporting source.

Selected readings

Gardiner C. Means, "Notes on Inflexible Prices," *American Economic Review*, March 1936, pp. 28–35.

Price Behavior and Business Policy (Washington, Temporary National Economic Committee, 1940), Monograph 1, appendix 1, pp. 165–168.

The Structure of Industry (Washington, Temporary National Economic Committee, 1941), Monograph 27.

Jules Backman, "Price Inflexibility and Changes in Production," *American Economic Review*, September 1939, pp. 480–486.

John K. Galbraith, "Monopoly Power and Price Rigidities," *Quarterly Journal of Economics*, May 1936, pp. 456–475.

Frederick C. Mills, "Price Data and Problems of Price Research," *Econometrica*, October 1936, pp. 289–309.

Don D. Humphrey, "The Nature and Meaning of Rigid Prices, 1890–1933," *Journal of Political Economy*, February–December 1937, pp. 651–661; of particular interest for use of an earlier study by Frederick C. Mills covering the period 1890–1925.

Willard L. Thorp, "Price Theories and Market Realities," *Papers and Proceedings of the American Economic Association*, March 1936, pp. 15–22.

Reopening the controversy

The old controversy flared again in the late 1950's, when Means presented relatively current WPI data to the Senate Antitrust Subcommittee of the Judiciary Committee to sustain his contention that the industries characterized by administered prices caused the bulk of the increase in the WPI during the last half of the 1950's. To the considerable extent to which the validity and reliability of the WPI for this purpose were the center of controversy, John M. Blair—then chief economist for the subcommittee—and Stigler led the debate.[6]

Prior to the exchange of views cited above, the Price Statistics Review Committee (popularly referred to as the Stigler Committee, reflecting his chairmanship) functioned during 1959 and 1960. Both their summary recommendation and a more fully stated version relative to use of buyers' prices deserve full quotation in that order:

> The individual product prices should, where feasible, be collected from buyers (not from sellers, as at

present) to get more accurate information on actual transaction prices.[7]

> We recommend that a major shift be made to the collection of buyers' prices. Large and continuous buyers of manufactures should be able to supply prices which truly represent the effective terms on which transactions are made. We do not believe that this shift to buyers' prices will be simple or free of new difficulties, but it is the most promising source of comprehensive, continuous, and reliable price quotations.
>
> Where buyers' prices are not available, we recommend extensive use of unit values, at least as benchmarks to which the monthly prices are adjusted. Unit values are inferior to specification transaction prices, but when unit values are calculated for fairly homogeneous commodities, they are more realistic than quoted prices in a large number of industrial markets.[8]

The brief text of the report preceding the more detailed recommendation makes clear that these recommendations rest basically on two staff papers attached to the report but specifically presented as the responsibility of their individual authors. Harry E. McAllister (who also served as secretary of the Stigler Committee) evaluated the WPI in terms of internal data, frequency of price change in relation to number of reporters, comparison of WPI data based on sellers' prices with those which he collected from a sample of large buyers, and a comparison with Census unit values.[9] John A. Flueck's evaluation rested on enumerating some of the main reasons that actual transaction prices may differ from list prices (buttressed by quotations from various publications), and a comparison of WPI prices with government bid prices.[10]

Considering the dubious quality (for evaluating a price index) of unit value data due to the product mix problem and of government bid prices because of marked differences in the market leverage of a government and of the buyers' price data because of an obvious bias as well as other measurement problems shared by sellers' and buyers' prices, it is regrettable that a lawyer was not a member of the committee. Economists and statisticians perhaps should be forgiven for forgetting upon whom the burden of proof rests.

The BLS response

Be that as it may, the Bureau's official response to the recommendations, as given by Commissioner Ewan Clague, was to "place emphasis first on more intensive efforts to obtain actual transactions prices from sellers, obtaining prices from buyers only where absolutely necessary, because of the great difficulty and expense involved in the latter method";[11] and to question the soundness of the recommended use of unit value data in the WPI "because tests which we have made show that real price changes cannot be separated from changes in product mix . . ."[12] His prepared statement documents both positions in considerable detail.[13]

Lazare Teper, an outstanding expert on price indexes, testified at the same hearings that "the suggestion that price quotations be collected from buyers does not seem realistic. It certainly would represent a very costly procedure which may not necessarily yield what is expected of it. . . [as to use of unit values] The Committee is clearly on a wrong path."[14] His full statement presents his reasons. A footnote, incidentally, illuminates pitfalls involved in use of government bid prices to evaluate the WPI.[15]

The Subcommittee's report pithily summarizes the general reaction to the recommendation that the Bureau move as rapidly as possible to collec-

Table 1. Reporting sources for the Wholesale Price Index and number of price series used

Reporting source	Sources used				Price series used		
	February 1937		January 1970		January 1970		
	Number	Percent	Number	Percent	Number	Percent	Number used per item
Total	784	100.0	2,445	100.0	7,726	100.0	3.2
Company reports	383	48.8	1,906	78.0	7,107	92.0	3.7
Trade publications	367	46.8	394	16.1	415	5.4	1.1
Trade associations	31	4.0	11	.4	11	0.1	1.0
Government agencies	3	0.4	134	5.5	193	2.5	1.4

tion of prices from buyers: "The enthusiasm of the Review Committee for this recommendation was not shared generally by the witnesses." [16]

Apparently the Appropriations Committees of the Congress shared this lack of enthusiasm, for no additional resources were made available. A modest increment was approved to permit the Bureau to initiate development of the Industry Sector Indexes (ISPI). Development of these indexes, in which prices are classified by the Standard Industrial Classification system, was recommended by the Stigler Committee.

User views

In 1965-66, the Joint Economic Committee's Subcommittee on Economic Statistics conducted a major exploration of the needs for improved statistics. As a first step, the subcommittee solicited the views of a large group of users of government statistics. Among over 70 respondents, two called attention to the problem of transactions prices. Arthur F. Burns commented, "Too frequently, statistics on wholesale prices represent list prices rather than actual prices charged." [17] Herbert Stein submitted a recent speech by Alfred C. Neal in which Neal asserted that "In the area of wholesale prices, I am inclined to place at the top of the priorities an attempt to obtain data on actual prices paid by the buyer, not the price supplied by sellers . . . ." [18]

Like other government agencies, the Bureau was invited to comment on the compendium of recommendations. As to Neal's suggestion, the Bureau response was that "The project has merit, at least on a selective basis, because it will enable a better evaluation to be made of price trends for industries characterized by complicated rebate and discount structures. . . . This would be a costly project but one which BLS has recommended for selected projects for a number of years." [19]

As one phase of its project, the subcommittee held hearings in May 1966 on price statistics, focusing on the extent to which the Stigler Committee recommendations had been implemented during the intervening 5 years. With respect to the recommendation to move toward use of buyers' prices, Raymond Bowman (then Assistant Director of the Budget Bureau for Statistical Standards) stated:

> There is general agreement with the objective of this recommendation, i.e., that the WPI should reflect realistic, actual transaction prices, not quoted prices. Price respondents (sellers) are requested to report all discounts applicable to quoted prices . . . It is recognized that such discounts are not universally reported.
>
> We agree with BLS that the first step toward implementation of this recommendation should be through a limited and experimental program to identify commodity areas in which the differences are important. . . . Because of the heavy costs and respondent burden involved, collection of price data from buyers should be undertaken only if other methods are not successful.[20]

Bowman's statement concisely summarized the more detailed statement by Commissioner Arthur M. Ross.[21] Lazare Teper, agreeing that reporters do not always report all discounts, went on:

> These short-term distortions on the index may make it at times a bit less sensitive to current price changes. Collection of actual transaction prices, of course, is a massive and costly operation. On the other hand, it is conceivable that ways may be found to secure better cooperation from respondents and to get more accurate responses from them. Experimental research is called for in this area.[22]

The subcommittee's report, citing the differences between list and actual transaction prices as a deficiency in the WPI,[23] recommended that "Collection of data on prices paid by buyers for selected products, such as metals and machinery, should be initiated in order to insure obtaining the terms of actual transactions which often differ significantly from list prices . . . ." [24]

Expansion of industry sector indexes

With resources unaugmented, the Bureau devoted such of its industrial price program resources as could be mustered to expanding the Industry Sector Indexes—approximately doubling the number of SIC 4-digit industry indexes published, with a roughly proportionate increase in 5-digit product class indexes. Implementation of this Stigler Committee recommendation was deemed the wiser use of scarce resources. This recommendation has been supported not only unanimously but enthusiastically—except for providing the additional resources which are a prerequisite for providing the complete battery of output price indexes and input price indexes essential to achieve their major purposes. Thus far, the program has been limited to output price indexes, for which

there are fewer problems in using data collected primarily for the WPI.

Without fanfare but persistently the Bureau through its commodity analysts has pressed toward obtaining actual transaction prices from sellers. As Teper suggested, there are ways to improve cooperation and thus obtain more accurate responses. Substantial progress has been made in a number of industries, thanks largely to commodity analysts able to convince reporters that accurate reports of actual prices serve not only the public interest in accurate official price indexes, but also their own long-term best interests. Substantial credit is due to those in the business community who by and large have deepened and extended their voluntary cooperation. All of these reporters are voluntary, as has been the case throughout the history of the WPI, but there has been a marked improvement in the quality of cooperation.

To illustrate: The WPI for motor vehicles reflects not only actual transaction prices but also a sophisticated adjustment for quality changes, only because of the wealth of detailed data supplied by the manufacturers, at no small expense to them. On a less structured and more informal basis, the Bureau receives the necessary data from many if not most of the companies which report machinery prices. Recently, the representative of a company which at one time reported pretty much on a "take it or leave it" basis spent most of a day with BLS staff assisting in the correct calculation of a particularly complex price change. The overall picture is not as rosy as these examples may imply; the point is that appreciable progress is being made.

Although personal visits to reporting companies are limited (usually in connection with establishing a new reporter), extensive use of the telephone is efficient, relatively inexpensive (a rough rule of thumb for estimating costs of field trips is $100 per man-day), and a channel for building relationships conducive to reporting accurately. It is more typical than not, when the trade press or other publications report discounting, for the appropriate commodity analyst to check the reports immediately with reporting companies and other sources of information. Like quality adjustment, the pursuit of actual transaction prices is virtually a daily problem in calculating the WPI.

By the mid–1960's it was apparent that BLS was unable to pursue the recommendation for use of buyers' prices. The National Bureau of Economic Research evidently considered such a study a worthwhile project. Stigler's own strong convictions on the relative merits of sellers' versus buyers' prices evidently made him willing to invest much of his time in the tedious if challenging task of data collection and index calculation. Although field work covered the period from the fall of 1965 to mid–1967, the data and their indexes are for 1957 through 1966. A few sellers were included in their sample, but it consisted predominately of large manufacturers, government agencies, and a few hospitals. The study was limited to relatively few industries, constituting less than one-fifth of the weight of the WPI. For the commodity groups to which the indexes for individual series were aggregated and which are given the titles corresponding to the appropriate WPI major groups, the coverage varies sharply. The BLS indexes shown in Stigler and Kindahl were constructed by them from BLS series corresponding to theirs, and at the group level, of course, are not those published by BLS. Its appearance and the attendant publicity raise a variety of questions to which relatively brief answers may be given on my personal responsibility. Bureau review and assessment are not complete.

Assessing the data

Does the study invalidate the WPI? Absolutely not. As Stigler and Kindahl very properly point out, the study was not a test of the WPI.[25] Stigler personally may think so, or that Stigler and Kindahl tends to indicate so.[26] For the other pole of opinion, see testimony before the Joint Committee on July 14, 1970, by Means and Blair.[27]

Does the study demonstrate that buyers' prices more nearly approximate actual transaction prices than do sellers' prices? Not unless one accepts either type of price as an actual transaction price as used in calculation of an index of price change. Obviously, Stigler and Kindahl's indexes differ from BLS indexes in various ways and by very narrow to very wide amplitudes. Given the differences in samples, specifications, collection and calculation procedures, differences are to be expected.

This discussion assumes that Stigler and Kindahl agree substantially with the BLS definition of an actual transaction price, which is list or book "prices less all discounts, allowances, rebates, free deals, etc., so that the resulting net price is the actual selling price of the commodity for the specified basis of quotation.[28] To this might be added "plus any premium, etc." This digression may seem unnecessary, but the literature abounds with use of the term in very different and usually much broader connotations. Actually much criticism of the WPI (and CPI) stems from frustration involved in attempting to use it for lack of an appropriate index.

The Bureau usually obtains prices f.o.b. production or central marketing point, to avoid reflecting changes in transportation costs. Stigler and Kindahl's data from buyers normally would include these charges which introduces another source of differences.

Can BLS use Stigler and Kindahl as a pilot study? No, but both data in the book and data which its authors may have in their possession could be very helpful. A BLS pilot study of buyers' prices necessarily would be constructed to test the feasibility of collecting such prices on a continuing basis (rather than an essentially one time), using the mail or average BLS agents (rather than two distinguished professors supported by the prestigious NBER), and including small buyers as well as large.

Stigler and Kindahl published the number of price series used each year for each commodity. These data show a consistent pattern. They rise from a small number of reporters in the early years to a peak in 1964 and 1965, followed by a pronounced decline in 1966. The former phenomenon, which indicates the inability or unwillingness of the reporter to produce records in earlier years or Stigler and Kindahl's inability to determine comparable prices from such records, would not be relevant for BLS if data were collected currently. The drop in 1966, however, is decidedly pertinent in appraising the potential success in obtaining reporters on a continuing basis.

If Stigler and Kindahl recorded man-days spent in data collection, such information would be most useful. BLS must consider any major change in terms of its costs. For the industrial price program, these must be regarded as almost fixed. Much more light on the problems of maintaining comparability, even within the broader specifications Stigler and Kindahl employed, and of problems in identifying the specified item and its price would be most helpful. Invoices were not designed with a view to aiding the price collector. During World War II, I was involved in collecting buyers' prices and can testify that the problems progressed almost geometrically as I moved from food to textiles and apparel to machinery.

Will the Bureau move to a WPI based on buyers' prices? It is as unlikely as it is undesirable. To produce enough price quotations for reliable measures of price change from month to month would require a much larger sample of reporters. To take Stigler and Kindahl's average of 17 per commodity (a figure with very wide variances) versus the BLS average of slightly more than three as a very conservative estimate of the required sample size, BLS would be forced to curtail sharply the number of commodities included in the WPI—unless its resources were expanded tremendously. Discussing the question of whether an index should include a small or large number of commodities, Mitchell observed that "Every restriction in the scope of the data implies a limitation in the significance of the results." [29]

The Bureau has long been interested in two uses of buyers' prices. For the WPI, where it is established conclusively that actual transaction prices cannot be obtained in any other way, buyers' prices should be used given the necessary resources. Looking forward to constructing input prices for the Industry Sector Indexes, it is quite probable that collection of prices from buyers might be unavoidable in some instances. In both cases, buyers' prices even collected at longer intervals might be used advantageously to spot commodity areas in which corrective action is indicated. As noted earlier, the Bureau's commodity analysts are using Stigler and Kindahl data for precisely this purpose.

In terms of a longer run and much more ambitious project—constructing a General Price Index, covering all sectors of the economy—price data from the very important government sector probably can be most reliably, efficiently, and economically collected from the purchasing government agencies.

The Bureau is no more prejudiced toward sellers'

and against buyers' prices than it is wedded to the theory of a unique price. It is cribbed, cabined, and confined by the basic economic problem of allocating scarce resources to meet many needs. □

———*FOOTNOTES*———

[1] *The Making and Use of Index Numbers* (BLS Bulletin 656, 1938), p. 25. (Mitchell, of course, gained his greatest fame in later years for his work on business cycles and on many other economic and statistical areas, but was a principal architect of the Wholesale Price Index in roughly its present form.)

[2] Ibid., p. 26.

[3] George J. Stigler and James K. Kindahl, *The Behavior of Industrial Prices* (New York, National Bureau of Economic Research, 1970), General Series 90.

[4] *The Structure of the American Economy* (Washington, National Resources Committee, 1939), pp. 122–152.

[5] Ibid., p. 185.

[6] George J. Stigler, "Administered Prices and Oligopolistic Inflation," *Journal of Business*, January 1962, pp. 1–13: John M. Blair, "Administered Prices and Oligopolistic Inflation: A Reply," *Journal of Business*, January 1964, pp. 68–81 (see also Stigler's comment, pp. 82–83, and McAllister's comment, pp. 84–86, of the same issue); Walter Adams and Robert F. Lanzillotti, "The Reality of Administered Prices," *Administered Prices: A Compendium on Public Policy* (U.S. Senate, Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, 1963), pp. 5–21.

[7] *Government Price Statistics*, Hearings before the Subcommittee on Economic Statistics of the Joint Economic Committee (U.S. Senate, 1961), Pt. I, p. 21.

[8] Ibid., p. 71.

[9] Ibid., Staff Paper 8, pp. 373–418.

[10] Ibid., Staff Paper 9, pp. 419–458.

[11] *Government Price Statistics*, Hearings before the Subcommittee on Economic Statistics of the Joint Economic Committee (U.S. Senate, 1961), Pt. II, p. 559.

[12] Ibid., p. 560.

[13] Ibid., pp. 602–603.

[14] Ibid., p. 673.

[15] Ibid., pp. 672–673.

[16] *Government Price Statistics*, Report of the Subcommittee on Economic Statistics of the Joint Economic Committee (U.S. Senate, 1961), p. 8.

[17] *Improved Statistics for Economic Growth*, A Compendium of Views and Suggestions From Individuals, Organizations, and Statistics Users (U.S. Senate, Joint Economic Committee, Subcommittee on Economic Statistics, 1965), p. 15.

[18] Ibid., p. 130.

[19] *Improved Statistics for Economic Growth*, Comments by Government Agencies on Views and Suggestions From Individuals, Organizations, and Statistics Users (U.S. Senate, Joint Economic Committee, Subcommittee on Economic Statistics, 1966), p. 48.

[20] *Government Price Statistics*, Hearings before the Subcommittee on Economic Statistics of the Joint Economic Committee (U.S. Senate, 1966), p. 11.

[21] Ibid., pp. 59 and 63.

[22] Ibid., p. 154.

[23] *Government Price Statistics*, Report of the Subcommittee on Economic Statistics of the Joint Economic Committee (U.S. Senate, 1966), p. 8.

[24] Ibid., p. 17.

[25] Stigler and Kindahl, op. cit., p. 4.

[26] As quoted in press release dated June 26, 1970, issued by the National Bureau of Economic Research, announcing publication of *The Behavior of Industrial Prices*.

[27] Gardiner C. Means and John M. Blair, in their individual testimony, *Midyear Economic Review*, Hearings before the Joint Economic Committee (U.S. Senate, 1970) in press.

[28] *BLS Handbook of Methods for Surveys and Studies* (BLS Bulletin 1458, 1966), p. 92.

[29] Mitchell, op. cit., p. 53.

Determining the effects of quality change on the CPI

Recent studies cast doubt on view that Consumer Price Index shows upward bias because of inadequate correction for product improvement

JACK E. TRIPLETT

MANY ECONOMISTS believe that quality changes in goods and services are not adequately taken into account in the preparation of the Consumer Price Index (CPI). As a result, they believe, the CPI has a systematic and persistent upward drift which makes the index a questionable indicator of the course of inflationary price movements.

Products and services probably do tend to improve in quality as the years go by. It is easy, therefore, to suppose that the "market basket" priced by the Bureau of Labor Statistics must experience a similar change in quality. If not allowed for in some way, such improvements in quality would cause the computed price index to rise too rapidly, which is in contrast to the concept the CPI is supposed to measure: the cost of acquiring a *fixed* collection of goods and services. Thus, the argument goes, price indexes will drift upward even when no inflation is actually taking place, and they will give an exaggerated notion of the speed of inflation when prices are in fact increasing.

To what extent is the belief that price indexes are biased upward borne out by existing evidence? No assessment of the quality error in the CPI as a whole has yet been made, but a number of investigations have produced estimates of quality error in individual index components. The present article is a survey of existing studies, which present contradictory evidence. Some investigators found upward bias, but others reported that quality error might be negative—that is, when the BLS failed to correct adequately for quality changes, it resulted in a price index that rose too slowly, rather than too rapidly. The key studies are reviewed in the following section. For convenience of presentation they are grouped according to dates and products covered.

Automobiles

By far the best known empirical work on the subject of price indexes and quality change is Zvi Griliches' study of the CPI new automobile component.[1] Griliches employed what has come to be known as the "hedonic technique" for measuring quality change, an approach also used in a number of other studies. Briefly, this technique involves searching for variables or attributes which may account for quality differences among varieties of a product selling at the same point in time. For example, if we look at the automobile market as a whole, it appears (from analysis of the statistical data, as well as from knowledge of the nature of automobiles and the behavior of consumers in the aggregate) that a more powerful engine, other things equal, is generally preferred to a less powerful one. People differ in how much they are willing to pay for more power, but there are clear statistical regularities between power ratings and the price paid for an automobile, after allowing for differences in size, comfort, economy, and so on. Regression analysis is used to isolate an "implicit price" for power (as well as for the other things); then if the power of a 1970 car exceeds that of the same car in 1969, the 1969 implicit price for power can be used to adjust for the value of the change in power between the 2 years.[2] Other attributes can be allowed for in the same way.

Griliches presented several different estimates of quality-adjusted automobile price indexes, but all his quality-adjusted indexes showed that the new automobile component of the CPI rose too rapidly. Indeed, for the 1954–60 period, during which the CPI index of new automobile prices rose 11.3 percent, Griliches' quality-adjusted index

Jack E. Triplett is assistant professor of economics, Washington University, St. Louis, Mo.

numbers actually declined. The decreases he recorded in his several indexes ranged from 1.0 percent to 26.6 percent. These results were widely interpreted as strong evidence that the CPI rose far too rapidly during the inflation of the late 1950's, and several economists have suggested that there might not have been any inflation at all.

However, a second study of quality bias in the CPI new car component reached just the opposite conclusion. Philip Cagan [3] used an entirely different technique to allow for quality change in autos: the "vintage price" method.[4] When Cagan compared his quality-adjusted index, for the years 1954–60, with the CPI component, he found his own index had risen *more* than the CPI—16.7 percent compared with 11.3 percent in the CPI—suggesting ". . . that the CPI is not biased upward and may even overcorrect for quality improvements in automobiles. How that happened is not clear." [5]

Since Cagan and Griliches produced nearly identical estimates of the value of quality change, most of the difference in their results stems from their adjusting different price series. Griliches applied his quality indexes directly to the published CPI auto component. Cagan, on the other hand, adjusted an index of list prices for the cars priced for the CPI. If we take Griliches' quality figures and apply them to an index of *list* prices, we get an estimated 12.7-percent *increase* in the price of cars, corrected for quality changes, between 1954 and 1960—not far from the actual CPI estimate of an 11.3-percent increase, and (like Cagan's result) a somewhat greater price increase than was recorded by the published CPI.

Which is the appropriate basis for adjustment—list prices or the actual CPI? There are arguments either way. Because the CPI always included some quality adjustments, applying a quality index to the published CPI new auto component probably introduces double-counting of quality changes.[6] On the other hand, an index based on changes in list prices may not correspond to the movements of actual transactions prices, although the longer the time span, the better the approximation.

In view of the divergence in movement between the index of list prices and the CPI auto component, close examination of the CPI during the 1954–60 period seems imperative. The required information can be extracted from an unpublished BLS memorandum by Thomas W. Gavett, on which the following paragraphs are based.

Table 1. Comparisons of percent changes in price indexes for automobiles, 1953–60

Period	Published CPI	New series of transaction prices		List price indexes (adjusted for quality changes)	
		Unadjusted for quality change	Adjusted for quality change	Griliches	Cagan
1953–54	2.6	0.9	−3.2	−0.5	(1)
1954–55	−1.7	2.9	−4.5	−2.3	−2.5
1955–56	−.9	.9	−.4	2.2	6.3
1956–57	5.1	12.9	9.9	4.7	6.1
1957–58	4.2	1.3	−.8	3.2	5.3
1958–59	4.2	6.2	3.4	4.5	.4
1959–60	.1	2.4	3.5	−.2	.4
1953–60	14.2	30.3	7.4	11.2	(1)
1954–60	11.3	29.1	11.0	12.5	16.7

[1] Not available.

NOTES: Cumulative changes computed by chaining.

SOURCES:
Column 1: Computed from annual CPI new automobile component.
Column 2: Based on an unpublished BLS memorandum by Thomas W. Gavett.
Column 3: Column 2 divided by an index of quality, computed by Gavett using material from Griliches, op. cit. (1961, 1964), and specifications of cars in the New Price Series.
Column 4: From an index of list prices computed from Griliches, op. cit. (1961), p. 185, table 6, divided by a quality index taken from Griliches, op. cit. (1964), p. 186, table 8, with correction of a clerical error noted by Thomas W. Gavett. The column records changes in the resulting index.
Column 5: Cagan, op. cit., p. 230, table 5.

In mid-1954, BLS began to gather information on the typical or average price concession (discount, or over allowance on trade-ins) allowed by dealers on the car selected by BLS for pricing. When price concession information first became available, it was not "linked" out of the index. Instead, prices including concessions were compared directly with previous prices (which were, in effect, list prices). The full amount of the reported price concession was treated as a price decrease for the month when data on price concessions were first collected. Because the overall impact on the index was spread over a period of time, the error introduced into the index affects it from the end of 1953 through 1955.[7]

In order to have an index for 1953–56 free of the concession error, we made use of information on price concessions compiled by Gavett to construct a new price index for the whole 1953–60 period.[8] This is an index of transactions prices, without quality adjustment, and free (or as nearly free as it can be made) from the price-concession error affecting the CPI. The results are shown in the second column of table 1. While the published CPI for cars rose by 14 percent, from 1953–60, the new price series shows an increase about double that figure. The next step was to deflate the new price series by use of a quality index appropriate

to the cars of the price series. The results, detailed in column 3 of table 1, are in my opinion the best estimate that can be made of the true course of price movement for automobiles for the 1953–60 period.

This index indicates that there was substantial quality error in the automobile price index during this period. But, contrary to some economists' opinion, it also indicates that inflation was real and not just a product of faulty engineering in the price indexes. Cagan's result (column 5 of table 1), and what I have labeled the "Griliches' Quality-Adjusted List Price Index," are both not far from the mark, though Griliches' original CPI comparisons were thrown off by the price-concession error, just as was the CPI itself.

Around 1960, major revisions were accomplished in the way quality changes were made in the new automobile component,[9] so one would not expect the Griliches-Cagan conclusions on quality bias in the automobile component necessarily to hold beyond the period they studied. Several more recent studies[10] have examined automotive components of the price indexes for the period after 1960. All of them agree in finding that automobile price indexes seem biased *downward* since 1960, with the major part of the discrepancy occurring soon after cost-based quality adjustments were incorporated into the indexes. (See table 2.) Although the CPI component declined, the indexes reported in the studies increased. This group of studies should be interpreted with caution, especially since there is the possibility of bias in both quality measurement techniques employed by the investigators.[11] However, they do strongly suggest that quality adjustments in the CPI (and in the WPI, since adjustments in both indexes are based on the same data) may have been too large. If the studies are correct, one should be wary of concluding that price indexes are always rising too rapidly.

Table 2. Percent changes in price indexes for vehicles, selected periods, 1960–67

Author or source	Period	Percent change
Actual CPI (auto component)	1960–66	−7.2
Triplett (automobiles)	1960–66	+9.6
Dhrymes (automobiles)	1961–64	[1] +13.2
Hall (pickup trucks)	1961–67	+8.9

[1] This figure was computed from the later version of Dhrymes' paper. In the earlier version, a 7.0-percent decrease was reported.

SOURCE: See the studies cited in footnote 10.

Studies of refrigerator prices

Appliances offer a fertile field for investigations into quality change. Two studies have evaluated quality bias in the CPI refrigerator component.[12] The refrigerator index has been falling continuously through most of the postwar period; interestingly, both studies of refrigerator prices suggest that the CPI component may have declined too fast.

Burstein computed his indexes from refrigerator prices in mail-order catalogs. He expressed surprise at finding that his quality-adjusted index fell (in a period of falling prices) more than an index which lacked quality adjustments: "Why should procedures ignoring quality changes impart a *downward* bias to a price index? A plausible explanation is that the prices of the . . . models chosen for pricing by the Bureau fell relative to the prices of refrigerators and freezers as a group." [13]

Burstein's paper opens up some intriguing questions, but the specific result (that the CPI may be biased downward) relies exclusively on the behavior of indexes of mail-order prices and these indexes could be given a different interpretation. However, Burstein's interpretation is consistent with a later study by Dhrymes.[14]

Using a variant of the hedonic technique Dhrymes produced a quality-adjusted price index for refrigerators covering most of the postwar period. Between 1950 and 1960, Dhrymes' refrigerator index fluctuates, but shows no clear trend at all. Over the same period, the CPI refrigerator component declined by over one-third. After 1960, Dhrymes' index moves downward at about the same rate as the CPI, except for a precipitous and unexplained drop in the final year of his study. Overall, Dhyrmes' data are consistent with downward quality bias in the CPI refrigerator component.

Although I have reservations about each of the studies on refrigerators, both point to downward, not upward, bias in the CPI. In the face of such evidence, one has less faith that price indexes always drift upward because of quality change.

Other studies

Although there has been much recent research on the problem of quality measurement,[15] some of the studies did not present results that can be

compared with the CPI. A noteworthy group of studies (unpublished) were carried out within BLS by Thomas W. Gavett.[16] Covering automatic washing machines, men's suits, and carpets, these studies are the only ones conducted in conjunction with close examination of actual pricing and processing procedures within the indexes for the products studied. The latter two employed actual price quotations from the WPI. Condensed portions of the results are presented in table 3.

The analyses of washing machines and suits gave quality-adjusted indexes slightly below the corresponding CPI and WPI components, but their author judged the differences not statistically significant, especially since the indexes computed were, for various reasons, not precisely comparable with the published indexes with which they are compared. For the carpet study, the discrepancy between the quality-adjusted index and the CPI and WPI components was considerably larger. All three of the recomputed indexes are consistent with upward quality bias in the respective components.

Next, we examine a few investigations into price changes in services. The services components of the CPI have consistently risen more rapidly than price indexes for commodities, taken as a whole. Of major importance are the medical care components.

Table 3. Comparison of percent changes in CPI and WPI with percent changes in indexes adjusted for quality change, various periods, 1958–66

Period	No quality adjustment [1]	Quality adjusted [2]	Change in WPI	Change in CPI
	Automatic washing machines			
1963–64		−1.74	0.11	−1.35
1964–65		−1.48	−2.23	−1.36
1965–66		−1.46	−0.33	−.58
1963–66		−4.61	−2.45	−3.25
	Men's suits			
1958–66	2.01	19.27	22.07	24.25
	Carpets			
1959–66	2.91	−11.79	[3] −4.38	[4] 1.20

[1] For men's suits and for carpets, price index computed from WPI price quotations, without quality adjustments.
[2] For automatic washing machines, hedonic quality adjustments were applied to a price index computed from prices taken from **Consumer's Digest Price Buying Directory.** For men's suits and for carpets, hedonic quality adjustments were applied to the index described in the first footnote.
[3] "Soft surface floor coverings" component of the WPI.
[4] "Rugs, soft surface" component of the CPI (percent change from 1957–59 average.)

SOURCE: Unpublished BLS memorandum by Thomas W. Gavett.

Table 4. Summary of conclusions of several studies of price indexes and quality change, various periods 1947–66

Author	Product or service	Period	Conclusion
Gavett	Washing machines	1963–66	Slight upward bias.
Gavett	Men's suits	1958–66	Slight upward bias.
Gavett	Carpets	1959–66	Upward bias.
Martin	Hospital costs	1954–61	Upward bias.
Scitovsky	Hospital costs	1951–65	Downward bias.
Barzel	Medical Services	1945–64	Upward bias
Lamson	Theater admissions	1947–64	Upward bias.

NOTE: "Upward bias" means the quality-adjusted price index computed in the study rose less than the relevant CPI component if prices were rising, or fell more than the CPI component, if prices were falling. "Downward bias" indicates the opposite finding.

It has often been argued that one of the defects in the CPI medical care components is that they price units such as "hospital room" and "physician's fee," and that the correct transaction unit—and therefore the appropriate unit for pricing—is the cost of a cure. It has been alleged, furthermore, that a move toward pricing the cost of recovery from an illness would produce a lesser increase than the present CPI procedures.

Such allegations seemed to be borne out in a somewhat tentative study which related hospital costs to the length of stay for particular illnesses.[17] Though daily charges, in a sample of hospitals, rose about the same as the CPI hospital room component, adjusting for changes in the length of stay cut the increase in the price index almost in half. (The years studied were 1954 to 1961.)

However, a second study found just the opposite result: "In the 14 years from 1951–52 to 1964–65, the costs of treatment of all five illnesses covered by the study (with one minor exception) increased more—some of them substantially more—than the BLS medical care, price index." [18] A number of objections have been raised concerning the methodology of the Scitovsky study.[19] But the debate actually indicates that the appropriate pricing concept in the medical services area is not patently obvious. Nor is the concept of quality in medical care without serious conceptual difficulties, which are intertwined with the problem of defining the appropriate measurement units for transactions and output.

In order to get around some of these problems, Yoram Barzel [20] constructed a quality-adjusted medical price index based on insurance rates (for "Blue Shield" plans). Between 1945–64, the CPI "Physician's Fees" index rose by 85 percent, while Barzel's index rose only 66 percent.

A final study on services was concerned with

motion picture theaters.[21] The results are especially questionable, since they are derived almost exclusively from a sample of theaters in Seattle which were "unchanged" over the period 1947–64. For what the findings are worth, the adjusted (for *some* quality changes) index for these theaters rose less than either an index of their actual ticket prices or the CPI theater admissions index.

Conclusions of the studies noted in this section are summarized in table 4. Without attempting to evaluate these studies, most point to upward bias in price index components.

Conclusions

The empirical studies surveyed in this paper do not exhaust the investigations that have a bearing on the problem of quality error in price indexes. But they show that the index may have negative as well as positive errors due to quality changes. The studies of the quality problem are themselves of uneven quality, so some should carry more weight than others. Also, a simple count shows more conclusions of "upward bias" than of "downward bias." Nevertheless, those that show downward quality error indicate that the widespread view that price indexes always overstate the degree of inflation may be incorrect.

Notice that these studies do not point to a positive conclusion: we have not proved that price indexes are biased either upward or downward; rather, they establish only that the proposition that indexes are systematically upward-biased is not conclusively confirmed by the available evidence. If individual components show both upward and downward errors, the overall error may go either way.

The reader may wonder, however, how it is possible that quality error can cause price indexes to be biased downward. Clearly downward bias can result when deterioration in products and services is not fully allowed for in the indexes. There are frequent allegations of this, particularly in services.

But it is also quite possible for quality errors to cause the index to understate price increases even when the quality of products is improving. The reason is that BLS does not simply price whatever products may appear in stores and ignore any change in quality that may occur. Instead, for most products there is an attempt to control for quality differences. This means that the prices that are compared for the index are not necessarily prices of product varieties which show the average rate of quality improvement.

In order to establish the direction or the size of quality error in the indexes, we need to examine the actual quality errors that creep into individual components. These errors will be determined, not solely by the extent and rapidity of quality change in the marketplace, but also by the particular marketing arrangements for different products and by the interaction of these factors with the mechanisms set up by BLS to try to control the size of quality errors permitted in index comparisons. Any extended discussion of these matters is beyond the scope of the present paper. Elsewhere it has been shown that even when the quality of a product is improving rapidly, the quality errors that get into the index may give it a downward error instead of the upward bias so frequently assumed.[22] □

FOOTNOTES

[1] "Hedonic Price Indexes for Automobiles: An Econometric Analysis of Quality Change," Staff Paper 3 in Price Statistics Review Committee, *The Price Statistics of the Federal Government*, General Series Number 73 (New York, National Bureau of Economic Research, 1961). Additional results from the study were published in Zvi Griliches, "Notes on the Measurement of Price and Quality Changes," in National Bureau of Economic Research, Conference on Research in Income and Wealth, *Models of Income Determination*, Studies in Income and Wealth, Volume 28 (Princeton, N.J., Princeton University Press, 1964).

[2] This is an intuitive explanation of the hedonic technique. For a complete discussion of concepts and problems, see Griliches, op. cit. (1961); Jack E. Triplett, "The Theory of Hedonic Quality Measurement and Its Use in Price Indexes," BLS Staff Paper Number 6; Richard Stone, *Quantity and Price Indexes in National Accounts* (Paris, Organization for Economic Cooperation and Development, 1965); and Thomas W. Gavett, "Quality and a Pure Price Index," *Monthly Labor Review*, March 1967, pp. 16–20.

[3] "Measuring Quality Changes and the Purchasing Power of Money: An Exploratory Study of Automobiles," *National Banking Review*, December 1965, pp. 217–236; reprinted in Zvi Griliches, ed., *Price Indexes and Quality*

Change: Studies in New Methods of Measurement (Cambridge, Harvard University Press, 1971).

[4] This technique rests on the hypothesis that prices for used cars of different ages differ partly because the older cars have less useful life remaining and partly because newer cars differ in quality from older ones. If a pure rate of depreciation can be established to allow for the aging effect, the remainder of the price difference can be taken as an estimate of the value of quality change.

[5] Cagan, op. cit., p. 231.

[6] An estimate of the value of quality changes made in the auto component over an extended period of time is contained in Olga A. Larsgaard and Louise J. Mack, "Compact Cars in the Consumer Price Index," *Monthly Labor Review*, May 1961, pp. 519–523.

[7] I do not wish to convey the impression that concessions data were introduced into the index in this fashion simply because the BLS was unaware of its impact. When the concession information became available, it was argued within the Bureau that the price after any concession had always been the appropriate concept for the CPI, and that linking concessions would ignore real price change that occurred *before* the first reports on dealer price concessions. That is, it was believed that at some previous period (perhaps around 1950) cars had actually sold at list prices. (Indeed, popular reports indicate transactions prices were well above list prices in the immediate postwar years.) Since these price decreases had been missed by the CPI, bringing concessions in by direct comparison, it was argued, preserved the validity of the index in making comparisons, such as for the period 1950–57.

[8] It should be emphasized that the computations reported here are based on Gavett's data, but they are not the constructions produced by Gavett (except where indicated), nor are they used for the same purposes. Therefore, it should not be inferred that Gavett is necessarily in agreement with anything expressed in this section.

[9] Estimates of the cost of quality changes were obtained from manufacturers and used as adjustments in both the CPI and the WPI. See Margaret S. Stotz, "Introductory Prices of 1966 Automobile Models," *Monthly Labor Review*, February 1966, pp. 178–181; and Ethel D. Hoover, "The CPI and Problems of Quality Change," *Monthly Labor Review*, November 1961, pp. 1175–1185.

[10] These include (in order of completion): Jack E. Triplett, "Automobiles and Hedonic Quality Measurement," Journal of Political Economy, May–June 1969, pp. 408–417; Phoebus J. Dhrymes, "On the Measurement of Price and Quality Changes in Some Consumer Capital Goods," *American Economic Review*, May 1967, pp. 501–518, and "Price and Quality Changes in Consumer Goods: An Empirical Study," in Griliches, ed., op. cit. (1971); Richard J. Olsen, "Some Aspects of Quality Change as an Economic Variable," (Rutgers University, unpublished Ph. D. dissertation, 1968); and (on pickup trucks, a closely related product entering the WPI but not the CPI), Robert E. Hall, "The Measurement of Quality Change from Vintage Price Data," in Griliches, ed., op. cit. (1971).

[11] See Triplett, op. cit. (1969). An elaboration of this point appears in the full report from which the present article is condensed.

[12] Meyer L. Burstein, "Measurement of Quality Changes in Consumer Durables," *The Manchester School*, September 1961, pp. 267–279, and Dhrymes, op. cit. (1971). A number of other studies were carried out on various WPI components and are discussed in the full report.

[13] Burstein, p. 279.

[14] Dhrymes, op. cit. (1971).

[15] See Zvi Griliches, ed., op. cit. (1971).

[16] These are contained in the unpublished Gavett memorandum referred to in the text.

[17] Leonard W. Martin, "Pure Price Indexes, Quality Change, and Hospital Costs," *Proceedings* of the American Statistical Association, Business and Economic Statistics Section, 1966, pp. 479–487.

[18] Anne A. Scitovsky, "Changes in the Costs of Treatment of Selected Illnesses, 1951–65," *American Economic Review*, December 1967, pp. 1182–1195.

[19] See, for example, Yoram Barzel, "Costs of Medical Treatment: Comment," *American Economic Review*, September 1968, pp. 936–938.

[20] "Productivity and Price of Medical Services," *Journal of Political Economy*, November–December 1969, pp. 1014–1027.

[21] Robert D. Lamson, "Measured Productivity and Price Change: Some Empirical Evidence on Service Industry Bias, Motion Picture Theaters," *Journal of Political Economy*, March–April 1970, pp. 291–305.

[22] Jack E. Triplett, "Quality Bias in Price Indexes and New Methods of Quality Measurement," in Zvi Griliches, ed., op. cit. (1971).

Technical Note

The Use of Price Indexes in Escalator Contracts

IN LONG-TERM CONTRACTS governing wages, rents, continuous or future delivery of a product, alimony payments, administration of legacies, and delivery of a new product for which the seller has no satisfactory cost estimate, to name a few examples, changes in the purchasing power of the dollar pose a problem because they are beyond the control of the contracting parties. One method the parties use to protect themselves against unforeseen price change, especially in times of inflation, is the escalator clause. Essentially, this attempts to have the transaction price represent constant-value units as measured by the quantity of goods and services which a given amount of money will buy. It usually employs a price index as an objective means of adjusting the actual price. One advantage of escalation is that the techniques and measures used to convert monetary units into constant-value units are normally mechanical and, once established, cannot be manipulated by either party. Another is that it is relatively inexpensive to administer since, after the mechanics have been agreed upon, very little computing is required.

This article discusses the techniques of escalation using the two major price indexes published by the Bureau of Labor Statistics—the Consumer Price Index (CPI) and the Wholesale Price Index (WPI). It does not discuss the pros and cons of using one type of index or data as against another, or the desirability of escalation in preference to other means of protecting against price change.[1] Both of these are matters for the contracting parties to decide. But, for those who are interested in escalation, the article highlights some of the essential qualities of the data they may specify in the contract, shows how these data should be described in the agreement, and suggests techniques for adjustments.

BLS Data for Escalation Purposes

The Consumer Price Index. The CPI measures changes in the cost of a list of goods and services which represents the items important in the expenditures of urban wage earners and clerical workers and their families. It does not measure their actual expenditures or their total cost of living, both of which include outlays for such purposes as income taxes, contributions to charity, and personal insurance—things which the workers and their families do not "consume." Nor does it measure the cost of changes in the manner or level of living which are typically associated with changes in income, size of family, the age of family members, etc. It does, however, measure changes in the prices of things which the "average" family normally buys for current consumption and, conversely, the purchasing power of the dollar spent by workers and their families as a group.

The same items are priced month after month, using specifications to insure that identical qualities are priced, in about 50 cities These cities represent all urban areas from metropolitan New York City to communities with as few as 2,500

[1] Other methods include hedging, which involves use of a counter-balancing transaction; cost plus contracts, which places the risk on one of the parties; target or incentive contracts, which stipulate the original price and a fee, with the fee increased if costs are decreased; and delivery price contracts, which provide that price will be determined by market or cost conditions at the time of future delivery.

From the *Review* of August 1963

residents. Price trends in each city affect the United States index according to population.

Within each city, price changes for the sample goods and services are combined with weights based on the importance in family expenditures of the sample items and the related items which they represent. Thus, if families make 1 percent of their outlays for milk and 20 percent for rent, a 5-percent rise in rents would have 20 times as much effect on the index as a 5-percent rise in milk prices.

Once the item sample has been determined, it stays fixed until the next major weight revision [2] or until there is clear evidence that an alteration in the list of goods or services is called for. For example, as wages and their purchasing power rise, workers begin to spend proportionately less for food and other necessities and eventually the index weights must be revised. Also, new items must be added from time to time as they become important—such as television sets and nylon hose.

The CPI is published about the 25th of the month following that to which the index applies and reflects prices collected at varying dates during the entire month. Separate indexes are available for most of the largest cities: for New York, Chicago, Los Angeles, Detroit, and Philadelphia on a monthly basis; for the others on a quarterly basis. In addition to the total, or the All Items index, separate indexes are calculated for major categories of family spending: Food, housing, apparel, transportation, etc.[3]

The CPI has been used for many years as a wage escalator in labor-management contracts. It is estimated that about 2 million workers are now covered by such agreements. The index is also used to a lesser extent to adjust rent payments, royalties, pensions, and alimony payments. Recently, an insurance company began issuing life insurance policies which contain a provision that benefits will be increased in proportion to the rises in the CPI.

The Wholesale Price Index. The WPI is a general purpose index designed to provide a continuous monthly series showing price changes, singly and in combination, for all commodities sold in primary markets of the United States. The index measures the general rate and direction of price movements in primary markets and the specific changes for individual commodities or groups of commodities. It is based on a sample of over 2,100 commodities chosen to represent a wide variety of commodity specifications and markets. The prices used in constructing this index are those which apply at the first important commercial transaction for each commodity. Most are the selling prices of representative manufacturers or producers or prices quoted on organized exchanges or markets. The basic weights are total transactions as reported in the latest industrial censuses.

The index is intended to measure price changes between two periods of time, excluding the influence of changes in quality, quantity, terms of delivery, level of distribution, unit priced, or source of price. To accomplish this, the index calculations are based on the relative change from one period to the next in prices of identical or nearly identical items, as defined by precise specifications.

The basic All Commodities index is divided into 15 major groups and about 80 subgroups. In addition, some 300 "product class" indexes, which group commodities characterized by similarity of raw materials, production processes, or end use, are of particular interest to users of escalator clauses.[4] The Bureau will also, under contract, construct indexes for special combinations of individual series to meet the specifications of the parties to an escalator agreement.

A 1961 survey of WPI users [5] revealed that 932 companies or individuals used the WPI for the escalation of sales or purchase contracts totaling nearly $14 billion. The indexes most frequently specified in escalator contracts are shown on the following page.

---

[2] These revisions, based on detailed surveys of workers' incomes and expenditures, are made at intervals of about 10 years. The next revision is scheduled for completion with the January 1964 index. A summary of the major changes incident to the revision was published in the July issue of the *Review*, pp. 794–795.

[3] A more detailed description of the index as currently calculated is available on request.

[4] Official monthly indexes are available separately for some of the major groups of commodities, as well as for the total, continuously since 1890. A finer classification by subgroups of commodities is available since 1913. In 1952, the third level of classification— product class—was introduced; these have been extended back to 1947.

[5] Questionnaires were sent to the 2,700 names on the mailing list for the monthly press release and to the 4,200 who receive the detailed report. The number of usable returns totaled 3,026.

	Number of contracts
Metals and metal products	178
All commodities	124
All commodities other than farm products and foods	87
Finished steel products	87
Steel mill products	73
Iron and steel	66
Machinery and motive products	24
Electrical machinery and equipment	23
Machinery and equipment	19
Structural steel shapes	19
Petroleum and products	19
Industrial chemicals	16
General purpose machinery and equipment	15
Chemicals and allied products	14
Carbon plates	13
Crude petroleum	10
Lumber and wood products	10
Specially constructed index for metals and metal products	10

Elements of Escalation

There are three major elements in an escalator clause contract:

1. Establishment of the initial price or rate at the time of the contract. The escalator clause protects against radical changes in real costs from the original estimate; it cannot correct an erroneous or inequitable original price. In fact, if the original price is incorrect, almost any escalator clause will exaggerate the error over time.

2. Selection of an appropriate escalating index. Escalation is usually based on an index which is assumed to represent the commodity or service being escalated. The escalator, then, is subject to any limitations inherent in the escalator index. The CPI is generally used for escalating wages and items sold at retail levels; the WPI is more often used for adjusting prices of raw materials or production equipment, industrial rents, etc.

3. Procedures for carrying out the escalation. Six basic points are usually defined in escalator mechanisms:

A. Identification of the Index To Be Used. The index used as the escalator should always be completely identified regardless of whether it is a widely known index or a special combination of individual series or categories. Exact title and the index base period should be indicated. For example, an adequate identification would be: The Consumer Price Index, All Items, U.S., 1957–59=100, or the Wholesale Price Index, All Commodities (Except Farm and Food Products), 1957–59=100, issued by the U.S. Bureau of Labor Statistics. The indexes are published first in a monthly press release, about 2 weeks later in a detailed report, and, about a month thereafter, in the Current Labor Statistics section of the *Monthly Labor Review.* The publication to be used should be specifically named in the contract.

If the contract is based on the WPI, it is safer to specify whether the preliminary or final index [6] is to be used. The CPI is final on first publication. If an item or group or specially computed combination of individual WPI series is to be used, the BLS code or category numbers should be included in the identification.

In specially computed indexes based on either the CPI or WPI, the relative weights of items should be specified. For example, an index for escalating the price of turbines might assign the major components of the product the following relative importances to reflect changes in material costs:

	BLS Code	Weight (percent)
Carbon steel plate	10-14-26	50
Carbon steel sheet	10-14-46	20
Electrical sheet	10-14-50	15
Steel forgings	10-15-71	7½
Copper wire	10-26-01	7½

B. Reference Dates of Escalation. The date to which the index being used as the base of the escalator refers should always be indicated. The reference base period is usually not the same as the base period of the price index or series; for example, the reference index may be the CPI for March 1962, stated on the 1957–59 official base period. The reference date of indexes on which subsequent changes are to be computed should also be specified. The parties may prefer—for the escalator base or the subsequent adjustments—to use a particular month's index, an annual average, or an average for 3 months, or 6 months, or 5 years, or any other period or date, whatever suits their purpose. In any event, the contract should specify precisely the reference dates of the indexes to be used.

---

[6] Indexes are considered preliminary for 1 month, or until the index for the month following the date of reference is published.

C. Frequency of Adjustment. It should also specify the effective dates of adjustments. The parties may agree that adjustments are to be made quarterly. For example, if the index goes up or down by a specified number of points or fraction of a point by the end of the quarter, the change in wages, rents, etc., takes place automatically at a stipulated time. If the index does not change by at least this amount, then no change is called for in the wage rate, rent, or product price.

On the other hand, the change in the payment may be required whenever the index reaches a certain point—118.0 (1947–49=100), 120.0, etc.—or when it changes by a specified amount. Thus, if an increase of 1 cent in a wage rate is called for whenever the index moves up 0.5 point, the time interval is immaterial—it may be 1 month or 6, or 12, etc.

Two factors should be considered in deciding the frequency of adjustments:

1. Too frequent adjustments may create some difficulties because of the seasonal or erratic movements of prices, particularly for farm products and foods. As commodities move up the processing scale away from raw materials into more highly fabricated goods, seasonal price changes tend to become progressively less important. Use of quarterly, semiannual, or annual average indexes will minimize such periodic fluctuations and result in a smoother adjustment pattern.

Conversely, in a period of continuous price movement in one direction, infrequent adjustments may understate the true change somewhat, since escalator clauses adjust only for what has already happened. When prices are rising, payments do not increase as rapidly as the index; when prices are falling, payments do not decrease as fast as the index.

2. The time lag between collection of the basic price data and publication of the indexes does not permit the contracting parties to time adjustments to coincide with the occurrence of price changes. For the CPI and the WPI, 4 to 6 weeks elapse between the collection and the release of the index, even in preliminary form. If a final index is used, then the lag increases by at least a month. Unless provision is made for this reporting lag, the understatement of the true price change will be intensified when prices are changing rapidly. In many instances, particularly for rents, retroactive payments are called for in order to correct the time lag.

D. The Mechanics of Adjustment. The heart of the escalator clause is the method of adjustment, which can be varied in many ways, depending on the purpose for which the index is to be used and the wishes of the contracting parties. There are two basic methods of adjusting payments in accordance with a price index—one is to apply to the price (or the wage rate) some multiple of the percentage change in the index; the other is to provide that for each specified absolute change in the index, the price will change by some specified amount. Either method is satisfactory. However, unless the base index is exactly 100.0, a change of one index point is not the same as a change of 1 percent. When the index is *greater* than 100, a change of an index point is less than a change of 1 percent and when the index is *less* than 100, a change of a point is more than a change of 1 percent. Therefore, a clause might read that prices will change 1 *percent* for each 1-*percent* change in the index or that prices will change a given *dollar-and-cents* amount for each 1-*point* change in the index.

Many wage agreements contain a cents-to-point relationship, requiring that wage rates be upped by a cent for every change of one-half (or 0.5) point from the base index. Others condition the change on 0.6 point, a whole point, etc. Such a relationship frequently is predicated on the wage rate-price index relationship at the time of the agreement. For example, if the base index for escalation is 120.0 and the average wage is $2.40 per hour, then one index point is equivalent to 2 cents and one-half point equals 1 cent. To maintain this relationship, the parties may agree on a 1-cent wage increase if the index moves up one-half point. Under this type of agreement, a new cents-to-point relationship must be calculated when the BLS changes its index base period, because rebasing changes the value of an index point.[7] The index-wage relationship can also be of the percentage type. This is less frequently used in wage agreements than the cents-to-point relationship—perhaps because the resulting wage

[7] The reference base for both the CPI and the WPI was changed in 1962 from 1947–49=100 to 1957–59=100. Although the indexes are also available on the 1947–49 base, users should consider shifting to the new base as soon as practicable.

rates might result in fractions of a cent or because the concept is not quite as simple.

For leases and other long-term price agreements, the percent-of-change technique offers no difficulty. If this method is adopted, the clause should specify how the change is to be computed; for example, the parties may decide that an index change of 12.5 percent is to result in a price adjustment of 12 percent, 12.5 percent, or 13 percent, or they may work out a schedule of changes, as in the cents-to-point contracts. As both the CPI and the WPI are published to one decimal place, it is desirable that contracts refer to the indexes in these terms.

E. Upper and Lower Limits of Adjustment. The escalator clause should specify whether adjustments will be made for index changes in either direction or only one. If an agreement mentions increases only, presumably decreases are not contemplated. Some clauses, on the other hand, specify that wages, rents, etc., are to move down as well as up but are not to drop below a specified minimum; for example, a wage escalation clause may call for a 1-cent decrease for every 0.4 index point down to an index level of 97.8.

F. Provision for Revision of the Index. The Bureau occasionally publishes corrections of indexes previously published as final, because of late reports or errors. The contract should specify whether or not account is to be taken of such corrections.

For statistical accuracy, the Bureau is committed to keep the composition of the indexes in line with prevailing conditions. In both the CPI and the WPI, the BLS revises commodity specifications, adds new products, discontinues obsolete items, and, from time to time, revises the weighting structure and reference base.

Escalator mechanisms cannot be controlled by either party, so agreements often stipulate a procedure to follow if the escalator mechanism changes or disappears. In most cases, this procedure simply states that the original issuing agency will be sole judge of the comparability of successive indexes, and that if the agency cannot supply indexes which are comparable, a named independent authority (such as the dean of the business school or the head of the economics department in the State university) will select a method of continuing the contract. When the relationship is one of cents to point as in a wage contract, the parties may want to renegotiate. For this reason, the Bureau gives notice of anticipated changes in the official indexes at least 6 months in advance.

—Francis S. Cunningham
Division of Industrial Prices and Price Indexes

Postwar price cycles: a new chronology

Fluctuations in the rate of change of consumer prices generally match changes in economic activity

GEOFFREY H. MOORE

INFLATION is characterized by a general and widely diffused rise in prices and costs. However, all prices and factors affecting prices do not begin to rise or fall at the same time. Moreover, prices do not all move at the same pace. These differences in price behavior have significant consequence. Real wages—money wages adjusted for price changes—may rise or fall, with vital effects on the wage earner and his family. Profit margins, dependent on the difference between prices and costs, may rise or fall, thereby encouraging or discouraging expansion of production, hiring of workers, development of investment plans, or shifts of resources from one activity to another.

This article sets forth some of the results of a recent study of the cyclical behavior of prices.[1] It describes a new chronology of fluctuations in the rates of change in the price level, relates these fluctuations to those in overall economic activity, examines the extent to which price changes involve the entire price system, measures the tendencies of some prices to lead and others to lag, and sketches the relationship of price cycles to changes in costs and profits. Recent developments are touched on with a very broad brush.

Reference chronology for prices

A simple yet effective device for studying business cycles is the National Bureau of Economic Research's reference chronology of peaks and troughs in economic activity, created by Wesley Clair Mitchell. It is a widely used device in tracing fluctuations in the economy and has imprinted upon the minds of many economic statisticians the meaning of "shaded areas" in charts of monthly time series.

In view of the usefulness of such a framework, it seems sensible to adopt a similar strategy for studying movements in the price system. To do so, however, a number of questions have to be faced. Should the chronology represent peaks and troughs in the level of prices or in their rate of change? If the latter, how should the rate of change be measured? monthly? quarterly? What type of data should be used: unadjusted or seasonally adjusted? What index or set of indexes of prices should be used to construct the chronology? What criteria should be set up to define the chronology and identify its turning points?

The business cycle chronology was based on the working definition of business cycles set forth by Mitchell in his 1927 volume, *Business Cycles—The Problem and Its Setting*,[2] and later refined by Arthur F. Burns and Mitchell in their 1946 monograph, *Measuring Business Cycles*.[3] In brief, the definition applied three criteria to the problem: the magnitude, the duration, and the diffusion of fluctuations in economic activity. One inquired how large the decline or rise in aggregate activity was, how long it lasted, and how widely it was diffused over different economic sectors. Turning points were identified not by referring to a single aggregate, such as gross national product, but by determining the consensus among a number of series, each of which had some claim to represent or reflect total economic activity.

There is much to be said for developing a price chronology in a similar manner. Whether it is the level of prices or their rate of change that is selected as the ultimate variable, attention should naturally be focused upon swings that are of substantial size, last more than just a few months, and are widely diffused throughout the price system.

Geoffrey H. Moore is Commissioner of Labor Statistics, Bureau of Labor Statistics.

It would be convenient to depend upon a single general price index for this purpose. Unfortunately, although the idea of an index of the general price level is an ancient one, there is today no single widely accepted measure of it. The three leading candidates would be the Consumer Price Index, the Wholesale Price Index, and the Gross National Product Deflator. Each of these has its merits and deficiencies for the purpose.

The Deflator is quarterly, whereas the other two indexes are monthly, and other things being equal, a monthly chronology would be preferred. The Deflator has the largest economic coverage, but that also means it includes some dubious elements, notably in the government sector where the "price" is really a wage rate. For this reason many consider the Private GNP Deflator a better price index. The Deflator is affected not only by changing prices but also by changing weights, because it is derived by dividing current dollar GNP by an estimate of GNP in constant dollars, whereas the other two indexes use fixed weights and hence reflect price changes alone.

The Wholesale Price Index, of course, covers only one part of the price system—commodities, not services—has some gaps in its industrial coverage and depends in part upon list prices rather than actual transaction prices. The Consumer Price Index is the closest approximation of the three to an actual transaction price index but is limited to prices paid by urban wage earners' and clerical workers' families. Unlike the other two, it includes prices for existing goods, such as houses and used cars, as well as for newly produced goods and services.

These considerations do not point to a clear-cut conclusion, except to suggest a real need for a monthly general price index. Lacking this, I have based the chronology in this paper upon the Consumer Price Index, using the GNP Deflator and the Wholesale Price Index, and some of their principal components (for example, the Private Deflator and the WPI for industrial commodities) to provide supplementary evidence. The CPI has risen almost continuously since 1954, but there have been sizable fluctuations in its rate of increase, and the chronology identifies these fluctuations. The rate of inflation is, of course, of major concern. The chronology shows when this rate, as measured by the CPI, reached high points and low points since 1947.

To aid us in identifying turning points in the price cycle, we turned to a National Bureau of Economic Research computer program recently developed by Charlotte Boschan and Gerhard Bry. Essentially, this program reproduces, in an objective and mechanical fashion, most of the choices of "specific cycle" turning points that used to be entirely dependent upon the judgment of National Bureau staff. Of course, it uses criteria that are similar to those used by the staff. It bases its choices upon whether the fluctuations in the data are sufficiently large and long enough to be reflected in various moving averages, but does not explicitly use any criterion as to the size of a swing. Despite this, it is rather uncanny in its ability to detect and identify turning points independently selected by experts. We used the turns selected by the computer program in a large majority of instances. The exceptions were due to the occasional failure of the program to mark a large movement because it is too short, or (more frequently) to mark very small movements simply because they last quite long.

After deciding upon the rate of change in prices as the variable that the chronology would represent, several other decisions remained. First, the rates of change had to be seasonally adjusted or derived from seasonally adjusted indexes. During the past year the Bureau of Labor Statistics has been reporting the seasonally adjusted rate of change in the CPI. The seasonal pattern has a relatively small effect upon the level of the index (currently the largest and the smallest seasonal factors are, respectively, 100.12 in July and 99.83 in January and February). Nevertheless, it has a substantial effect upon rates of change over short periods. For example, the rate of change from July 1969 to January 1970 is raised from an annual rate of 5.7 percent to 6.3 percent after seasonal adjustment, which is equivalent to dividing a seasonal index of 90 into the unadjusted rate. This seasonal effect has been powerful enough to cause the unadjusted July to January rates to be lower than either the preceding or the following January to July rates in 4 years out of the past 5.[4]

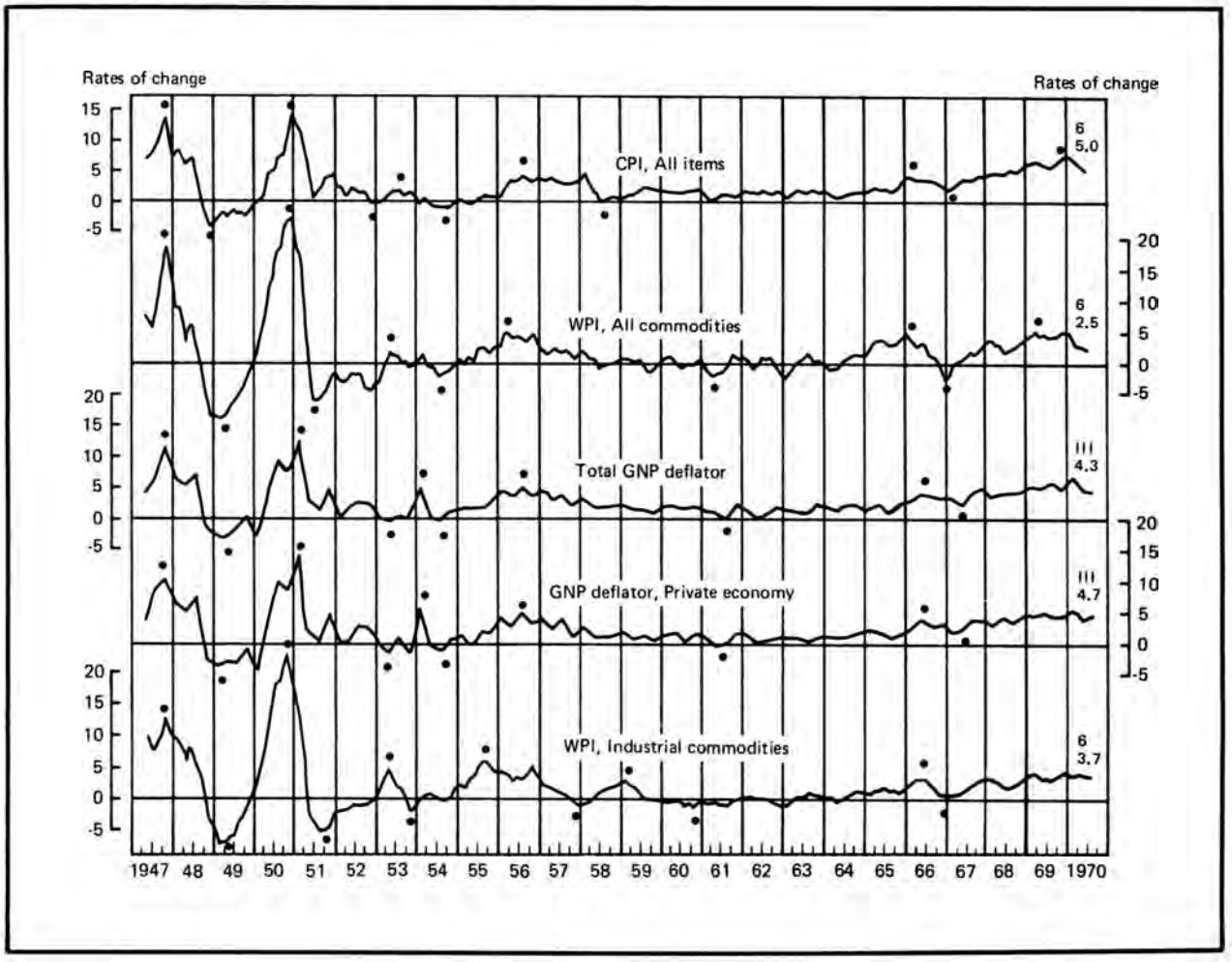
Next, it is necessary to determine precisely how the rate of change is to be measured. The range of possibilities is wide. The interval over which change is measured can be as short as 1 month or as long as 12 months or more. Monthly indexes can be averaged over calendar quarters,

or over moving 3-month intervals and rates of change measured between these averages. More complicated smoothing formulas can be applied. Generally, month-to-month changes are highly erratic, so some form of smoothing is desirable. On the other hand, smoothing formulas can twist and distort cyclical patterns and timing relationships. After some experimentation I concluded that the rate of change over a 6-month span met reasonably well such criteria as smoothness, simplicity, and limited distorting effects, for the CPI and most other price and wage series. For series that are available only in quarterly form, quarter-to-quarter changes are used. Occasionally we use changes over 12-month or 4-quarter spans, when these are the only data available or when the 6-month or 1-quarter rates are unduly erratic.

Postwar price cycles

Taking into account the foregoing considerations, chart 1 shows the reference chronology, based upon the rate of change in the Consumer Price Index, together with rates of change in the other comprehensive indexes mentioned earlier. Six contractions in the rate of change are identified: in 1947–48, 1950–52, 1953–54, 1956–58, 1959–61, and 1966–67. We have marked a tentative peak in February 1970. If this peak is confirmed by data later this year and in 1971, this will mark the beginning of the seventh contraction since 1947. Taking the 23-year period between the 1947 and 1970 peaks, we find that expansions in the rate of change lasted 162 months in the aggregate, while contractions covered 106 months. That is, although

Chart 1. Rates of change in comprehensive price indexes



the Consumer Price Index has been generally rising during this period, the rate of increase has declined over long stretches—aggregating nearly 9 years.

The other indexes show broadly similar fluctuations, but with exceptions, especially in the period 1959–64. In terms of these comprehensive indexes, therefore, the chronology seems to represent fluctuations that are widely diffused in the price system. This matter will be examined more directly later.

During the first three contractions in the rate of change in the CPI, the rate fell below zero; that is, the index declined. But the rate barely reached zero in the next two contractions (1958 and 1961), and did not do so at all in the last one (1967). Indeed, the level of the rate at its successive low points becomes progressively higher throughout the period. There is a related tendency for the declines in the rate to become progressively smaller. In the first two contractions the rate dropped 18 and 15 percentage points; in the next two, 3 and 4½ percentage points; and in the last two, 2 and 2½ percentage points. (See table 1.) However, the high points in the rate have not become progressively higher, nor have the expansions become progressively larger. If there has been a rising floor under the rate, there has not been a rising ceiling also. One possible explanation, which needs further exploration, is that the rising importance of services, and the diminishing importance of foods in family budgets has had the effect of preventing declines in the rate of change of the CPI from reaching as low a level in recent years as they did earlier in the postwar period.

Price cycles and business cycles

How does the price chronology compare with the business cycle chronology? Four of the price contractions correspond with the four business contractions of 1948–49, 1953–54, 1957–58, and 1960–61. But the business expansion of 1949–53 was interrupted by the price contraction of 1950–52, and the long business expansion that began in 1961 was interrupted by the price contraction of 1966–67. Each of these interruptions was also characterized by some hesitancy in business as well. Hence there is a notable degree of correspondence between the behavior of the rate of change in the Consumer Price Index and general economic activity. Since World War II, every economic slowdown or actual recession has been accompanied by a cyclical contraction in the rate of change in the price level, and cyclical contractions in the rate of change in the price level have not occurred at other times.

This is not to say, however, that a business recession is a necessary condition for a reduction in the rate of inflation. As already noted, two such reductions since 1947 have occurred at times when the economy merely slowed down. Moreover, several of the declines in the rate of price rise that

Table 1. Comparison of peaks and troughs in the rate of change of the Consumer Price Index (all items) with those for selected price indexes, 1947–70

Peaks and troughs in the rate of change in the Consumer Price Index, all items			Lead (−) or lag (+) in months, at turns in the Consumer Price Index, all items						
			Consumer Price Indexes for—			Wholesale Price Indexes for—			GNP implicit price deflator
Peak or trough	Date	Rate (percent)	Food	Other commodities [1]	Services [1]	All commodities	Industrial commodities	Consumer finished goods	
Peak	October 1947	13.8	0			0	0	0	0
Trough	November 1948	−4.3	0			+3	+5	0	+5
Peak	November 1950	14.3	0			0	−1	−2	+2
Trough	November 1952	−0.6	+3			−17	−15	0	+5
Peak	July 1953	2.1	+7			−3	3	+7	+6
Trough	August 1954	−1.2	+2			−1	−10	−1	−1
Peak	July 1956	4.3	−3	+5	+7	−5	−11	+17	0
Trough	July 1958	−0.2	0	0	+2	[2]	−8	+1	[2]
Peak	July 1959	2.3	+10	−3	−1	[2]	−5	+7	[2]
Trough	March 1961	0	0	−10	+2	0	−6	−1	+4
Peak	January 1966	4.1	1	[2]	+5	0	+3	−1	+3
Trough	January 1967	1.6	0	[2]	+3	−1	−3	−1	+3
Peak	February 1970 [3]	6.7							
Median lead (−) or lag (+), in months			0	−1.5	+2.5	−0.5	−4	−0.5	+3

[1] Comparable data not available prior to 1956.
[2] Tentative.
[3] No timing comparison.

NOTE: Rates of change in the Consumer and Wholesale Price Indexes are computed over 6-month spans, centered, seasonally adjusted at annual rate. Rates of change in the GNP deflator are computed from quarter to quarter, centered, seasonally adjusted at annual rate.

were associated with business cycle contractions began well before the contraction in business activity got under way. The 1947 and 1956 peaks in the rate of change in the Consumer Price Index both came about a year before the business cycle peak, and the 1959 price peak came 10 months before the business peak. In fact, in 1948, all of the decline in the rate of change in prices—and it was substantial—occurred before the recession began. In 1953, the two peaks coincided. More often than not, then, the CPI has begun to decelerate while business activity was still expanding.

On the other hand, low points in the rate of price change have coincided rather closely with business cycle troughs, at least on three out of four occasions. The 1948 upturn in the rate of price change (from a level of minus 4 percent) came 11 months before the business upturn, but the 1954 price upturn coincided with the business upturn, while the 1958 and 1961 price upturns followed the business turn by 3 months and 1 month, respectively. In short, declines in the rate of price change have typically started earlier and hence have continued somewhat longer than business cycle contractions.

It is important to note, however, that the rate of price change has usually persisted at a low level, even a negative level, beyond the point of upturn. Perhaps the most striking finding is that a year or a year and a half after the business peak the rates of price change have all been in the vicinity of zero, plus, or minus 1 percent.

The diffusion of price change

One of the characteristics of business cycles that Wesley Mitchell deemed important, and which he demonstrated empirically time and again, was their generality. Mitchell and Burns wrote in their 1946 volume: "A business cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals. . . ." Among the many activities are prices, and we have just seen that the rate of change in the price level is clearly one of the participants in the ebb and flow of business cycles.

This observation does not, however, directly answer the question whether the price chronology we have constructed reflects widespread, similar movements among different prices. We can get at this question by examining diffusion indexes of prices, for such indexes report how many out of a given population of prices are rising at a particular time and how many are falling. In terms of the popular conception of whether or not the economy is experiencing inflation, or whether it is getting worse or better, variations in the degree of generality of price increases are perhaps of more significance than variations in the rate of change in a price index.

The price diffusion indexes constructed in this analysis illustrate several propositions. First, at all times some prices are falling and some are rising, but the proportions that are in the one category or the other vary greatly. Second, the most widespread increases in prices have generally occurred during the periods marked off as expansions in our price chronology, while the most widespread reductions in prices have generally occurred during the contractions. This reflects the fact that the Consumer Price Index increases more rapidly at some times than at others partly because price increases are more widespread at those times, not only because the increases are larger.

Third, there are discernible sequences in the process whereby price changes spread through the economy: prices of industrial materials take an early position, wholesale prices of manufactured goods move somewhat later, and retail prices of consumer goods and services come still later. The sequences among those parts of the price system are so long drawn out, in fact, that on several occasions (notably during 1957–58) the most widespread *declines* in the early moving prices came almost at the same time as the most widespread *increases* in consumer prices. Unless the sequences in the price system are taken into account, therefore, one could be misled into thinking that the cyclical swings in prices are less general than they are in fact.

Leads and lags

The diffusion indexes depict some of the sequences in the price system. But we can examine the matter more thoroughly by referring to the rates of change in a larger array of price indexes using the price chronology as a reference frame in the same way that the business cycle chronology has been used to study leads and lags in economic

activities generally. In this manner we can observe not only the leads and lags of other prices vis-a-vis the Consumer Price Index, but also their leads and lags with respect to one another.

Looking first at certain major components of the Consumer Price Index, we find that the turns in the commodity component match those in the total index very closely. On five occasions since 1956 (when the commodity-service grouping first became available) the turns in the rate of change in the commodity index and in the total index came in exactly the same month, while on the remaining occasion the commodity turn was 1 month earlier. This correspondence is due more to food prices, whose volatile movements have a marked effect on both the commodities component and the total, than to commodities other than food. As for prices of services, their well-known tendency to lag is apparent. Perhaps less well known is the fact that the rate of change in service prices undergoes cyclical movements that correspond closely, except for the lag, to those in commodity prices. The lag of service prices behind commodity prices averages about 3 months.

Turning to wholesale prices, we find that the total WPI exhibits a slight tendency to lead the total CPI. That is, it leads on five occasions, exactly coincides 4 times, and lags only once. The lead appears to derive more from the industrial commodities in the WPI than from the farm products, processed foods and feeds component. The latter component, however, matches the CPI quite closely, and of course compares most directly with the food price component of the CPI, which, as we have seen, itself has a dominant effect on the CPI. The behavior of consumer prices depends, to an extent most city dwellers are probably unaware of, on the behavior of farm prices.

The industrial commodities component of the WPI has turned before the CPI 9 times since 1948, coincided once, and lagged twice. The tendency to lead is imparted primarily by the prices for crude and intermediate materials other than foods, rather than for finished goods. Prices for crude materials other than food have led 9 out of 10 turns in the CPI since 1947; the average lead is about 4 months. This index is similar in its movements and timing to the weekly spot market index of industrial materials prices. On most occasions the turns in the rates of change in these two materials price indexes have occurred within a month or two of each other. Prices for producer finished goods—that is, machinery, equipment, trucks, office furniture, and so on—show about as much tendency to lag behind as to lead the movements in the CPI.

The rate of change in the GNP Deflator is a lagging indicator in comparison with the rate of change in the CPI. This is true also of the Private Deflator, since its turns usually coincide with those of the total. The Deflators have lagged behind the turns in the CPI far more frequently than they have led or coincided with it, and the average lag has been about 3 months. The reason for the lag may lie in the fact that personal consumption expenditures—that is, the type of expenditure reflected in the CPI—constitute less than two-thirds of total GNP, while the prices for the two largest elements in the remainder—fixed investment goods and government services—are relatively sticky.

Our review of the complex structure of leads and lags in the price system has merely scratched the surface of the subject. Very generally, the discernible sequences in the manner in which price changes spread through the economy are as follows: Prices of industrial materials move first. Wholesale prices of manufactured goods move somewhat later. Retail prices of foods and other commodities follow shortly thereafter, and retail prices of services, such as passenger fares and medical fees, bring up the rear. In this review, we have dealt with prices for fairly large groupings of goods and services and have not dealt at all with the prices of fixed assets, such as land or buildings, or the price of labor, or of interest rates. There is much room for further investigation.

Costs and profits

During the past few years, economists and statisticians have developed a systematic body of data that connects the rate of change in the price level with rates of change in labor compensation, output per man-hour, labor costs, profits and other costs per unit of output. From these data, a fairly clear picture of the general behavior of costs and profits in the United States emerges.

When prices are relatively stable or declining—

the bottom of the price cycle—the rate of increase in output per man-hour is high. It diminishes, however, as prices rise. Rates of increase in hourly compensation for workers, on the other hand, are usually at a moderate level but soon begin to rise, partly in response to the upward movement of prices. The rate of change in unit labor costs is low and oft n declining during the beginning phase of price expansion but rises sharply in the later phase as a result of the opposing movements of the rates of change in labor compensation and in productivity. Other unit costs follow a similar path. The effect of all this on unit profits is to produce a rapid rise at the start of a price expansion, but a decline at the end.

The situation is reversed when inflation starts to subside. When the rate of price increase first starts down, output per man-hour continues to grow at lower rates for a while but presently starts up, contributing to a reduction in physical costs. Not long afterward, the rate of increase in hourly compensation turns down. The output rise and the compensation slowdown generate a decline in the rate of increase in unit labor costs and other unit costs start showing more moderate rates of increase. In summary, at the start of a price contraction, increases in total unit costs exceed those of prices—with unit profits therefore declining—but the downswing in costs exceeds that in prices before the bottom of the price contraction is reached.

How does the current situation in the United States stack up in terms of the price chronology we have outlined? As stated earlier in the article, we have placed a tentative recent peak for the chronology of prices in February 1970, based upon the rate of change in the Consumer Price Index. This is the month when the seasonally adjusted rate of change over a 6-month interval reached its highest level in the current upswing, 6.7 percent per year. (February is simply the central month of that interval, which runs from November 1969 to May 1970.) Since then, the 6-month rate has begun to decline, and the most recent observation on it (covering the period March to September 1970) is 5.0 percent.

We do not consider this peak to be firmly established as yet, since the decline has not been very large or very long. But there is evidence to support it in the behavior of the Wholesale Price Index, the Gross National Product Deflator, and indexes of unit labor costs and unit profits. Moreover, all of the price diffusion indexes for the current period have receded from their highs, which were reached during 1968 and 1969. That is, fewer prices have been rising in recent months, and more have been declining. The general trend has been one of a slowing in the pace of price and cost inflation, and that is the reason for recognizing it, at least tentatively, in our chronology of price change. □

———*FOOTNOTES*———

[1] This article is adapted from a paper presented at a colloquium "The Business Cycle Today," which was sponsored by the National Bureau of Economic Research in September 1970. The full paper will be published as *The Cyclical Behavior of Prices* (BLS Report 384, 1970).

[2] Wesley C. Mitchell, *Business Cycles—The Problem and Its Setting* (New York, National Bureau of Economic Research, 1927).

[3] Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles* (New York, National Bureau of Economic Research, 1946).

[4] The substantial seasonal effect on the rate of change can be illustrated as follows. The increase in the seasonal factor from 99.83 in January to 100.12 in July is 0.6 percent at an annual rate. If the increase in the unadjusted index is at a 6-percent annual rate, the seasonal factor accounts for about 10 percent of the rise. Of course, it has an equal and opposite effect on the increase from July to January. The ups and downs in the rate of increase that are attributable to seasonal factors can be quite misleading in judging trends in the rate of inflation. As the figures given below indicate, the seasonally adjusted rates show far more clearly the onset of inflation in 1965, its interruption in 1967, and its continuation thereafter, than do the unadjusted rates.

	Percent change at annual rate, CPI, all items	
	Unadjusted	*Seasonally adjusted*
1964—January–July	1.1	0.6
July–January	1.1	1.6
1965—January–July	2.4	1.9
July–January	1.5	2.0
1966—January–July	4.2	3.7
July–January	2.5	3.1
1967—January–July	3.2	2.6
July–January	3.6	4.2
1968—January–July	5.0	4.4
July–January	4.3	5.0
1969—January–July	6.7	6.1
July–January	5.7	6.3
1970—January–July	6.0	5.4

Prices in 1972: An analysis of changes during Phase 2

Prices of finished goods rose less at retail than at manufacturers' level; spread narrowed between price increases for services and those for nonfood commodities

JOEL POPKIN

PRICE BEHAVIOR in 1972 was marked by the existence of Phase 2 of the Economic Stabilization Program put into effect by the President on August 15, 1971. Phase 1 of that program consisted of a freeze of virtually all wages and prices that lasted until November 13, 1971. Phase 2, which ensued immediately, consisted of a varied program of regulation ranging from the exemption of prices of certain raw commodities, particularly farm products, to the imposition of absolute control of the rate of price increase in areas such as medical care. In between there were regulations governing the extent to which cost increases could be passed through as price increases and the extent to which profit margins could rise.

Prices for most major groups of commodities and services in the Consumer (CPI) and Wholesale (WPI) Price Indexes rose at a slower rate in 1972 than in the first 8 months of 1971 up to the freeze. The major exceptions were food prices at retail and wholesale and the price index for crude nonfood materials, a component of the Industrial Commodities Index of the WPI.

During 1972 the Consumer Price Index rose 3.4 percent. The annual rate of increase for the 13 months after Phase 2 began in November 1971 was also 3.4 percent. The analysis of price behavior throughout this article will be based largely on movements during the 13 months from November 1971 when Phase 2 began through December 1972. How the rate of advance during this time period compares with periods before and during the Phase 1 freeze is shown in table 1 for the CPI and WPI and their major components. Changes are expressed at annual rates (all seasonally adjusted except services).

Joel Popkin is assistant commissioner for Prices and Living Conditions, Bureau of Labor Statistics. Toshiko Nakayama, an economist in the Division of Consumer Prices and Price Indexes, assisted.

From December 1969 to December 1970 the rise in the CPI slowed by 0.6 percentage points. From December 1970 to August 1971 (up to the start of the freeze) the rate dropped further by 1.7 percentage points. From the start of the freeze through December 1972, the first 16 months of the Economic Stabilization Program, the CPI increased at an annual rate of 3.2 percent, a drop of 0.6 percentage points from the pace of the first 8 months of 1971. During the 13 months of Phase 2 through December of 1972 the rate was down 0.4 percentage points from the rate in the 8 months before the freeze.

In the spring of 1971, there was a sharp decline in mortgage interest rates which affects the comparisons made between the first 8 months of 1971 and periods preceding and following them. If the change in the CPI in the first 8 months of 1971 is recalculated to exclude mortgage interest costs and the effect the elimination of the excise tax on autos had on the August CPI, the rate of advance is higher, 4.8 rather than 3.8 percent.[1] With these exclusions during January-August of 1971 and the exclusion of mortgage interest costs from the CPI during Phase 2, the decline in the rate of advance of the CPI in Phase 2 through December compared to the pre-controls period is slightly more than 1 percentage point. A decline in the rate of advance of the CPI from 1970 to the first 8 months of 1971 still shows up, even when mortgage interest costs are eliminated from 1970 data, but that decline is much smaller.[2]

Consumer prices

The pattern of movement in the CPI was varied throughout 1972. In the first 3 months of Phase 2 it rose at an annual rate of 4.8 percent. In spring as food prices fell and price rises for services decelerated, the pace of increase slowed to 2.2 percent in the 3 months ending in June. In the 3 months

ending in September, the pace quickened to a rate of 4.6 percent as prices of food began to rise again sharply and those of nonfood commodities advanced at a faster rate than in the second quarter. Increases in the food and nonfood components slowed in the final 3 months of the year with the result that the CPI rose at a lower rate of 3.2 percent from September to December.

Implicit price deflator

Another measure of price change, available quarterly, is the implicit price deflator (IPD) for private gross national product. From the fourth quarter of 1971 to the fourth quarter of 1972, a period roughly commensurate with Phase 2, the rise in the IPD was lower than the 3.9-percent rate from the end (fourth quarter) of 1970 to the third quarter of 1971, the quarter in which the freeze was imposed (table 2). A major factor contributing to this slowdown was a slackening in the advance in unit labor costs. The rate of advance for compensation per man-hour fell to 6.6 percent during 1972 from 7.1 percent during 1971 up to the quarter in which the freeze was ordered. Moreover, throughout most of 1972 the rate of increase in compensation per man-hour fell, reaching a low of 4.4 percent in the third quarter. Output per man-hour advanced more rapidly during Phase 2—4.9 percent—than in 1971, before the freeze—4.3 percent. Because of these two factors, unit labor costs rose at the lowest rate for any four-quarter period since 1965. Since the rise in the deflator exceeded the increase in unit labor costs during Phase 2 through December 1972, unit nonlabor costs advanced in 1972, but less rapidly—based on indications from preliminary data—than in pre-freeze 1971.

The deflator for personal consumption expenditures (PCE), a component of the deflator for private GNP, rose 2.5 percent in 1972. Because both this deflator and the one for private GNP have moving weights they are not measures of price change alone, but both are calculated, alternatively, on a fixed weight basis. On this basis the deflator for PCE is more nearly comparable to the fixed weight CPI. From the fourth quarter of 1971 to the fourth quarter of 1972, the fixed weight PCE deflator increased less than the CPI. Much of this difference is attributable to the treatment of owner-occupied housing in the two indexes.[3] The annual rate of change in the fixed weight deflator for PCE from the third to the fourth quarter of 1972 was 2.9 percent as compared with 3.9 percent between the third and fourth quarter averages of the CPI.

Wholesale prices

The Wholesale Price Index for all commodities rose at a faster rate in the 13 months after the freeze than in the 8 months before it. This occurred as a result of an acceleration during Phase 2 in price rises for farm products and processed foods and feeds that more than offset a deceleration in the rate of advance for industrial commodity prices. The rate of

Table 1. Changes in Consumer and Wholesale Price Indexes, selected periods 1968–72

[Seasonally adjusted, except services, compound annual rate]

Item	12 months, Dec. 1968 to Dec. 1969	12 months, Dec. 1969 to Dec. 1970	8 months prior to Phase 1, Dec. 1970 to Aug. 1971	3 months, Phase 1, Aug. 1971 to Nov. 1971	13 months, Phase 2, Nov. 1971 to Dec. 1972	16 months, Phases 1 and 2, Aug. 1971 to Dec. 1972	First 7 months, Phase 2, Nov. 1971 to June 1972	Second 6 months, Phase 2, June 1972 to Dec. 1972
CONSUMER PRICE INDEX								
All items	6.1	5.5	3.8	1.9	3.4	3.2	3.1	3.9
Food	7.2	2.2	5.0	1.7	5.0	4.4	4.0	6.1
Commodities less food	4.5	4.8	2.9	0	2.5	2.0	2.5	2.5
Services	7.4	8.2	4.5	3.1	3.6	3.5	3.7	3.5
WHOLESALE PRICE INDEX								
All commodities	4.8	2.2	5.2	−.2	6.6	5.3	5.3	8.1
Farm products and processed foods and feeds	7.5	−1.4	6.5	1.1	14.7	12.0	7.6	23.6
Industrial commodities	3.9	3.6	4.7	−.5	3.5	2.7	4.4	2.6
Selected Stage of Processing Indexes:								
Crude materials except food	10.2	4.6	3.3	2.3	10.3	8.8	8.5	12.6
Intermediate materials except food	3.9	3.1	6.5	−.7	4.0	3.1	4.8	3.0
Producers' finished goods	4.6	4.9	3.7	−2.0	2.3	1.5	4.1	.2
Consumers goods except food	2.9	4.0	2.2	−.4	2.4	1.9	2.9	1.8
Consumer foods	8.2	−2.5	6.8	.3	8.8	7.1	5.4	12.9

Table 2. The anatomy of price change

Item	Change in quarterly averages					
	IV-68 to IV-69	IV-69 to IV-70	IV-70 to III-71 [1]	Phase 1 III-71 to IV-71 [1]	Phase 2 1972 IV-71 to IV-72 [2]	Phases 1 and 2 III-71 to IV-72 [1,2]
Deflator: Private GNP	5.0	4.8	3.9	1.0	2.7	2.3
Personal consumption expenditures	4.8	4.5	3.4	1.2	2.5	2.2
Private construction:						
Residential	6.4	.1	6.5	−.8	6.2	8.1
Nonresidential	9.4	9.0	11.4	7.2	8.4	4.7
Producers' durable equipment	3.2	5.1	3.1	−2.9	2.6	1.4
Government purchases of goods and services [3]	5.3	8.0	3.5	−.1	5.6	4.4
UNIT COSTS						
Total private, all persons						
Deflator: Private GNP	5.0	4.8	3.9	1.0	2.7	2.3
Unit labor costs	8.2	5.2	2.7	1.0	1.6	1.5
Compensation per man-hour	6.9	6.8	7.1	4.7	6.6	6.2
Output per man-hour	−1.2	1.6	4.3	3.7	4.9	4.6
Unit nonlabor costs	−.9	5.4	6.1	1.1	4.6	3.9

[1] Compound annual rate. [2] — preliminary, January 1973 data. [3] Excluding services of government employees.

advance in industrial commodities prices during Phase 2 was slower than before the freeze, but the slowing was largely due to the deceleration that began in July. The extent of this deceleration was influenced by the fact that the Price Commission approved price increases for new cars that were less than the value BLS placed on the quality changes in 1973 models. Some analysts feared increases for industrial commodities, which exceeded 4 percent until the summer of 1972, portended an acceleration for the CPI. This did not occur in Phase 2 and for good reason.

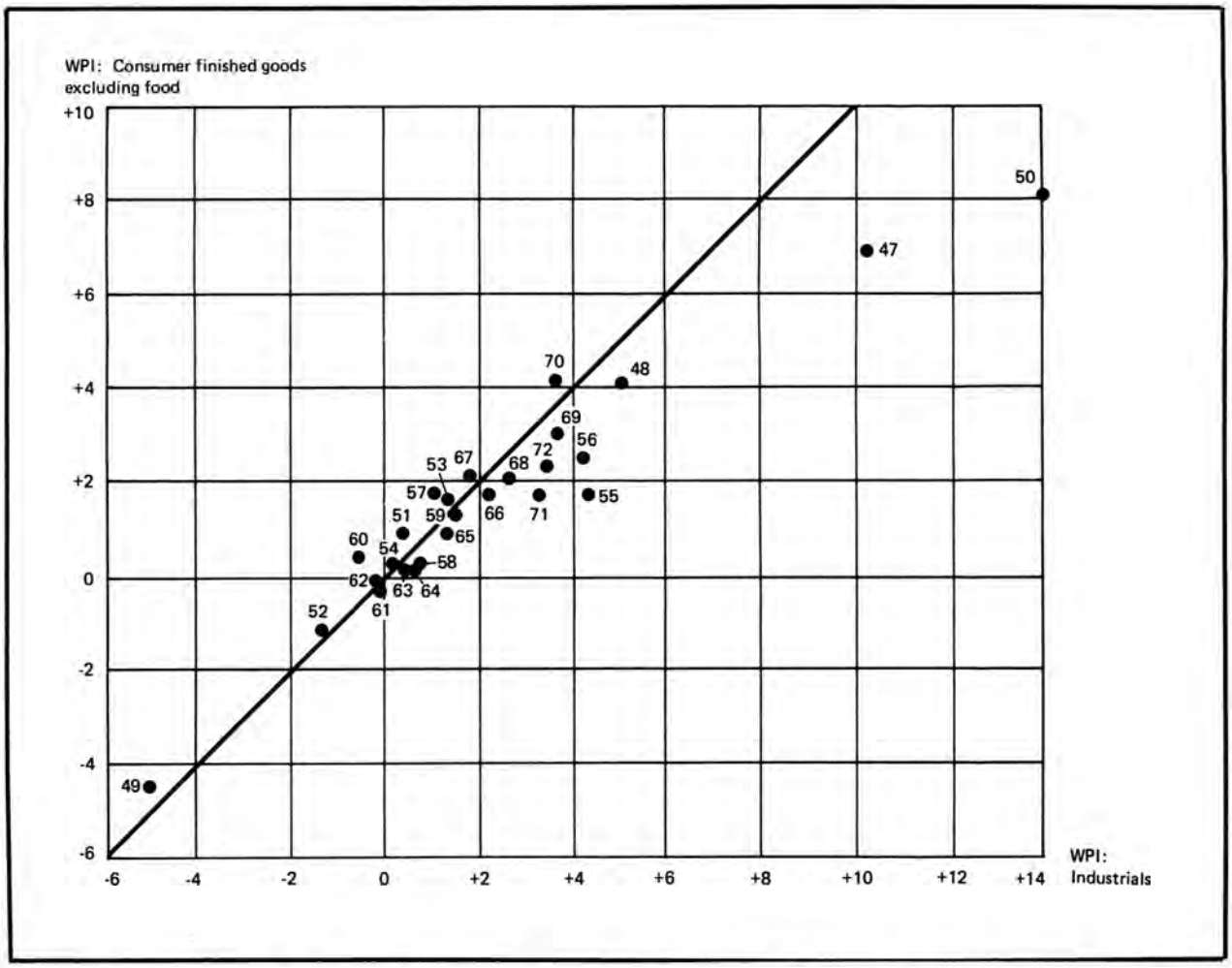
Changes in the CPI, primarily the nonfood commodities component, are directly affected by changes in the prices manufacturers charge for consumer finished goods. And it is not unusual for the industrial commodities price index as a whole to rise or fall more than its consumer nonfood finished goods component when industrial prices are rising or falling.[4] This can be seen from chart 1, which compares changes in the industrial commodities price index with changes in prices of its component for consumer nonfood finished goods. The percentage change in the industrial commodities index from December of one year to December of the next for each year from 1947 through 1972 is measured along the horizontal axis. Percentage change data for the consumer nonfood finished goods component of the WPI industrials index for the same years are measured along the vertical axis.[5] The diagonal line represents equal changes in both series. For the most part, when industrial prices rise (especially 2.0 percent or more) consumer finished goods prices rise less than industrial prices; when industrial prices decline, consumer finished goods prices fall less or rise slightly. All but one of the exceptions—observations above the diagonal when industrial prices are rising and below the line when they are falling—are years which include at least in part the recessionary phase of a full or mini business cycle.[6] Price relationships in Phase 2 did not deviate from those found in past years of expansion. The rate of rise in industrial prices during Phase 2—3.5 percent—did not signal an acceleration in finished goods. They rose at a rate of 2.4 percent.

Commodities: A comparison

Prices of consumer finished goods in the WPI directly affect prices of commodities in the CPI. During the first 13 months of Phase 2, the annual rate of increase in prices of nonfood commodities in the CPI was only slightly higher than the advance of consumer nonfood finished goods in the WPI. And when prices of houses and used cars are excluded from the CPI component, retailers' prices rose less than manufacturers' prices during Phase 2.

Historically, retail prices of nonfood commodities have risen somewhat faster than manufacturer's prices of consumer nonfood commodities—about one-half percent a year on average from 1956 through 1971. Part of the reason is that the retail component includes used cars and houses that are not in the wholesale measure. But even if they were eliminated, retail prices still have risen faster than

Chart 1. Changes in Wholesale Price Index for industrial commodities relative to its component for consumer finished goods excluding foods, 1947–72



NOTE: Percent changes for year ending in December, except 1947 which is 11-month span (January–December 1947). Phase 2 is represented by 13-month span from November 1971 to December 1972.

wholesale prices for these commodities in all but 3 years from 1956 to 1971.[7] The relationship during Phase 2 is then another exception from the typical pattern.

Several explanations are worth considering. It may be that a slackness of demand made it impossible for retailers to push through to the usual extent increases in the prices they paid for the commodities they distribute. But consumer demand was strong in 1972. Or it could be that a slowdown in labor costs as a result of the slowdown in the rate of wage increase and the likely increase in sales per man-hour in retailing caused profit margins to rise up to their Phase 2 limit.[8] But there is no reason to expect that the unit labor cost situation was more favorable for retailers in 1972 than in earlier years in the 1960's. Or it could be that the growth of the economy in 1972, in bringing about an increase in sales and a decrease in unit fixed costs, invoked the profit margin constraint sooner for retailers than for manufacturers, thus preventing retailers from raising prices as much as they might have based on past relationships. There is some evidence for this last possiblity.

Based on an examination of profit data from IRS, over past business cycle contractions, the pre-tax profit margin for the manufacturing sector tends to fall more in absolute percentage points and frequently in percent than the profit margin for the retail sector. Historically the profit margin in manufacturing has been higher than in retailing. If profit margins conformed with this historical experience,

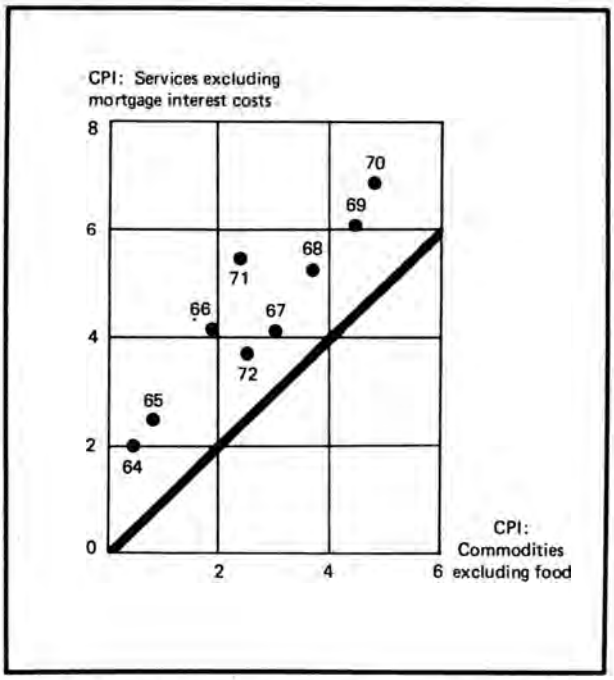
manufacturers profit margins, on a calendar year basis, could have risen from the business cycle trough reached in 1970 by more percentage points than those for retailers, if not by a greater percentage amount, in regaining their pre-recession high.[9] Thus, because of the profit margin rule, there may have been more room for price increases for consumer nonfood commodities at the manufacturer's level than at the retail level, and this may be why retail prices did not rise as fast as might be expected relative to manufacturers' prices for nonfood commodities.

Nondurables. Retail prices of nondurables rose somewhat less than prices of similar goods in the WPI during Phase 2. This was the first year since both series became available in 1956 in which retail prices for these commodities rose less than manufacturers' prices when the latter were rising. In 3 of the 4 years from 1968 to 1971, the difference exceeded 1 percentage point. (See table 3.)

The most important rise at retail was for apparel, prices of which increased more than at wholesale. Retail prices for gasoline and footwear also increased but at a slower rate than at wholesale. The rise in footwear prices was of course fueled by the sharp advance in prices of hides. In 1972, however, the advance in retail footwear prices was particularly low, given the substantial increase in hide prices.

Durables. Retail prices for durables rose faster than wholesale prices for these goods. This faster rise is mainly attributable to the advance in prices of houses and used cars. Houses and used cars are not priced for the WPI and were exempted from regulation during Phases 1 and 2. In 1972 strength in demand for automobiles spilled over, as it usually does, to used cars resulting in price rise during Phase 2. The rise began in the spring of 1972 after a period during which used car prices fell. (The earlier decline was probably due to the elimination of the 7-percent excise tax on new cars, which made them cheaper relative to used cars so a downward adjustment of used car prices had to occur.) Prices of new cars and furniture rose less at retail than at the manufacturers' level.

Chart 2. Changes in Consumer Price Index for commodities less food relative to services excluding mortgage interest costs, 1964–72



NOTE: Percent changes for year ending in December. Figures for 1972 are 13-month span ending December 1972.

Services

Over periods of time as long as a year, service prices excluding mortgage interest costs usually rise 1.5 to 2.5 percentage points faster than prices of nonfood commodities. Chart 2 at left shows December-to-December percentage changes from 1964 to 1971 for the nonfood commodities component of the CPI on the horizontal axis and for the services component excluding mortgage interest costs on the vertical axis. The diagonal line shows where the points would lie if services always rose at the same rate as nonfood commodities' prices. The point plotted for Phase 2 (November 1971–December 1972) is one of the two closest to the diagonal line and represents a departure from past experience. The only other exception occurred in 1967, in part a year of economic slowdown.

This departure from past patterns is an important aspect of price behavior during Phase 2. But its attribution to Phase 2 controls is not unambiguous. In certain sectors like medical care and rent, where direct controls were put in place, there was a sharp

Table 3. Changes in wholesale and retail prices for consumer goods and services

[Seasonally adjusted (except total services and rent), compound annual rate]

Item	Relative importance Dec. 1971		Index	8 months prior to Phase 1, Dec. 70–Aug. 71	3 months, Phase 1, Aug. 1971 to Nov. 1971	13 months, Phase 2, Nov. 1971 to Dec. 1972	16 months, Phases 1 and 2 Aug. 1971 to Dec. 1972	1972			
								3 months ending			
	CPI	WPI						Mar.	June	Sept.	Dec.
Consumer Price Index				3.8	1.9	3.4	3.2	3.6	2.2	4.6	3.2
Consumer goods	100.0		CPI	3.4	1.4	3.3	3.0	3.8	2.0	5.4	2.3
		100.0	WPI	4.1	−1.1	5.0	3.8	2.8	2 5	6.7	5.9
Food	35.5		CPI	5.0	1.7	5.0	4.4	7.2	0	7.0	5.2
		39.2	WPI	6.8	.3	8.8	7.1	3.8	2.7	10.0	15.8
Commodities less food	64.5		CPI	2.9	0	2.5	2.0	2.4	2.7	4.1	1.0
		60.8	WPI	2.2	−.4	2.4	1.9	2.9	2.5	3.2	−.3
Nondurables less food[1]	37.8		CPI	3.0	1.4	2.5	2.3	2.4	1.3	3.7	2.3
		37.2	WPI	1.8	.4	2.8	2.3	2.5	2.9	3.9	2.8
Apparel, less footwear	7.5		CPI	2.2	1.7	2.5	2.4	3.0	.3	2.3	4.6
		10.7	WPI	1.9	.7	1.9	1.7	.7	1.4	2.1	3.5
Footwear	2.5		CPI	2.6	3.7	3.2	3.2	2.0	3.6	3.6	4.2
		2.1	WPI	5.2	−3.0	9.3	6.9	10.6	21.9	2.2	5.8
Gasoline	4.7		CPI	.1	−.7	2.6	2.0	−5.8	−.4	17.5	.4
		5.3	WPI	2.8	3.7	5.7	5.3	5.0	4.0	14.3	4.2
Durables[1]	26.8		CPI	2.5	−.3	2.5	2.0	2.8	3.1	5.9	−1.0
		23.6	WPI	3.0	−3.9	2.1	.9	2.5	2.1	3.4	−5.5
New cars	3.4		CPI	−1.1	−13.3	1.1	−1.8	9.1	3.6	4.0	−14.4
		12.7	WPI	4.4	−8.8	2.3	.1	4.3	−1.0	5.6	−11.4
Furniture	2.2		CPI	3.0	1.0	1.7	1.6	1.3	1.7	1.3	2.3
		2.7	WPI	3.3	.4	2.6	2.2	2.8	2.1	2.8	3.4
					−1.2						
Appliances, including radio and TV	2.7		CPI	1.3	−.4	.1	0	.8	−.4	−.4	0
		3.5	WPI	.9	−1.2	−.8	−.9	−.8	−.4	4.0	−5.9
Services	100.0	—	CPI	4.5	3.1	3.6	3.5	4.4	3.1	3.0	3.9
Rent	13.5	—	CPI	4.3	2.8	3.5	3.3	3.8	3.4	3.1	3.7
Household less rent	41.1	—	CPI	1.9	5.5	4.6	4.8	5.1	4.4	2.6	5.2
Medical care	14.8	—	CPI	6.9	1.5	3.3	2.9	2.7	3.9	1.8	7.1
Transportation	14.9	—	CPI	8.0	.6	1.9	1.1	0	3.0	4.2	−.6
Other services	15.7	—	CPI	4.2	3.6	2.8	3.0	2.3	1.6	4.2	3.8

[1] Includes commodities not shown separately in table.

reduction in the rate of increase. But there were at least equally sharp decelerations in other parts of the service sector in many of which small firms, exempt from most, if not all, forms of regulation, abound. Prices of most services had started to slow down prior to the freeze, even after the effects of the sharp decline in mortgage interest rates is taken into account. During Phase 2, however, the deceleration became more marked and characterized almost every item for which there is an index. The slowdown for transportation services during Phase 2 was by far the sharpest among the five major services components. The advance in charges for medical care services slowed by about 40 percent during Phase 2 and rents by about 20 percent. Physicians fees rose at a rate not much different from the 2.5 percent limitation (exclusive of cost pass-throughs) placed on them by the Price Commission. Hospital service charges advanced well within the 6-percent limit. The increase for rent is lower than the 4.3 percent in 1971 prior to the freeze; rent increases in Phase 2 were limited to 2.5 percent plus pass-through of selected costs. Rates of increase for household services less rent (excluding mortgage interest costs) and other services also declined during Phase 2. In many parts of these service areas in particular, there is a prevalence of small firms with 60 or fewer employees, which are generally exempt from regulation.

Food

Food price increases were of concern virtually throughout Phase 2. Of the three major CPI components, the food index rose most from November 1971 through December 1972. As is typical for food, the index displayed considerable volatility. Food purchased in grocery stores, the major part of the total food index, rose to a peak annual rate for the year of 10.6 percent in the 3 months ending in February and then declined at a rate of 2.3 percent in the 3 months ending in May. Fueled by sharp rises in meat prices, the index accelerated to a rate of 7.9 percent in the 3 months ending in September. In the last 3 months of 1972 the rate continued to rise, but at a somewhat slower pace. The slowdown was due to fruits and vegetables, as most other major food components accelerated. Prices of restaurant meals rose at a rate of 4.2 percent in the 13 months ending in December. Price rises accelerated throughout the summer reflecting the rise in meat prices.

As is usual, the pattern of movement in the CPI food component throughout the year mirrored rises in food prices in the WPI, but retail food prices rose less than wholesale, a relationship that usually obtains, especially when wholesale price rises exceed 2 percent.

Industrial commodities

During Phase 2 through December 1972, the WPI industrial commodities index rose 3.5 percent. The largest advances were recorded for hides, skins, leather and related products, and lumber and wood products. If these two groups are eliminated from the 13 major product groups comprising the index, the increase for the 13-month period was 2.9 percent.

By stage of process, the largest rise among industrial commodities was for crude materials. It is not uncommon for crude materials prices to rise sharply during periods of rapid cyclical expansion like 1972. Prices for iron and steel scrap, wastepaper, and coal rose briskly. Worldwide imbalance between supply and demand was the principal cause of the large advances in wool and hides prices. Under the influence of rising crude materials prices, the index for intermediate materials, supplies and components except food also rose. Leather and lumber and wood products contributed significantly to the increase. Increases for finished goods, producer and consumer (nonfood), were substantially lower than those at either the crude or intermediate level. The price advance for producer finished goods in Phase 2 was markedly slower than the increase of 4.6 percent in 1969 and 4.9 percent in 1970 and the 3.7 percent annual rate in the first 8 months of 1971 before the freeze. □

FOOTNOTES

[1] The mortgage interest cost component of the CPI measures not only changes in mortgage interest rates but also changes in the size of mortgages, which are related to changes in house prices.

[2] The slowdown in the 8 months of 1971 before the freeze was due to a deceleration from 1970 in prices of both nonfood commodities and services (even excluding mortgage interest costs) which more than offset an acceleration in food prices.

[3] The homeownership segment of the CPI Housing component incorporates prices for major elements which make up the cost of providing housing services (taxes, insurance, maintenance, interest rates, and the prices of required capital goods), and thus may be regarded as an attempt to estimate a cost function for housing services. All prices which enter the index are, in principle, current market prices, so the homeownership component is a measure of the *current* cost of providing housing services. The PCE Housing component approximates the price of housing services for owner-occupied houses by using measured rents for units that are in fact rented. Although benchmark data on owner-occupied and rented single-family dwellings are used in computing the national accounts, the PCE *price* measure is driven by the CPI Rent index, which is a comprehensive rent measure, heavily weighted toward multi-family units.

[4] Except for minor adjustments, the industrial commodities index consists of four major stage-of-production components. The groups are crude nonfood materials for further processing, which in December 1971 had a relative importance of 4 percent, intermediate nonfood materials, supplies and components, 55 percent, producers' finished goods, 14 percent, and consumer nonfood finished goods, 27 percent.

[5] The percentage change for 1947 is the annual rate of increase from January to December of that year for both series since the consumer nonfood finished goods index is not available for December of 1946 or earlier periods.

[6] Because the industrial commodities index includes crude and intermediate goods prices of which affect prices of consumer nonfood finished goods with some lag, it can be argued that changes in consumer nonfood finished goods prices should be plotted lagged behind those in industrial prices. The most important part of that lag has been found to be short, about one quarter (see Joel Popkin and Paul Earl, "The Relationship Between the Behavior of Consumer and Wholesale Prices," Papers and Proceedings of the American Statistical Association, Business and Economic Statistics Section, 1971). If a scatter diagram similar to chart 1 is plotted lagging the consumer nonfood finished goods index 3 months behind the industrial commodities index only one important difference emerges. The point representing 1951, the only nonrecessionary year above the diagonal line in chart 1 when industrial prices are rising,

would be plotted below the diagonal line. Thus, the only exceptions to the general phenomenum that the industrial commodities price index rises or falls more than its consumer nonfood finished goods component would be recessionary or mini-recessionary years. It then becomes apparent that because crude materials prices usually fall considerably during recessions, they pull the industrial index down without affecting prices at subsequent stages of production by anywhere near the same amount.

[7] Estimates of the CPI nonfood commodities index excluding used cars and houses are available only back to 1956. The 3 years that are exceptions are 1960, 1964, and 1965. In 1964, both series rose by the same small amount. In the other 2 years, the WPI for consumer finished goods excluding food rose faster primarily because of new car prices which dropped more at retail than at wholesale. In 1965, this was attributable to the reduction in auto excise taxes which are included in the CPI, to the extent they are passed through to consumers, but not in the WPI.

[8] The profit margin requirement is that price increases instituted by firms result in a pre-tax profit margin no higher than that which obtained for a weighted average of the best two out of the firms three fiscal years ending before August 15, 1971. Based on available data the high was reached in 1968, following the mini-recession of 1967. In 1969 profit margins appear to have edged downward toward their recession low reached in 1970. The years 1968 and 1969, then, would on average be the best two years upon which to base a calculation of the maximum allowable profit margin to which margins could return in 1972.

[9] If company A wants to raise its profit margin to 4 percent from 2 percent by raising prices only, and company B wants to raise its profit margin to 8 percent from 6 percent by raising prices only, then, arithmetically, company B will find it can raise its prices by a slightly larger percentage in reaching its objective than can company A in reaching its objective. Thus, even if manufacturers were able under the profit margin rule only to raise their respective margins by the same number of percentage points as retailers, manufacturers could raise their prices, holding other things constant, more than retailers since manufacturers' profit margins are on average at a higher level than those of retailers.

Chapter V. Productivity and Technological Change

Technical Note

Industry Indexes of Output Per Man-Hour

JEROME A. MARK*

THE INDUSTRY INDEXES of output per man-hour prepared by the Bureau of Labor Statistics measure changes in the relationship between the physical production of an industry and the man-hours expended in that production.[1] Although traditionally output per man-hour has been the measurement most frequently used, discussion of physical output per man-hour is often simplified if conducted in terms of its reciprocal: man-hour requirements per unit of production (unit man-hours). Therefore, this form of index is used in the following description.

For an industry producing a single uniform product, the unit man-hour index is simply the ratio of the man-hours required to produce a unit of product over two periods of time. Symbolically, this ratio may be expressed as follows:

$$I_u = \frac{1}{I_p} = \frac{l_t}{l_0}$$

Where I_u represents the unit man-hour index, I_p represents the output per man-hour index, and l_t and l_o denote unit man-hours expended in the current and base periods, respectively.

For an industry producing a number of products—the more typical case—the unit man-hours index is the ratio for two periods of the total hours expended in the production of a given composite of products. Indexes of such industries vary with the composite of products specified and can take many symbolic forms. Letting q_o and q_t represent base period and current period quantities of a given product, respectively, two of these forms are:[2]

a. Using a current period composite

$$I_u = \frac{\Sigma q_t l_t}{\Sigma q_t l_o}$$

b. Using a base period composite

$$I_u = \frac{\Sigma q_o l_t}{\Sigma q_o l_o}$$

An index constructed according to (a) compares the man-hours expended in the production of the current composite with man-hours which would have been required to produce the current composite in the base period. This index thus eliminates the effects of variations over time in the relative importance of products on unit man-hours. Similarly, an index constructed according to (b) compares the man-hours expended in both periods in producing the base period composite.

In either form, the index of unit man-hours may be expressed as the quotient of an index of man-hours and an index of production, and this is how the BLS series is actually constructed.

The man-hours index measures the change in aggregate man-hours between the base and current periods. The appropriate production index is the one which compares the quantities of the various products in the current to the base period, each weighted by the base period man-hours expended per unit produced. Thus, this current period weighted unit man-hour index employs a

*Of the Division of Productivity and Technological Developments, Bureau of Labor Statistics.

[1] The procedures described in this technical note which are used in developing the BLS industry output per man-hour indexes, such as the two appearing on pp. 1241-1248 of this issue, stem from a number of works in this field. Important earlier studies include:

W. Duane Evans and Irving H. Siegel, "The Meaning of Productivity Indexes," *Journal of the American Statistical Association*, March 1942, pp. 103-111.

Solomon Fabricant, *Employment in Manufacturing, 1899-1939* (New York, National Bureau of Economic Research, 1942).

Harry Magdoff, Irving H. Siegel, and Milton B. Davis, *Production, Employment, and Productivity in 59 Manufacturing Industries, 1919-1936* (Philadelphia, Works Progress Administration, National Research Project, 1939) Report S-1, 3 vols.

U.S. Department of Labor, Bureau of Labor Statistics, *Trends in Output Per Man-Hour and Man-Hours Per Unit of Output—Manufacturing, 1939-53* (Washington, 1955). BLS Report 100.

U.S. Department of Labor, Bureau of Labor Statistics, "The Measurement of Trends in Output Per Man-Hour," *Techniques of Preparing Major BLS Statistical Series* (Washington, 1955), BLS Bulletin 1168, Ch. 14.

[2] The first of these, with weights implicitly or explicitly referring to the current period, is often referred to as the "Paasche" form; the second is known as the "Laspeyres" form. There are a number of index formulations such as the Fisher "Ideal" index, in which a compromise between beginning and ending period weighting is sought. BLS measures, however, follow the above forms.

base year weighted production index divided into the man-hours index. Conversely, the base period weighted unit man-hour index is consistent with a production index which utilizes current period weights.[3]

Unit man-hours index	*Man-hours index*	*Production index*

1. Paasche form—Base period weights

$$I_u = \frac{\Sigma l_1 q_1}{\Sigma l_0 q_0} \div \frac{\Sigma l_0 q_1}{\Sigma l_0 q_0}$$

$$= \frac{\Sigma l_1 q_1}{\Sigma l_0 q_1}$$

2. Laspeyres form—Current period weights

$$I_u = \frac{\Sigma l_1 q_1}{\Sigma l_0 q_0} \div \frac{\Sigma l_1 q_1}{\Sigma l_1 q_0}$$

$$= \frac{\Sigma l_1 q_0}{\Sigma l_0 q_0}$$

Methods and Sources

In constructing the indexes of output per man-hour and unit labor requirements, the Bureau follows the concepts outlined wherever possible. Because available data on output and man-hours are collected for many purposes, rather than for specific use in productivity measurement, it is frequently necessary to make departures and adopt approximations which vary considerably by industry.

Production Indexes

Industry production indexes are prepared from basic product data published by various public and private agencies, using the greatest amount of detail available.[4] The number of physical units produced is the basic unit of measurement, but this often leads to questions. For example, should textile production be measured in linear yards, square yards, or pounds of the various types of cloth? The Bureau tries—wherever there is a choice—to measure output in terms of the unit which is most nearly proportional to the unit man-hours spent in its production. In some industries, production is measured in more than one way, e.g., in mining industries both tons of raw ore and tons of recoverable ore are used to obtain two different series of indexes.

As already indicated, the different units of products are then combined with base year weights to derive the production measure. Although the mathematical form of the production index implies use of unit man-hour weights, most often this information is not available for individual products. Other weights are then substituted—unit labor costs, unit value added, or unit value. For most industries, the Bureau uses unit values as weights. Data on unit labor cost and unit value added are available for only a few industries.

The introduction of substitute weights such as unit value results in an industry unit man-hour index which shows the change in man-hours per dollar of total value, in terms of base year value per unit for each product. Changes in these indexes reflect shifts in product "mix." Thus, a change can occur in the index without any change in the unit man-hour requirements for any product of the industry.

The extent to which error or bias may be introduced by the use of unit value or other substitute weights is not known. An index weighted with unit values is equivalent to one weighted with unit man-hours if the unit man-hour and unit values of the products are proportional or if there is no correlation between the relative change in quantity and value per man-hour.[5]

There is evidence that unit values are fairly reliable approximations of unit man-hour requirements for individual products where wages constitute a large proportion of total value of output. Moreover, the error generated in the production index by an error in the weights is generally considerably smaller than the error in the weights themselves. It usually requires a substantial error in the assumption of proportionality between

---

[3] Unit man-hour data are rarely available for each year for separate products. In general, therefore, indexes cannot be prepared in this form.

[4] The Bureau of the Census of the U.S. Department of Commerce is the major source of product statistics for the manufacturing industries. The Bureau of Mines compiles most of the information for mining, cement, coke, and nonferrous metals industries. Other important Government sources include the U.S. Department of Agriculture, the Fish and Wildlife Service of the Department of the Interior, the Interstate Commerce Commission, and the Bureau of Internal Revenue. Important sources of trade association data include the Tanners Council, Textile Economics Bureau, National Association of Hosiery Manufacturers, National Canners Association, Rubber Manufacturers Association, and the American Iron and Steel Institute.

[5] See Irving H. Siegel, "Further Notes on the Differences Between Index Number Formulas," *Journal of the American Statistical Association*, December 1941, pp. 519-524.

unit value and unit labor requirements to seriously change the production index level.

Coverage. Production data are rarely available for the entire output of an industry. However, for most industries in the series published by the BLS, the products covered usually represent at least 70 percent of each industry's total value of output.

The quantity data which are available usually relate only to the primary products of the industry—the set of products accounting for the principal portion of its total output. In addition, these quantity data are usually only available on a "wherever made" basis. That is, they include quantities produced by establishments in other industries where the products are secondary items as well as quantities produced by establishments where they are the principal ones. If the proportion of total production of primary products made within the industry remains the same, the production index will reflect industry production movements.[6] Information on secondary products and on custom contract work is available only for limited periods and generally then in terms of dollar value rather than physical quantity. Although the proportion of an industry's output covered by quantity data is usually substantial, the ratio may vary from year to year.

For the output per man-hour or unit man-hours index, an additional problem enters with the use of the man-hours index because reported man-hours include the total man-hours of each establishment classified in the industry regardless of the particular products being produced. Consequently, to assure comparability between man-hours and output series, benchmark adjustments are made whenever a Census of Manufactures is available. For Census years, the following procedure is used: (1) A physical quantity production index is derived for the primary products of the industry wherever made. (2) An index of total dollar value is computed for these products. (3) This value index is divided by the physical quantity index to obtain a price index. (4) The price index is then used to deflate the total value of the industry's production (which includes primary and secondary products). The resultant industry index is one of physical output with unit value weights. This method of coverage adjustment assumes that the price movements of the secondary products of the industry are the same as the price movements of the primary products.

From time to time, as information becomes available, products not made in the base year are introduced into the output measure. The production of these items is added to the composite of output when they were first produced (if the data are available) and is counted as "zero" for the years preceding. Based usually on the relationships to other products in the industry, an estimate of the base year unit man-hour requirements or substitute weight is introduced.

Alternative Production Indexes. When adequate annual physical production data are not available, other types of production measures are constructed. The most commonly used alternative measure is an index of deflated value of production. To derive this index, data on the industry's value of production are divided by an appropriate industry price index. The resultant index shows the change in the real value of production between the base and current period.

In concept, these indexes are identical to those physical output indexes which employ substitute unit value weights. Thus, for example

	Deflated value index	*Value index*	*Price index*
Laspeyres form I_d		$=\frac{\Sigma p_t q_t}{\Sigma p_o q_o} \div \frac{\Sigma p_t q_t}{\Sigma p_o q_t}$	
		$=\frac{\Sigma p_o q_t}{\Sigma p_o q_o}$	

where p_t and p_o represent prices of products in the industry in the current and base periods, respectively. This index requires quantities of all items produced in each year. These data are not available for the particular industries where this measure is used, and quantity data are usually available for the base year only, so that the deflated value indexes employed usually take the following forms:

	Deflated value index	*Value index*	*Price index*
Paasche form I_d		$=\frac{\Sigma p_t q_t}{\Sigma p_o q_o} \div \frac{\Sigma p_t q_o}{\Sigma p_o q_o}$	
		$=\frac{\Sigma p_t q_t}{\Sigma p_t q_o}$	

[6] Strictly speaking, the derived production index reflects the industry primary product production movements which in turn represent the output movement for the entire industry.

In either form, the deflated value indexes, in contrast to physical volume indexes, are constructed from value of production data which relate to total value of products produced by the industry only. The price indexes used in deflating these values, however, are of primary products derived on a wherever-made basis.

For most industries where deflated value measures are used, only data on value of shipments are available. In order to derive the deflated value of production, these data are adjusted for the net change in the industry's inventories to approximate total production.

Another alternative measure used occasionally by the Bureau is based on the physical volume of material consumed. A consumption index of this type provides a satisfactory indicator of production trend in those industries where the amount of material consumed per unit of output remains fairly constant.

Man-Hour Indexes

The man-hour indexes measure the relative change, from the base year, of an unweighted aggregate of labor input. Man-hours are treated as homogeneous and additive with no distinction being made between hours of different groups of employees. Data on changes in qualitative aspects of man-hours, such as skill, efficiency, health, experience, age, and sex of persons comprising the aggregate, are not used and often not available.

The man-hour data are the total hours expended by employees in establishments classified in the industry, including not only those hours spent on primary activities of the establishment but also those on the production of secondary products.

Indexes are developed for all employees in each industry and for production workers. The term production workers covers working foremen and all nonsupervisory workers, including leadmen and trainees, "engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, packing, warehousing, shipping, maintenance, repair, janitorial and watchmen services, product development, recordkeeping, auxiliary production for plant's own use (e.g., powerplant operations), and other services closely associated with the above production activities of establishments." The term thus includes some indirect as well as direct plant labor.

Two major sources are used for developing these series. For most manufacturing industries the various censuses and annual surveys of manufactures furnish man-hours data for production workers and employment data for all employees (including nonproduction workers). For most private nonagricultural industries (including manufacturing), the Bureau of Labor Statistics publishes employment and average weekly hours data for production and nonsupervisory workers and employment data for all employees. Census provides data for more industries within manufacturing than BLS.

The two sources differ also in their definitions of man-hours. The Census data include all hours at the plant, worked or paid for, and exclude paid time for vacations, holidays, or sick leave, when the employee is not at the plant. Overtime and other premium pay hours are included on the basis of actual time at the plant. In contrast, the Bureau of Labor Statistics data include time for paid vacations, holidays, and sick leave, as well as plant man-hours. Differences in the data from the two sources for the same industry however, may as well be due to sampling and reporting differences as to differences in definition.

The all employee man-hours estimates which have been used to derive indexes of output per all employee man-hours are composed primarily as follows: (a) published data on the number of production worker man-hours, (b) published data on nonproduction worker employment, and (c) an estimate of the average annual hours of nonproduction workers. The two published components for the selected industries come mainly from two sources, the Bureau of the Census and the Bureau of Labor Statistics. Indexes based on Bureau of the Census publications incorporate the concept of hours at work, excluding vacation time, holidays, disability time (sick leave), and personal time off; those based on BLS employment and earnings statistics cover payroll hours which include plant hours plus hours of company paid sick leave, vacations, holidays, etc. Estimates of nonproduction worker man-hours which would be consistent with the two concepts of man-hours were necessary.

The basic procedure for estimating nonproduction worker man-hours for an industry using BLS employment and man-hours was to obtain an estimate of scheduled weekly hours for nonproduction workers for a given year, and to adjust that estimate annually with the trend of scheduled weekly hours for office and other nonproduction workers in manufacturing industries as found in various studies by the Department of Labor. Estimates for industries using Census data involved the additional step of subtracting paid leave time, and were put on an annual basis by multiplying the scheduled weekly hours by the number of 5-day workweeks actually worked in each respective year.

The most recent and complete estimate of nonproduction worker scheduled weekly hours for manufacturing was derived from unpublished data from a survey conducted by the BLS on employer expenditures for selected supplementary remuneration practices in manufacturing industries. In this survey, respondents furnished data on the hours in the standard workweek in 1959 for executive, professional, and supervisory employees in one group, and for clerical and other nonsupervisory employees in another group.

Estimates for leave time (vacations, holidays, etc.) were derived from a variety of sources. The data on vacations and holiday leave were estimated largely from two Bureau of Labor Statistics bulletins, *Wages and Related Benefits, 60 Labor Markets, 1959–60; Employer Expenditures for Selected Supplementary Remuneration Practices for Production Workers in Manufacturing Industries, 1959* (Nos. 1265–62 and 1308, respectively); and from BLS industry wage studies, as well as various National Industrial Conference Board studies. Disability and personal time off were based on Social Security Administration estimates plus data obtained in a Bureau of Labor Statistics survey. All-manufacturing estimates were used for vacations, holidays, etc., except when additional data permitted individual industry estimates.

Prior to 1959, information for total manufacturing from the various community wage surveys conducted by the Bureau was used to derive the trends for holidays, vacations, and the scheduled workweek. These trends were then applied to the 1959 levels.

Limitations

Because of the wide variety of concepts and definitions of productivity, it is important for the user of the BLS series to consider the definitions and terms presented in this description in relation to their purpose: to provide a measure of the change in average man-hour requirements for the physical output of various industries. While this type of productivity index serves diverse purposes, it is not strictly appropriate for certain uses. Some characteristics of the indexes which limit their use in answering particular questions should be noted.

First, productivity is measured in terms of labor input only. This type of index is especially helpful in estimating labor requirements and analyzing employment fluctuations. It does not mean, however, that labor is the sole or principal factor responsible for productivity gains. Nor can it be assumed that an index of unit fuel, energy, capital, or total factor requirements necessarily follows the same trend as man-hour requirements.

Second, output is measured in terms of completed goods, weighted generally by unit value rather than such possible weights as unit labor requirements or cost, or unit value added. BLS index series do not take into account savings by the industry in the consumption of materials, fuel, and power as a result of greater integration, better raw materials, or changes in product composition.

Third, the indexes do not generally reflect changes in the quality of an industry's output. Data are not generally available for quantifying changes in the serviceability of various commodities.

Fourth, the indexes are affected by shifts of product composition among establishments and workers at different levels of efficiency. The series may therefore not be used to represent the trend for any individual firm or group of workers.

Finally, a small difference between two annual indexes should not be interpreted as a significant change. Productivity series are based on production and man-hour data which are subject to varying margins of error. Recognizing that productivity indexes may be useful even though approximate, it is important to apply them only in those areas where they are appropriate.

Output per man-hour increased at a lower rate than in 1972; analysis of 1967–73 period shows part of the productivity slowdown is accounted for by employment shifts

J.R. NORSWORTHY AND L.J. FULCO

Productivity and costs in the private economy, 1973

PRODUCTIVITY ROSE 3.0 percent in 1973 in the total private economy, a lower rate than 1972, when it increased 3.8 percent, and slightly lower than the 3.1 percent average annual rate which has prevailed over the last two and a half decades. This lower rate of growth in output per man-hour in 1973 signaled the end of the period of rapid expansion which began in 1971.

In the *nonfarm sector*, output per man-hour increased 3.1 percent, compared to a 4.2-percent increase in the preceding year. In both 1972 and 1973, nonfarm output per man-hour rose at a faster rate than did productivity in the total private economy because of declines in farm output per man-hour.

In *manufacturing*, growth in output per man-hour, although substantial, also fell off somewhat in 1973, rising 4.7 percent compared to 5.4 percent in 1972. Productivity growth in manufacturing reflected the continued strength of the output advance in this sector—9.7 percent in 1973 and 8.9 percent in 1972 in real terms.

In *nonfinancial corporations*, output per man-hour increased 3.5 percent in 1973, compared to a 4.0-percent increase in 1972. This sector, which includes all corporations doing business in the United States except banks, insurance companies, and stock and commodity brokers, showed an increase in output of 7.7 percent, compared to a 7.4-percent rise 1 year earlier. (See table 1.)

The index of output per man-hour in the private sector hit a peak in the first quarter of 1973 of 116.4 but it declined slightly in the subsequent three quarters; the average for the year was 116.2 (1967=100). In contrast, compensation per man-hour was highest in the fourth quarter (157.7) reflecting a continuous rise in compensation through the year. The interaction of these divergent movements of output per man-hour and compensation per man-hour resulted in an 8.9-percent rise (at an annual rate) in unit labor costs in the fourth quarter. The increase for the year 1973 as a whole was 4.7 percent.

J. R. Norsworthy is chief, and L. J. Fulco, an economist, in the Division of Productivity Research, Bureau of Labor Statistics.

Farm slowdown

The decline in output per man-hour in the farm sector in recent years is a reversal of a long-standing relationship between productivity growth in the farm and nonfarm sectors. The following tabulation shows annual average percent change in output per man-hour by major sector:

Period	*Farm*	*Nonfarm*
1947–68	5.9	2.7
1969–73	.5	3.2

For many years, output per man-hour in the farm sector, although lower in absolute terms than productivity in the nonfarm sector, grew at a significantly faster pace than the rest of the economy, as mechanization was introduced and harvesting and cultivation tasks transferred from manual labor to mechanical and chemical processes. Thus, output increased and man-hours declined, producing a rapid growth of output per man-hour in farming.

However, in both 1972 and 1973, the real net value of output in the farm sector was less than in the preceding year, after allowing for the value of products which are consumed on the farm (such as fertilizer and animal feed). Employment and man-hours did not decline to the same extent, and thus output per man-hour declined—6.8 percent in 1972 and 4.6 percent in 1973. Annual percent changes in productivity in the farm sector from 1969 to 1973 are shown below:

Measure	*1969*	*1970*	*1971*	*1972*	*1973*
Output	3.0	2.8	4.9	−5.2	−5.9
Man-hours	−6.4	−5.5	−1.6	1.7	−1.3
Output per man-hour	10.1	8.7	6.6	−6.8	−4.6

Completion of the recovery

Part of the reduction in the rate of productivity growth for the private economy is attributed to completion of the business recovery from the 1969–70 economic downturn. A typical recovery pattern from postwar business slumps is as follows: First, as sales recover, inventory accumulations are drawn down. Next, businessmen increase output by more intensely using the existing work force and capital stock. This effect sometimes appears as an increase in average weekly hours, accompanied by a sharp increase in output per man-hour. Then as output continues to increase, the work force is increased. Productivity continues to grow rapidly. In the latter stages of the recovery, the increase in labor input (man-hours) usually continues to grow at a rapid rate for one or two quarters after the rate of growth in output slackens; output per man-hour grows more slowly and may even fall slightly as the work force adjustment is completed.

This same pattern emerges from examination of the recovery in the private economy since the 1969–70 downturn. Man-hours and output both fell in 1970, and labor productivity increased very slowly (1.0 percent). In 1971, output increased by 3.5 percent while man-hours continued downward, although only slightly. Output per man-hour increased strongly by 4.1 percent. In 1972 the rate of growth of output increased to 6.5 percent, and man-hours rose by 2.7 percent. Thus, productivity grew somewhat more slowly than in 1971—3.8 percent—but still well above the long-term trend rate. In 1973, the completion of the recovery was marked by the reduced rate of growth of output. After a first-quarter growth rate of 9.3 percent (seasonally adjusted annual rate), output in the second and third quarters increased only 2.6 and 3.6 percent, respectively, while man-hours continued to increase strongly at annual rates of 3.8 and 3.2 percent. Output per man-hour fell slightly in the second quarter and increased only slightly in the third. By the third quarter of 1973, the recovery was about complete; the fourth quarter showed the first effects of the

Table 1. Annual rates of change in productivity and related measures, 1969–73

Sector and measure	1969	1970	1971	1972	1973	1972				1973			
						I	II	III	IV	I	II	III	IV
TOTAL PRIVATE ECONOMY													
Output per man-hour	0.4	1.0	4.1	3.8	3.0	2.1	6.5	3.1	5.2	5.8	−1.2	0.4	−0.8
Output	2.8	−.5	3.5	6.5	6.2	5.4	10.4	5.8	8.4	9.3	2.6	3.6	1.5
Man-hours	2.3	−1.5	−.6	2.7	3.2	3.2	3.6	2.6	3.0	3.3	3.8	3.2	2.3
Compensation per man-hour	7.6	7.6	7.0	6.8	7.8	9.9	5.9	4.9	7.4	11.3	6.3	7.3	8.1
Unit labor cost	7.1	6.5	2.8	2.9	4.7	7.6	−.5	1.7	2.0	5.2	7.6	6.9	8.9
Real compensation per man-hour	2.1	1.5	2.6	3.5	1.5	6.3	2.8	1.2	3.6	5.2	−2.3	−1.7	−1.6
Implicit price deflator	4.5	4.8	4.3	2.9	5.4	4.9	1.5	2.8	3.5	5.7	7.5	7.3	8.6
NONFARM SECTOR													
Output per man-hour	−.1	.7	4.0	4.2	3.1	2.5	5.7	5.6	4.7	5.0	−.8	1.8	−1.9
Output	2.8	−.6	3.4	7.0	6.6	5.6	11.0	7.0	8.3	9.2	3.9	4.4	−.1
Man-hours	2.9	−1.3	−.6	2.7	3.4	3.0	5.0	1.3	3.4	4.0	4.8	2.6	1.9
Compensation per man-hour	7.0	7.3	7.0	6.9	7.6	9.9	5.2	6.7	6.8	10.7	5.3	8.0	8.4
Unit labor cost	7.2	6.6	2.8	2.6	4.4	7.2	−.5	1.0	2.0	5.4	6.2	6.1	10.5
Real compensation per man-hour	1.6	1.2	2.6	3.5	1.3	6.3	2.0	2.9	3.1	4.6	−3.3	−1.1	−1.3
Implicit price deflator	4.5	5.0	4.4	2.3	4.1	4.4	1.0	1.9	2.9	4.3	5.9	4.7	7.9
MANUFACTURING													
Output per man-hour	2.5	.6	7.1	5.4	4.7	7.8	7.4	8.6	5.7	3.9	3.8	5.0	−3.3
Output	4.3	−4.9	2.9	8.9	9.7	12.2	15.3	11.4	14.3	10.3	7.7	5.0	1.2
Man-hours	1.8	−5.4	−4.0	3.4	4.8	4.1	7.4	2.6	8.2	6.2	3.8	−0.0	4.7
Compensation per man-hour	6.3	7.2	7.0	6.3	7.9	11.1	4.9	4.4	6.8	10.8	8.2	9.3	5.4
Unit labor cost	3.8	6.6	−.1	.9	3.1	3.1	−2.3	−3.8	1.1	6.6	4.2	4.1	9.0
Real compensation per man-hour	.9	1.2	2.6	2.9	1.6	7.6	1.6	.8	3.2	4.7	−.7	.2	−4.1
NONFINANCIAL CORPORATIONS													
Output per man-hour	2.1	.9	5.5	4.0	3.5	4.7	2.5	3.6	3.4	7.3	1.0	4.6	−3.3
Output	4.6	−1.4	3.5	7.4	7.7	9.0	8.6	5.1	10.4	11.6	5.0	6.1	.5
Man-hours	2.4	−2.3	−1.9	3.3	4.0	4.1	6.0	1.5	6.8	4.0	4.0	1.5	3.9
Compensation per man-hour	7.3	7.2	7.3	6.8	7.6	11.5	4.1	5.9	4.9	12.1	6.6	9.0	6.0
Unit labor cost	5.2	6.3	1.6	2.7	3.9	6.5	1.6	2.3	1.4	4.4	5.5	4.2	9.7
Real compensation per man-hour	1.9	1.2	2.8	3.4	1.3	7.9	1.0	2.2	1.3	5.9	−2.1	−.2	−3.4
Implicit price deflator	2.7	4.5	3.1	2.3	3.7	4.9	1.6	2.2	3.2	3.8	4.7	4.0	6.1

energy problem, as output grew more slowly than man-hours, and productivity again fell slightly, at an annual rate of 0.8 percent.

Recent movements in unit labor costs reflected the cyclical recovery in output per man-hour as well as rapidly rising compensation per man-hour. In both 1971 and 1972, substantial increases in compensation per man-hour occurred in the first quarter, as employers' social security contributions increased. Except for these first-quarter rises, the rate of increase grew in each quarter throughout 1972 and 1973. Since output per man-hour increased less in 1973, unit labor costs rose more than in proportion to the rise in compensation. The largest increase in unit labor costs in 1973—8.9 percent at an annual rate—occurred in the last quarter when compensation per man-hour rose at an annual rate of 8.1 percent and output per man-hour fell at an annual rate of 0.8 percent.

The productivity slowdown since 1966

In the postwar period (1947–73), output per man-hour has grown at an average rate of 3.1 percent a year in the total private economy. However, in some recent years, the rate of growth of output per man-hour has been lower. It is possible to estimate the gap between the level of output per man-hour today and the level it would have attained had the productivity slowdown not occurred. In 1969 and 1970, output per man-hour increased 0.4 percent and 1.0 percent, respectively. Although productivity then grew at faster than trend rates for the next 2 years, 4.1 percent in 1971 and 3.8 percent in 1972, the entire shortfall was not recovered in either the total private or in the nonfarm sector. (See chart 1.)

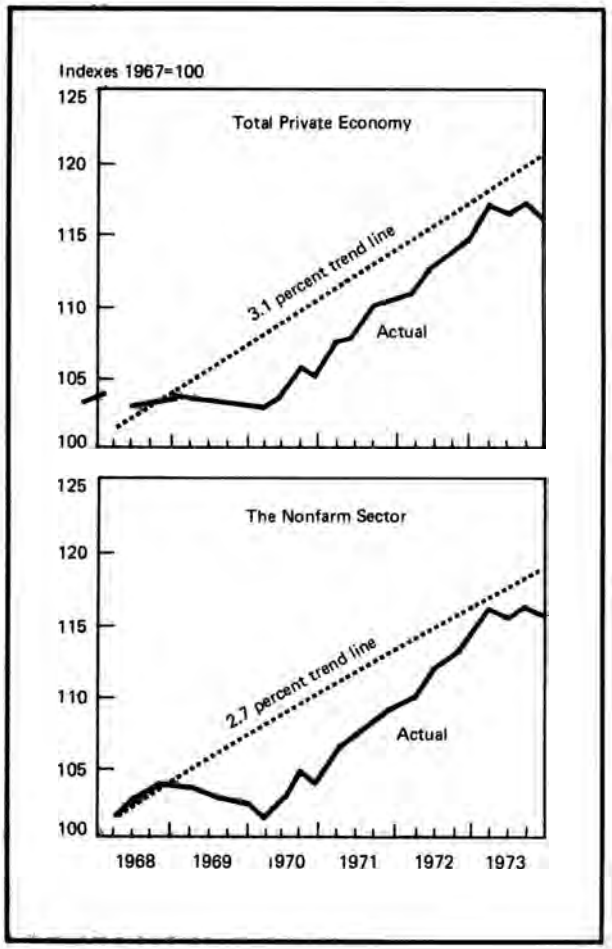
Output per man-hour measures reflect productivity changes which occur within the component subsectors as well as man-hour shifts between the subsectors with different levels of output per man-hour. Conceptually, the annual change in productivity in the private economy can be separated into two major parts: A "productivity effect" and a "shift effect." [1]

The productivity effect is the change in output per man-hour which would have taken place if the proportions of total man-hours remained the same for each sector, but output per man-hour changed within each sector. The shift effect is the change in output per man-hour which would have taken place if output per man-hour remained the same in each sector and only the shift in man-hours had taken place.[2] There is also a third effect which results from the interaction of the productivity change and the shift in man-hours. This effect is quite small in each postwar year.

In 1947, more than 18 percent of all man-hours in the private economy were expended in agriculture. By 1973, the proportion had fallen to 5.2 percent. Over this period, about 10 percent of the growth in output per man-hour can be attributed to the shift of labor from agricultural to nonagricultural employment because output per man-hour was higher in the nonfarm sector than in agriculture. Levels of output per man-hour and annual proportions of total man-hours engaged in agricultural and nonagricultural sectors are shown in table 2.

This shift effect was more important in the earlier part of the period than it has been since 1967, for

Chart 1. Actual and trend levels of output per man-hour, 1968–73



example. From 1947 to 1957, the shift accounted for about 0.5 percent per year increase in productivity or about one-seventh of the total annual rate of increase; from 1967 to 1973, the shift accounted for a productivity increase of only about 0.1 percent per year, about one-thirtieth of the total annual rate of increase. Because this shift phenomenon explains a major part of the decline in the annual rate of productivity increase in the postwar period, it should be examined in some detail.

Table 3 separates annual productivity changes since 1947 into these three effects. Two major characteristics of the shift effect are revealed by this breakdown.

First, the productivity effect is more important than the other effects over the whole period; that is, productivity growth within each of the two broad sectors has been far more important than the effect of relative shifts in employment between sectors for the whole postwar period. We can treat column two in table 3 as a shift-adjusted productivity growth series.[3] Rounding off columns 1 and 2 to the nearest tenth gives a comparison of the unadjusted index published by the Bureau of Labor Statistics compared with a shift-adjusted index of output per man-hour for the private economy.

Table 2. Output per man-hour and man-hour proportions in the farm and nonfarm sectors, 1947–73

Year	Output per man-hour			Proportion of total private man-hours	
	Total private economy	Nonfarm	Farm	Nonfarm sector	Farm
1947	2.29	2.62	0.77	0.82	0.18
1948	2.39	2.70	.90	.83	.17
1949	2.47	2.81	.88	.82	.18
1950	2.67	2.98	1.00	.84	.16
1951	2.75	3.04	1.00	.85	.15
1952	2.80	3.07	1.09	.86	.14
1953	2.92	3.16	1.24	.87	.13
1954	2.99	3.24	1.30	.87	.13
1955	3.12	3.38	1.31	.87	.13
1956	3.12	3.36	1.37	.88	.12
1957	3.22	3.43	1.45	.89	.11
1958	3.32	3.52	1.60	.89	.11
1959	3.43	3.64	1.63	.90	.10
1960	3.49	3.69	1.72	.90	.10
1961	3.61	3.79	1.85	.90	.10
1962	3.78	3.97	1.90	.91	.09
1963	3.92	4.09	2.07	.91	.09
1964	4.07	4.24	2.10	.92	.08
1965	4.21	4.36	2.30	.92	.08
1966	4.37	4.52	2.39	.93	.07
1967	4.46	4.59	2.65	.93	.07
1968	4.59	4.72	2.65	.94	.06
1969	4.61	4.72	2.92	.94	.06
1970	4.66	4.75	3.17	.94	.06
1971	4.85	4.94	3.38	.95	.05
1972	5.04	5.15	3.14	.95	.05
1973	5.18	5.30	3.01	.95	.05

Table 3. Productivity growth rates by source, 1948–73

Year	Annual percent change in output per man-hour	Percent change due to productivity change	Percent change due to shift in man-hours	Percent change due to interaction: productivity and shift
1948	4.45	3.85	0.61	−0.015
1949	3.16	3.54	−.36	−.026
1950	8.10	6.79	1.27	.037
1951	2.97	1.92	1.01	.029
1952	1.95	1.36	.61	−.018
1953	4.19	3.45	.76	−.021
1954	2.43	2.49	−.06	−.0003
1955	4.40	4.20	.18	.013
1956	.18	−.32	.51	−.019
1957	2.92	2.43	.49	−.002
1958	3.08	2.88	.21	−.007
1959	3.58	3.35	.22	.010
1960	1.60	1.46	.15	−.003
1961	3.46	3.20	.26	−.004
1962	4.70	4.45	.24	.016
1963	3.62	3.33	.30	−.007
1964	3.89	3.64	.24	.014
1965	3.41	3.17	.24	−.008
1966	3.97	3.54	.43	.012
1967	2.06	1.94	.12	−.010
1968	2.89	2.77	.11	.007
1969	.44	.23	.24	.032
1970	1.03	.95	.09	−.011
1971	4.14	4.13	.02	−.0002
1972	3.78	3.76	.02	.005
1973	2.93	2.82	.09	.014
AVERAGES				
1948–73	3.21	2.90	0.31	.0014
1967–73	2.47	2.37	.10	.005
1958–66	3.48	3.22	.25	.002
1948–57	3.48	2.97	.50	−.002
1948–66	3.48	3.09	.38	−.00002

Second, the importance of the shift effect declines rather sharply from the beginning of the period to the end of the period, even though the trend is not smooth. To clarify this decline in the shift effect, we have averaged the changes for three periods: 1948–57, 1958–66, and 1967–73. For the period 1948–57, the shift effect averages 0.5 percent per year; for 1958–66, 0.25 percent per year; and for 1967–73, 0.1 percent per year. Thus, an important part of the decline in the rate of productivity increase in recent years is directly traceable to the declining effect of the shift of labor from agricultural to nonfarm employment.

There are two key factors in the declining contribution of the shift effect to overall productivity growth: first, as the nonfarm share of total private man-hours increases, the effect of shifting a fixed number of workers from farm to nonfarm diminishes. Second, although the level of productivity is higher in the nonfarm sector than in the farm sector, over the long term, productivity in agriculture has increased faster than in the nonfarm sector. Thus, as the level of output per man-hour in the farm sector approaches the higher level in the nonfarm sector,

the effect of shifting man-hours out of agriculture will lead to a smaller increase in productivity for the total private sector. For example, in 1947, nonfarm output per man-hour was about 3.4 times as high as in agriculture; by 1973, it was about 1.8 times the farm level. In these terms, then, a 1-percent shift in man-hours from agriculture would have only about half the effect on overall productivity growth in 1973 than the same shift would have had in 1947.

The contribution of the shift effect to productivity growth in the private economy has declined substantially in recent years, and there is little reason to suppose that either of the two factors noted above will be reversed. Consequently, it is more meaningful to examine the shortfall in productivity growth in recent years against a yardstick which abstracts from the effect of the employment shift from agriculture. To do so, we have constructed a trend line corresponding to a shift-adjusted productivity growth index which we compare with a conventional 3.1 percent productivity growth trend in chart 2. The shift-adjusted growth rate, noted on the chart as G*, is the average of farm and nonfarm growth rates weighted by man-hours in each sector.[4]

Chart 2. Output per man-hour in the total private economy, 1947–73

[1947=100]

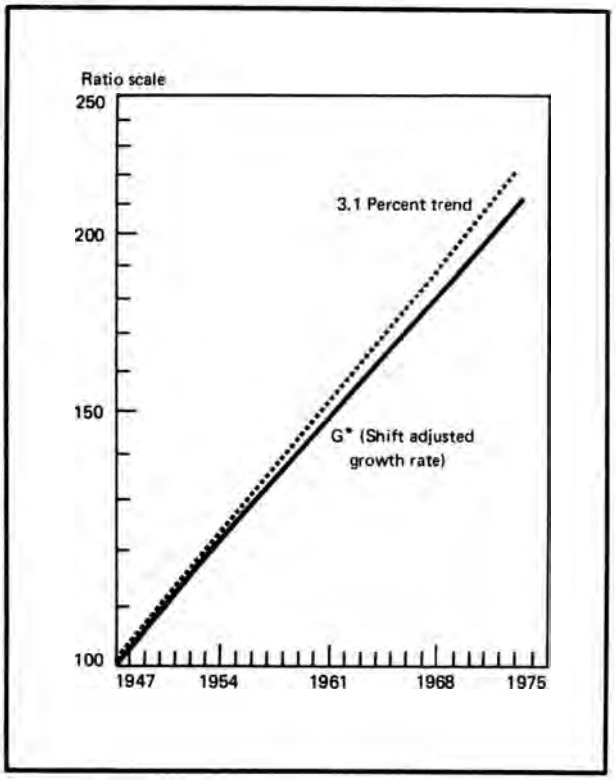


Table 4. Analysis of productivity shortfall, 1966–73

Year	Indexes of productivity, total private, all persons			Cumulative shortfall of actual from—	
	G*	3.1 percent trend	Actual	G*	3.1 percent trend
1966	100.00	100.00	100.00	0.00	0.00
1967	102.80	103.10	102.06	.74	1.04
1968	105.67	106.30	105.00	.67	1.30
1969	108.61	109.60	105.47	3.14	4.13
1970	111.62	113.00	106.55	5.07	6.45
1971	114.70	116.50	110.97	3.73	5.53
1972	117.87	120.11	115.16	2.71	4.95
1973	121.12	123.83	118.54	2.58	5.29

NOTE: G* denotes shift-adjusted growth trend, that is, the productivity changes which would have occurred had there been no employment shift.

The recent productivity slowdown appears less serious when compared with the shift-adjusted growth trend[5] than with the 3.1-percent average rate of growth in the total private sector over the period—the conventional growth trend. (See table 4.) (Similarly, the shift-adjusted growth trend probably provides a more realistic basis for projecting future productivity movements than the aggregate trend.)

Consequently, part of the recent productivity slowdown can be accounted for by the decreased contribution of the shift of man-hours from agriculture. There are no readily discernible reasons, however, for the rest of the slowdown. While employment has expanded rapidly since 1966, investment has more than kept pace, so that the capital/labor ratio increased somewhat from 1966 to 1972, the last year for which data are available. When capital is disaggregated to structures and equipment, the same pattern holds.[6]

Employment and man-hours

Employment in the total private economy increased in 1973 to about 76.2 million, an increase of 3.3 percent over the year before. Both the level and the percentage increase were the largest in the postwar period. Man-hours increased 3.2 percent in 1973, the largest increase since 1959. The man-hour increase was slightly smaller than the rise in employment due to the small decline (0.1 percent) in average weekly hours, to 37.7. (See table 5.)

Employment growth, at least for manufacturing, must be viewed in the context of the recovery. Em-

ployment growth was affected by the slowing of economic growth begun in 1969. The largest adjustment occurred in the manufacturing sector, in which the employment decline lasted until the third quarter of 1971. The expansion that began then continued through 1973, and by the fourth quarter, employment in manufacturing equaled the level of the first quarter of 1969 in this sector.

Costs and prices

Unit labor costs, which are affected by changes in output per man-hour and compensation per man-hour, rose 4.7 percent in the private economy from 1972 to 1973. This increase was larger than those which occurred in either 1972 or 1971, when the increases were 2.9 and 2.8 percent, respectively. The faster rate of cost increase reflected the slower rate of productivity growth last year, coupled with a faster rate of increase in compensation per man-hour. The increase in unit labor costs in the fourth quarter was greater than the increase in the second or third quarters, because as 1973 drew to a close, productivity was declining while compensation per man-hour was increasing.

Real compensation per man-hour grew at a slower rate in 1973 than the year before, even though money compensation increased faster. Since real compensation per man-hour takes account of changes in the Consumer Price Index, the slower rate of growth of real compensation per man-hour reflects the faster rise of prices in 1973. Real compensation per man-hour increased 1.5 percent in 1973 compared to 3.5 percent in 1972.

Unit nonlabor payments in the private sector increased 6.6 percent in 1973. This measure, which includes capital consumption allowances, net interest, indirect business taxes and profits, had increased 2.8 percent the year before. Profits in nonfinancial corporations increased 17.4 percent from 1972 to 1973, after increasing 13.7 percent from 1971 to 1972. Unit profits were also higher, up 9.0 percent in 1973 compared to 5.8 percent in 1972.

The rate of change of the implicit price deflator in the private economy, which reflects changes in unit labor costs, unit nonlabor costs and unit profits, increased in 1973, having slowed in each of the preceding 2 years. The increase in 1973—5.4 percent—was the largest annual increase measured. Table 6 shows how the movement of the component parts of the implicit price deflator interacted to produce the annual change. In the period beginning in 1965, unit profits rose little or not at all in every year except 1973, when they registered their largest contribution to price change since 1955. Thus, the unusual increase in unit profits, added to the continuing increase in unit labor and nonlabor costs, produced the large increase in the implicit price deflator. □

Table 5. Percent change in man-hours, employment, and average weekly hours in the private economy, annual rate, 1973

(Change over previous quarter at annual rate)

Item	1973				
	Annual	I	II	III	IV
MAN-HOURS					
Total private economy	3.2	3.3	3.8	3.2	2.3
Nonfarm sector	3.4	4.0	4.8	2.6	1.9
Manufacturing	4.8	6.2	3.8	−.0	4.7
EMPLOYMENT					
Total private economy	3.3	3.1	3.2	3.6	3.6
Nonfarm sector	3.5	4.0	3.9	3.3	3.1
Manufacturing	4.6	5.5	4.6	1.2	4.4
AVERAGE WEEKLY HOURS					
Total private economy	−.1	.2	.7	−.4	−1.2
Nonfarm sector	−.1	−.0	.8	−.7	−1.2
Manufacturing	.2	1.0	−1.0	−1.0	.0

Table 6. Distribution of price changes in the implicit price deflator, private economy, 1965–73

(In percent)

Year	Price change	Percentage point distribution of price change		
		Unit labor costs	Unit profits	Other unit[1] costs
1965–66	2.5	1.7	0.2	0.6
1966–67	2.9	2.2	−.8	1.4
1967–68	3.6	2.8	−.1	.9
1968–69	4.5	4.4	−1.2	1.3
1969–70	4.8	4.1	−1.7	2.5
1970–71	4.3	1.8	.6	1.9
1971–72	2.9	1.9	.4	.6
1972–73	5.4	3.0	1.6	.9

[1] Includes depreciation, interest, and indirect business taxes.

FOOTNOTES

[1] Algebraically, we can therefore partition the change in output per man-hour for the private economy as:

$$\Delta P_t = \Delta P_t^A \cdot S^A_{t-1} + \Delta P_t^N \cdot S^N_{t-1} \quad \text{(productivity effect)}$$
$$+ \Delta S_t^A \cdot P^A_{t-1} + \Delta S_t^N \cdot P^N_{t-1} \quad \text{(shift effect)}$$
$$+ \Delta S^A_t \cdot \Delta P_t^A + \Delta S_t^N \cdot \Delta P_t^N \quad \text{(interaction effect)}$$

where:

P_t is output per man-hour in the private economy in year t

P_t^A is output per man-hour in the farm sector in year t

P_t^N is output per man-hour in the private nonfarm sector in year t

S_t^A is the share of total private man-hours in the farm sector in year t

S_t^N is the share of total private man-hours in the nonfarm sector in year t

$t-1$ refers to the value of a variable for the previous year

Δ is a *first difference* operator:

ΔP_t denotes $P_t - P_{t-1}$

ΔS_t^A denotes $S_t^A - S^A_{t-1}$

[2] Implicit in our analysis is the assumption that each new worker shifting into the nonfarm sector has the same productivity as the average worker in that sector. To the extent that new workers enter subsectors with lower labor productivity than the nonfarm average, our procedure overstates the shift effect.

[3] There are substantial shifts in man-hours during the postwar period among subsectors of the nonfarm economy as well. The effects of these shifts are also being investigated.

[4] With this designation, we ignore the interaction effect. This effect should, properly speaking, be divided between the shift-adjusted productivity measure and the measure of the shift effect, so that the two resulting series account for the total productivity change. The interaction effect is so small that no allocation procedure would change the values of the shift-adjusted productivity growth series.

[5] A weighted average growth trend can be defined in the notation of footnote 1 above, as

$$G = S^A_t \cdot \Delta P_t^A + S_t^N \cdot \Delta P_t^N$$

For purposes of smoothing and insuring certain desirable properties in the resulting series, we have constructed a Divisia index of growth rates, which uses average weights for each sector based on shares in the current and previous years:

$$G^* = \frac{(S^A_t - S^A_{t-1})}{2} \cdot \Delta P_t^A + \frac{(S_t^N - S^N_{t-1})}{2} \cdot \Delta P_t^N$$

[6] The capital labor ratio increased by 17.4 percent from 1966 to 1972 for an employees-based measure of labor input, and by 21.8 percent for a man-hour measure. For equipment only, the increases were 25.4 percent and 30.0 percent. The annual rates of increase were in each case greater than for the period 1958-66. These ratios are based on the Constant Cost II measures of the capital stock from the Bureau of Economic Analysis, U.S. Department of Commerce.

Measuring productivity in the Federal Government

Productivity for organizations sampled rose at an annual average rate of 1.6 percent a year from fiscal 1967 through fiscal 1973

CHARLES ARDOLINI AND JEFFREY HOHENSTEIN

THE EFFICIENCY with which the public sector discharges its responsibilities is of paramount importance to the Nation's economic health. With this sector accounting for one out of every six jobs in the economy, the productivity of the public employee has a significant effect on the tax burden shared by all citizens. The lack of adequate measures of productivity for this sector has been one of the most serious data gaps we have had to contend with in our national productivity statistics. For several years, an effort has been undertaken by a joint interagency task force to develop and refine productivity measures for the Federal sector.[1] This article presents the results of the Bureau of Labor Statistics' current measurement efforts in this area. About 1.7 million man-years, or 61 percent of the employment in the Federal civilian government, are currently covered by the output per man-year measures developed for this sector.

Background

Since 1898, when the Bureau first began to measure productivity, coverage has been restricted to the private sector. The most comprehensive measure of output per man-hour currently prepared by the Bureau covers the total private economy only.[2] General government has been excluded because the real gross product for this sector in the national accounts is defined as base-year wages and salaries of government employees multiplied by changes in government employment.[3] The use of this real product estimate for productivity measurement purposes would imply a zero productivity growth for the government sector and introduce a bias in an overall measure. (However, estimates for government enterprises such as the Tennessee Valley Authority and the Bonneville Power Administration are included in the private measure because their outputs are sold and thus they are comparable with the treatment of the private sector in the national accounts.)

Before 1971, there were only a few isolated efforts by Federal agencies to measure the productivity of an entire organization or selected organizational components. This included a landmark effort in 1962 by the U.S. Bureau of the Budget (now the Office of Management and Budget) to explore the feasibility and usefulness of productivity measurement in five government organizations. The study demonstrated that productivity measures could be prepared for four of the five organizations covered and concluded that valid measures could be developed for many other government activities.

In the fall of 1970, at the behest of the Joint Economic Committee, the General Accounting Office began to investigate the feasibility of measuring productivity in the Federal Government. Subsequently, a joint interagency team (composed of the Office of Management and Budget, the General Accounting Office, and the Civil Service Commission) was established which surveyed the existing agency measurement systems. This team concluded that these systems probably could generate the data required for productivity index construction, and it recommended the establishment of a joint Federal productivity measurement task force which would receive technical assistance and manpower support from the Bureau of Labor Statistics.

During fiscal year 1972, the task force collected data for fiscal years 1967–71 from 114 organizational units[4] in 17 agencies representing about 55 percent of the Federal civilian work force. Man-year coverage was expanded to 60 percent when data were collected covering fiscal years 1967–72.

In July 1973, the Office of Management and Budget endorsed the continuation of the project to measure Federal productivity, and full responsibility

Charles Ardolini is chief of the Division of Industry Productivity Studies, Bureau of Labor Statistics, and Jeffrey Hohenstein is an economist in the same division.

for collecting input, output, and related information and for developing the productivity measures shifted to the Bureau of Labor Statistics. The Joint Financial Improvement Program,[5] the General Services Administration, and the Civil Service Commission were to study the reasons for productivity change and ways in which to enhance productivity in the Federal sector, as well as several related subject areas.[6]

In fiscal 1974, the Bureau extended the data base to fiscal 1973, expanded coverage to include organizational units not previously covered, improved the quality of some of the input and output data, and refined the methodological procedures used by the task force to construct productivity indexes.

Concepts

In a general sense, productivity may be defined as the relationship of real, that is, physical, output (goods and services) to real input. Productivity measures can be grouped into two broad classes. The first expresses productivity as the relationship of output to one type of input such as labor, capital, or energy, and the second expresses productivity as the relationship of output to a combination of inputs. Although the former measures relate output to one input, they do not measure the specific contribution of the factor to production. Rather they express the joint effect of a variety of interrelated influences such as changes in technology, substitution of one factor for another, utilization of capacity, skill levels and the efforts of the work force, and managerial and organizational skills on the use of the factor in the generation of output.[7] It is this type of measure, output per man-year indexes, that has been developed for the Federal Government.

Productivity measures for the Federal Government compare the current output-input relationship with that of some previous reference period, in this case, fiscal 1967. These measures reflect the changes which have actually taken place regardless of the mission of the organization. In that sense, they must be distinguished from measures of effectiveness which provide a means of determining whether an agency is proceeding toward its objectives by establishing a relationship between organizational actions and mission accomplishment. Both types of measures are useful tools: the productivity measures indicate changes in the real cost of producing an agency's output and the effectiveness measures determine the value of an agency's output to the recipients of its goods and services. These latter indicators are much more difficult to develop and attempts have been limited.

Ideally, a productivity index should relate final outputs to their associated direct and indirect input(s). And, in fact, the output data included in the overall sample are final from the perspective of the organization providing the information and from the 16 functional areas within which these data are classified. However, since the outputs of one organization may be consumed wholly or partially by another Federal organization in the production of its final outputs, all output indicators in the Federal sample may not be final from the perspective of a higher level organization, for example, the entire Federal Government. Therefore, the overall statistics do not represent "Federal productivity" but rather, the weighted average of the productivity changes of the measured Federal organizations included in the sample.

Perhaps this distinction can best be described in terms of an analogy with the productivity measures available for the private sector. The Bureau of Labor Statistics develops productivity indexes for selected industries, such as steel, as well as for major sectors of the economy, such as manufacturing. The sector indexes are "net" measures excluding the intermediate outputs of the component industries within each sector. Therefore, that portion of the steel industry's output consumed by other manufacturing industries is excluded from the output index for the manufacturing sector. If all manufacturing industries were measured separately on a "gross" basis and then aggregated, the resulting measure would not represent the productivity of the manufacturing sector because of the inherent duplication.

Although it would be desirable to have a net measure of "Federal productivity," it is not available at this time. While many of the measured outputs are consumed outside of the Federal Government, sufficient data are not available to determine the degree of internal consumption. Nevertheless, the overall indexes do provide some insight into Federal productivity trends.

Methods used

For an organization producing a single uniform product or performing a single uniform service, the productivity index simply measures the change over time of the ratio of units produced to man-years. However, most organizations produce several types

of products. To construct a composite output index, the several outputs must be combined in some meaningful fashion. This is accomplished by multiplying the quantity of each product produced each year by the man-years required to produce one unit of output in the base year. Thus, those products which require more labor time are given more importance.

In the Federal sample, over 850 output indicators have been aggregated by the Bureau of Labor Statistics into output indexes by combining the quantities of each type of output by their respective actual or estimated fiscal 1967 labor requirements. These weights were constructed from the detailed output and input data provided by each participating organization. Output indexes were constructed by dividing the weighted output quantities each year by the weighted output quantity in the base year.

The nature of the indicators varied substantially. They included such diverse items as trademarks disposed, tank repairs, weather observations, square feet of buildings cleaned, electrical power generated, and deportable aliens located. The output volume ranged from several hundred units completed per year (for example, river basin studies) to billions (such as mail delivery items).

Man-year indexes were developed by dividing the man-year aggregates for each year by the aggregate in the base year. As in all input measures used by the Bureau of Labor Statistics to develop productivity indexes, man-years are considered homogeneous and additive. Adequate information is not available to separately weight the various types of labor. Each man-year reflects the regularly scheduled time, overtime, and leave time of all full-time, part-time, or intermittent employees. A man-year is equivalent to one individual paid for 40 hours a week, 52 weeks a year.

Output indexes were divided by corresponding man-year indexes to derive the productivity measures for the overall measured sample and for 16 major functional activities, such as procurement and supply, general support, and training and education. Although indexes were also constructed for each of approximately 200 organizational units, these will not be published. Rather, they are returned to each organization for its own use (for example, to stimulate further examination of the causes of productivity change within each organization) and are used by BLS as one method of validating the basic data (that is, by examining the reasonableness of the derived trends).

Data on personnel compensation (wages and fringe benefit costs) also were submitted to the Bureau of Labor Statistics. Compensation indexes were constructed as described for man-years.

Slightly more than 41 percent of the organizational units were unable to provide any data as far back as fiscal year 1967. Under certain circumstances, simply adding new information as it became available to the existing data base would distort the various calculations. Consequently, as additional data on output, man-years, and compensation became available, they were linked to the existing data series. The linked series provided the basis for constructing indexes of output per man-year, unit labor costs, unit labor requirements, and related information.

Productivity trends

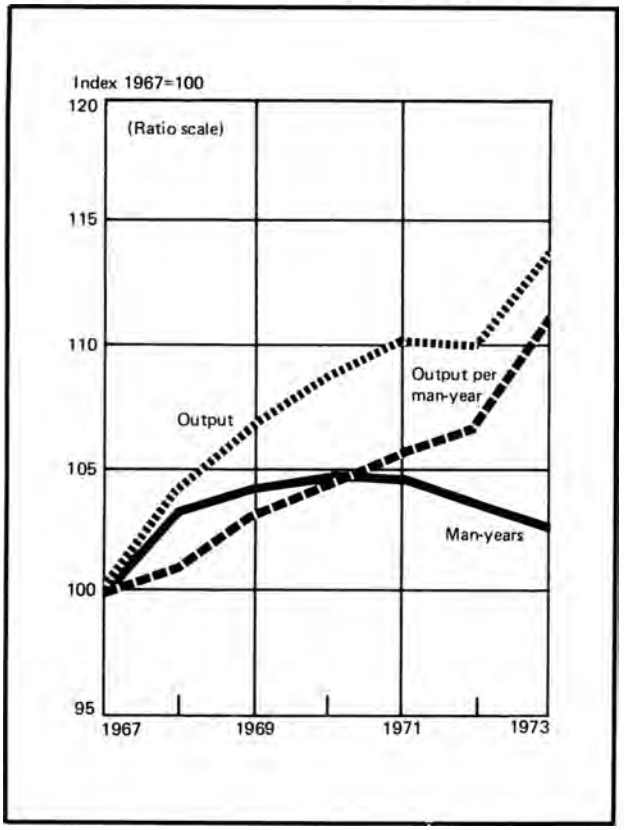
Productivity for the total measured sample rose at an average annual rate[8] of 1.6 percent a year during fiscal 1967 through fiscal 1973. This increase reflected an average increase in output of 1.9 percent a year coupled with a modest rise in the man-year resources consumed—0.3 percent a year. (See chart 1 and tables 1 and 2.) Within each of these series, the year-to-year percent changes varied substantially, with the largest productivity gain of 4.3 percent occurring in fiscal 1973. In this year, output rose about 3.5 percent while man-years declined 0.8 percent, continuing the downward trend in man-years started in fiscal 1971.

Since the overall rate masks the divergent trends of its components, data for the 200 organizations have been classified into 16 functional areas of government activity. (For definitions of these areas, see exhibit 1.) Some of these categories, such as standard printing and power, are more homogeneous than others, such as citizens' records and specialized manufacturing.[9] Nevertheless, these categories do provide insight into the trends for the major functional areas underlying the overall sample.

For these 16 groups, average annual changes ranged from—2.4 percent for standard printing services to 5.8 percent for power and general support activities. Two of the 16 functions—printing and health care—showed annual average productivity declines of 2.4 and 0.7 percent, respectively.

Analysis of the printing plant trend indicates easier jobs are being contracted out to commercial firms while the government printers are doing the more difficult jobs, thus creating a downward bias in the measure. This example reflects the quality problem,

Chart 1. Indexes of output per man-year, output, and man-years, total measured sample, fiscal years 1967–73



or more specifically, the product mix problem in measuring productivity. If the output data were available in sufficient detail to allow quantification of easy versus difficult jobs, for example, the effects of these shifts could be removed from the measure. Similarly, the output per man-year decline in health care might be misleading because the current measures do not properly reflect the increase in quality of medical care. Federal medical managers have reported an increase in staff per patient and advances in medical technology—for example, open heart surgery and kidney dialysis—which have increased the scope and cost of diagnostic and treatment procedures during this period.

Each of the functional indexes exhibit a wide range in year-to-year movements, with six of the functional groups declining in 1973.

Productivity increased at an average annual rate of 2.4 percent a year from fiscal years 1968–73 in those government units engaged in the overhaul and repair of heavy equipment. Modernization of plant and equipment was one of the major factors underlying this productivity gain.

As indicated earlier, indexes also have been developed for the 200 organizations providing output and input data to the Bureau of Labor Statistics. These organizations ranged in size from less than 100 man-years to hundreds of thousands of man-years. In 1973, the number of organizations showing productivity increases was slightly greater than the number showing declines, 103 compared to 97. However, for the 6-year period, nearly three-fourths of the organizations showed productivity increases, and about half of these increases exceeded 4 percent per year. The following tabulation shows the distribution of average annual percent changes in output per man-hour for fiscal years 1967–73 among the 200 organizations:

Number of organizations	*Percent change in output per man-year*
	Less than—
2	—10
1	— 8 to —10
6	— 6 to — 8
17	— 4 to — 6
11	— 2 to — 4
18	0 to —2
41	0 to 2
	More than—
36	2 to 4
28	4 to 6
12	6 to 8
6	8 to 10
22	10

Unit labor costs

Over the 6-year period, compensation rose at an average rate of 8.8 percent per year, with year-to-year changes ranging from 4.9 percent in 1968 to 11.7 percent in 1970 and 1971.

The associated average increase in productivity of 1.6 percent a year was not sufficient to maintain a stable level of unit labor costs. Consequently, unit labor costs rose 7.1 percent a year over this period. Unit labor costs will rise to the extent that changes in average compensation are not offset by increases in productivity. The smallest gain in unit labor costs of 1.8 percent occurred in fiscal 1973, when the average compensation gain of 6.3 percent was partially offset by a 4.3-percent increase in productivity.

There was wide variation in unit labor cost trends among the functional areas, ranging from a 0.1-percent average annual increase in general support to 11.5 percent a year in standard printing. (See table 3.) In general, the dispersion in the changes in unit labor costs among the various functions was almost entirely a reflection of the variation in the

Table 1. Functional and summary indexes of output per man-year, measured portion of the Federal civilian government, fiscal years 1967–73

(Fiscal 1967=100)

Functional groupings	Fiscal year							Rate of change, fiscal years 1967–73
	1967	1968	1969	1970	1971	1972	1973	
Citizens' records	100.0	100.5	103.7	106.7	111.0	116.7	120.0	3.3
Reference services	100.0	102.1	110.7	111.2	111.3	114.2	109.2	1.8
Loans and grants	100.0	105.0	109.4	121.5	135.1	138.1	129.5	5.6
Training and education	100.0	101.0	99.8	97.5	102.8	100.3	101.1	.2
Agriculture and natural resources	100.0	101.6	101.2	102.4	108.0	110.8	111.5	2.0
Regulation	100.0	106.6	114.7	119.6	117.2	116.9	123.0	3.0
Medical services	100.0	102.1	102.4	101.4	100.7	95.3	98.8	−.7
Power	100.0	103.7	123.9	131.9	131.9	138.5	136.5	5.8
Transportation	100.0	110.9	117.7	119.6	113.4	116.7	123.1	2.5
Postal service	100.0	98.3	98.9	99.4	101.6	102.7	108.4	1.3
Specialized manufacturing	100.0	106.5	110.6	120.7	139.8	132.9	128.1	5.2
Standard printing	100.0	98.4	94.4	93.1	87.8	87.2	88.7	−2.4
Procurement and supply	100.0	103.7	114.4	107.7	107.1	106.6	107.6	.7
Overhaul and repair of equipment	(1)	100.0	98.7	103.4	110.8	110.6	108.5	[2] 2.4
Maintenance of facilities	100.0	102.3	102.6	108.2	110.1	108.2	105.5	1.2
General support services	100.0	106.3	110.1	114.8	128.2	132.4	138.7	5.8
Total of functional groupings	100.0	100.8	102.9	104.0	105.7	106.5	111.1	1.6

[1] Index fiscal 1968=100.

[2] Rate of change is for fiscal years 1968–73.

rates of productivity growth. There was a great deal of homogeneity in average yearly compensation changes among the organizations in the functional areas. Almost all of the functions experienced changes in average yearly compensation within plus or minus 2 index percentage points of the 8.8-percent average change for the overall sample. Thus, in general, there was a strong inverse relationship between the functions' productivity and unit labor cost experience.

Standard printing and medical services, the only functions with declining productivity, experienced the greatest average increases in unit labor costs—11.5 percent and 9.3 percent, respectively. In contrast, the power, loans and grants, specialized manufacturing, and general support functions, all of which had average productivity gains of over 5 percent, had the smallest increases in unit labor costs.

Measurement problems

Several problems in measuring productivity in the Federal sector arise primarily because most Federal activities are service-oriented. It is often difficult to define and quantify the outputs of government organizations since they usually do not produce clearly specified physical products such as those in the goods-producing sectors of the private economy.

A recurring concern of many Federal managers has been that some reported outputs do not reflect changes in output quality. The definitions of changes in quality of output in general are somewhat ambiguous. For purposes of labor productivity measurement, changes in output quality refer to changes in the characteristics of the output which reflect an altered production process with different base-period labor requirements for producing the output. For these purposes, changes in output characteristics which affect the value of the output to the user but which do not reflect an altered production process or different base-period labor requirements do not require special treatment.

If productivity indexes are derived from output

Table 2. Functional and summary average annual rates of change for output per man-year, unit labor costs, compensation per man-year, output, and man-years, fiscal years 1967–73

Functional groupings	Output per man-year	Unit labor costs	Compensation per man-year	Output	Man-years
Total of function l groupings	1.6	7.1	8.8	1.9	.3
Citizens' records	3.3	4.6	8.1	4.6	1.2
Reference services	1.8	5.6	7.5	6.1	4.2
Loans and grants	5.6	2.6	8.4	8.2	2.5
Training and education	.2	8.1	8.2	2.7	2.5
Agriculture and natural resources	2.0	6.0	8.2	.1	−1.9
Regulation	3.0	4.8	7.9	5.3	2.2
Medical services	−.7	9.3	8.5	1.1	1.8
Power	5.8	2.3	8.3	11.6	5.5
Transportation	2.5	8.7	11.4	4.4	1.8
Postal service	1.3	7.5	8.9	1.6	.3
Specialized manufacturing	5.2	1.5	6.8	7.2	1.9
Standard printing	−2.4	11.5	8.8	−4.1	−1.7
Procurement and supply	.7	6.9	7.7	−5.1	−5.8
Overhaul and repair of equipment [1]	2.4	5.7	8.2	−3.4	−5.7
Maintenance of facilities	1.2	7.0	8.3	−1.4	−2.6
General support services	5.8	.1	5.9	−2.4	−7.7

[1] Rate of change is for fiscal years 1968–73.

measures which have not been adjusted for changes in output quality, they will reflect both real changes in efficiency and apparent changes resulting simply from alterations in the basic characteristics of the output. Thus, when quantifying outputs, it is necessary to identify changes in output quality and to adjust for these changes in order to obtain a meaningful measure of productivity.

Another important problem to be solved in measuring Federal productivity is that of quantifying outputs in sufficient detail to adjust for shifts in types of outputs. If the output units represented by one output indicator are not homogeneous and if over a period of time the proportion changes between those units that are more labor intensive and those that are less labor intensive, the resulting output per man-year measure will reflect this change as well as productivity changes.

Outputs which take many months or, in some cases, years to complete also present difficult measurement problems. Quantifying such outputs only in the year they are completed often produces inaccurate and erratic output indexes. In order to obtain a meaningful measure, organizations must either estimate what proportion of these long-term outputs were produced in each year or break these outputs down into component parts, each of which is completed in a relatively short time.

Closely related to the problem of quantifying output are the difficulties which emerge when the Federal Government contracts out work. In these cases, the final output measure for a government agency may reflect not only the results of the activities of government employees but also those of the private contractors. It is important in these cases to deter-

EXHIBIT 1. Definitions of functional areas

The following definitions briefly describe the nature of the organizations classified within each function:

1. *Citizens records*—Organizations maintaining records of government obligation to citizens and vice versa, also criminal and demographic records.
2. *Reference services*—Organizations maintaining library or publications services, or developing statistical information for the public.
3. *Loans and grants*—Organizations making research grants and various business loans.
4. *Training and education*—Organizations overseeing training, education, and social welfare programs.
5. *Agriculture and natural resources*—Organizations responsible for overseeing and protecting natural resources.
6. *Regulation*—Organizations responsible for enforcing Federal statutes in such areas as interstate commerce, immigration, taxation, and labor.
7. *Medical services*—Organizations operating hospitals, clinics, or public health programs.
8. *Power*—Organizations responsible for generation, sale, or transmission of electric power.
9. *Transportation*—Organizations responsible for operating U.S. canals, and maintaining safe conditions in U.S. airways and waterways.
10. *Postal service*—Organization responsible for delivering the mail and providing other services, such as mail insurance and money orders.
11. *Specialized manufacturing*—Organizations involved in manufacturing-type activities, such as printing currency or maps and fish production.
12. *Standard printing* — Organizations printing standard text or statistical documents.
13. *Procurement and supply* — Organizations responsible for purchasing and distributing supplies.
14. *Overhaul and repair of equipment*—Organizations responsible for upkeep of major military equipment.
15. *Maintenance of facilities*—Organizations responsible for the operation and upkeep of Federal buildings or installations.
16. *General support services*—Organizations performing overall administrative and supportive activities such as personnel, automatic data processing, and budget.

mine which output is exclusively associated with government employees since the input measure is limited to them. For example, the Manpower Administration administers contractor-operated job training programs. Here the outputs of the contractors should not be used unless a strong case can be made that the workloads of the Federal employees depend on and remain proportional to the workloads of the contractors. Attempts were made to adjust for this problem in this study.

The increasing use of the regional generalist, who divides his or her time among several program areas, has made it difficult to accurately allocate manpower to each individual output. This manpower allocation is crucial in developing proper weights for combining the outputs. Further, reorganizations have made it difficult to obtain consistent output and man-year data and to continue measuring relatively stable organizational units.

The Bureau has attempted to resolve these and other problems to the extent possible. Much work still remains to be done, and the Bureau will be concentrating on improving the output indicators.

Future plans

During the current fiscal year, the Bureau of Labor Statistics will extend the data series to include fiscal 1974 information. In addition, the Bureau will be introducing fiscal 1972 unit man-year weights which will be used to combine output quantities from 1972 forward.

Some efforts will be devoted to expanding the coverage in the Federal sector. As mentioned earlier, 46 agencies covering about 61 percent of Federal employees are presently in the sample. It is believed that this coverage can be expanded perhaps to a maximum of 70 percent of Federal employees. It is doubtful if measures can ever be developed for areas such as the research activities in the National Aeronautics and Space Administration and the Atomic Energy Commission, parts of the Defense Department, and parts of the State Department.

Therefore, most work will be concentrated on improving the output indicators reported. This will involve attempting to develop indicators more representative of the results of the agency's activities in terms of better definition and greater product detail than some of those presently included.

On the input side, some attention will be devoted to exploring ways of taking into account changes in the characteristics of the Federal work force. In the present set of measures, all man-years are treated as homogeneous and additive. It would be desirable to determine what effect shifts in the composition of the work force have on the changes in output per unit of labor input.

In addition to the continuation of productivity

Table 3. Functional and summary indexes of unit labor costs for the measured portion of the Federal civilian government, fiscal years 1967–73

(Fiscal 1967=100)

Functional groupings	Fiscal year							Rate of change fiscal years 1967–73
	1967	1968	1969	1970	1971	1972	1973	
Total of functional groupings	100.0	104.1	109.5	120.9	132.9	141.9	144.5	7.1
Citizens' records	100.0	103.0	107.6	119.9	124.3	127.1	126.4	4.6
Reference services	100.0	100.8	100.3	113.2	122.1	126.3	134.0	5.6
Loans and grants	100.0	102.6	105.6	108.2	104.9	108.5	122.7	2.6
Training and education	100.0	105.8	113.1	129.7	135.2	147.4	155.7	8.1
Agriculture and natural resources	100.0	104.8	113.2	127.8	132.4	134.7	138 4	6.0
Regulation	100.0	98.1	101.3	109.8	118.6	125.0	125.1	4.8
Medical services	100.0	102.8	107.3	123.2	135.5	155.9	159.7	9.3
Power	100.0	101.8	93.9	94.4	104.2	107.6	115.4	[2]3
Transportation	100.0	95.3	100.0	115.2	134.7	142.2	151.6	8.7
Postal service	100.0	106.7	113.9	123.1	138.0	147.0	148.7	7.5
Specialized manufacturing	100.0	100.9	104.4	104.1	96.3	105.4	114.4	1.5
Standard printing	100.0	107.0	117.8	132.8	155.0	173.5	181.9	11.5
Procurement and supply	100.0	102.0	94.9	114.4	127.6	135.5	139.8	6.9
Overhaul and repair of equipment	(1)	100.0	119.4	123.5	128.9	130.4	138.9	[2]5.7
Maintenance of facilities	100.0	104.5	106.7	108.5	121.3	136.5	150.2	7.0
General support services	100.0	97.5	93.4	103.6	101.3	102.1	95.7	.1

[1] Index, fiscal 1968=100.

[2] Rate of change is for fiscal years 1968–73.

measurement, the Bureau of Labor Statistics will analyze causal factors underlying the productivity change. The Joint Financial Management Improvement Program also will continue to concentrate on the analysis of causal factors.

One conclusion reached in the effort to measure Federal productivity was that if adequate measures could be developed for this sector, the knowledge and insights gained would be applicable to State and local government productivity measurement. However, more developmental work needs to be completed before productivity of State and local governments, which represents about 80 percent of total civilian government employment, can be measured.

FOOTNOTES

[1] More than a dozen reports covering Federal productivity measurement and enhancement have been prepared since June 1972.

[2] In addition, the Bureau's productivity measurement program includes major sectors of the economy such as private nonfarm and manufacturing and a group of about 50 selected industries.

[3] See Jerome A. Mark, "Progress in measuring productivity in government," *Monthly Labor Review*, December 1972, pp. 3–6.

[4] These units fall within the categories of general government and government enterprises.

[5] The Joint Financial Management Improvement Program is a joint undertaking of the Office of Management and Budget, the General Accounting Office, the Treasury Department, the General Services Administration, and the Civil Service Commission, working in cooperation with each other and with each of the operating agencies to promote improved financial management on a governmentwide scale and in individual agencies.

[6] For results of those studies, see Joint Financial Management Improvement Program, *Report on Federal Productivity, Volume 1*, June 1974.

[7] For a more detailed discussion of the concepts and measurement of productivity, see *The Meaning and Measurement of Productivity*, Bulletin 1714 (Bureau of Labor Statistics, September 1971).

[8] All average annual rates of change are based on the linear least squares trends of the logarithms of the index numbers. Different rates may result from using the compound interest formula.

[9] For a listing of the organizations participating in this study, and other related information, see *Report on Federal Productivity, Volume 1*.

Modernization and manpower in textile mills

Technological changes are altering skill requirements, but modernization lags behind other industries

ROSE N. ZEISEL

OUTPUT PER MAN-HOUR has been increasing in the textile industry, an improvement which is largely associated with the adoption of technological advances. Nevertheless, the average mill is still highly labor intensive, and its equipment is outmoded relative to other industries. Outlays for more modern equipment are increasing, but the investments planned for the next several years are still substantially below the peak outlays of the 1960's and may not be large enough to enable the industry to maintain a favorable competitive position. Overall employment may not change appreciably by 1980, but job content and occupational requirements will continue to be affected by changing technology.

This article analyzes technological developments of the industry, emphasizing the effect on manpower of these changes. Some indicators of technological progress as well as the industry's efforts to increase investment in equipment and research will also be presented. Before examining these developments, some of the characteristics of the industry will be discussed.

Industry profile

Concentrated largely on the east coast, the textile industry, with more than 7,300 mills, is the ninth largest employer in the country. The industry consists basically of three stages of manufacture—the manufacture of yarn and thread; the manufacture of fabric, some types of clothing, and carpets; and the finishing processes. Although many of the larger mills engage in all the stages of manufacture from raw material to finished product, the great majority of establishments are small single-unit organizations which produce only one intermediate product, which has either been commissioned or is sold to another manufacturer.[1] The industry is thus seriously fragmented, with a large number of small mills for which it is difficult to finance new equipment. These mills may be vulnerable to economic setbacks if their ability to compete effectively with domestic or foreign goods is eroded by obsolete equipment. To some extent, however, the effects of fragmentation are being offset by the growth of larger vertically integrated companies.

Labor intensity. In spite of a decline over the decade, the industry is still highly labor intensive relative to other manufacturing industries. In the 10 years ending in 1971, the ratio of payroll to value added—a measure of labor intensity—averaged 0.54 compared with 0.48 in all manufacturing. With the exception of the furniture and leather industries, textiles had the highest payroll-value added ratio of the 20 major manufacturing industries in 1971. Considerable variation, however, exists within the industry, with carpet mills on the low side and weaving mills on the high side of the average.

Labor force. Nearly a million people are employed in textile mills, and some characteristics are distinctive to the industry. In spite of a steady downtrend in the last decade, production workers constitute a very high proportion of textile employees (88 percent) compared with all manufacturing (72 percent). About half the employees are women, compared with 28 percent in all manufacturing, and in some sectors of the industry, such as knitting, the proportion of women is considerably higher. Black workers have made significant gains in recent years. About 115,000 black workers were employed in textile mills in 1970 compared with 45,000 in 1960, more than 2½ times as many.

The work force is immobile relative to other industries. It consists largely of semiskilled workers

Rose N. Zeisel is an economist in the Division of Technological Studies, Office of Productivity and Technology, Bureau of Labor Statistics.

and persons with comparatively low educational attainment. Moreover, the mills are generally located in small nonurban communities where opportunities for other employment are limited, and several family members may work in the same mill. In addition to the personal and locational characteristics which tend to limit textile workers' mobility, the skills acquired in the mill generally are not transferable.

Changing markets. Changes in technology, in demography, and in import penetration in the 1960's reshaped the industry. Of particular importance was the dramatic growth of synthetic fibers, which resulted in uneven growth patterns among the industry sectors. While cotton broadwoven production did not rise appreciably over the decade, output of synthetic broadwovens increased very sharply. Changing technology also resulted in new processes, new products, and new markets. For example, new knit goods products are causing considerable dislocation in the industry as inroads are being made into traditional woven goods markets. At the same time, demographic changes shifted markets to the teenage, fashion-conscious groups and more recently to the young marrieds interested in practical, moderately priced household goods. For example, carpeting—primarily synthetic, tufted—experienced the sharpest rise in output of all the major sectors.

Imports have also seriously affected some sectors of the industry, although international agreements since the mid-1960's have been a moderating influence. Imports of all textile products constituted about 9 percent of domestic consumption in 1971, compared with 4 percent a decade earlier. The cotton import-consumption ratio, at about 12 percent in 1971, was more than double the ratio a decade earlier. Manmade fiber textile imports increased more than fourfold in the last 5 years, to about 7 percent of domestic consumption in 1971. The wool ratio stood at 24 percent, and for many individual textile products the ratio was even higher.

Technological lag

In general, the American textile industry has not been in the forefront of technological advance in spite of many machine improvements and innovative fiber use. Many reasons can be cited. After the war, the necessity to rebuild European mills and the growth of the industry in Asia provided mills in those countries with the incentive to invest in new technology, while at the same time American mills were operating below capacity. But basically, the fragmented organization of the textile industry, severe cyclical business patterns, low profit margins of the average mill, and historical conservatism to long-term debt have tended to discourage basic research and long-range investment for new technologies.[2]

This cautious adoption of new technologies by the average mill has been accompanied by a lag in technological development by the American machine-building industry. Most textile machine companies in the United States have neither the financial resources nor the productive capacity to develop new technologies. As a result, machine manufacturers have largely devoted themselves to improving existing mill machinery rather than promoting fundamental redesign. Also, they have tended to become job-order shops producing what their customers request.[3] For example, machine companies are still manufacturing picker machine parts for early 1900 models. A few parts are actually interchangeable with current models because basically the picking process has not changed very substantially. At the same time newer technology which eliminates the necessity for a separate picking operation has been installed in fewer than 50 mills.

While the lag in the application of technology is not new, it is particularly important right now because advanced concepts in technology are being developed and accepted in other countries. For example, open-end spinning, an innovation developed in Czechoslovakia, is now manufactured by more than a dozen international machine companies, none of which are American. (One U.S. manufacturer is believed to be developing another system of open-end spinning.) Exhibited commercially only 7 years ago, adoption of these machines has been relatively rapid in foreign countries, but in the United States it is limited to evaluation by a few mills.

Major developments. Technological advances which significantly affect productivity growth can be classified roughly into three types. The first involves modifications to conventional machines affecting speed, capacity, automaticity, cleaning, and materials transfer. These changes account for most of the improvement in basic textile manufacture in the 1960's. In general, they have been adopted by the average mill. The second group includes new technologies which, however, can be tied into the existing machinery. These innovations, such as chute-fed

carding and winding on the loom, have been adopted by larger modernized mills, but not by the average mill. The third group includes more radical innovations, such as open-end spinning, which constitute a change in process and which would involve replacing operative machinery. In general, such new technologies have been restricted to a few leading mills, particularly in the yarn and weaving sectors, although in a few sectors (such as carpeting) very radical process innovations (such as tufting) have been fully accepted. Some of the major innovations of the last few years, their manpower impact, and rate of diffusion are presented in table 1. In this section, only selected developments in fiber use, spinning, and weaving will be discussed as examples of the industry's technological problems.

Fiber technology. The textile industry has shown great flexibility in its adaption to synthetic fibers. While in 1960 natural fibers accounted for over 70 percent of all fibers consumed, today synthetic fibers hold almost this proportion of the total. Although there are no definitive data, the shift from natural to synthetic fiber has been an important factor in the industry's productivity growth. In general, manmade fibers require less labor per unit of output because they do not need the cleaning and other preparatory work necessary for natural fibers. Moreover, certain types of synthetic fibers can actually bypass the whole spinning process in the preparation of some fabrics.

Yarn manufacture. In general, yarn is still manufactured on a series of discrete machines, very similar to the process half a century ago, although a continuous yarn system has been adopted by a small number of mills. Nevertheless, numerous machine improvements and auxiliary attachments (greater speed and capacity, automatic sensors, integration of processes, and improved materials handling) have continually increased mill productivity. For example, one yarn mill built in 1970 reported operating 175 spindles per employee, compared with a roughly similar mill opened by the same company in 1964 with 110 spindles per employee.

Probably the major breakthrough in spinning since the introduction of the current system of ring spinning is the implementation of the process known as open-end spinning, mentioned earlier. It combines

Table 1. Major innovations in the textile industry, 1965–72

Innovation	Description and impact	Diffusion
Texturizing	Heat sets a crimp in synthetic fiber to provide bulk, an additional process on specialized machines. Stimulated growth of knitting sector.	Commercially started mid-1960's; very rapid growth since then.
Continuous yarn system	Integrates several processes, eliminating conventional picker machines and the lap rolls. Reduces unit requirements for machine operators and material handlers.	Installed experimentally in several mills in mid-1960's; adoption very limited since then.
Direct-feed carding	Eliminates picking process and associated manpower	Installed in relatively few mills.
Open-end spinning	Integrates roving, spinning, and winding. Can produce 2 or more times the output of the conventional spindle.	Installed for evaluation in several mills.
Spinning attachments	Automatic doffing (unloading) machines reduce unit requirements for doffer operators	Automatic doffers installed in a few mills experimentally in mid-1960's; still limited to 1 percent of spindles in early 1970's.
	Automatic devices for piecing (tying) broken yarn. Reduces unit requirements for spinners	Automatic piecing devices not available commercially.
Winding attachments and integration	Automatic creeling (loading) of machines; automatic tying-in of yarn ends. Reduces unit requirements for operators.	Automatic creeling and tying-in machinery installed in only a few of the newest mills.
	Integration of filling winding with weaving. Eliminates separate process and associated handling.	Winding on the loom installed only in largest mills in mid-1960's. Now installed on 30 percent of looms.
Shuttleless loom	Operates at faster speeds and requires fewer auxiliary operations than shuttle looms. Can produce about 50 percent more cloth than the average shuttle loom per hour.	Installed in only a few mills in mid-1960's. Now account for 7 percent of all looms.
New knitting machines	New machines operate at faster speeds and are more automated. Electronic pattern making devices reduce pre-knit time. Reduces unit labor requirements and permits greater flexibility in design change.	Very substantial growth of new machines in last 5 years. Electronic patternmaking being rapidly adopted.
Continuous computerized finishing	Integrates dyeing and finishing techniques and incorporates computerized instrumentation. Reduces unit labor costs and improves quality.	Very substantial growth.

into one process the three separate operations of roving, spinning, and winding. Output per machine hour may be two or more times that of the conventional machine.[4] However, investment in the open-end system in this country has been delayed by the advances which have been made in the conventional process, some drawbacks inherent in this newer system, and the high cost of replacement.

Weaving. American mills continue overwhelmingly to use the conventional weaving method of shuttle looms, but those used are faster, wider, and more automated than 5 years ago. Improvements such as laborsaving warp-tying methods and winding attachments are also greatly reducing unit labor requirements. Adoption of the new shuttleless looms, which has been relatively rapid in some foreign mills, is still very limited in the United States, although it is generally acknowledged that these looms permit increased speed, reduced maintenance, less noise, and fewer preparatory processes. According to one company's report, production was maintained at the same level with 40 percent fewer shuttleless looms than with conventional looms. This would require less floor space and 30 percent less labor.[5] Other reliable industry reports generally confirm this potential increase in productivity with the shift to shuttleless looms. Although the cost of replacing operative shuttle looms must first be justified, interest in shuttleless weaving by the larger mills is expected to increase substantially.

The competitive position of weaving mills is being tested by the advance in knitting technology. Following Europe's lead by about 5 years, technological changes in knitting and knitting yarn have stimulated phenomenal output growth and greatly reduced unit labor requirements. Warp knit machines, now gaining broad acceptance in traditional woven-goods markets, can produce about twice the quantity of cloth per hour as the double-knit machine does. Electronic knitting in which construction of goods is controlled by electronic impulses has been relatively well accepted, and now electronic pattern scanners can reduce preknitting preparation time and permit more rapid adoption of fashion changes.

Effect on employment and occupations

While technological advances are generally considered beneficial to economic growth, the measureable effect on employment in any one industry is not always clear. In general, if the rise in output per man-hour is not accompanied by an equivalent or larger increase in output, employment (total hours worked) will decline. In hosiery, the only sector for which BLS productivity measures are available, the rate of increase in output from 1960 to 1971 fell slightly behind the growth rate of output per man-hour, and man-hours and employment declined slightly.[6] On the other hand, in the case of carpeting in which technological changes greatly increased output per man-hour, employment nevertheless rose very sharply because of the more than commensurate gain in output. The outlook for employment depends therefore on the relationship of output changes to productivity changes. A projection by BLS for 1980 consistent with a 4-percent unemployment rate shows that employment in the textile industry may not change appreciably from the current level.[7]

Job content. The impact of technological advance on job content is also difficult to assess. The "mix" of duties performed by the operator—the relative time allotted to each duty—is changing and, in some cases, one or more of the duties are being eliminated entirely. As shown earlier, many traditional manual functions requiring dexterity and skill are being replaced by electronic detection and automatic repair devices. Consequently, considerably more of the operator's time (card tender, spinner, and others) is now spent patrolling the machine to detect malfunctions than was the case a decade earlier, and this trend will continue. A very sizable reduction in time spent for repairing broken yarn is expected when a new device, the automatic yarn piecer, is adopted. The change in skills required can be seen in a very rough comparison of a ring spinning operator's time in the most modern mill in the 1960's and in the 1980's. As estimated by industry experts, the approximate percent distribution of time spent on each task may be, roughly, as follows:

Task	*1960's*	*1980's*
Total	100	100
Repairs yarn	49	30–35
Creels or loads	12	5–10
Cleans	10	5–10
Patrols	27	40–45
Miscellaneous	2	10

There is some question whether these changes raise skill requirements. For some jobs, such as loom fixer, a high degree of skill has always been necessary, but newer more sophisticated instrumentation may require more skill and more technical knowl-

edge. For some semiskilled operators, however, there would appear to be a downgrading of skill when the new machine or accessory equipment is so automated as to actually require less training and less experience. For example, the required level of skill of the spinner will be lowered with the use of automatic piecing devices. The shuttleless loom requires less training by weavers than does the shuttle loom. At the same time, however, it can be said that the operator's responsibility increases as these machines become more continuous and more automatic, because the cost of downtime (when the machine is not working) becomes more costly.

Occupational structure. In addition to changing the job content, advancing technology is altering mill requirements for various occupations. In general, long-term trends show a decline in the proportion of blue-collar workers in the mill and in the industry, with the possible exception of skilled workers. As machine speed, capacity, and automaticity increases, for example, fewer semiskilled operatives, such as spinners and weavers, are required for the same production. Similarly, unit requirements for laborers are being sharply reduced in all modernized mills as materials handling is more mechanized or two operations are combined. In contrast, skilled workers such as mechanics and fixers are becoming more essential as textile machines increase in complexity and continuity. New technologies, such as computer processing and pollution control devices, may also require more technically trained personnel than the textile industry has generally required. Among white-collar workers, every major group—professional and technical, managers and officials, clerical and sales—has been increasing as a proportion of total employment.

Changes in occupational distribution in the industry reflect shifts in the importance of subindustries, changes in management organization, and the availability of labor, as well as adoption of technological advances. Comparison of Census data for 1970 and Bureau of Labor Statistics projections for 1980 show the following occupational changes (in percent):

Occupation	*1970*	*1980*
Total	100.0	100.0
White collar	14.9	20.7
Blue collar	85.1	79.3
Craftsmen, foremen	11.5	11.4
Operatives	68.2	63.7
Laborers	3.9	3.0
Service workers	1.5	1.2

Worker adjustments. While technology advances are considered beneficial to the worker in the long run, short-term adjustments, particularly to workload changes, continue to be an area of major concern. Since only about one-fourth of all textile workers are in mills covered by labor-management agreements, provisions for easing such adjustments are made largely at management's discretion.

Efforts to significantly increase unionization have not been successful. Contraction of the Northern textile industry since World War II seriously depleted union membership, and Southern mills have, in general, been resistant to organization. Management's opposition to unionization has been made possible, in part, because of the availability of rural farm labor, although less so than in former years. In addition, while the traditional mill town no longer exists, the concept of paternalism continues, and this relationship between worker and management does not encourage union participation. The workers' attitudes which play a large part in their failure to organize are associated with their rural background and low level of education.[8]

Productivity growth

Although approved BLS measures of productivity for the industry are not available, a rough indication of productivity changes can be derived by examining output data developed by the Bureau of Labor Statistics and the Federal Reserve Board and man-hours data gathered by the Census Bureau. Increases in output per man-hour in the 10 years ending in 1971 are suggested by the substantial average annual rise in output, 4½ to 6 percent, compared with the moderate rise in man-hours of less than 1 percent annually. Most of the improvement occurred in the first half of the decade as output rose to near-capacity levels. In addition, the improvement in output per man-hour during the last decade reflects a shift to more capital-intensive sectors, particularly knitting and carpet production, and a shift to greater use of the manmade fibers which have lower unit labor requirements than do natural fibers.

For individual sectors of the industry, an examination of various measures of output and man-hour data in the 1960–70 period (the latest date for which complete data are available) suggests considerable variation in productivity growth. For synthetic broadwovens, growth is suggested by an average

annual rise of about 10 to 11 percent in output and of 6½ percent in man-hours. The annual growth rate of cotton broadwoven output was negligible, or may have even declined, but an average decline of almost 4 percent in man-hours annually indicates an advance in output per man-hour. In the knitting sector, the improvement in output per man-hour appears to have been substantially greater than in broadwovens as output rose an average of 8.5 to 9 percent annually, while man-hours increased about 2 percent a year on the average. In the carpet industry, production increased an average of 12–14 percent annually, and man-hours rose 5.5 percent annually—suggesting an even more rapid gain in output per man-hour than in the knitting industry. In almost all sectors, the improvement in output per man-hour was considerably greater in the first half of the decade than in the second.

For the hosiery sector, the Bureau of Labor Statistics index of productivity (output per man-hour) shows a rapid increase between 1961 and 1971 of an average annual rate of 6.6 percent compared with 4.1 percent in the previous 10 years. This high rate of growth, which is not likely to continue in the 1970's, accompanied a sharp increase in output and rapid technological changes associated with the shift to pantyhose.

Best plant practice. While no general conclusions can be drawn, some indication of the potential productivity level for each subindustry is suggested by the difference between the productivity levels of the most efficient plants and the subindustry average. Comparative data are presented in table 2 on value added per production worker man-hour in 1967 for the "more efficient" and "less efficient" plants in several sectors of the industry.[9] (Although it has limitations, value added per man-hour is used here as an approximate indicator of productivity.) For purposes of this report, the "more efficient" mills are defined as those which fall into the highest quartile of the ranking of plants by value added per production worker man-hour; the "less efficient" are those in the lowest quartile.

In the industry sectors for which 1967 data are available, value added per production worker man-hour in the more efficient mills ranged from almost two and a half to more than five times greater than in the less efficient mills. The differences were smallest in the yarn (except wool) mills and in the cotton weaving mills; the largest variance was in the tufted carpet sector. Although these data are not fully comparable with available 1958 data, it appears that the difference between the more efficient and the less efficient plants has broadened since 1958 in several sectors, including tufted carpets and knit fabrics. In the yarn and cotton broadwoven mills, the efficiency difference was about the same in 1967 as in 1958.

Although the wide range in productivity levels within an industry sector may reflect differences in management, labor, and other factors, one of the important keys, judging by Census data, appears to be capital outlays. Expenditures for plant and equipment per employee by the more efficient mill in 1967 were larger than outlays by the less efficient mill or the average mill in almost every sector shown in table 2. The 1958 study generally confirms these findings.

Capital expenditures. Following a decade of low investment and general contraction, the textile industry sharply increased capital outlays in the 1960's. A booming economy, sharply improved textile demand assisted by trade agreements, revised depreciation rates, and investment tax adjustments encouraged mills to invest in new equipment and reduce the level of technologically outmoded facilities. Expenditures for plant and equipment rose from $330 million in 1961 to a peak of $820 million in 1966, according to the U.S. Department of Commerce.

Table 2. Value added and capital expenditures, ratios of "more efficient" to "less efficient" plants and to average plant 1967

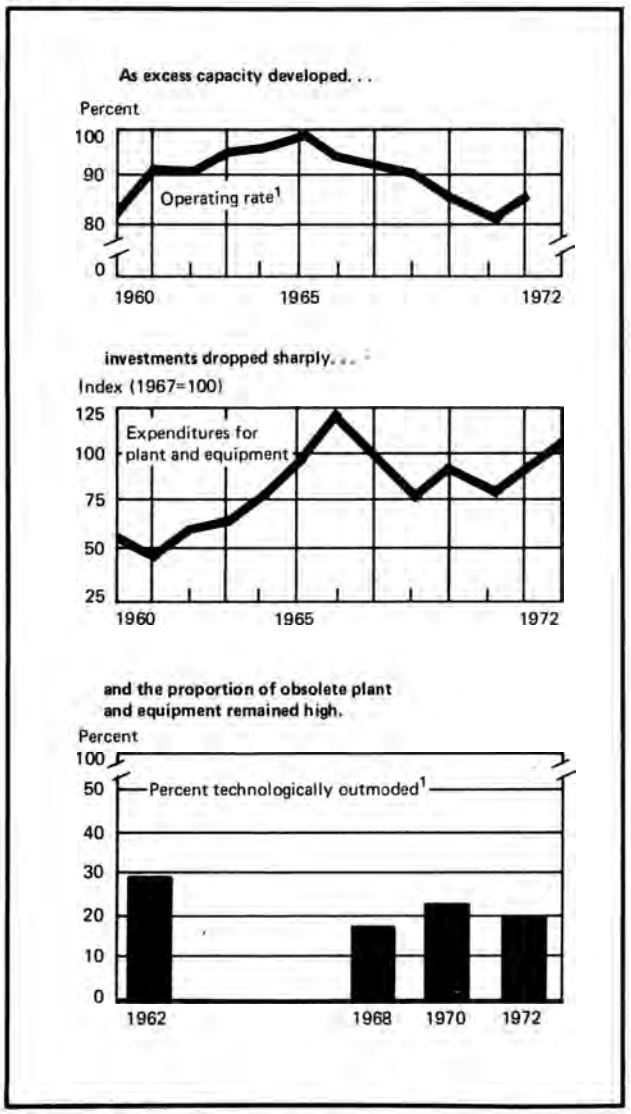
Industry sector	Value added per production worker man-hour		Capital expenditures per employee	
	"More efficient" to "less efficient" plants	"More efficient" to average plant	"More efficient" to "less efficient" plants	"More efficient" to average plant
Weaving, cotton	2.4	1.5	0.9	1.2
Weaving, narrow fabric	3.5	1.8	3.3	2.3
Hosiery, women's, except socks	2.8	1.6	1.7	.8
Knit outerwear	4.0	2.1	1.7	1.4
Knit fabric	4.9	2.2	2.7	1.9
Carpets, tufted	5.2	1.9	1.3	1.3
Yarn mills, except wool	2.4	1.4	1.3	1.3
Throwing and winding	4.5	2.0	5.1	1.3

NOTE: Establishments in each sector were ranked by the ratio of value added per production worker man-hour. The "more efficient" establishments are those in the highest quartile; the "less efficient" are those in the lowest quartile.

SOURCE: Based on unpublished Census data prepared for the National Commission on Productivity.

However, from 1966 to 1971, as capacity utilization dropped sharply, capital expenditures declined 25 percent. (See chart 1.) This was contrary to the pattern in all manufacturing, in which expenditures remained stable and then rose in spite of a sharp drop in capacity utilization. Since textile machinery prices rose about 24 percent in those 5 years, real capital spending declined considerably more sharply than the dollar figures would indicate. It should be noted that this was the pattern primarily of the basic spinning and weaving mills. Knitting and carpet mills increased capital outlays very significantly in the last half of the 1960's. Although expenditures for the industry as a whole increased in 1972, they were still considerably below the 1966 peak.

Chart 1. Investment decline in the textile industry in the late 1960's



[1] Data are for December of the year.

SOURCES: U.S. Department of Commerce and McGraw-Hill Publications Co., Economics Department.

Table 3. Indicators of technological change, 1951–71

Indicator	Average annual rate of change [1]			
	1951–61	1961–71	1961–66	1966–71
Payroll per unit of value added	−1.3	−0.5	−1.5	0.2
Capital expenditures per production worker	.6	4.5	18.7	−5.0
Research and development per sales dollar [2]	.....	.3	1.9	−2.6

[1] Linear least squares trends method.

[2] Of textile and apparel companies which have research and development programs.

SOURCE: Bureau of Labor Statistics; Bureau of the Census; Bureau of Economic Analysis; National Science Foundation.

These investments were insufficient to substantially reduce technologically outmoded facilities. A recent survey of technological obsolescence in large textile companies revealed that 20 percent of plant and equipment was still technologically outmoded in 1972 compared with 29 percent in 1962.[10] Only the transportation equipment industry (excluding autos and airlines) had a larger proportion of outdated equipment in 1972.

Anticipating a more favorable economic climate, the industry plans to increase spending to $640 million in 1975, about 14 percent above the 1970 outlay.[11] This expenditure, however, would be 22 percent below the 1966 peak. Considering the increase in machinery prices, and the degree of technological obsolescence, this effort may be insufficient to modernize the industry.

Funds for research and development. Outlays for research and development of new products and processes totaled $58 million in 1971, nearly double the outlay 10 years earlier.[12] However, these investments are a very small percentage of sales of companies performing research and development and represent only the very largest companies. (See table 3.) Moreover, these activities have been cut back sharply in recent years, and as far as is known, one or two mills are now doing basic research, and only a few mills are doing developmental work. To a large extent, the industry relies on research carried out by synthetic fiber producers, machine manufacturers, the Federal Government, and foreign manufacturers. However, industry plans for 1975 call for peak outlays of $81 million or 40 percent above 1970.[13]

Although industry outlays for new plant and equipment and for research and development appear to be relatively insufficient at this time, it is possible that with a strong economic recovery in the 1970's, textile mills will adopt the level of technology necessary to assure a favorable competitive position. □

———*FOOTNOTES*———

[1] For more background information on the textile industry, see *Technology and Manpower in the Textile Industry of the 1970's*, Bulletin 1578 (Bureau of Labor Statistics, 1968).

[2] Thomas Stanback, Jr., *Tax Changes and Modernization in the Textile Industry* (New York, National Bureau of Economic Research, 1969).

[3] Paul W. Strassman, "Textiles," *Risk and Technological Innovation* (Ithaca, N.Y., Cornell University Press, 1959).

[4] John F. Dulken, "New Horizons in Spinning," *Modern Textiles*, August 1971, p. 7.

[5] "Shuttleless Looms: The Weaver's Weapon," *Textile World*, August 1972, pp. 47–48.

[6] An official productivity index is available only for this sector of the textile industry. For this and other official indexes, see *Indexes of Output Per Man-Hour, Selected Industries*, Bulletin 1758 (Bureau of Labor Statistics, 1972).

[7] *The U.S. Economy in 1980: A Summary of BLS Projections*, Bulletin 1673 (Bureau of Labor Statistics, 1970). The projections will be updated in a forthcoming publication.

[8] Robert Blauner, *Alienation and Freedom, The Factory Worker and His Industry* (Chicago, University of Chicago Press, 1964), pt. 4.

[9] Based on unpublished Census data prepared for the National Commission on Productivity. For 1958 data, see *Technology and Manpower in the Textile Industry of the 1970's*, p. 31.

[10] *How Modern is American Industry* (New York, McGraw-Hill Publications, Economics Department, 1972).

[11] *Business Plans for New Plants and Equipment, 1972–75* (New York, McGraw-Hill Publications, Economics Department, 1972).

[12] *Research and Development in Industry* (Washington, National Science Foundation, April 1972). Data include apparel industry.

[13] *Business Plans for Research and Development Expenditures, 1972–75* (New York, McGraw-Hill Publications, Economics Department, 1972).

Productivity in telephone communications

Output per man-hour tripled in past two decades, largely owing to new technologies and high demand, but the gains have tended to narrow somewhat in recent years

HORST BRAND

OUTPUT PER MAN-HOUR in telephone communications [1] more than tripled over the past two decades, rising 6.5 percent a year, substantially above the rate for the private economy as a whole. Gains were high throughout most of the period, but tended to be somewhat higher in the 1950's, averaging 6.9 percent annually. Throughout both the 1950's and 1960's, output expanded rapidly. However, savings in man-hours, made possible particularly by direct dialing, came more slowly during the latter decade, partly because they were offset by increasing manpower requirements for maintenance and repair and business services. Thus, between 1960 and 1972, productivity advanced at an average annual rate of only 5.2 percent.

With the exception of 1970, gains in output per man-hour have tended to slacken somewhat in recent years, in part reflecting fewer opportunities for improving upon the high levels of productivity already achieved in central office and transmission plants, as well as the complexities in improving upon such labor-intensive processes as installation, maintenance, and repair.[2]

The business slowdown of the early 1970's was also a factor retarding the rate of gain in output per man-hour. In 1970, productivity rose by little more than 1 percent, the lowest annual increase for any year of the period under study. Reduced productivity growth then was associated mainly with relatively slower output growth. In 1971, too, output growth was comparatively slow; the strong recovery in productivity in that year was due in part to a drop in man-hours. Marked slowdowns in output growth were also experienced in earlier periods of business contraction. For example, in 1958 and 1961, both recession years, output rose by around 6 percent, compared with the two-decade average annual rate of output increase of just over 8 percent; in 1970, output rose by less than 7 percent. The impact of reduced output growth on productivity in earlier slowdowns was smaller, however, since man-hours declined rather sharply then. By contrast, man-hours rose strongly in 1970. (See chart 1.)

Output and demand

Productivity gains in telephone communications have been closely linked to expansion in output, which almost quintupled between the early fifties and the early seventies. (See table 1.) The wide availability of telephones has of course spurred the

Table 1. Indexes of output per man-hour and related data, telephone communications, 1951-72

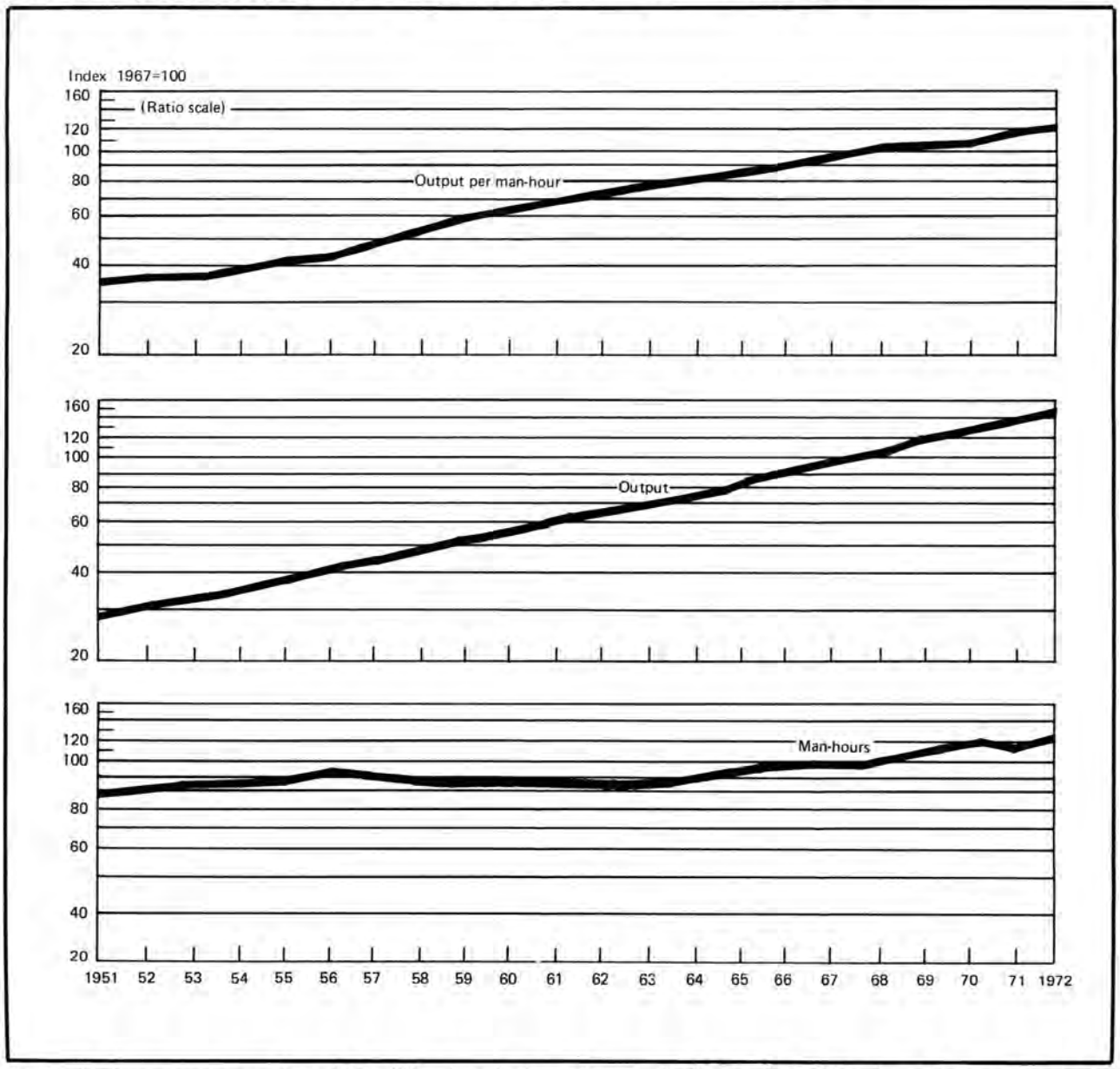
[1967=100]

Year	Output per employee man-hour	Output	Man-hours
1951	36.9	29.3	79.4
1952	37.7	31.1	82.4
1953	38.5	33.0	85.7
1954	41.1	35.3	85.8
1955	43.8	38.7	88.3
1956	45.1	42.2	93.6
1957	49.4	46.7	94.5
1958	55.7	49.4	88.7
1959	61.8	54.1	87.5
1960	65.6	57.9	88.2
1961	71.5	61.6	86.2
1962	76.4	66.1	86.5
1963	81.8	70.8	86.5
1964	85.3	76.4	89.6
1965	89.1	83.5	93.7
1966	93.0	92.2	99.1
1967	100.0	100.0	100.0
1968	106.2	108.1	101.8
1969	108.4	119.9	110.6
1970	109.6	127.9	116.7
1971	118.7	134.4	113.2
1972 [1]	123.2	146.9	119.2
	Average annual rates of change (percent)		
1951-72	6.5	8.1	1.6
1960-72	5.2	8.3	3.0

[1] Estimated.

Horst Brand is an economist in the BLS Office of Productivity and Technology. This study was conducted with the financial support of the National Commission on Productivity.

Chart 1. Output per employee man-hour and related data, telephone communications, 1951–72



demand. There were more than 125 million installed telephones (including private line phones) in the United States in 1971,[3] bringing the total of telephones to 60 per 100 population, as compared with 29 per 100 in 1951. More than nine-tenths of all households had telephones in 1971, as against less than two-thirds 20 years earlier. Growth in installed *residential* telephones (177 percent) significantly exceeded *business* telephone installations (149 percent) during this period.

The quintupling of the industry's total output since 1951, when viewed in the context of the more than twofold rise in the number of installed telephones, indicates intensification of user demand. The key factor underlying this intensification has probably been rising family incomes: The median income of families and unrelated (primary) individuals rose 79 and 76 percent in constant dollars between 1951 and 1970. Other important factors are likely to have been the growth in the number of households (rising by more than 21 million between 1951 and 1972); growing dispersion of the population in the suburbs of metropolitan areas (in 1969, 55 percent of the population residing in metropolitan areas lived outside central cities, compared with 42 percent in 1950); increasing geographic

mobility;[4] and the expanding communications needs of business and government, spurred in part by the same dispersion tendencies that have affected residential telephone demand, as well as by more systematic use of the telephone as a tool of management.[5]

Employment

Although productivity in the telephone industry during the past two decades surpassed that in the nonfarm economy as a whole, the growth of its employment has been less vigorous. Short-term fluctuations, moreover, have been considerably more pronounced. These fluctuations had varied causes. In the late 1950's and early 1960's, it was evidently the effect of technological changes which caused employment to contract. In recent years, declines in the trend rate of growth in output probably was the major factor slowing the expansion in employment. Swings in man-hours tended to be somewhat more pronounced than swings in employment.

Between 1951 and 1972, jobs in the telephone industry increased at an average annual rate of 1.4 percent, compared with 2.1 percent for nonfarm jobs as a whole. The industry's employment decreased between 1957 and 1963 while nonfarm jobs continued their postwar rise, but it expanded strongly again after 1963. It did not, however, regain the 1957 peak for 9 years. After 1970, employment in the industry again tended to rise at a lower annual rate than in the nonfarm economy as a whole (1.2 as against 1.5 percent).

Technology and productivity change

Technologies have not evolved uniformly in all operations of the telephone industry. Adoption of new technologies is necessarily gradual and requires some constraints on new equipment design so it would be compatible with the old equipment that remains. Several generations of switching technologies, for example, operate side by side, each serving large numbers of telephones. In 1970, the most advanced (and therefore as yet least diffused) technology, electronic switching, served 2.3 million telephones; cross-bar dial systems served 49.1 million; step-by-step dial systems, 47.5 million; and panel dial systems, 5.6 million.[6] These systems must be compatible with one another in their ability to receive and send calls, as well as with diverse existing transmission technologies.

While productivity levels tend to be higher with the newer than with the older technologies, new methods developed in connection with new technologies are frequently applied in connection with the old. For example, telemetering devices for detecting trouble in electronic switching systems have been adapted to electro-mechanical switching systems. More generally, existing systems are improved even as others are developed and replace them. Such adaptations and improvements tend to narrow the productivity gap between new and old technologies, at least during the earlier years; they may also retard the rate of diffusion of the new technology. Thus, the American Telephone & Telegraph Co. had estimated the adoption of electronic switching systems would spread rapidly after their introduction in 1965, with 11 percent of all dial lines served by 1970.[7] In fact, only about 2 percent of such lines were so served that year. While the development potential of new technologies is usually much greater than of the old,[8] a reason why they tend to evolve relatively slowly is that decisions to commit large-scale resources are frequently delayed pending refinement and favorable cost comparisons.[9]

Striking gains have been achieved in transmissions technology, but these gains have benefited toll (long-distance) service far more than local service, resulting in divergent cost and productivity trends.[10] Coaxial cables, for example, now transmit 32,400 telephone messages simultaneously, compared with 480 for the first coaxial cable introduced in 1941, and 5,580 for those installed in 1953.[11] New systems with a capacity of 90,000 messages are being installed.[12] The capacity of major microwave transmitters—which obviate the need for cables over long distances—has more than tripled in recent years to 20,000 circuits per route.[13]

These developments have spurred the growth of direct dial toll calling and have accelerated the growth of demand for private-line long-distance service. In 1971, about 72 percent of all long-distance calls were dialed directly, compared with 56 percent of a smaller total in 1966. Direct long-distance dialing evidently boosts productivity in telephone communications, since "[each] further percentage point of improvement in this ratio represents about $35 million in additional annual expense savings at current calling rates," according to the AT&T.[14] The volume of long-distance private-line service, as roughly indicated by operating revenues of large carriers, increased more than tenfold be-

tween 1951 and 1970 (compared with a fivefold increase in local private-line service). The increase apparently has also contributed to productivity advances in the industry since leasing of lines augments the utilization of communications capacity.[15]

Local service, on the other hand, appears to have remained relatively labor intensive. While improvements in installation methods and procedures have tended to reduce repair and maintenance requirements,[16] basic technology of local service transmissions—the two wires connecting a telephone station to the local exchange—has changed little over the years. There have indeed been substantial service improvements, such as the extension of local service areas to encompass entire metropolitan areas and the elimination of multiparty subscriber lines. But such improvements are not strictly laborsaving and do not in themselves raise productivity.

Partly as a result of the continued high labor intensity of local service transmission, as well as installation and maintenance, the decline in the number of telephone industry employees per 10,000 installed telephones has slowed in recent years. According to the American Telephone & Telegraph Co., 148 employees were required to service 10,000 telephones in 1950, and 96 in 1960—a drop of 35 percent. By 1971, the ratio fell to 77, a decline of only 20 percent.[17] This slowdown can also be attributed to the earlier completion of direct local and toll call dialing, which resulted in substantial labor savings. In recent years, such savings have not been much of a factor.

Changes in occupational structure

Long-term growth in telephone industry employment has been accompanied by significant shifts in occupations—shifts which have been tied closely to technological changes and which have involved higher levels of skills and training. Notable also has been a declining trend in the employment of women.

The virtually complete conversion of manual to automatic dialing, long-distance dialing, and automatic-message accounting have resulted in the long-term decline in the number of operators. In the immediate postwar period, telephone operators accounted for nearly one-half of the industry's total employment. Since then, their relative importance has lessened. Despite the increase in their number between 1963 and 1970, the relative decline has continued; in 1971, they represented less than a quarter of the total. (See table 2.) They accounted for four-fifths of the drop in total telephone industry employment between 1957 and 1963, and for one-seventh of the gain in subsequent years. These changes resulted largely from technological developments.[18]

By contrast, plant personnel—including central office craftsmen, installers, repairmen, linemen, and maintenance men—has rapidly expanded both in absolute numbers and in relative importance. Plant personnel exceeded operators for the first time in 1962, and constituted close to one-third of the industry's total employment in 1971. Central office craftsmen, assigned to the repair and maintenance of switching and related equipment, and installers and exchange repairmen have almost tripled in number since 1946; in 1971, their number was nearly half again as high as in 1962. The rise has been associated in part with the rapid increase in the number of installed telephones and of central office switchboards—at an average annual rate of 5.2 percent and 2.8 percent, respectively.[19] The downtrend in the number of line, cable, and conduit men—occasioned by the continued introduction of laborsaving methods in the installation of wires as well as by advances in wire and cable technology[20]—halted and reversed after 1963, although by 1971 that number had barely recovered its postwar peak of 1956.

The number of professional and semiprofessional personnel tripled over the postwar period; the relative importance of such personnel grew from less than 5 percent in 1951 to more than 10 percent in 1971. The expansion reflected in part the shift from

Table 2. Sex and occupational composition of telephone industry employment, selected years

[Percent]

Occupational group	1951	1962	1971
Total (in thousands)	644.0	687.5	942.0
Percent distribution	100.0	100.0	100.0
Men	33.3	44.0	46.5
Women	66.7	56.0	53.8
Professional and semiprofessional	4.9	8.4	10.7
Business, sales, and clerical	24.2	29.9	29.8
Operators	43.7	28.0	23.9
Plant personnel	23.0	29.4	32.4
Central office craftsmen	6.1	9.4	11.0
Installation and exchange repair	7.8	10.6	11.3
All other plant	9.1	9.4	10.1
All other personnel	4.2	4.3	3.2

the use of conventional electro-mechanical accounting and other records-processing machinery, still prevalent in the fifties, to electronic data processing, which has required the employment of programmers and other technical personnel versed in computer methods.[21]

Plant investment and research

The advance in telephone industry productivity has in part reflected the rapid expansion and modernization of physical plant, as well as research and development. The gross book value of communications plant owned by large carriers at the end of 1970 was reported at over $60 billion. The constant dollar value of communications plant quadrupled over the 1951–70 period, having grown at an average annual rate of 6.7 percent, compared with 2.9 percent for the capital stock of American industry as a whole.[22] Such trends suggest a rising ratio of capital to labor in the industry. But the expansion of plant has tended, at least in part, to be capitalsaving. For example, "the book cost per circuit mile of the Long Lines Department's transmission plant has decreased from about $60 in 1950 to about $20 today [in 1970]—and currently Long Lines is installing new interstate plant at an average cost of about $12 per circuit mile."[23]

Research and development play a vital role in an industry such as telephone communications, which heavily depends on technological advances and product innovations to raise productivity. No attempt is made here to determine quantitatively the relation between research and productivity in the industry.[24] The pertinent expenditure and employment data refer to the magnitude of the research and development effort and are not indicative of its economic effects.

Data on these variables are not available for the telephone industry as a whole, but only for the Bell Telephone Laboratories (an affiliate of American Telephone & Telegraph Co.), which, however, dominates the research effort of the industry. In early 1972, the Bell laboratories employed approximately 17,000 persons in research and development, representing nearly 5 percent of the estimated total of such employment in U.S. industry.[25] By far the larger portion of expenditures for research is devoted to the development and monitoring of new products and processes, systems engineering, analysis of operating problems, and design of computer programs for the management of resources. The relation between the Bell Telephone Laboratories and Western Electric Co., the manufacturing subsidiary of the American Telephone & Telegraph Co., helps ensure smooth progression from product design to manufacture. The Western Electric Co. also maintains laboratories of its own, researching processes of equipment manufacturing.[26]

Outlook

Basic demographic factors are likely to be less important stimuli of growth in demand for services of the telephone industry in the years ahead than they were during the 1960's. With more than nine-tenths of all households now served by telephones, growth from this source, by and large, will be limited to the increase in the number of households, projected at 18–20 percent between 1971 and 1980 by the Bureau of the Census.[27] However, second lines and lines in second homes are likely to contribute to future growth. The number of telephone calls, which rose by about one-fifth per household between 1960 and 1970, may slow somewhat, partly because of the uptrend in telephone rates (which is expected to continue for some time).[28] While higher flat rates seem unlikely to limit gains in local calls, higher toll rates may somewhat retard the growth in long-distance telephoning.

Changes in the variety of services offered will remain important sources of industry growth and of possible advances in telephone communications productivity. For example, the electronic central office will make automatic transfer of calls to designated locations possible. "Picturephone" service—visual telephony that transmits the voice and face of callers or presents telephone-transmitted computer output data on a screen—is expected to be used increasingly (it was introduced to the public in 1970).[29] Computer data traffic, which currently accounts for about 3 percent of all telephone time consumed, is expected to grow rapidly, with projections of telephone time consumed running upward of 10 percent of total time by 1980.[30]

Continued substantial advances are likely in satellite communications technology and in the uses to which it will be put. Since the mid-1960's, the COMSAT-managed global communications satellite system has evolved rapidly. The first generation of *Intelsat* satellites—the *Early Bird,* launched in

1965—had a capability of 240 two-way telephone circuits or one TV channel, and a relatively brief design life, estimated at 18 months (it operated satisfactorily for much longer than that). The latest (fourth) generation of *Intelsat* is capable of an average of 5,000 circuits plus TV, in varying combinations, and has an estimated design life of 7 years.[31]

In view of the anticipated slower growth of telephone installations, industry employment will expand more moderately than it did over the past two decades. Continued technological advances in long-distance communication and in local transmission, installation, and maintenance (considering the intensified research in this area) will also moderate the growth of employment. Projections of the Bureau of Labor Statistics suggest that the industry's employment between 1970 and 1980 will rise 9 percent, or by about 85,000 jobs—an addition about equal to the increase that occurred during the 1969–72 period. Actual increases since 1971 have been running somewhat above the projected trend.[32] □

———*FOOTNOTES*———

Note: The indexes for the telephone communications industry will be kept current and will be included in the annual BLS bulletin, *Indexes of Output Per Man-Hour, Selected Industries.*

[1] The telephone industry consists of establishments primarily engaged in furnishing telephone communications service by placing parties in vocal conversation with one another. It is designated as No. 481 in the *Standard Industrial Classification Manual*, 1972 edition, issued by the Office of Management and Budget, and is part of Group 48, Communication.

The output of the industry is defined and measured in terms of the real value of operating revenues of all telephone carriers with $1 million or more in annual revenue, reporting each year to the Federal Communications Commission; and of selected large carriers, not subject to reporting requirements, for which the FCC reports the data. The real value of operating revenue is derived by means of appropriate deflationary procedures. A technical note detailing the calculation of the productivity measure is available upon request.

[2] American Telephone & Telegraph Co., *1971 Annual Report*, pp. 20–22.

[3] *Statistics of Communications Common Carriers*, Year ended December 31, 1971 (Federal Communications Commission), tables 5 and 6.

[4] The proportion of the population classified by the Bureau of the Census as migrants (that is, moving to a different county in the same State or between States) did not change significantly between 1950 and 1970, but the numbers of migrants rose 27 percent. Among young persons (14 to 24 years), the proportion of migrants rose from 10 percent to 14 percent, and the number doubled.

[5] One of the main reasons why the Federal Telecommunications System—a leased telephone network providing direct dial access to all levels of government, particularly the Federal Government, as well as to the nationwide public telephone network—was installed in 1964 was the desire for better utilization of the telephone as a management tool. Prior to 1964, the telephone in government was underutilized compared with private business. Since that time, Federal Telecommunications System has caused the number of public business calls to increase by 15 to 17 percent annually. (Source: L. Plotkin, Director of Operations of the Federal Telecommunications System.)

[6] *Statistics of Communications*, table 16.

[7] *Technology and Manpower in the Telephone Industry, 1965–75* (U.S. Department of Labor, Manpower Administration), p. 29, Manpower Research Bulletin 13.

[8] "We are still in the childhood of ESS development." Paul F. Draudt, Engineering Manager of the American Telephone & Telegraph Co., cited in the firm's publication, *Electronic Switching: A New 'Brain' for Communication*, December 1969, p. 12.

[9] Ibid.

[10] "Technological advances in the telephone industry have produced almost phenomenal reductions in the unit costs of inter-exchange circuits, particularly for the longer haul circuits predominantly used for interstate services, while most of the technological advances in the short-haul toll and exchange service fields have resulted primarily in service improvements rather than in average unit cost reductions." From a letter by a telephone industry executive, cited in Charles F. Phillips, Jr., *The Economics of Regulation* (Homewood, Ill., Richard D. Irwin, Inc., 1955), p. 159.

[11] William M. Ellinghaus, "The Bell System's Role in Data Communications," *Bell Telephone Magazine*, November–December 1970, p. 28.

[12] Ibid.

[13] Information provided by the American Telephone & Telegraph Co.

[14] American Telephone & Telegraph Co., *1971 Annual Report*, p. 5.

[15] ". . . [Since private line services] travel [along] the same cable and relay routes as our message telephone service, they contribute significantly to our ability to take maximum advantage of the economies of scale that high capacity transmission systems provide." Ibid.

[16] Diebold Group, *Automation: Impact and Implications; Focus on Developments in the Communications Industry,*

April 1965, p. 57. Also *Technology and Manpower in the Telephone Industry*, p. 32.

[17] American Telephone & Telegraph Co., *1971 Annual Report*, p. 22.

[18] Telephone companies follow careful procedures to cushion the impact of prospective manpower reductions on employees. For details, see *Manpower Planning and Technological Change, Case Studies of Telephone Operators*, Bulletin 1574 (Bureau of Labor Statistics, 1968); and J. Joseph Loewenberg, *Effects of Change on Employee Relations in the Telephone Industry* (unpublished Ph. D. dissertation, Graduate School of Business Administration, Harvard University, 1962), especially ch. 3.

[19] *Statistics of Communications*, table 16.

[20] *Technology and Manpower in the Telephone Industry*, p. 45.

[21] Major fields of computer applications in the Bell System are listed in Diebold Group, *Automation*, pp. 53–54. Diebold reports 399 computers installed by the Bell System between 1956 and 1963. As of 1970, close to 700 computers were operating in the communications industry.

[22] *Fixed Nonresidential Business Capital in the United States, 1925–1970* (U.S. Department of Commerce, November 1971). Rates are for gross stocks, figured at 100 percent of Bulletin F service lines, straight-line depreciation, at constant cost.

[23] American Telephone & Telegraph Co., *1970 Annual Report*, p. 6.

[24] See Simon Kuznets, "Inventive Activity: Problems of Definition and Measurement," in *The Rate and Direction of Inventive Activity*, A Report of the National Bureau of Economic Research, Inc. (New York, 1962), for a discussion of what is involved in ascertaining the relation between research and development, and productivity.

[25] *Research and Development in Industry, 1969* (Washington, National Science Foundation, 1971); American Telephone & Telegraph Co., *Your Business*, March 1972, p. 9.

[26] American Telephone & Telegraph Co., *1967 Annual Report*, p. 14. See also McKinsey & Co., Inc., *A Study of Western Electric's Performance* (New York, American Telephone & Telegraph Co., 1969), pp. 46–47.

[27] *Statistical Abstract of the United States, 1972* (Bureau of the Census), p. 38.

[28] American Telephone & Telegraph Co., *Share Owners' Quarterly*, Autumn 1972.

[29] American Telephone & Telegraph Co., *Picturephone Service: Adding Sight to Sound*, August 1970.

[30] *Electronics*, November 24, 1969, p. 82.

[31] Communications Satellite Corporation, *Annual Report to the President and Congress*, May 31, 1971, pp. 27 and 39.

[32] *Tomorrow's Manpower Needs*, Bulletin 1737 (Bureau of Labor Statistics, vol. 4, revised 1971).

Labor requirements for construction of single-family houses

Building single-family houses involves more than 500,000 full-time jobs for workers in the construction industry

ROBERT BALL AND LARRY LUDWIG

BUILDING AN AVERAGE single-family house requires about 1,337 on-site man-hours of labor—slightly more than two-thirds of a construction man-year—according to a recent Bureau of Labor Statistics study. In this survey, the "average" house cost close to $26,000 and had roughly 1,600 square feet of floor space.

In terms of the value of the house, each $1,000 generates about 137 man-hours of labor in all sectors of the economy. Of these man-hours, 62 are expended in construction—52 on-site and the balance off-site, in contractors' offices and warehouses.

In addition to the direct employment generated in the construction industry, 75 man-hours of employment per $1,000 of construction are created in industries which mine, manufacture, distribute, and sell the materials used in single-family house construction. Thus, for every hour of on-site construction work, an additional .2 hour is spent in contractors' offices and warehouses and 1.4 hours in other industries. (See table 1.)

Estimates of man-hours required and full-time employment generated are based on a survey conducted by the Bureau of Labor Statistics under contract with the Department of Housing and Urban Development. This article presents a summary of findings, with a full report scheduled for release later this year.

According to the survey, construction of this type provided an estimated 450,000 construction workers with full-time jobs and required an additional 74,000 jobs for off-site construction personnel such as administrators, appraisers, engineers, architects, secretaries, and clerks in 1969. In addition, about 561,000 jobs were generated in industries which provide materials used in construction of houses.[1]

Table 1. Man-hour requirements, by industry, 1962 and 1969

Industry	1962			1969		
	Per 100 square feet of livable space	Per 1000 current dollars of construction [2]	Percent [1]	Per 100 square feet of livable space	Per 1000 current dollars of construction	Percent [1]
All industries	238	202	100.0	218	137	100.0
Construction	99	84	41.6	98	62	45.3
On-site	85	72	35.6	82	52	38.0
Off-site	14	12	5.9	16	10	7.3
Other industries	139	118	58.4	120	75	54.7
Manufacturing	72	61	30.2	65	41	29.9
Wholesale trade, transportation, and services	36	31	15.3	32	20	14.6
Mining and all other	31	26	12.9	22	14	10.2

[1] Calculated on basis of man-hours per $1,000. Except for rounding, percent distribution would be the same on square footage basis.

[2] Revised data.

The survey

The study was designed to measure the number of man-hours required for each $1,000 of single-family house construction price. It was based on a sample of 250 houses built in the continental United States stratified by geographic location, estimated cost of the houses, and degree of urbanization where they were built. Only private, new, conventionally built, single-family houses were considered within the scope of the survey.

Most of the houses in this study were located within metropolitan areas and had one story, a wood frame, basement, two or more bathrooms, forced air heating and a garage. Moreover, more than one-third of the houses surveyed had central air-conditioning. On the average, the construction of a single-family house took about 21 weeks to complete. Actual construction took place during 1968 and 1969; however, most of the homes were completed and sold during 1969.

On-site man-hour requirements, material requirements, and construction costs were obtained by BLS field representatives directly from over 4,000 general and specialty trade contractors. In addition to labor and material costs, profits, overhead, and selling expenses were included in the construction price. Ex-

Robert Ball and Larry Ludwig are economists in the Division of Productivity Research, Bureau of Labor Statistics.

From the *Review* of September 1971

cluded were the value of the land or lot and all capital improvements in the community, such as streets, sewers, recreational facilities, and so on.

Man-hour requirements other than for construction were developed from the interindustry growth model and reflect the labor expended to mine, process, transport and distribute the materials used in construction. Estimates were derived by first classifying and aggregating material values by type and deflating by an appropriate price index. These deflated values were matched with the appropriate industry sectors in the interindustry growth model to generate estimates of final demand. Sector productivity factors were then applied to derive employment and man-hours by industry group.

Change in on-site labor requirements

Comparison of data with an earlier study's results (from 1962) [2] reveals a decline in on-site man-hour requirements. This change reflects a host of economic factors including the introduction of new processes and materials, geographic shifts in demand, shifts in types of housing produced, and, of course, productivity growth. It is extremely difficult to isolate the effects of productivity change on labor requirements from these other factors.

In addition, the size of the sample in 1962 was considerably smaller than in the current survey, with only about a third as many respondents, and was limited to FHA- and VA-approved houses, in contrast to the current study which covers all new, conventionally built, private, single-family houses built for sale or custom-built under contract and costing $75,000 or less.

With these limitations in mind, two measures of change in on-site man-hour requirements were developed, one based on square footage, the other on constant dollars, using a Bureau of the Census single-family housing price index[3] to deflate the current dollar value.

On a square footage basis, man-hours per unit of output declined by slightly more than one-half of one percent a year. On a constant (1962) dollar basis—the effects of price increases having been removed—the decline was much sharper, almost 2 percent a year, as shown below.

	1962	1969	Average annual percent change
Man-hours per 100 square feet	85	82	—0.6
Man-hours per 1000 constant dollars	72	64	—1.9

The difference between these two measures reflects the lack of standardization of a square foot of single-family housing. That is, since homes built in 1969 have more bathrooms, air conditioning, and other features of improved quality, real value increased substantially faster than a measure of output based on square footage alone. These improvements also required a greater number of man-hours to install, but the increase in labor time was not proportionate to the increase in real value.

Distribution of on-site man-hours

In the construction of the houses studied, 69 percent of the on-site man-hours were worked by skilled tradesmen, 28 percent by semiskilled and unskilled workers, and 3 percent by nonproduction employees (supervisors, engineers, clerks). (See table 2.) Four major building crafts—carpenters, painters, bricklayers, and plumbers—accounted for three-fourths of the skilled employees. Carpenters were the most frequently used occupation at the site. With wood still used so extensively to frame, cover (in whole or in part), floor, and trim single-family houses, it is not difficult to understand why carpenters hold such a commanding position.

Over one-fifth of the man-hours were expended by laborers, helpers, and tenders, a somewhat larger proportion than was found in the earlier study. To a very large extent this reflected the greater use of prefabricated materials, which often require less skill to install. Except for this shift, there was relatively little change in occupational requirements.

Table 2. Percent distribution of on-site man hours by occupation and type of contractor, 1969

Occupation	Percent distribution	Contractor	Percent distribution
Total	100.0	Total	100.0
Supervisory, professional, technical and clerical	2.8	General	31.3
Carpenters	34.9	Carpentry	16.9
Painters	7.3	Plumbing, heating, ventilating and air conditioning	8.7
Bricklayers	5.7	Painting and paper hanging	6.5
Plumbers	4.3	Masonry and stonework	9.0
Cement finishers	2.5	Concrete and stucco work	7.2
Electricians	3.0	Electrical (except heating)	3.7
Plasterers and lathers	1.7	Plastering and lathing	1.4
Sheet-metal workers	1.3	Roofing and siding	2.0
Roofers	0.9	Ceramic tile, terrazzo, and marble work	2.2
Operating engineers	1.8	Excavation and grading	1.6
Tile setters	1.4	Wood flooring	0.9
Soft floor layers	0.6	Other flooring	1.6
All other skilled trades	3.3	Wallboard	4.0
Laborers	14.1	All other types	2.9
Helpers and tenders	13.8		
Truckdrivers and miscellaneous workers	0.5		

NOTE: Detail may not add to totals due to rounding.

In terms of organizational characteristics of the industry, the study found that general contractors accounted for over 30 percent of the man-hours in on-site construction, while carpentry contractors accounted for 17 percent. In terms of the occupational distribution, however, carpenters accounted for 35 percent of the on-site man-hours. Based on a comparison with the earlier study, carpentry man-hours have increased considerably while hours worked by general contractors have declined, indicating that general contractors are concentrating more of their effort on coordinating, financing, and purchasing while subcontracting more on-site work to carpentry contractors.

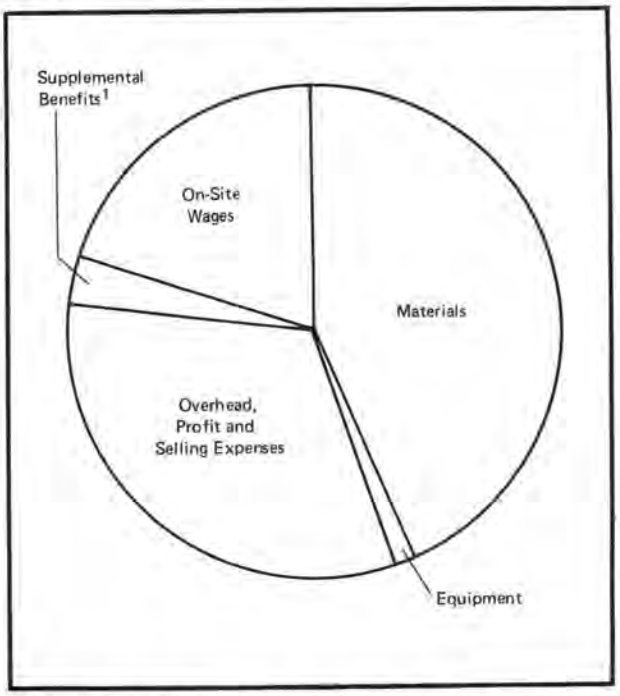
Distribution of costs

Materials, including equipment, represented $442.90 per $1,000 or 44 percent of the construction price. (See chart 1.) The most important materials category was lumber and wood products, accounting for about 18 percent of the total or $179.60 per $1,000. The second most important material grouping was stone, clay, and glass products representing $95.30 per $1,000 of construction price.

On-site wages and salaries (including overtime) accounted for over 20 percent of construction price. Employer contributions for social security, unemployment insurance, and other benefits make up an additional 3 percent. The remaining 33 percent included profit, selling expenses, and overhead (such as architectural fees, office and warehouse expenses, and contractor financing).

The complete report, in addition to extending data contained in this article, will include man-hours and costs by selected characteristics of houses, a listing of types of materials used, costs by type of contractor, and wages by occupation. Other information: extent of unionization, degree of specialization in homebuilding, prevalence of apprenticeship training programs and recommendations for improving construction efficiency. In addition, the published study will include a description of methodology, scope, and limitations of the survey. □

Chart 1. Distribution of construction costs for single-family houses, 1969



[1] Supplemental benefits (fringes), FICA (Social Security), and Unemployment insurance.

FOOTNOTES

[1] These estimates, while representing only jobs created by houses built for sale and custom-built under contract, actually accounted for virtually all jobs in single-family housing construction, because the other major grouping, owner-built houses, provides relatively few on-site jobs. The estimates were derived using 1,800 hours a year for on-site construction workers and 2,080 hours for other workers.

[2] In residential construction, the following detailed bulletins have been published, and summaries of the studies appeared in the *Monthly Labor Review* (issues in parenthesis after bulletin citations): *Labor and Material Requirements for Private One-Family House Construction* (BLS Bulletin 1404, 1964) (*MLR*, July 1964, pp. 797–800); *Labor and Material Requirements for College Housing Construction* (BLS Bulletin 1441, 1965), (*MLR*, September 1965, pp. 1100-1104); *Labor and Material Requirements for Public Housing Construction* (BLS Bulletin 1402, 1964). Other studies in this series include civil works projects of the Corps of Engineers, federally aided highways, Federal office buildings, hospitals and nursing homes, elementary and secondary schools, and sewer works. In progress are studies of multi-family houing and a recycling of public housing and Federal highways.

[3] See John C. Musgrave, "The Measurement of Price Changes in Construction," *Journal of the American Statistical Association*, September 1969, pp. 771-786.

Productivity and unit labor costs in 12 industrial countries

U.S. manufacturing productivity rose sharply in 1971 and 1972; unit labor costs showed little change in contrast to big rises in other countries

PATRICIA CAPDEVIELLE AND ARTHUR NEEF

PRODUCTIVITY in manufacturing, as measured by output per man-hour, rose substantially in the United States in both 1971 and 1972 and, in contrast to the 1960's, nearly equaled the overall rate of increase in 11 other industrial countries studied. The U.S. productivity growth almost offset the rise in hourly compensation, and manufacturing unit labor costs declined slightly in 1971 and rose only 1 percent in 1972. Productivity growth in the 11 other countries as a group offset only about half the increase in hourly compensation, and the rise in average unit labor costs was 14 percent over the 2 years.

The December 1971 dollar devaluation and other currency realignments further improved the relative cost position of U.S. manufacturers in 1971 and 1972. In terms of U.S. dollars, the percent increase in unit labor costs for the 11 foreign countries was twice the increase calculated on the basis of national currencies.

In the first half of 1973, preliminary estimates indicate that productivity in U.S. manufacturing was nearly 6 percent above the same period in 1972 and that unit labor costs were up only about 1 percent. Preliminary estimates for five of the foreign countries show that productivity increased at about the U.S. rate in Canada and three times the U.S. rate in Japan over the same period and that changes in unit labor costs—after adjustment for changes in currency values—ranged from a decline in the United Kingdom to substantial increases in France and Germany. Preliminary estimates for 1973 are shown in table 1.

This article discusses recent trends in manufacturing output per man-hour, hourly compensation,[1] and unit labor costs for 12 industrial countries and summarizes the trends since 1960. Unit labor costs are presented on a U.S. dollar basis [2] as well as in national currencies because major changes in currency values have a significant effect on relative costs. The data pertain to percent year-to-year changes. No reference is made to levels of productivity or costs between countries.[3] Data concepts and revisions of the Bureau's previously published estimates are briefly described in the appendix.

Recent trends

Output per man-hour. In the United States, output per man-hour in manufacturing increased 7.1 percent in 1971 and 5.3 percent in 1972. The large increases followed the general pattern of productivity gains during an economic recovery. In 1970, U.S. productivity had risen by less than 1 percent. The trend in Canada and the United Kingdom was similar to that in the United States, although the productivity increases were not so large. (See table 2.)

In Japan and most of the European countries, where recent economic slowdowns and recoveries generally lagged behind the United States by about 1 year, 1971 output per man-hour gains were the smallest in recent years. Productivity rebounded in Japan and the European countries in 1972.

The rate of increase in U.S. output per man-hour slowed in the first half of 1973, but output per man-hour was still almost 6 percent above the level

Table 1. Percent change in productivity and labor costs, first half 1972 to first half 1973

Country	Output per man-hour	Hourly compensation	Unit labor costs		Exchange rate [1]
			National currency	U.S. dollars	
United States	5.9	7.1	1.1	1.1	----------
Canada	5.0	8.5	3.3	3.3	0
Japan	18.9	18.7	−.2	11.6	11.7
France	8.9	13.5	4.3	14.9	10.2
Germany	7.8	11.5	3.4	15.3	11.5
United Kingdom	9.4	9.5	.1	−4.7	−4.7

[1] Value of foreign currency relative to U.S. dollar.

Patricia Capdevielle and Arthur Neef are economists in the Division of Foreign Labor Statistics and Trade, Bureau of Labor Statistics.

From the *Review* of November 1973

Table 2. Average annual percent change in output per man-hour, 1960–72

Country	1960–72	1960–65	1965–70	1970	1971	1972
United States	3.2	4.3	2.0	0.7	7.1	5.3
11 countries	6.1	5.5	6.7	5.2	4.8	7.6
Canada	4.2	4.4	4.4	1.6	5.7	4.4
Japan	10.4	8.5	13.4	12.7	3.5	10.1
Belgium	6.5	5.1	7.7	4.5	4.6	10.0
Denmark	7.0	4.9	8.5	5.9	7.3	11.0
France	5.9	4.9	6.5	5.0	4.8	7.2
Germany	5.9	6.4	5.6	2.5	4.9	7.0
Italy	6.2	6.8	5.3	5.0	4.3	6.9
Netherlands	7.1	5.2	8.5	8.2	5.7	7.2
Sweden	7.3	7.6	7.5	5.4	2.7	7.9
Switzerland	5.1	2.4	6.7	8.2	5.3	5.0
United Kingdom	4.0	4.1	3.7	.6	5.6	5.6
European Economic Community						
Original [1]	6.0	5.9	6.1	4.1	5.1	7.3
Expanded [2]	5.6	5.5	5.6	3.5	5.4	7.1

[1] Belgium, France, Germany, Italy, and the Netherlands.
[2] Belgium, Denmark, France, Germany, Italy, the Netherlands, and the United Kingdom.

in the first half of 1972. In the five other major countries for which preliminary data are available, increases in the first half of 1973 were all larger than their 1972 advances.

Hourly compensation. The rate of increase in hourly compensation in U.S. manufacturing slowed from 7.0 percent in 1971 to 6.3 percent in 1972—a gradual moderation from the 1970 rate of advance. (See table 3.)

In the 11 foreign countries combined, hourly compensation rose nearly 14 percent in 1971 and 13 percent in 1972. In France, Germany, Italy, and the United Kingdom, the 1971 and 1972 increases were somewhat smaller than the advances made during the 1970 wage explosions. In Canada, Japan, and the Netherlands also, the 1971 and 1972 increases were moderations from peak 1970 compensation gains. However, hourly compensation gains accelerated in Denmark and Sweden from 1970 to 1972 and the largest compensation advances in Belgium and Switzerland occurred in 1971.

Hourly compensation in the United States accelerated beginning in the fourth quarter of 1972. In the five other major countries except the United Kingdom, the first half 1973 compensation gains were larger than the advances made in 1972.

Unit labor costs. In the United States, manufacturing unit labor costs declined 0.2 percent in 1971 and increased only 1 percent in 1972, as large productivity advances almost completely offset compensation gains. (See table 4.)

In contrast, in Japan and the European countrits, unit labor costs rose sharply in 1971 because hourly compensation continued to advance much more rapidly than productivity. In 1972, reobunding productivity gains offset the large compensation advances to a greater extent, and unit labor costs in most of the countries increased at only about half the 1971 rates. In Canada, the 1971 and 1972 unit labor cost increases were sizable compared to the U.S. cost trend, although they averaged less than in Japan and the European countries. In the 11 foreign countries combined, unit labor costs increased 8.5 percent in 1971 and 5.1 percent in 1972.

Unit labor costs in U.S. manufacturing began to rise in the fourth quarter of 1972, reversing the cost declines of the previous two quarters, but in the first half of 1973 they were still only 1.1 percent above the level in the first half of 1972. In Canada, France, and Germany, unit labor costs in the first half of 1973 were 3 to 4 percent above the same period in 1972, whereas in Japan and the United Kingdom, unit labor costs were virtually stable.

Unit labor costs in U.S. dollars. In terms of U.S. dollars, unit labor costs increased an additional 3 percentage points in 1971 and an additional 9 percentage points in 1972 for the 11 foreign countries as a group, because of the December 1971 dollar devaluation and other 1971–72 currency realignments. (See table 5.) The currency adjustments particularly affected Japan and Germany; from 1970 to

Table 3. Average annual percent change in hourly compensation, 1960–72

Country	1960–72	1960–65	1965–70	1970	1971	1972
United States	5.1	3.7	6.1	7.2	7.0	6.3
11 countries	9.5	8.8	9.3	14.9	13.8	13.1
Canada	6.2	3.5	7.6	8.0	8.0	7.4
Japan	14.1	13.2	15.2	18.8	15.7	16.1
Belgium	9.9	8.8	9.4	13.6	14.0	13.0
Denmark	11.1	9.2	11.8	11.5	13.2	14.7
France	9.5	9.0	10.0	13.6	12.4	12.5
Germany	9.3	9.6	8.3	15.2	14.4	11.4
Italy	11.2	13.6	9.4	20.0	18.4	13.8
Netherlands	12.1	11.4	11.9	14.8	14.5	12.5
Sweden	10.4	10.3	10.1	10.6	12.5	12.9
Switzerland	8.3	8.8	7.1	11.0	12.8	11.9
United Kingdom	8.0	6.4	7.4	14.5	12.7	14.4
European Economic Community						
Original [1]	9.9	10.1	9.2	15.4	14.5	12.3
Expanded [2]	9.4	9.0	8.8	15.2	14.3	12.9

[1] Belgium, France, Germany, Italy, and the Netherlands.
[2] Belgium, Denmark, France, Germany, Italy, the Netherlands, and the United Kingdom.

1972, the yen appreciated 18 percent and the mark 14 percent, respectively, in terms of U.S. dollars. In contrast, Canada and the United Kingdom allowed their currencies to float during this period, and the Canadian dollar and British pound increased only about 5 percent in terms of U.S. dollars.

The net effect of the December 1971 devaluation of the U.S. dollar and the other 1971–72 currency changes was to decrease substantially the number of foreign currency units necessary to purchase U.S. manufactured goods and thereby to lower U.S. unit labor costs relative to those in the other countries.[4]

The U.S. dollar was devalued by another 10 percent in mid-February 1973 and continued to float downward in value relative to most other major currencies in the first half of 1973. The effect of the 1973 currency adjustments is to further improve the labor cost position of U.S. manufacturing relative to most of the 11 other industrial countries. The percent change in the value of currencies of other major countries relative to the U.S. dollar from annual average 1972 to March 1973, the first full month following the devaluation, and from March 1973 to June 1973 are shown in the following tabulation:

Country	*1972–March 1973*	*March–June 1973*
Canada	−0.6	−0.2
Japan	15.7	−1.0
France	11.9	5.8
Germany	13.3	9.1
Italy	2.8	−4.6
United Kingdom	−1.1	4.2

Table 4. Average annual percent change in unit labor costs in national currencies, 1960–72

Country	1960–72	1960–65	1965–70	1970	1971	1972
United States	1.8	−0.7	4.0	6.5	−0.2	1.0
11 countries	3.2	3.1	2.4	9.2	8.5	5.1
Canada	1.9	−.8	3.1	6.2	2.2	2.9
Japan	3.3	4.3	1.6	5.4	11.7	5.5
Belgium	3.2	3.5	1.5	8.7	9.1	2.7
Denmark	3.8	4.0	3.0	5.3	5.4	3.3
France	3.5	3.8	3.2	8.2	7.2	5.0
Germany	3.3	3.0	2.6	12.4	9.0	4.1
Italy	4.7	6.3	3.9	14.3	13.4	6.5
Netherlands	4.7	5.9	3.1	6.0	8.4	4.8
Sweden	2.9	2.6	2.4	4.9	9.6	4.6
Switzerland	3.0	6.3	.4	2.7	7.3	6.5
United Kingdom	3.8	2.2	3.6	13.8	6.8	8.3
European Economic Community						
Original [1]	3.6	3.9	2.9	10.9	9.0	4.7
Expanded [2]	3.6	3.4	3.0	11.3	8.4	5.4

[1] Belgium, France, Germany, Italy, and the Netherlands.
[2] Belgium, Denmark, France, Germany, Italy, the Netherlands, and the United Kingdom.

Table 5. Average annual percent change in unit labor costs in U.S. dollars, 1960–72

Country	1960–72	1960–65	1965–70	1970	1971	1972
United States	1.8	−0.7	4.0	6.5	−0.2	1.0
11 countries	3.3	3.0	1.8	10.4	11.6	13.7
Canada	1.9	−2.9	3.5	9.6	5.6	4.9
Japan	4.1	4.2	1.8	5.4	15.3	20.9
Belgium	3.7	3.5	1.4	9.8	11.5	13.2
Denmark	3.2	4.0	.9	5.5	6.9	10.0
France	2.7	3.8	1.0	1.3	7.6	14.7
Germany	4.8	3.7	4.1	20.9	14.3	13.5
Italy	4.9	6.2	3.8	14.3	15.1	12.8
Netherlands	5.4	6.7	3.0	6.2	12.3	14.0
Sweden	3.2	2.6	2.3	4.6	11.3	12.3
Switzerland	3.6	6.2	.5	2.7	12.4	14.6
United Kingdom	2.2	2.1	−.4	14.1	9.0	10.8
European Economic Community						
Original [1]	4.2	4.3	2.9	12.6	12.1	13.5
Expanded [2]	3.6	3.6	2.0	12.8	11.4	12.8

[1] Belgium, France, Germany, Italy, and the Netherlands.
[2] Belgium, Denmark, France, Germany, Italy, the Netherlands, and the United Kingdom.

Trends since 1960

Tables 2 through 6 summarize data on changes in productivity, compensation, and unit labor costs in the United States and the 11 other countries from 1960 to 1972. Previous articles have discussed the earlier trends in more detail.[5]

Output per man-hour. The overall 1960–72 rate of productivity growth in the 11 foreign countries combined was almost twice the rate of increase in the United States. In the United States, output per man-hour rose an average 4.3 percent during the economic expansion from 1960 to 1965, then only 2 percent per year from 1965 to 1970. In most of the other 11 countries, in contrast, average productivity increases in the second period were about equal to or greater than the average increases in the first 5 years. Productivity made the most dramatic acceleration in Japan, from 8.5 percent per year in 1960–65 to 13.4 percent per year in 1965–70.

In 1971 and 1972 combined, output per man-hour increased in the United States at twice the average U.S. rate since 1960. In Canada also, the 2-year productivity advance was more rapid than the Canadian trend since 1960. The productivity gains in most of the European countries, averaged for the 2 years, were about equal to their longer term trends; while in Japan the 2-year productivity rise was slower than the long-term Japanese rate because of the relatively small 1971 increase.

Hourly compensation. For the 1960 to 1972 period as a whole, the average rate of increase in hourly compensation among the European countries was about twice the U.S. rate; in Japan it was almost three times the U.S. rate. Hourly compensation in the United States rose less than the long-term average from 1960 to 1965, but accelerated in the next 5 years to an increase of over 7 percent in 1970. With the U.S. wage acceleration, the differentials in the compensation trends from 1965 to 1969 were reduced between the United States and every other country except Canada and Japan. In 1969 or 1970, Japan and most of the European countries experienced a wage explosion. The compensation trend moderated somewhat in most countries since 1970, but the recent advances in all 12 countries were nevertheless larger than their average rates of increase since 1960.

Table 6. Indexes of output per man-hour, hourly compensation, and unit labor costs, all employees, in manufacturing, and value of currencies, selected countries, 1960–72

[1967 = 100]

Item and country	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972[1]
OUTPUT PER MAN-HOUR													
United States	80.5	82.5	87.2	90.7	95.0	98.8	100.1	100.0	104.8	107.3	108.0	115.7	121.3
11 countries	68.7	71.6	75.0	78.6	84.7	89.6	94.4	100.0	108.3	116.3	122.4	128.3	138.1
Canada	75.9	80.1	84.3	87.4	91.2	94.5	97.1	100.0	107.3	113.2	115.0	121.6	126.9
Japan	52.5	59.4	62.0	67.0	75.9	79.1	87.1	100.0	112.6	130.0	146.5	151.7	167.0
Belgium	69.2	70.7	75.6	78.9	84.1	87.8	94.0	100.0	109.0	120.1	125.5	131.3	144.4
Denmark	68.2	71.6	74.6	76.3	82.7	87.3	91.7	100.0	110.6	121.0	128.1	137.5	152.6
France	69.6	72.8	76.1	79.8	84.0	88.7	94.8	100.0	108.2	115.1	120.9	126.7	135.8
Germany	66.4	70.0	74.5	78.4	84.5	90.4	94.0	100.0	107.6	113.8	116.7	122.4	131.0
Italy	65.1	67.4	74.1	76.5	81.5	91.6	96.0	100.0	108.4	112.2	117.8	122.9	131.3
Netherlands	67.8	71.3	73.0	75.3	82.6	87.8	93.1	100.0	110.7	120.7	130.6	138.0	148.0
Sweden	61.4	64.3	69.1	72.7	81.6	87.7	93.3	100.0	110.5	118.0	124.3	127.6	137.6
Switzerland (wage earners only)	80.4	80.5	79.9	82.1	85.8	90.6	95.2	100.0	105.3	116.0	125.5	132.2	138.8
United Kingdom	76.8	77.4	79.3	83.6	89.7	92.4	95.7	100.0	106.8	108.3	109.0	115.0	121.5
European Economic Community													
Original[2]	67.3	70.4	74.7	78.3	83.8	89.8	94.6	100.0	108.1	114.6	119.2	125.3	134.4
Expanded[3]	69.4	71.9	75.7	79.5	85.1	90.3	94.8	100.0	107.9	113.4	117.3	123.7	132.5
HOURLY COMPENSATION IN NATIONAL CURRENCY													
United States	76.6	79.0	82.3	85.0	89.0	91.2	95.3	100.0	107.2	114.0	122.2	130.8	139.0
11 countries	57.3	62.2	68.1	73.5	79.9	87.4	94.7	100.0	109.0	120.4	138.3	157.4	178.0
Canada	72.2	74.1	76.2	79.0	82.0	86.1	92.9	100.0	107.3	115.3	124.5	134.5	144.5
Japan	43.1	50.2	57.3	64.0	71.9	81.0	89.3	100.0	116.2	137.5	163.4	189.0	219.5
Belgium	54.6	57.4	61.6	67.2	75.1	82.3	91.1	100.0	106.4	115.9	131.7	150.2	169.7
Denmark	50.3	56.1	60.9	65.6	71.1	79.4	90.2	100.0	112.0	124.8	139.2	157.6	180.7
France	56.4	62.1	68.3	74.7	80.5	86.5	92.7	100.0	112.3	122.5	139.1	156.4	175.9
Germany	54.3	60.6	68.5	73.2	78.9	86.7	94.5	100.0	105.9	115.5	133.0	152.1	169.4
Italy	49.5	52.5	61.5	73.2	82.3	89.0	91.4	100.0	107.2	117.6	141.1	167.0	190.0
Netherlands	46.4	52.8	56.1	61.5	71.9	80.5	90.0	100.0	110.3	124.6	143.0	163.7	184.1
Sweden	50.4	55.1	61.5	67.8	74.5	82.0	90.4	100.0	109.4	120.3	132.9	149.6	168.8
Switzerland (wage earners only)	57.1	62.2	68.2	74.3	80.4	86.6	94.0	100.0	105.3	112.3	124.7	140.7	157.4
United Kingdom	65.1	70.2	73.8	77.2	82.8	90.5	99.7	100.0	108.7	116.8	133.8	150.8	172.6
European Economic Community													
Original[2]	53.7	59.1	66.1	72.5	79.3	86.5	93.1	100.0	108.3	118.4	136.6	156.5	175.8
Expanded[3]	56.5	61.8	67.9	73.6	80.0	87.4	94.7	100.0	108.5	118.2	136.1	155.6	175.6
UNIT LABOR COSTS IN NATIONAL CURRENCY													
United States	95.2	95.8	94.3	93.7	93.5	92.3	95.2	100.0	102.3	106.3	113.2	113.0	114.1
11 countries	83.4	86.9	90.8	93.5	94.3	97.5	100.2	100.0	100.6	103.5	113.0	122.6	128.9
Canada	95.1	92.5	90.4	90.4	90.0	91.1	95.6	100.0	100.0	101.9	108.2	110.6	113.8
Japan	82.1	84.4	92.4	95.5	94.7	102.4	102.5	100.0	103.2	105.8	111.5	124.6	131.5
Belgium	78.9	81.2	81.4	85.1	89.3	93.7	196.9	100.0	97.6	96.5	104.9	114.4	117.5
Denmark	73.8	78.4	81.7	86.0	86.0	91.0	98.4	100.0	101.3	103.2	108.7	114.6	118.4
France	81.1	85.3	89.7	93.6	95.8	97.6	97.7	100.0	103.7	106.4	115.1	123.4	129.6
Germany	81.7	86.5	92.0	93.3	93.3	95.8	100.5	100.0	98.5	101.5	114.0	124.3	129.4
Italy	76.1	78.0	82.9	95.7	101.0	97.2	95.2	100.0	98.9	104.8	119.8	135.9	144.7
Netherlands	68.5	74.1	76.8	81.7	87.0	91.7	96.6	100.0	99.6	103.3	109.5	118.7	124.4
Sweden	82.0	85.7	89.1	93.3	91.3	93.5	96.9	100.0	99.0	102.0	107.0	117.2	122.6
Switzerland (wage earners only)	71.0	77.3	85.3	90.5	93.7	95.6	98.8	100.0	99.9	96.7	99.3	106.5	113.4
United Kingdom	84.8	90.6	93.1	92.4	92.3	98.0	104.1	100.0	101.8	107.9	122.8	131.1	142.0
European Economic Community													
Original[2]	79.8	83.9	88.5	92.7	94.6	96.3	98.4	100.0	100.2	103.4	114.6	124.9	130.8
Expanded[3]	81.5	85.9	89.7	92.6	94.0	96.8	99.9	100.0	100.6	104.3	116.0	125.7	132.5

Table 6. Continued—Indexes of output per man-hour, hourly compensation, and unit labor costs

Item and country	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972[1]
VALUE OF FOREIGN CURRENCY RELATIVE TO THE U.S. DOLLAR													
11 countries	100.4	100.9	100.6	100.5	100.4	100.4	100.2	100.0	97.5	97.3	98.4	101.3	109.5
Canada	111.3	106.5	100.9	100.0	100.0	100.1	100.1	100.0	100.1	100.2	103.4	106.8	108.9
Japan	100.6	100.3	100.4	100.2	100.0	100.2	99.9	100.0	100.4	101.1	101.1	104.2	119.5
Belgium	99.6	99.6	99.8	99.6	99.9	100.1	99.7	100.0	99.5	99.1	100.1	102.4	112.9
Denmark	101.3	101.1	101.2	101.1	100.9	100.9	101.0	100.0	93.3	92.8	93.1	94.3	100.4
France	100.3	100.3	100.4	100.4	100.4	100.4	100.1	100.0	99.4	95.0	89.0	89.3	97.5
Germany	95.6	99.3	99.7	100.0	100.3	99.8	99.7	100.0	99.9	101.6	109.3	114.7	125.0
Italy	100.5	100.5	100.5	100.4	100.0	99.9	100.0	100.0	100.1	99.5	99.5	100.9	106.9
Netherlands	95.5	99.3	100.0	100.0	99.9	100.1	99.5	100.0	99.5	99.4	99.6	103.2	112.2
Sweden	99.9	99.9	100.1	99.5	100.2	100.1	99.9	100.0	99.9	99.8	99.5	101.1	108.5
Switzerland	100.2	100.2	100.1	100.2	100.2	100.0	100.0	100.0	100.3	100.4	100.4	105.3	113.4
United Kingdom	102.1	101.9	102.1	101.8	101.5	101.7	101.5	100.0	87.0	86.9	87.1	88.9	90.9
European Economic Community													
Original[2]	97.9	99.8	100.0	100.2	100.2	100.0	99.9	100.0	99.7	99.0	100.6	103.4	112.1
Expanded[3]	99.2	100.4	100.6	100.6	100.6	100.5	100.3	100.0	96.5	96.0	97.3	100.0	107.1
UNIT LABOR COSTS IN U.S. DOLLARS[4]													
United States	95.2	95.8	94.3	93.7	93.5	92.3	95.2	100.0	102.3	106.3	113.2	113.0	114.1
11 countries	83.7	87.6	91.3	93.9	94.7	97.9	100.5	100.0	98.1	100.7	111.3	124.2	141.2
Canada	105.8	98.6	91.3	90.4	90.0	91.2	95.7	100.0	100.2	102.1	111.9	118.2	124.0
Japan	82.6	84.6	92.7	95.7	94.7	102.6	102.4	100.0	103.7	106.9	112.7	129.9	157.1
Belgium	78.6	80.9	81.3	84.8	89.2	93.8	96.6	100.0	97.1	95.6	105.0	117.1	132.6
Denmark	74.7	79.2	82.6	87.0	86.8	91.8	99.5	100.0	94.5	95.8	101.1	108.1	118.9
France	81.3	85.6	90.1	94.0	96.2	97.9	97.9	100.0	103.0	101.1	102.4	110.2	126.4
Germany	78.1	85.9	91.7	93.3	93.6	95.6	100.2	100.0	98.3	103.1	124.6	142.5	161.7
Italy	76.5	78.3	83.4	96.1	101.0	97.1	95.1	100.0	99.0	104.3	119.2	137.2	154.7
Netherlands	65.4	73.6	76.8	81.8	86.9	91.8	96.2	100.0	99.1	102.7	109.1	122.5	139.6
Sweden	81.9	85.6	89.2	92.8	91.5	93.6	96.8	100.0	98.9	101.8	106.5	118.5	133.1
Switzerland(wage earners only)	71.1	77.4	85.4	90.6	93.9	95.6	98.8	100.0	100.2	97.1	99.7	112.1	128.5
United Kingdom	86.6	92.3	95.0	94.0	93.7	99.6	105.8	100.0	88.6	93.7	106.9	116.5	129.1
European Economic Community													
Original[2]	78.1	83.7	88.5	92.8	94.9	96.4	98.3	100.0	99.9	102.3	115.3	129.2	146.6
Expanded[3]	80.9	86.3	90.3	93.2	94.6	97.2	100.2	100.0	97.0	100.0	112.9	125.7	141.9

[1] Estimates derived from preliminary data or current data from statistical series other than those used for measuring long-term trends.
[2] Belgium, France, Germany, Italy, and the Netherlands
[3] Belgium, Denmark, France, Germany, Italy, the Netherlands, and the United Kingdom.
[4] Indexes in national currency adjusted for changes in prevailing exchange rates.

Unit labor costs. For the whole period 1960 to 1972, the United States and Canada had significantly smaller rates of increase in unit labor costs than the 10 other countries. In the early 1960's, unit labor costs actually declined in the United States and Canada, while they increased rapidly in Japan and the European countries. In contrast, in the 1965–70 period, unit labor costs increased at a faster rate in the United States than in the other countries. In recent years, however, unit labor costs have again grown more slowly in the United States.

Unit labor costs in U.S. dollars. After adjustment for the several currency realignments from 1960 to 1972,[6] the average annual rate of increase in unit labor costs in U.S. dollars for the 11 foreign countries combined is increased slightly from 3.2 percent per year to 3.3 percent per year. The rates of increase in unit labor costs for particular countries, however, are raised or reduced significantly. For example, unit labor costs in Japan increased 3.3 percent per year from 1960 to 1972 on a national currency basis but rose 4.1 percent per year in U.S. dollars, while unit labor costs in the United Kingdom increased 3.8 percent per year in national currency but 2.2 percent per year in U.S. dollars.

The countries whose currencies were devalued during the 1960's (Canada, Denmark, France, and the United Kingdom) thereby lowered their unit labor costs relative to the United States, while the countries which revalued (Germany and the Netherlands) thereby increased their costs relative to the United States. When the United States devalued the dollar in late 1971, the relative unit labor costs of all the 11 other countries were increased, and the costs of Germany and Japan were further raised by their additional revaluations.

The following tabulation shows the average an-

nual percent change (compound rate of change [7]) in the value of the currencies of selected foreign countries relative to the U.S. dollar between 1960 and 1970, and between 1970 and 1972:

Country	*1960–70*	*1970–72*
11 countries	−0.2	5.6
Canada	−.6	2.7
Japan	.1	8.9
European Economic Community (expanded)	−.2	5.1
France	−1.2	4.8
Germany	1.4	7.0
United Kingdom	−1.3	2.2

Average unit labor costs in the 11 foreign countries as a group increased 33 percent in terms of U.S. dollars in the 10 years from 1960 to 1970 (35 percent in national currencies), compared to a 19-percent rise in the United States, for a cost trend difference of 14 percentage points. From 1970 to 1972, unit labor costs measured in U.S. dollars increased 27 percent in the 11 foreign countries (14 percent in national currencies), in contrast to a cost rise of only 1 percent in the United States, resulting in a 2-year cost trend differential of 26 percentage points—nearly twice the differential of all the previous 10 years. □

FOOTNOTES

[1] Compensation is defined as all payments made by employers directly to their employees, before deductions of any kind, plus employer contributions to legally required insurance programs and contractual and other private welfare plans for the benefit of employees. Labor cost includes all employer production costs which can be allocated to labor and includes, in addition to compensation, employer expenditures for recruitment and training; the cost of canteens, medical clinics, and various other plant welfare facilities and services; and taxes (other than social security taxes, which are part of compensation) that are levied on payrolls or employment rolls. Unfortunately, annual data are not available on total labor costs. Labor cost as used in this article, therefore, approximates more closely the concept of compensation. However, adjustments have been made for all significant changes in taxes that are regarded as labor costs, and the omitted items of labor cost represent at most only about 4 percent of total labor costs in any country.

[2] Changes in currency values are based on average certified noon buying rates in New York City for cable transfers, published in the *Federal Reserve Bulletin*.

[3] It would be desirable to have comparative measures of the levels of output per man-hour and labor costs per unit of output for all manufacturing. Such comparisons, however, require data on comparative levels of output, and this information is not available for the manufacturing sector.

The output of the manufacturing sector in any country consists of numerous products—products that cannot be combined in physical units. They are, therefore, combined in value terms. This gives country measures of aggregate manufacturing output, but each country's output is measured in its own currency units. To compare outputs among countries, a common unit of measure is needed—such as U.S. dollars. The needed conversion factors are not available. The existing exchange rates are not suitable for comparing output levels, as has been shown in earlier studies. (See, for example, Milton Gilbert and Associates, *Comparative National Products and Price Levels*, Paris, Organization for European Economic Cooperation, 1958.) Even if allowed to fluctuate freely, exchange rates would only represent, at best, the relative values of currencies for goods and services that are traded—not the relative values of total manufacturing output. The 1971 and 1973 devaluations of the U.S. dollar greatly altered comparative levels of output as measured in U.S. dollars at prevailing exchange rates, but they did not alter comparative levels of real output.

[4] When a country devalues, the cost of its manufactured goods to foreign purchasers might be expected to fall by the amount of the devaluation, since the devalued currency becomes available to foreign purchasers at less expensive exchange rates. This would occur if the export goods are priced in the devalued currency and domestic prices remain unchanged. However, since it would cost more for the devaluing country to import materials, the domestic prices of its goods that are manufactured using imported materials may rise. In addition, a devaluation may have indirect effects on demand, prices, wages, and costs, so that not all of the immediate cost advantage gained in international trade through a currency devaluation remains effective in the longer term.

[5] See Arthur Neef, "Unit labor costs in 11 countries," *Monthly Labor Review*, August 1971, pp. 3–12, and "Unit labor costs in the United States and 10 other nations, 1960–71," *Monthly Labor Review*, July 1972, pp. 3–8.

[6] Germany and the Netherlands revalued their currencies in 1961, the value of the Canadian dollar depreciated in the early 1960's, the United Kingdom and Denmark devalued in 1967, and France devalued and Germany revalued in 1969. The Canadian dollar was allowed to float June 1970, several other countries floated their currencies during 1971, and in December 1971 the United States devalued the dollar, Japan and Germany revalued their currencies, and Belgium, Italy, the Netherlands, Switzerland, and the United Kingdom terminated their floats and set new exchange rates. Canada did not terminate its float, and the United Kingdom resumed a float of its currency in June 1972.

[7] The compound rate of change is shown in place of the least squares trend average annual rate of change in order to show the rate of change which actually occurred rather than the long-term trend derived from data in which the large and irregular adjustments in currency valuations are reduced in importance.

APPENDIX

In general, the output figures used to construct the productivity and unit labor costs indexes presented in this article refer to the gross product originating in each country's manufacturing sector—that is, value of production minus the value of goods and services purchased from other producing units. The compensation and man-hours figures refer to wage and salary workers, except for Switzerland where only wage workers are covered. Data sources, general concepts, and data limitations were described in an earlier article.[1]

The data relate to all manufacturing industries combined and do not necessarily reflect the trends for specific industries or products. In addition, the figures are averages which reflect not only industry productivity and cost changes, but also the effects of shifts in the relative importance (weight) of industries with different levels of productivity and labor costs and, for the country groupings, changes in the relative importance of individual countries over the time period covered.

Combined data are shown for the 11 foreign countries, the original European Economic Community (less Luxembourg), and the expanded European Community (less Luxembourg and Ireland). The data have been combined by aggregating the output, compensation, and man-hours figures for each year—adjusted, where necessary, for comparability of coverage and concept. Because man-hours are measured in common units, they pose no problem of aggregation. However, the aggregation of output and compensation data for country groupings requires the use of a common set of value relationships, since each country's output and compensation is measured in terms of its own currency.

The par values of prevailing exchange rates in effect in 1967 were used in combining the output and compensation data. The use of 1967 exchange rates, however, does not necessarily reflect the comparative real values of currencies for manufacturing output. Past studies have shown that the use of prevailing exchange rates to convert national products measured in national currencies to a common currency unit can be very misleading. Unfortunately, exchange rates reflecting the real value of manufacturing output are not available for combining the outputs of the 11 foreign countries covered in this article. However, it would take exchange rates very different from those in effect in 1967 to affect greatly the combined trend indexes for the European Economic Community countries or all 11 foreign countries. In this regard, use of exchange rates in effect either in 1960 or those following the realignment of currencies in mid-December 1971 has little effect on the combined indexes. The use of current 1973 exchange rates would have a greater, but still relatively minor, effect on the combined indexes.[2]

The percent changes shown in tables 2 to 5 are computed from the least squares trend of the logarithms of the index numbers. The least squares method reduces the influence of year-to-year changes that deviate from the more "normal" trend. As a result, some of the rates of change shown in tables 2 to 5 may appear inconsistent with the indexes in table 6, particularly for hourly compensation and unit labor costs in the countries which have experienced a recent wage explosion and for unit labor costs in U.S. dollars that reflect large and irregular adjustments in currency valuations.[3]

Data revisions. Revisions of the Bureau's previously published estimates reflect either country revisions of the basic data or the availability of more complete information. The estimates for 1972 as well as some of the figures for earlier years are derived from preliminary data or current statistical series other than those used for measuring long-term trends.

Basic data on output, man-hours, and compensation in manufacturing have been revised by several of the countries. Particularly significant is a downward revision for Japan in the estimate of manufacturing output since 1967 because of the rebasing of the Japanese manufacturing output measure. As a consequence, the output per man-hour trend since 1967 is reduced significantly and the unit labor cost trend is substantially increased.

The United Kingdom also rebased its manufacturing output measure and, in addition, made revisions in its compensation and employment series for the whole period in its latest national accounts report. However, these changes have relatively little effect on the productivity and cost trends prior to 1970.

The substitution of new data series for Sweden, the Netherlands, and Belgium result in only small changes in the output per man-hour, hourly compensation, and unit labor cost trends. For Sweden,

recently developed aggregate man-hours and national accounts compensation data for manufacturing industries were substituted for the previous series for manufacturing and mining, and the national accounts output statistics have also been changed to manufacturing industries only. For the Netherlands, manufacturing output in constant prices from national accounts has been substituted for the previous output series, and for Belgium the manufacturing employment series used to estimate aggregate man-hours has been modified.

The aggregate compensation data for Switzerland have been revised, resulting in larger rates of increase in hourly compensation and unit labor costs during the first half of the 1960's. The revisions have little effect on the 1965 to 1972 period.

For the United States and most of the other countries included in this article, data for recent years have been revised as national accounts are issued for an additional year with revised data for several previous years and as employment or man-hours series are rebased to new benchmarks. In addition, Canada revised its compensation and man-hours data slightly for the whole period. □

—FOOTNOTES—

[1] See Arthur Neef, "Unit labor costs in 11 countries," *Monthly Labor Review*, August 1971, pp. 10–12.

[2] For example, for the 11 foreign countries the least squares trend rates of change for 1960–72 are 6.1 percent for output per man-hour, 9.5 percent for hourly compensation, 3.2 percent for unit labor costs in national currency, and 3.3 percent for unit labor costs in U.S. dollars using the 1967 exchange rates, but they are 6.4 percent for output per man-hour, 9.7 percent for hourly compensation, 3.2 percent for unit labor costs in national currency, and 3.5 percent for unit labor costs in U.S. dollars using the March 1973 exchange rates.

[3] For example, for the 11 foreign countries the least squares trend rates of change for 1960–72 are 9.5 percent for hourly compensation, 3.2 percent for unit labor costs in national currency, and 3.3 percent for unit labor costs in U.S. dollars, while the compound rates of change are 9.9 percent for hourly compensation, 3.7 percent for unit labor costs in national currency, and 4.5 percent for unit labor costs in U.S. dollars. For Japan, the least squares trend rates of change for 1960–72 are 14.1 percent for hourly compensation, 3.3 percent for unit labor costs in national currency, and 4.1 percent for unit labor costs in U.S. dollars, while the compound rates of change are 14.6 percent for hourly compensation, 3.8 percent for unit labor costs in national currency, and 5.4 percent for unit labor costs in U.S. dollars.

Chapter VI. Wages and Earnings

The relationship between changes in wage rates and in hourly earnings

Data from a sample of 87 establishments indicate the possibility of diverse movements in the two pay series

VICTOR J. SHEIFER

To WHAT EXTENT are general wage rate changes reflected in average hourly earnings data? In practice, do wage rate changes so dominate that there is little difference in the movements of hourly earnings and rate changes? Or are fluctuations in premium pay and changes in the occupational mix and other factors of sufficient importance to cause significant deviations in the behavior of the two measures?

This question is important in an analysis of statistics of wage movements, since alternative measures of wage change sometimes present apparent anomalies. For example, although average hourly earnings of manufacturing production workers advanced considerably less between December 1968 and December 1969 than during the same period a year earlier (5.8 percent compared with 6.9 percent), general wage rate adjustments effective in the 2 years were much the same—5.2 percent in 1968 and 5.1 percent in 1969.

A limited amount of information bearing on this issue was derived by analyzing replies, covering the December 1966–July 1967 period, from 87 establishments [1] reporting in two Bureau of Labor Statistics programs—one on wage developments in manufacturing (which covers general wage rate changes) and the other dealing with data on employment, payroll, and hours (which yields average hourly earnings data). This article compares changes in the establishments surveyed in gross hourly earnings, the most commonly used earnings series, and effective wage rate adjustments, conceptually the most closely related wage rate data.

Because the analysis was made as part of an internal program evaluation rather than as part of a comprehensive assessment of the relationship between the two statistical series, the study covered only a short time span and a small number of observations. Furthermore, since the questionnaire on wage developments in manufacturing is not sent to establishments when information for them is available from the Bureau's separate current wage developments project (which covers most unionized situations involving 1,000 workers or more), the establishments in the study discussed in this article are relatively small and are not a representative sample of manufacturing units. Despite these shortcomings, the findings throw some light on the question under consideration, serving to clarify issues and, possibly, to stimulate further research.

The statistical series

The Bureau's survey of wage developments in manufacturing defines general wage rate increases as those affecting, at any one time, at least 10 percent of the production and related workers in an establishment or all workers covered by a single collective bargaining agreement even if the agreement applies to fewer than 10 percent of the workers.[2] The Bureau prepares separate series covering wage decisions reached in given time periods and wage changes placed into effect during those periods.[3] The latter include, in addition to wage changes currently decided upon, those previously determined but deferred, and changes under cost-of-living escalator provisions.

The Bureau derives average hourly earnings in an establishment by dividing total payroll outlays in a given time period by the number of hours paid for.[4] As in general wage change statistics, several series are available. Data covering gross average hourly earnings are available for all establishments. Data on earnings excluding overtime and the effects of interindustry employment shifts are available for manufacturing industries only.[5]

Victor J. Sheifer is a director of the current wage developments project, Division of Trends in Employee Compensation, Bureau of Labor Statistics.

Conceptual differences

The distinction between wage rate and earnings changes can be clarified when we recognize that, although an individual worker's wage rate ordinarily is the primary determinant of his hourly earnings, it does not necessarily follow that, over short periods, fluctuations in his hourly earnings are the result of wage rate changes. Earnings fluctuations may stem from variations in output under incentive wage plans or in the volume of premium-paid overtime, holiday, weekend, or late shift work. Moreover, promotion, job reevaluation, or within-grade wage adjustments may affect an employee's wage rate even in the absence of a general wage change.

The forces affecting earnings do not always move in the same direction. A worker's hourly earnings may decline despite a wage rate boost, for example, because of a drop in premium overtime work or a transfer from night to day work resulting in loss of a night-shift differential.

Average hourly earnings are, of course, affected by adjustments in the pay of individual workers. Consequently, the various forces that influence an individual worker's earnings also affect the average for a group of workers. However, even if individual earnings remain unchanged, the average for a plant as a whole could be affected by a change in the occupational mix, for example, the hiring or dismissal of workers and the resulting change in the relative number of employees at various earnings levels. Similarly, shifts in employment among plants with differing wage levels will affect multiplant averages.[6]

Establishments showing wage increases

Average differences between hourly earnings changes and general wage rate increases in 55 establishments where wage rates increased during the period are shown in table 1. (None of the factories reported a wage reduction, and 32 reported no wage change.) Since it is conceivable that the longrun impact of a wage change is not immediately apparent, possible lagged adjustments are considered. Data for 1-month intervals compare the wage rate increase with the earnings change during the month of the increase. Data for intervals of 2 months or more compare the same rate increase with earnings changes over successively longer time spans beginning with the month prior to the rate increase.

Fewer months were available for comparison of wage rate changes with average hourly earnings changes in instances where plants increased wage rates near the end of the December 1966–July 1967 period.[7] Consequently, the varying averages among time intervals in the top half of table 1 are the result both of developments within the establishments and of changes in the size of the sample. To eliminate the influence of changes in the sample, the bottom half of the table is restricted to the establishments (there were only nine of them) for which 7-month data were available.

Table 1 is limited to averages; individual establishment data are depicted in the scatter diagrams on page —. The diagonal line on these diagrams serves as a reference line, showing the locus of all points representing equal changes in earnings and wage rates. Actual observations above and below the diagonal line reflect instances in which earnings changes were greater and less, respectively, than wage rate increases. The number of observations above and below the diagonal line is presented, as is the coefficient of correlation between the wage rate increases and the earnings changes.[8]

A detailed examination of table 1 or inspection of the scatter diagrams impresses us with the

Table 1. Average differences between general wage rate increases and hourly earnings changes in 55 establishments increasing wage rates, December 1966–July 1967 [1]

(Cents per hour)

Time interval since general wage rate change	Number of establishments studied	Average earnings change less rate increase	
		Sign of change ignored	Sign of change considered
	All establishments		
1 month	55	7.9	−1.8
2 months	46	9.3	−1.4
3 months	36	9.9	−2.3
4 months	27	12.7	1.6
5 months	24	11.4	.9
6 months	20	9.8	−1.8
7 months	9	9.9	−5.6
	Establishments for which 7-month comparisons could be made		
1 month	9	9.0	−3.5
2 months	9	8.6	−1.5
3 months	9	7.9	−4.4
4 months	9	18.0	6.1
5 months	9	14.4	.6
6 months	9	8.2	−4.0
7 months	9	9.9	−5.6

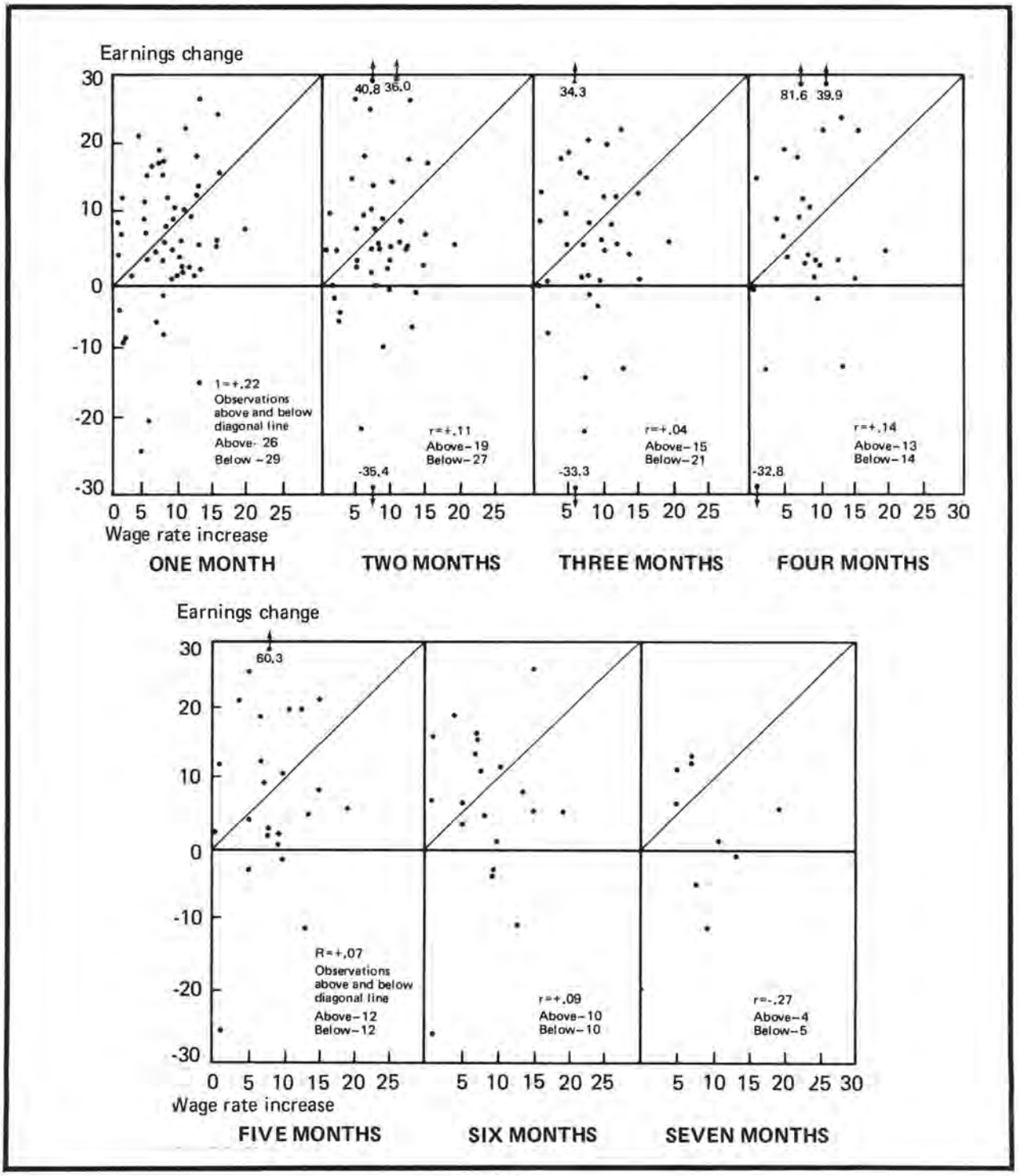
[1] Averages were computed by giving equal weight to each establishment.

absence of any indication of a clear and consistent relation between general wage rate increases and average hourly earnings movements in individual establishments. This is true not only for the month of the wage-rate adjustment but also for comparisons involving average hourly earnings over longer time spans.

Table 1 shows an average difference (sign

Chart 1. General wage increases and hourly earnings changes in 55 establishments increasing wages, December 1966–July 1967

[Data in cents per hour]



ignored) between the earnings change in the month of the wage increase and the wage increase of 7.9 cents per hour in all 55 establishments. The scatter of the points on the diagram is so great that the coefficient of correlation between 1-month earnings changes and wage rate increases is only +.22, which is not statistically significant, that is, it could easily have arisen by chance from a situation in which the true correlation was zero.

Assuming wage changes do dominate the picture, but only after a time lag, we would expect a closer relation in comparisons using longer time intervals. However, contrary findings are revealed in table 1 and the scatter diagrams; the average difference between earnings and wage changes rose to 9.9 cents and the correlation coefficient actually became negative when 7-month earnings changes (for which there were only nine observations) were compared with the wage rate change. The data, admittedly sketchy, provide little support for a time-lag hypothesis. None of the correlation coefficients shown were found to be significant, but the fact that all coefficients except that for the 7-month interval were positive indicates the presence of some weak relationship.

Conceivably, the closer average relationship between earnings and wage changes in the 1-month comparison was the result of developments in establishments not included in the 7-month comparison. Therefore, for what it is worth, a separate analysis was made of the nine establishments for which 7-month data are available. As the bottom half of table 1 shows, if we confine ourselves to these nine units, we still find the average spread between earnings changes and wage increases increasing, although to a considerably lesser degree, when 7-month earnings changes are used in place of 1-month changes.

Before concluding this discussion, we should note that in five of the seven scatter diagrams, a majority of the observations are below the diagonal line, reflecting a tendency for earnings changes to be less than wage rate increases. This raises an interesting question: Are employers often in a position to take steps—and if so do they—to reduce the cost impact of wage increases?

Explanatory variables

Since the Bureau's monthly employment, payroll, and hours survey provides hours and employment data as well as earnings information, we are able to consider in a very limited way two factors possibly contributing to the divergent earnings and wage rate changes just discussed.[9]

The influence of variations in premium pay for overtime hours can be examined by comparing wage rate-earnings relationships involving gross and straight-time hourly earnings. Coefficients of correlation between wage rate and gross hourly earnings changes (as shown on the scatter diagrams) are listed below, together with corresponding coefficients based upon hourly earnings adjusted to eliminate the influence of overtime premiums:

Time period	*Coefficients*	
	Based on gross earnings	*Based on straight-time earnings*
1 month	.22	.25
2 months	.11	.16
3 months	.04	.12
4 months	.14	.17
5 months	.07	.13
6 months	.09	.27
7 months	−.27	−.32

Except for the 7-month comparison, substitution of straight-time earnings improves the relationship but not to a great extent, the coefficients remaining low. At least for the establishments and time period considered, the lack of any substantial correlation between wage rate and gross earnings changes can be explained only to a limited degree by overtime premiums.

Even more negative findings on the impact of employment variations are shown in table 2. No systematic relationship can be discerned between straight-time earnings-wage rate differentials and

Table 2. Straight-time earnings-wage rate differentials and employment changes in 55 establishments increasing wages, December 1966–July 1967

Time period covered by earnings and employment changes	Number of establishments					
	Earnings change exceeding wage increase, and employment			Earnings change less than wage increase, and employment		
	Rising	Falling	Unchanged	Rising	Falling	Unchanged
Total	47	46	5	59	52	7
1 month [1]	13	8	----	12	18	3
2 months	9	9	2	17	7	2
3 months	7	10	----	9	9	1
4 months	7	7	1	4	7	1
5 months	6	5	1	7	5	----
6 months	3	5	1	8	3	----
7 months	2	2	----	2	3	----

[1] In 1 establishment, excluded from this tabulation, the earnings change was equal to the wage increase and employment increased over the month.

the direction of employment changes. The proportion of instances in which earnings changes were less than wage increases is not significantly different for cases when employment rose than when employment decreased. If changes in employment did influence establishment earnings levels, their impacts clearly were submerged by forces that could not be isolated.

Changes in other establishments

The preceding discussion suggests that a variety of forces other than wage rate changes may have marked effects on average hourly earnings within individual establishments. This impression is reinforced by examination of the monthly average hourly earnings changes in the 32 establishments that made no general adjustments in wage rates. For these establishments, the average (sign ignored) of the 224 [10] month-to-month variations in hourly earnings was as high as 6.6 cents.

As one would expect, changes were in opposite directions in many of these factories; and, within individual units, changes in a given direction in 1 month were frequently offset by opposite movements the next month. Nevertheless, the extent to which changes in opposite directions cancel out is surprisingly large and suggestive of a major influence by random factors; over the 7-month period, the average monthly change per establishment, taking account of the direction of the change, was less than 0.05 cent in the 32 factories.

Multiestablishment data

Although individual establishments are the basic building blocks, analysts commonly are interested in the overall pattern revealed by multiestablishment data, such as averages for separate industries or for the economy as a whole. Consideration of such multiestablishment averages provides further evidence of the importance of random effects.

As shown in table 3, the positive and negative divergences between gross earnings and wage rate changes in individual establishments largely cancel out in affecting multiestablishment averages. Differences exist in the month-to-month changes in earnings and wages, but the overall December–July increases in the two series are practically the same.

As one might expect, the average hourly earnings series exhibits greater month-to-month variability than does the wage rate adjustment series. In this connection, differences in reporting variability inherent in the two statistical systems should be considered.

Table 3. Gross average hourly earnings and average wage rate adjustments in 87 establishments, December 1966–July 1967

Month	Average hourly earnings	Earnings change from prior month	Average wage rate adjustment during preceding month
	Based on equal weights for each establishment		
Total		$.053	$.056
December	$2.585		
January	2.588	.003	.013
February	2.603	.015	.008
March	2.593	−.010	.005
April	2.626	.033	.004
May	2.632	.006	.008
June	2.630	−.002	.009
July	2.638	.008	.009
	Based on aggregate man-hour weights for each establishment		
Total		.056	.053
December	2.728		
January	2.724	−.004	.012
February	2.733	.009	.006
March	2.736	.003	.004
April	2.757	.021	.003
May	2.764	.007	.008
June	2.778	.014	.009
July	2.784	.006	.011

It is also interesting to observe that the same inferences would be drawn from the bottom as from the top half of table 3. Substitution of man-hour weights for equal weights raises the level of the hourly earnings series, indicating higher earnings in the larger establishments. However, month-to-month variation is modified to a much smaller degree; during the period covered, monthly fluctuations in establishment man-hours were not a major factor.[11]

Before concluding from table 3 that there are no significant differences in the movements of the two statistical series, several issues must be considered. For one thing, not all wage studies are based on "all manufacturing" data. It is conceivable that, as in individual establishments, significant differences between earnings and wage rate changes exist on the industry level and only average out on the overall manufacturing level.[12] Unfortunately, the size of the sample used in this study is too small for even the most casual examination of this point.

Secondly, if we eliminate December from consideration, our conclusions must be modified.

Overall January–July changes are:

	Earnings change	*Wage rate adjustment*
Equal establishment weights	$0.050	$0.043
Man-hour weights	.060	.041

Particularly when man-hour weights are employed, the similarity of the aggregate changes in each of the series is noticeably reduced by elimination of the initial month.

Shortrun and longrun comparisons

However, whether we deal with a 6- or 7-month period, we must emphasize the shortrun nature of the data. Since hourly wage rates are the dominant influence on employers' hourly payments to workers, regardless of time span, a strong force is operating to produce consistency in the behavior of earnings and wage rate change series. On the other hand, as we have seen, centrifugal forces may also be present, and at least some of them are likely to differ in intensity depending upon the period studied.

On a priori grounds, one would expect the shortrun forces leading to divergent behavior in the two series to be largely of a seasonal or of a random nature; for example, fluctuations in premium payments when seasonal or short-term unexpected changes in orders cause an establishment to vary the amount of overtime work. Our finding of much divergence in individual establishments but greater uniformity on a multiunit level is in line with this view.[13]

Systematic patterns of divergence are more likely to be noticeable over intermediate and long time spans—patterns in which positive or negative differences dominate at least for a time and produce significant variations in the behavior of earnings and wage rate changes. For example, cyclical forces enter the picture; the extent of overtime and of upgrading to attract or maintain a labor force is influenced by conditions in the labor market and tends to produce consistent variations in movements of earnings and wage rates in periods of prosperity and recession. Similarly, technological developments, partly through their effects on the skill mix, have a longrun effect on hourly earnings, independent of general wage rate changes.

In support of this view, cyclical and secular patterns can be observed in the comparative movements of manufacturing gross hourly earnings, hourly earnings excluding overtime, and earnings excluding overtime and effects of interindustry employment shifts. Variations in overtime and employment, the forces responsible for this behavior, are also influential in the shortrun but in a more erratic and less systematic manner.

Both overtime and interindustry employment variations curbed the upward movement of gross hourly earnings during postwar business contractions but had the opposite effect during expansions. This is shown in table 4 by the progessively smaller increases from left to right during expansions and by the progressively larger increases in contractions.

Over the entire 1939–69 period, the comparative behavior of the three series, not unexpectedly, resembled that during business expansions. Rates of increase in percent were the following:

	Total increase	*Annual (compound) rate of increase*
Gross hourly earnings	408.8	5.6
Straight-time earnings	386.4	5.4
Earnings excluding overtime and interindustry employment shifts	358.7	5.2

Over the periods considered, both overtime premiums and interindustry employment shifts led to divergent movements in hourly earnings and wage rate changes.[14] Whether other forces affecting hourly earnings—such as reclassifications of individual workers, merit increases, administration of incentive plans, geographic shifts in employ-

Table 4. Annual rates of increase in manufacturing production workers earnings during business cycle expansions and contractions, 1948–69

[In percent]

Period	Gross average hourly earnings	Straight-time average hourly earnings	Earnings excluding overtime and interindustry employment shifts
Expansions:			
October 1949–July 1953	6.8	6.6	5.9
August 1954–July 1957	5.4	5.1	4.8
April 1958–May 1960	3.8	3.5	3.2
February 1961–December 1969	4.2	4.0	3.9
Contractions:			
November 1948–October 1949	−.7	(1)	1.2
July 1953–August 1954	.6	1.7	2.5
July 1957–April 1958	2.7	3.3	4.4
May 1960–February 1961	1.2	2.4	3.2

[1] Less than 0.05 percent.

NOTE: Dating of expansions and contractions is based upon business cycle turning dates designated by the National Bureau of Economic Research. In the absence of any decision to the contrary, the period from February 1961 to December 1969 (the latest month for which final data were available when this article was written) has been treated as one of expansion.

SOURCES: Data for 1948–1961 and 1969 are from **Summary of Manufacturing Production Workers Earnings Series, 1939–68** (BLS Bulletin 1616, 1969), pp. 2–3, and Supplement 2, 1970.

ment, and changes in the occupational employment mix—reinforced or moderated this development is a question beyond the scope of this article.[15]

Concluding observations

There is an understandable desire to describe changes in even so complex a phenomenon as wages by use of a single all-embracing statistical series. Use of an average hourly earnings series represents a step in this direction.[16] However, the more general the wage measure, the more difficult it is to interpret. Thus, unlike a pure wage rate change series which measures variations in a single factor, average hourly earnings data reflect the combined effect of a variety of forces which individually are not isolated.

Both wage rate change and average hourly earnings series have their uses and their limitations. Certainly, where availability of series is not a restriction, the researcher should not be indifferent as to which he analyzes. While the conceptual differences are well recognized, much less is known about the comparative movements of the two series.

The study reported in this article found little correlation in the short-term movements of wage rates and hourly earnings in individual establishments. On the all-manufacturing level, greater similarity was found in the shortrun movements of average hourly earnings and average wage rate adjustments. Nevertheless, two factors—changes in overtime premiums and interindustry employment shifts—were found that could loosen the relation between the two series as the time span expands.

The tentative nature of these sample findings must be emphasized. To what extent would conclusions drawn from a study of 87 establishments over a 7-month period vary with a larger sample or longer time span? Are the specific results in any way peculiar to conditions during the first half of 1967? How significantly were the results influenced by possible errors in reporting and analyzing the data? What are the primary factors responsible for the findings? While it would be possible for us to speculate on these points, the information developed in this study is insufficient to provide adequate answers. The data are provocative but not conclusive; their greatest value is as a contribution to development of working hypotheses for more intensive analysis. □

———*FOOTNOTES*———

[1] The 87 establishments remained after selecting every ninth unit in the wage developments in manufacturing sample (yielding 208 establishments) and then deleting those not in the employment, payroll, and hours survey (80) and those for which complete information was not available for the entire period (41).

[2] The Bureau's measurement of wage rate changes is limited to general wage changes. Both the wage developments in manufacturing and the employment, payroll, and hours surveys (for manufacturing industries) provide wage or earnings data only for production and related workers.

[3] Wage rate change data covering major collective bargaining situations are published in the Bureau's monthly *Current Wage Developments*, and data for manufacturing industries are in annual *Monthly Labor Review* articles and in reports entitled *Wage Developments in Manufacturing*.

[4] Use of hours paid for rather than hours worked as the denominator largely eliminates the influence of changes in paid leave provisions. If payments per hour of leave are the same as earnings per hour worked, the addition, say, of an extra paid holiday will change neither total payroll nor hours paid for, merely changing the composition of each of these quantities. (The growth of paid leave over the years has caused a rise in total payments per hour worked relative to payments per hour paid for.)

[5] Convenient compilations of BLS hourly earnings data are *Employment and Earnings Statistics for the United States, 1909–68* (BLS Bulletin 1312–6, 1968); *Employment and Earnings, States and Areas, 1939–68* (BLS Bulletin 1370–6, 1969); and *Summary of Manufacturing Production Workers Earnings Series, 1939–68* (BLS Bulletin 1616, 1969).

[6] For a listing of major factors influencing the average hourly earnings series, see *Summary of Manufacturing Production Workers Earnings Series, 1939–68*, p. 14.

[7] December–July data for each factory were needed for the multiestablishment averages of table 3.

[8] In computing correlation coefficients, equal weight was given to each observation. Two issues arising in the preparation of table 1 and the scatter diagrams must be mentioned. Five of the establishments granted more than 1 wage increase, cost-of-living escalator adjustments in addition to other general increases being involved in three of these cases. To avoid complicating the presentation, the analysis in these instances stops with the month

prior to the second increase. Furthermore, where the wage rate adjustment was not uniform for all production and related workers in an establishment, the increase shown is the average change for all workers in the unit.

[9] Neither the employment, payroll, and hours survey nor the wage developments in manufacturing program collects data on other variables influencing average hourly earnings. No other sources of data were utilized in the analysis summarized in this article.

[10] Thirty-two observations in each of 7 months.

[11] The average hourly earnings column of table 3 applies to the 55 establishments raising wages and the 32 factories reporting no general wage change. Average wage rate adjustments were computed by averaging the total amount of wage increase during the month over all 87 establishments, including those that did not raise wages. Included in the computations were the second and subsequent increases omitted from table 1 and the scatter diagrams based on it. (See footnote 8.)

Current aggregate man-hour weights were used in computing the average hourly earnings data shown in the bottom half of the table; the figures are comparable to the hourly earnings data published by the Bureau. To preserve a pure wage rate change series, constant (December) man-hour weights were used in computing the average wage rate adjustments shown in the bottom half of the table. In this respect, the wage rate change data differ from published figures in the computation of which employment, rather than man-hour, weights are used. Moreover, the weights are adjusted annually—January figures are used throughout the year—to reflect establishment employment changes. See *BLS Handbook of Methods for Surveys and Studies* (BLS Bulletin 1458, 1966), chapters 2 and 17.

[12] See John E. Maher, "An Index of Wage Rates for Selected Industries, 1946–1957," *Review of Economics and Statistics*, August 1961, pp. 278–281.

[13] Industries reach their peaks at different times of the year, thus leading to some averaging out of the seasonal factor in the same manner as for random influences. For year-by-year comparisons of earnings and wage adjustment changes, see William Davis and Lily Mary David, "Pattern of Wage and Benefit Changes in Manufacturing," *Monthly Labor Review*, February 1968, pp. 40–48.

[14] Although employment weights are used in deriving Bureau measures of wage rate change (footnote 11), employment fluctuations have less impact on these measures than on hourly earnings series.

[15] For additional comparisons of earnings and wage changes, see Maher, op. cit.; and Richard A. Lester, "Negotiated Wage Increases, 1951–1967," *Review of Economics and Statistics*, May 1968, pp. 173–181. See also John T. Dunlop, *Wage Determination Under Trade Unions* (New York, Augustus M. Kelley, Inc., 1950), pp. 15–26. Lester's comparison, it must be pointed out, is between earnings changes and wage decisions, rather than effective wage rate changes. In this connection, see discussion on p. 10.

[16] Average hourly earnings is by no means the most comprehensive statistic. Bureau studies of employer payments for supplementary compensation, including outlays not appearing on the payroll, permit development of data on average hourly compensation. See *Employee Compensation in the Private Nonfarm Economy, 1966* (BLS Bulletin 1627, 1969).

Developing a general wage index

Needed: a single measure of wage rate change that also provides separate data for industries, union and nonunion employment, and the components of compensation for these classifications

NORMAN J. SAMUELS

DESPITE many theoretical advances and the best wage statistics in the world, we do not have a single measure that describes wages in the way other economic variables—such as unemployment, prices, and productivity—are described. To the question, "How much have wages increased?" we must equivocate with return questions, "Whose wages?" and "What do you mean by the term wages?"

The failure to develop an appropriate measure can be traced partially to a philosophical hesitancy to judge all labor as homogeneous, to the rejection of the notion of a price of labor to be considered in the same sense as the price of commodities, and to the recognition of the existence of the variety of labor markets. In 1880, Alfred Marshall wrote on this point:

> A word should be said as to the common phrase "The general rate of wages" or "the wages of laborers in general." Such phrases are convenient in a broad view of distribution, and especially when we are considering the general relations of capital and labor. But in fact there is no such thing in modern civilization as a general rate of wages. Each of a hundred or more groups of workers has its own wage problem, its own set of special causes, natural and artificial, controlling the supply-price, and limiting the number of its members; each has its own demand-price governed by the need that other agents have of its services.[1]

The processes of wage determination, thus, occur in literally hundreds of labor markets highly complicated by their overlapping effects. Each wage is determined, at a minimum, in at least three, interconnected markets: geographic, industrial, and occupational. Each of the markets is subject to secular, seasonal, and cyclical change. And each of the markets is subject to the influences of institutional factors (unions), Government wage policy (minimum wages), and the psychological and sociological motivations of individuals often impeding labor mobility in response to relative wage changes.

Priority has nearly always been given to the analysis of these interrelated markets to meet the needs of employers, employees, and their institutions for wage determination. We have wages for the hundreds of groups of workers and different measures of wages for them. A careful observer must make clear which measure he is discussing. There are wage rates, wage earnings, straight-time wages, gross wages; and there are wages per hour worked, and wages per hour paid for. There are weekly earnings, monthly earnings, and annual earnings. Even more complex is compensation, which includes the various supplements now a significant part of the return to labor. For all of these measures we have data, and all of them are used. Usually they reflect the demand side of the equation and the income results.

Neither individually, nor collectively do the measures tell us what is generally happening to wages. In fact, conflicting results are often found for short-run movements in the various series. Such results are not insignificant for understanding what is happening, but they are frustrating to the analyst's needs for uncovering general relationships. In times of rapid economic change demanding public policy decisions, summations of the detailed studies have not produced a whole satisfactory for those decisions.

Limitations of available measures

What is needed for policy purposes is not so much a measure of wages but a measure of wage rate change. The Council of Economic Advisers defined economic analysis as "a continuing search for patterns of regularity that can be helpful in framing judgments about the economy." [2] In recent times, the Bureau of Labor Statistics has

Norman J. Samuels is chief of the Division of Trends in Employee Compensation, Office of Wages and Industrial Relations, Bureau of Labor Statistics.

From the *Review* of March 1971

given attention to that definition with the development of quarterly and monthly changes in wages, prices, and productivity.

For wages, three general types of trend measures are developed and published: compensation per man-hour, average hourly earnings, and general wage change. Total compensation per man-hour is the most comprehensive measure, including both cash wages and supplements and covering all employees except general government employees, but it provides very little industry detail and is available only quarterly. Average hourly earnings is the most detailed measure with respect to industrial information and is available monthly but is limited to cash wages paid to production or nonsupervisory workers. General wage change reflects only wage increases granted across the board to at least 10 percent of the workers in an establishment, is restricted to wage earners in unionized situations and in nonunion companies only in manufacturing, and is available quarterly. These do not, by any means, exhaust the catalog of wage trends available, but the others are more restricted than those cited.

Why are these measures insufficient for economic analysis as the Council defined it? First, of course, are the limitations in coverage and timing already cited. Second, they do not always give the same results, particularly in the short run. For example: the annual rate of increase in average hourly compensation for all employees during the first and second quarters of 1970 fell from 6.4 to 5.9 percent, whereas the annual rate of increase in average hourly earnings rose from 3.9 to 6.1 percent, and general wage rate increases in manufacturing remained stable (although first-year wage rate changes under collective bargaining increased from 10.2 to 15.4 percent). Third, all of the factors affecting wages are operative, so that it is not possible to determine whether the price of labor has changed or whether shifts in the employment of labor have occurred. In a simplified analogy with price statistics (using that terminology), we have a cost-of-living type of measure in wages rather than a consumer-price type of measure. And both types of measure are needed in the labor compensation field. The difference between the two measures allows for a truer representation of the income and cost sides of wages—the well-being of workers and the wage effects on output decisions. More specifically, wage rates determine the relative shifts in supply and demand for various employments and we do not have a measure of change in this crucial statistic.

How crucial is this statistic to economic analysis? The Bureau of Labor Statistics has been working on a wage change model which is a variant of the Phillips Curve analysis. In applying the model to data covering the past 20 years, substantial instability in the specified relationships was found. The unanswered question from the investigation: Was the instability due to faulty specification of the model, or was it caused by the inconsistency between the theoretical statements about wage changes and the data used (average hourly compensation) to measure those changes? [3] The theoretical statements dealt with changes in rates and should have included only endogenous factors, whereas the data used included the exogenous factors arising from the labor markets.

Despite the frailty of the data base for economic analysis, public policy decisions must be made from such analysis. One particular issue over which serious dialogue has occurred during the past decade is an incomes policy, aimed at increasing real wages at the rate of productivity increase through price stability. The discussion has followed now familiar paths, but too little attention has been paid to the measure of wages required for such a policy.

The ideal measure should be a single measure that covers all employees, includes all forms of compensation, and is free of the effects of fluctuations in the amount of premium pay for overtime, shifts in employment between low-wage and high-wage industry, and changes in the mix of occupations. Whether the changes in occupational mix also reflect changes in the quality of labor may need further study; for the moment we will assume it does. Further, the measure should be available frequently, preferably monthly, but certainly quarterly.

What effects do the industrial, geographic, and occupational shifts in employment have on wages? Or the shifts in hours of work at either straight-time or premium pay? We do not really know, but some past studies and programs and recent experiments allow us to make some evaluation.

Varied approaches

URBAN WAGE RATE INDEX. The idea of a wage rate index is not new to the Bureau of Labor Statistics, but only in times of crisis has it been possible to

implement the concepts. World War II provided the crisis, and the National War Labor Board provided the need for the most detailed and extensive approach to the issue ever attempted. The result was the Urban Wage Rate Index begun in April 1943. A brief description is in order, for in many ways it embodies the concepts generally conceded to be necessary.

The Urban Wage Rate Index was based on the urban wages in a sample of 69 areas. The areas represented all the States (48 at the time) and were selected to represent among other things important industries, such as rubber in Akron and furniture in Grand Rapids. Within each area, establishment samples were drawn including approximately 6,600 establishments overall. Within each establishment, a sample of key jobs (uniform within industry) was studied to represent various skill groups and wage levels characteristic of the industries. Separate occupational data were collected for men and women and for experienced workers and learners. The data were collected by BLS field representatives directly from payrolls and other records, and the data were wages for individual workers, excluding premium pay for overtime and for work on late shifts. In combining the data, each occupation and sex were given constant weights, as was each covered industry, each major industry group within areas, and each region. In general, no changes in the relative importance of industries, individual areas, regions, and occupations influenced the results. The weights assigned represented the distribution of employees in the autumn of 1943.[4] The studies were conducted in April and October of each year (with a few exceptions) until 1947, when, the crisis having passed, the series was dropped, apparently not meeting the tests of the market for budget.

The Urban Wage Rate series was designed primarily for the use of the War Labor Board to control wages and the labor allocative function of wage differences. While the series begun in April 1943 included both manufacturing and nonmanufacturing industries, BLS was able to carry the manufacturing data back to January 1941, so that this data are available for manufacturing for a prestabilization period, the stabilization period, and the postwar period, including at least two rounds of wage increases following the lifting of controls. Evaluation of the Board's performance in stabilizing wages is not our purpose, but the differences in movement are instructive. During the prestabilization period (January 1941–October 1942), the urban wage rate series rose 17.0 percent, while gross average hourly earnings rose 30.7 percent; during the stabilization period (October 1942–August 1945), wage rates rose 13.9 percent while gross hourly earnings rose 14.7 percent; and in the postwar period (August 1945 to September 1947), wage rates rose 30.8 percent while earnings rose 22.2 percent. These dramatic differences illustrate the effects of shifts of employment on wages and the implications for public policy. True, the data represent widely differing economic periods and we would not expect such differences to occur normally, but normality (whatever that means) is rarely with us.

MANUFACTURING WORKERS. A second approach by BLS to the examination of the issue was a series begun in 1953 limited to manufacturing production workers. The series, which adjusts average hourly earnings for premium overtime pay and for employment shifts among industries, goes back to 1939 for selected periods and is monthly from 1947 to the present.[5] The adjustments are made to the monthly hours and earnings data produced by the BLS Office of Manpower and Employment Statistics and published in *Employment and Earnings*. The adjusted series provides a test of influence of two of the factors affecting wages. A comparison of the movements of the three measures of wage change—gross hourly earnings, adjusted straight-time hourly earnings, and wage rate index—in manufacturing industries over the period January 1941 to September 1947 is shown in chart 1. It illustrates, for that period, some of the differences in the effects of the various labor market factors on wage trends.

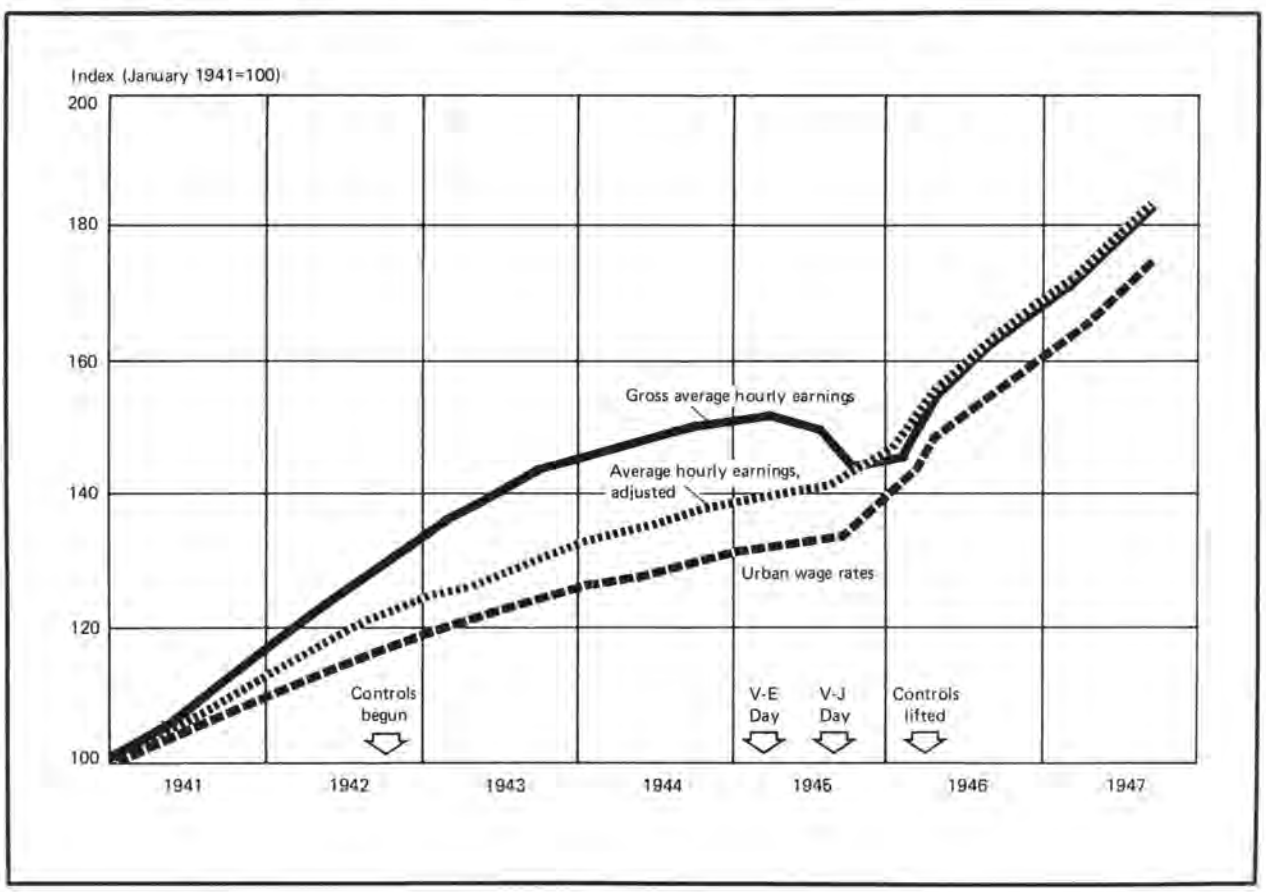
Over the period from 1939 to 1969, gross average hourly earnings increased at an average annual rate of 5.6 percent; straight-time average hourly earnings increased 5.4 percent; and straight-time earnings adjusted for industry employment shifts increased 5.2 percent. Thus, 0.2 percent a year in the change in average hourly earnings for factory workers has been attributable to each factor over the past three decades. These are fairly minimal effects, although practically any change compounded over 30 years has a real effect. But a recent study by Victor Sheifer [6] provides a more relevant analysis for our purposes. Sheifer compared the average annual increases for each of the series (gross, straight time, and adjusted for

employment shifts) over each of the business cycle expansions and contractions since 1948, with most interesting results. During periods of expansion, gross average hourly earnings increased at a higher rate than straight-time earnings, and both increased at higher rates than the series adjusted for employment shifts. During periods of contraction, the opposite occurred.

The adjusted series is certainly not as nearly a wage *rate* series as the old Urban Wage Rate series was, but it comes as close as currently available data permit to measuring wage rate changes over time for a significant segment of industry. The importance of Sheifer's findings is that they lead to clearer understanding of how necessary better wage rate data are to current analysis if we are to find the patterns required for policy.

WAGE CHANGE SERIES. A third approach to the analysis of wage change data which conceptually measures changes in wage is produced in the BLS Current Wage Developments program and provides wage changes resulting from collective bargaining and wage developments in manufacturing in nonunion situations. These measures move an average by a single amount by which wage rates will change—such as, if everyone in a situation received a 10-percent increase. This is an oversimplified definition of a much more complicated set of data, but it is the significance of the general approach that is appropriate to this discussion. This type of data is in many ways an improvement: it excludes intraestablishment occupational changes; it relates to wage rate changes; it excludes seasonal and cyclical factors associated with changes in hours of work and other random factors affecting wages. It is deficient in not taking into account changes in supplements (except for large collective bargaining situations), many of which are interchangeable with wages and accounted for in making wage adjustments. There

Chart 1. Wage movements in manufacturing industries, January 1941–September 1947



is, however, a more serious drawback. In the nonunion sectors (employing about three-fourths of the workers in the private economy), not all employers make general wage changes. A special study of the service industries made in 1966 revealed that about one third of the employees worked in situations where only individual wage adjustments were made. In fact, the study showed that 45 percent of the workers in nonunion establishments in both manufacturing and services had only individual wage adjustments.[7]

General wage rate changes in manufacturing industries take place in situations employing 85–90 percent of all factory workers. These data do, therefore, fairly represent the manufacturing sector. A comparison of the mean effective general wage adjustment with the adjusted average hourly earnings series cited above shows an expected relationship; that is, from 1960 to 1969, the general wage adjustments have been lower than straight-time average hourly earnings adjusted for industry shifts—the former increasing by 35 percent and the latter by 40 percent. (See table 1.)

The relationship is expected because, during an expansion phase, adjustments are made within the wage structure (including such factors as upgrading) which are not accounted for by general wage rate changes. Over a 9-year period, a difference of 5 percentage points is not unacceptable, but the short-run movements are often widely divergent. For example, the general wage increase during the 1st quarter of 1969 was 6.2 percent, compared to the annualized quarterly change of 5.4 percent in the adjusted hourly earnings series, whereas in the second quarter of 1970 the figures were 6.7 and 7.3 percent respectively.[8] These are terminal figures and do not indicate a trend. The interim quarters show somewhat erratic movements, and the number of them are too few to allow for a discernible pattern. (Some of the problems associated with comparisons between wage rate changes and average hourly earnings are discussed in Sheifer's article noted above.)

Developing a general index

From the foregoing, it is apparent that for each adjustment in wages made for the factors affecting wages a better measure becomes available. While the general wage change data come closest, the exclusion of individual wage adjustments or upgrading which is a form of wage increase, makes the measure too deficient, at the most crucial time, for use as a true general measure. Some other more generalized series or system must be used. Considering the information readily available, it is possible to develop an index based on data which are adjusted for overtime and interindustry employment shifts and for seasonal fluctuations. There is missing, however, another major factor affecting average earnings—occupational shifts. Some occupational shifts are accounted for—interindustry by holding industry weights constant; very short-run repetitive shifts are accounted for by seasonal adjustment. Long-run shifts in the intraindustry occupational structure are not accounted for. We have done some experimenting to examine how much influence such intraindustry occupational shifts might have on wages. The experiment used data from the BLS industry occupational wage survey program in those industries which were studied in the 1940's and repeated in the 1960's. The occupational employments were held constant for each period in each industry, and measures of difference were obtained from the average of occupational earnings when the employments were allowed to fluctuate. The results indicated that intraindustry occupational shifts accounted for 2 to 4.5 percent of the increase in wages in the average industry studied. For half the industries studied, there was no occupational shift effect. Where the effect was appreciable there had been significant production function changes. From such limited data, we would not say that the findings are representative. The experiment did find an occupational shift effect (albeit quite small for a 20-year period) in the types of industries where such shifts are expected or known to have happened.

Table 1. Wage changes in manufacturing

Year	Average hourly earnings (December to December)		Mean effective wage adjustments	
	Index	Percent change during year	Index	Percent change during year
1960	100.0		100.0	
1961	102.8	2.8	102.5	2.5
1962	105.1	2.2	104.7	2.1
1963	108.0	2.8	107.5	2.7
1964	110.3	2.1	109.7	2.1
1965	113.6	3.0	113.1	3.1
1966	118.1	3.9	117.0	3.4
1967	124.1	5.2	122.0	4.3
1968	132.4	6.6	128.5	5.3
1969	140.1	5.8	135.1	5.1

A final requirement for developing a general index or measure is that it reflect total compensation. The deficiency of wages, alone, as a measure of labor income or labor cost, is generally recognized.[9] Not only do wages comprise a smaller proportion of compensation now than formerly, but the allocation of changes between wages and benefits are affected by general economic circumstances. To collect compensation data for each of the factors influencing wages—industry, occupation, area, and others—is not at present possible, and certainly not for short-term movement. To obtain total compensation on an occupational basis would probably require a completely different method than that currently employed.

Given a general wage index with the characteristics described and accepted by the public, we might be able to answer the often posed question—"How much have wages increased?" Equally significant, a real measure of the price of labor associated with measures of employment and unemployment would provide a vastly improved tool for analysis in labor economics and for public policy. Although the conceptual and technical problems associated with developing the ideal index are enormous, the need is great and may become compelling as the complex mixture of private enterprise and public management of the economy proceeds.

Alfred Marshall was right, however; there are hundreds of labor markets, and, if we are to explain movement in the generalized measure, it is necessary to have the same type of measure for at least some of the markets. As with the Consumer Price Index or the unemployment rate, the overall change can only be understood or explained by the weights of changes in the subgroups. Thus, the general wage measure should provide separate data for industries, possibly areas, for union and nonunion employment situations, and show separately the various components of compensation for the different classifications. □

———*FOOTNOTES*———

[1] Alfred Marshall, *Principles of Economics* (New York, The MacMillan Co., 1947), 8th ed., p. 533.

[2] *Economic Report of the President*, February 1970, p. 69.

[3] William R. Bailey and Arthur Sackley, "An econometric model of worker compensation changes," *Monthly Labor Review*, September 1970, pp. 32–38.

[4] The foregoing description and subsequent data are taken from "War-Time Wage Movements and Urban Wage-Rate Changes," *Monthly Labor Review*, October 1944, pp. 684–704, and "Trends in Urban Wage Rates, September 1947," January 1948, pp. 45–50.

[5] *Summary of Manufacturing Production Workers Earnings Series, 1939–68* (BLS Bulletin 1616, 1969) and Supplements.

[6] Victor Sheifer, "The relationship between changes in wage rates and in hourly earnings," *Monthly Labor Review*, August 1970, pp. 10–17.

[7] Michael E. Sparrough, "Service Industry Wage Changes and Fringe Benefits," *Monthly Labor Review*, February 1968, pp. 35–39.

[8] See *Current Wage Developments*, October 1, 1970, tables 2 and 6.

[9] See Alvin Bauman, "Measuring employee compensation in U.S. industry," *Monthly Labor Review*, October 1970, pp. 17–24.

Better statistics

Although this country has better statistics than any other country, the appropriate criterion is not whether we rank first but whether our data are doing the job that has to be done. There is some evidence of a lag. For example, if we take account of the Federal resources that have been devoted to the development of economic statistics since 1963 we find that the level of support has remained the same while the real economy has increased by almost one-third. Furthermore, we find we are asking much more of our data than formerly. If policy is aimed at achiveing specific responses in economic activity, we must have more accurate statistical tools for measuring such changes. Better statistics are the surest way we now have of improving our economic knowledge.

—*Economic Report of the President*, 1971, page 62.

Usual weekly earnings of American workers

Special Labor Force Report examines demographic characteristics of workers responding to questions about their 'usual' weekly earnings

PAUL O. FLAIM AND NICHOLAS I. PETERS

EARNINGS TRENDS of American workers generally are measured in terms of average hourly and weekly earnings derived from industry payroll records. Such payroll (or establishment) data provide reliable measures of earnings by industry and geographic area, but reveal little about such demographic characteristics as sex, color, and occupation of the workers in the various earning categories.

In an effort to fill this information gap, the Bureau of Labor Statistics has examined responses to a special question put to wage and salary workers as part of the Current Population Survey in May of 1967 and subsequent years. The Current Population Survey is conducted for the Bureau of Labor Statistics by the Bureau of the Census in about 50,000 households, primarily to gather information on employment and unemployment. The special question in the May survey asked respondents to report how much they and/or the other working members of the household "usually earn per week at this job [that is, their principal job] before deductions." This article discusses estimates based on these responses, with special emphasis on data for full-time workers obtained in 1971.

Of the 67.7 million wage and salary workers for whom earnings data were obtained in May 1971,[1] about 57.6 million, or 85 percent, were classified as full-time workers, that is, they were actually working or usually worked 35 hours or more a week. Nearly 15 percent were classified as part-time workers, that is, they usually worked between 1 and 35 hours a week.[2]

Characteristics of earners

On the basis of their reported earnings in their principal job, workers were divided into several categories, ranging from earnings of under $25 a week to earnings of more than $200. Workers falling within each of these earnings intervals were then cross-classified according to demographic and occupational classifications. All of the classifications were, it must be emphasized, based on personal reports (rather than on actual records) and as such they may be subject to some bias as well as some unintentional errors on the part of the respondents.

Low earners. A sizable number of full-time workers were reported as usually earning less than $60 a week in May 1971.[3] Table 1 shows that about two-thirds of these low earners were women. Another 15 percent were men age 16 to 24; less than one-fifth were men age 25 and over.

Negroes, who make up only 11 percent of all wage and salary workers, accounted for about 20 percent of those usually earning less than $60 a week.[4] Negro women were particularly overrepresented in this low-earnings category. Although Negro women make up less than 5 percent of full-time wage and salary employment, they accounted for over 13 percent of those earning less than $60 a week.

On an occupational basis, the full-time workers usually earning less than $60 a week were heavily concentrated in the service and farm occupations. For example, private household workers, accounting for only 1 percent of all full-time wage and salary workers, made up 11 percent of those earning less than $60 a week. Other service workers were also overrepresented in this low earnings category, as were farm workers. Together, these three occupational groups, which made up barely one-tenth of all full-time wage and salary workers, accounted for nearly one-half of those usually earning less than $60 a week.

However, as table 1 shows, some workers earning less than $60 a week were reported for all occupations. Even among professional and technical workers—a group with median weekly earnings of nearly

Paul O. Flaim and Nicholas I. Peters are labor economists in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

$200—there was a sizable number (about 300,000) usually earning less than $60 a week. This apparent anomaly could be attributable to several factors. For some professional and technical workers, particularly those engaged in religious activities or performing social work, this may well represent their real earnings situation. For some others, however, this may represent an underreporting of earnings. For others, it may be related to an overreporting of hours, which might have caused them to be erroneously classified as full-time rather than part-time workers.

High earners. On the other end of the earnings scale, nearly 13 million workers were reported as usually earning more than $200 a week. The great majority of them (nearly 90 percent) are men 25 years of age and over. Negroes are badly underrepresented in this high-earnings category (table 1). These highly paid workers are heavily concentrated in the professional and managerial occupations and, to a lesser extent, among craftsmen and foremen. Though making up only two-fifths of the full-time wage and salary workers, these three occupations combined contained three-fourths of the wage earners in the $200-plus bracket.

Earnings trends for recent years

The usual weekly earnings of most groups of full-time workers have been rising steadily in recent years, even when measured in constant dollars. This becomes evident when the May 1971 findings are compared with similar data collected in 1967, 1969, and 1970. However, the earnings trends over this period have not been the same for all groups. (See table 2.)

For example, while the earnings of men and women working full-time rose at approximately the same pace between 1967 and 1971—by about 30 percent in current dollars and 6 percent in 1967 dollars—the rise was somewhat steeper for those 25 years and older than for those 16 to 24. The smaller gain in earnings for younger workers may be related to the very rapid increase in their numbers in recent years. The keen competition for jobs among young persons may have kept their earnings from rising as rapidly as those of the more sought-after adult workers.

Earnings for Negro workers, both male and female, have clearly grown at a faster pace than those for their white counterparts in the 1967–71 period. Thus, the relative gap in earnings between the two races has narrowed somewhat. In 1967, the median weekly earnings for Negroes was equivalent to 70 percent of the average for whites; by 1971, it had risen to 75 percent.

Among the major occupational groups, the 1967–71 increases in usual weekly earnings (in current dollars) ranged from about 20 percent for private household workers to about 30 percent for professional and technical workers. However, the earnings rise for professional workers appears to have lost steam in the last couple of years, probably a reflection of the employment difficulties experienced recently by these workers.

From a welfare as well as from an economic standpoint, perhaps the most important trend in earnings is that of workers, both male and female, who are heads of households. Over the 1967–71 period, the earnings (in current dollars) for these primary workers have risen by about 30 percent, or at a somewhat faster pace than the earnings for all full-time workers, which rose by 27 percent. After allowing for

Table 1. Distribution of full-time workers, by usual weekly earnings and selected characteristics, May 1971

Characteristic	Usual weekly earnings				
	Total	Under $60	$60–99	$100–199	$200 or more
AGE AND SEX					
Number (in thousands)	57,642	3,634	11,735	29,402	12,870
Percent distribution	100.0	100.0	100.0	100.0	100.0
Male	66.0	33.5	37.5	70.4	91.2
16 to 24 years	9.9	14.8	13.2	11.1	2.9
25 years and over	56.1	18.7	24.3	59.3	88.3
Female	34.0	66.5	62.5	29.6	8.8
16 to 24 years	7.6	18.1	16.6	5.9	.4
25 years and over	26.4	48.4	45.9	23.7	8.3
COLOR					
Number (in thousands)	57,642	3,634	11,735	29,402	12,870
Percent distribution	100.0	100.0	100.0	100.0	100.0
White	88.8	79.7	81.7	89.8	95.7
Male	59.3	26.6	28.6	63.1	87.8
Female	29.5	53.1	53.2	26.6	7.9
Negro and other races	11.2	20.3	18.3	10.2	4.3
Male	6.7	6.9	8.9	7.3	3.4
Female	4.5	13.4	9.3	3.0	.9
OCCUPATION					
Number (in thousands)	57,642	3,634	11,735	29,402	12,870
Percent distribution	100.0	100.0	100.0	100.0	100.0
Professional and technical workers	15.4	8.3	3.9	14.1	30.6
Managers-officials-proprietors	10.4	4.5	3.0	7.7	25.2
Clerical workers	17.9	14.8	26.2	20.6	5.0
Salesworkers	5.4	8.1	5.6	4.4	6.6
Craftsmen and foremen	14.9	3.1	6.3	17.7	19.4
Operatives	19.0	12.7	27.0	21.3	8.0
Nonfarm laborers	5.0	5.5	7.0	5.6	1.7
Private household workers	.9	11.1	1.0	.1	----
Other service workers	10.0	25.8	17.6	7.9	3.2
Farmworkers	1.2	6.1	2.4	.6	.2

price changes, the usual weekly earnings of male and female household heads working full-time have risen by about 8 percent, or at about double the pace in the average increase for all workers. Although these data refer to gross earnings and thus do not take into account any deductions or changes in deductions which might have been instituted during the 1967–71 period, they tend to indicate (despite widespread claims to the contrary[5]) that primary breadwinners have continued to make progress in terms of purchasing power in recent years.

Table 2. Medians of usual weekly earnings of wage and salary workers, by selected characteristics, in current and 1967 dollars

Characteristic	In current dollars				In 1967 dollars			
	May 1967	May 1969	May 1970	May 1971	May 1967	May 1969	May 1970	May 1971
FULL-TIME WORKERS								
Total	$109	$121	$130	$138	$110	$111	$112	$114
AGE AND SEX								
Male	125	142	151	162	126	130	131	134
16 to 24 years	97	108	112	114	98	99	97	94
25 years and over	131	148	160	172	132	136	138	142
Female	78	86	94	100	78	79	81	83
16 to 24 years	74	82	88	91	74	75	76	75
25 years and over	79	88	96	103	79	81	83	85
COLOR								
White	113	125	134	142	114	115	116	118
Male	130	146	157	168	131	134	136	139
Female	79	88	95	102	79	81	82	84
Negro and other races	79	90	99	107	79	83	86	89
Male	90	104	113	123	91	95	98	102
Female	63	73	81	87	63	67	70	72
OCCUPATION								
Professional and technical workers	145	167	181	189	146	153	156	156
Managers, officials, and proprietors	164	178	190	[1]200+	165	163	164	[1]165+
Clerical workers	91	102	109	115	92	94	94	95
Salesworkers	113	123	133	141	114	113	115	117
Craftsmen and foremen	131	146	157	167	132	134	136	138
Operatives	97	109	115	120	98	100	99	99
Nonfarm laborers	93	106	110	117	94	97	95	97
Private household workers	32	34	38	38	32	31	33	31
Other service workers	75	82	87	96	75	75	75	79
Farmworkers	58	66	71	74	58	61	61	61
HOUSEHOLD STATUS								
Male:								
Household head	131	147	158	170	132	135	137	141
Relative of head	88	101	105	108	89	93	91	89
Nonrelative of head	104	119	121	131	105	105	108	104
Female:								
Household head	81	91	100	106	81	81	86	88
Wife of head	79	87	95	101	79	80	82	84
Relative of head	72	79	85	89	72	72	73	74
Nonrelative of head	69	84	89	95	69	77	77	79
PART-TIME WORKERS								
Total	26	30	32	34	26	28	28	28

[1] Exact medians could not be computed, either in current or constant dollars, where more than 50 percent of a group's workers earned more than $200 a week.

Male-female differences in weekly earnings

As Victor Fuchs stated in a recent article, "The fact that men earn more than women is one of the best established and least satisfactorily explained aspects of American labor market behavior." [6] On the basis of hourly earnings data, Fuchs found that in 1959 the average female worker earned only 60 percent as much as the average male worker. A close look at the usual weekly earnings data reported for 1971 indicates that the male-female earnings gap did not narrow much during the intervening 12 years.

Although the proportion of women in the full-time labor force in the United States grew considerably during the 1960's, and although many women have gradually gained entry into high-skill, high-paying jobs, the average female worker was still earning much less than the average male worker in the spring of 1971. Table 3 shows that the median weekly earnings of women working full time was only $100, while the median for male full-time workers was $162. Expressed in relative terms, the weekly earnings of the average female full-time worker corresponded to only 62 percent of those of the average man working full time.

Table 3 also shows that the earnings of women working full-time are much lower than those of men at every age level. The male-female earnings differential, however, is particularly large for workers in the 35 to 44 and 45 to 54 age groups. In early 1971, the men in these two age groups were earning about $180 a week; women of the same age were barely exceeding the $100 weekly earnings average for women of all ages.

It is not within the scope of this article to identify and examine all the factors which may keep the earnings of women below those of men. Since much has been written about this topic in recent months,[7] only the most important factors will be discussed here. Of greatest importance are (1) the shorter workweek of female full-time workers, compared to that of male full-time workers, and (2) the greater concentration of women in clerical, sales, and service occupations, where wages have traditionally been very low.

In terms of male-female workweek differences, it should be noted that in 1971 women on full-time schedules in nonfarm wage and salary jobs worked an average 39.9 hours a week, while men in the same jobs worked an average 43.6 hours a week. In terms of differences in occupational distribution, clerical work, retail sales, and service occupations—three

fields where wages have traditionally been relatively low—accounted for nearly two-thirds of total female employment in 1971, compared with only one-fifth of total male employment.

Sex discrimination may, of course, play a part in the underrepresentation of women in certain occupations and in their shorter workweek and lower earnings. It should be noted, however, that in general women are less likely than men to acquire advanced educations. Also, because of family obligations, some women who may possess the education and skills, or at least the potential, for a higher occupation may often settle for a lower one in order to work closer to home or at more convenient hours.

In addition, career interruptions in the work life of a woman who is raising a family may restrict her accumulation of job seniority and constitute a further hindrance to her advancement in terms of skills and earnings. This combination of factors should be kept in mind when examining the male-female earnings differential. They are particularly important in explaining why the earnings of women begin to taper off so early during their working life—as is shown dramatically in chart 1.

Another factor in the male-female differential in weekly earnings is that women are not only less likely than men to work overtime, they are less likely to receive premium pay when they do. Only 15 percent of all women with full-time jobs worked overtime in May 1971, compared with about 30 percent of men working full time. Among those who did work overtime, only 33 percent of the women, compared with 38 percent of the men, received premium pay for the extra-long workweek. The main reason for this difference appears to be the fact that men are relatively more concentrated in blue-collar jobs, in such industries as manufacturing and construction, where premium pay is most readily available for overtime work.[8]

After allowance for these differences in the length of the workweek and in the frequency of premium pay for overtime work, it is evident that women do not trail men as much in terms of hourly earnings as they do in terms of weekly earnings.[9]

Occupational differences

A worker's occupation is clearly the most important single factor affecting the level of his weekly earnings. Table 4 shows some obvious differences in usual weekly earnings between the broad occupational groupings—that is, between blue-collar, white-collar, service, and farmworkers. The most striking differences, however, are those between the various occupations within these broad categories.

Table 3. Usual weekly earnings of full-time wage and salary workers, by age and sex, May 1971

Sex and age (in years)	Number of workers (in thousands)	Percent distribution by earnings						Median earnings
		Total	Under $60	$60–99	$100–149	$150–199	$200 or more	
Total	57,642	100.0	6.3	20.4	30.0	21.0	22.3	$138
Male	38,056	100.0	3.2	11.5	28.6	25.8	30.9	162
16 to 24	5,722	100.0	9.4	27.0	39.2	17.7	6.6	114
16 to 19	1,358	100.0	25.1	42.7	26.8	5.0	.7	82
20 to 24	4,364	100.0	4.6	22.1	43.0	21.7	8.5	124
25 or more	32,337	100.0	2.1	8.8	26.7	27.2	35.1	172
25 to 34	9,714	100.0	1.3	8.7	29.5	29.7	30.9	167
35 to 44	8,491	100.0	1.6	6.8	24.2	26.7	40.7	182
45 to 54	8,125	100.0	1.6	8.0	25.0	27.5	38.0	178
55 to 64	5,157	100.0	2.8	12.3	28.3	25.1	31.6	163
65 or more	848	100.0	17.1	18.8	26.9	15.7	21.5	123
Female	19,586	100.0	12.3	37.5	32.7	11.7	5.8	100
16 to 24	4,387	100.0	15.0	44.3	32.1	7.3	1.3	90
16 to 19	981	100.0	33.2	50.3	15.6	.5	.4	73
29 to 24	3,406	100.0	9.7	42.7	36.7	9.3	1.6	97
25 or more	15,199	100.0	11.6	35.5	33.0	13.0	7.0	103
25 to 34	3,913	100.0	9.1	33.6	36.4	14.8	6.2	108
35 to 44	3,843	100.0	11.0	36.3	33.6	12.1	7.0	102
45 to 54	4,390	100.0	11.8	36.0	32.1	13.3	6.9	102
55 to 64	2,664	100.0	12.2	36.8	30.6	11.7	8.7	101
65 or more	389	100.0	35.0	30.3	20.5	8.0	6.2	80

Within the white-collar group, for example, about one-half of the persons in both the professional-technical and managerial fields, but only 6 percent of those in the clerical field (who are mostly women) reported earning more than $200 a week in early 1971. Even among professional and technical workers there were some wide earnings differences. For example, about four-fifths of the engineers, but only one-third of the teachers, reported usual weekly earnings in excess of $200.

The lowest paid white-collar workers were clearly those in the clerical and retail sales occupations. Salesworkers outside of retail trade, on the other hand, ranked among the highest paid white-collar workers. The median for their usual weekly earnings was $188, about double that for retail sales workers ($95).

Among the blue-collar group, median weekly earnings ranged from $167 for craftsmen and foremen to $117 for nonfarm laborers. Median weekly earnings for operatives, an occupation where almost one-third of the employment is female, were $120, only slightly above those of nonfarm laborers.

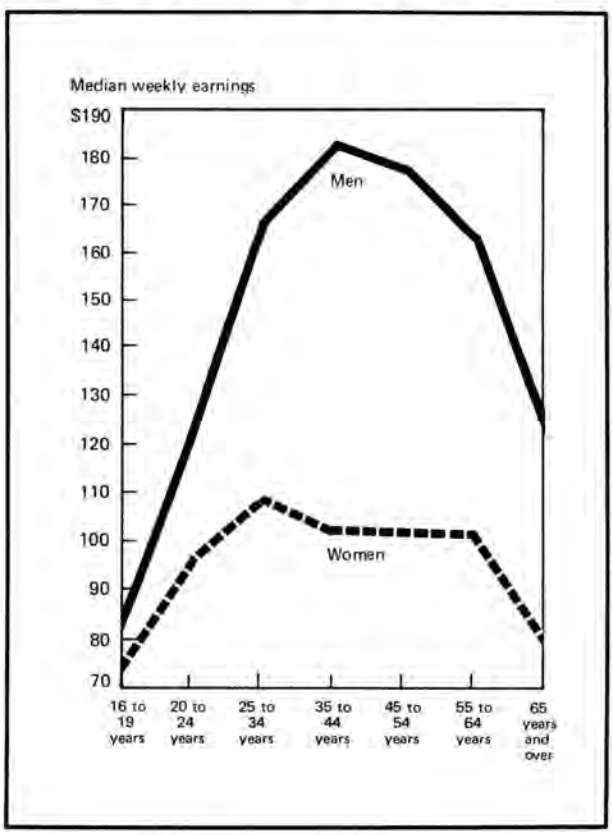
The most striking disparities in earnings between individual occupations are found in the service field. Earnings for workers in this category ranged from

over $163 a week for those engaged in protective service activities (including firemen, policemen, private guards, and so on) to a low of $38 a week for those performing private household work. It is, possible, however, that many household workers may have received payments "in kind," such as food and lodging, in addition to reported money earnings.

Next to private household workers, farm laborers have the lowest weekly earnings among major groups of American workers. One-third of them said they were earning less than $60 a week in May 1971, while only 2 percent were making more than $200 a week. It should be noted that farm laborers are limited in the number of weeks per year which the seasonal nature of their work permits them to work.[10] However, many of these workers may also receive payments in kind not reported as earnings.

In every major occupation where both men and women are employed in substantial numbers, men were earning considerably more than women in early 1971. This is evident from the median weekly earnings data by occupation, sex, and color shown in table 5. The occupational breakdown in this table is not sufficiently detailed, however, to determine whether the work roles of men and women in each occupational field are similar, or even approximately similar.

Chart 1. Male-female differences in usual weekly earnings of full-time workers, by age, May 1971



Earnings by industry

The interindustry differences in average weekly earnings are already well known from the regularly published data on payroll workers collected through the establishment survey. The new data on usual weekly earnings (which are derived from a household survey) shed new light on the intraindustry pattern of earnings. The data also provide earnings information for some industries, such as agriculture and private household services, for which no data are obtained through the payroll series.

In general, the earnings data regularly available from the payroll (or establishment) series give only the average levels of earnings for each industry, providing little information on the dispersion of earnings from the average and none about the demographic characteristics of the industry's high-wage and low-wage earners.[11] The usual weekly earnings data from the household survey, on the other hand, make it possible to group workers within an industry according to both their level of earnings and their salient personal characteristics (age, sex, color, and so on).

Despite some major differences in definition, coverage, method of collection, and computation between the weekly earnings data derived from the payroll series and those obtained through the Current Population Survey,[12] the two series yielded reasonably close results for most industries in May 1971. (See table 6). Where the two series differed widely (for the construction, retail trade, and the miscellaneous services industries), the earnings differences can be largely reconciled by taking into account the differences in coverage and definition. In the case of construction, for example, the $170 usual weekly earnings average from the May 1971 household survey covered about 3.8 million wage and salary workers, many of whom were not working specifically for a construction contractor, while many others, though employed by a construction contractor, may have been working as secretaries rather than performing actual construction tasks. On the other hand, the gross weekly earnings average of $209 from the May 1971 establishment survey refers only to

Table 4. Usual weekly earnings of full-time wage and salary workers, by occupation, May 1971

Occupation	Number of workers (in thousands)	Percent distribution by earnings						Median earnings
		Total	Under $60	$60–99	$100–149	$150–199	$200 or more	
All occupations	57,642	100.0	6.3	20.4	30.0	21.0	22.3	$138
White-collar workers	28,284	100.0	4.6	16.1	28.0	20.7	30.7	153
Professional and technical workers	8,849	100.0	3.4	5.2	20.5	26.4	44.5	189
Engineers	1,093	100.0	.1	.5	5.7	15.3	78.3	+200 [1]
Medical personnel	1,065	100.0	3.5	9.3	29.6	29.5	28.2	162
Teachers (except college)	2,415	100.0	4.5	5.6	26.2	32.2	31.5	171
Other professionals	4,276	100.0	3.6	5.1	18.7	25.2	47.4	194
Managers, officials, and proprietors	6,005	100.0	2.7	5.8	17.1	20.5	53.9	+200 [1]
Clerical workers	10,320	100.0	5.2	29.8	42.2	16.4	6.3	115
Steno, typists, and secretaries	2,975	100.0	5.3	28.9	49.1	13.8	2.8	113
Other clerical workers	7,344	100.0	5.2	30.2	39.4	17.5	7.7	116
Salesworkers	3,109	100.0	9.5	21.2	22.9	19.0	27.4	141
Retail sales	1,531	100.0	16.6	36.5	25.7	10.8	10.3	95
Other sales	1,579	100.0	2.8	6.3	20.2	26.8	44.0	188
Blue-collar workers	22,368	100.0	3.5	21.2	34.0	24.6	16.8	136
Craftsmen and foremen	8,565	100.0	1.3	8.6	29.3	31.6	29.2	167
Carpenters	638	100.0	3.0	11.1	28.6	26.1	31.2	164
Other construction craftsmen	1,660	100.0	1.2	9.8	23.7	28.2	37.1	177
Foremen	1,349	100.0	.4	5.3	22.5	27.3	44.6	190
Machinists	523	100.0	.6	4.6	35.4	39.3	20.1	161
Mechanics, automobile	685	100.0	2.3	15.1	36.8	30.8	14.9	144
Mechanics, other	1,322	100.0	.6	7.9	34.7	34.3	22.4	159
Metal craftsmen	545	100.0	1.1	2.9	29.2	37.9	28.9	172
Other craftsmen	1,842	100.0	1.7	9.9	31.5	33.8	23.0	160
Operatives	10,927	100.0	4.2	29.0	36.5	20.8	9.4	120
Drivers and deliverymen	2,121	100.0	2.6	16.6	35.7	26.1	19.0	143
Motor vehicles and equipment	434	100.0	----	6.7	32.3	48.4	12.7	161
Other durable goods industries	3,714	100.0	2.5	24.7	42.3	22.2	8.3	124
Nondurable goods industries	3,074	100.0	4.9	46.2	33.4	11.4	4.1	98
Nonmanufacturing industries	1,584	100.0	10.4	28.6	31.4	21.0	8.8	115
Nonfarm laborers	2,877	100.0	6.9	28.6	38.3	18.6	7.6	117
Construction	674	100.0	4.4	27.4	31.7	21.3	15.1	123
Manufacturing	924	100.0	3.8	27.5	46.5	16.3	5.9	119
All other industries	1,279	100.0	10.3	29.9	35.8	18.9	5.0	113
Service workers	6,283	100.0	21.4	34.6	26.0	11.4	6.6	91
Private household workers	544	100.0	73.9	21.1	3.3	1.1	.6	38
Other service workers	5,739	100.0	16.4	35.9	28.2	12.4	7.2	96
Protective services	952	100.0	1.5	9.3	30.7	32.9	25.7	163
Waiters, cooks, and kindred	1,228	100.0	31.0	39.9	18.4	7.3	3.5	75
Other services	3,558	100.0	15.3	41.6	30.8	8.6	3.5	91
Farmworkers [2]	706	100.0	31.7	39.5	19.6	5.7	3.4	74
Farm laborers	669	100.0	32.8	40.5	19.3	4.9	2.2	72

[1] Exact median could not be computed where it fell above $200.

[2] Includes farm managers, not shown separately.

those workers (about 2.7 million) who were employed by construction contractors and who were specifically engaged in construction tasks (as working foremen, journeymen, apprentices, laborers, and so on). As for the wide differences between the household and payroll data on weekly earnings in retail trade and miscellaneous services, it should be noted that the household data presented in table 6 refer *only* to full-time workers, while the payroll data refer to all production and nonsupervisory workers. Since a particularly large proportion of the workers in these two industries work only part-time, it follows that the earnings average from the payroll series should be considerably lower than that from the household survey.

In sum, when the coverage and definitional differences are taken into account, the average weekly earnings data by industry from the household survey appear to be in reasonably close agreement with the data from the payroll series. This being the case, one can proceed with some confidence in analyzing the household earnings data in terms of the various demographic groups which make up each industry's work force.

The differing patterns in intraindustry distribution of earnings are illustrated by the data in table 7. Of particular interest are the relatively large proportion of full-time workers in agriculture (28 percent) and private household work (71 percent) who were earning less than $60 a week in early 1971. This was in sharp contrast with the pattern for most other industries, where the great majority of the workers were earning more than $100 a week.

In terms of dispersion of earnings from the average, the earnings data for mining and construction workers represent an example of two widely different patterns. The median weekly earnings in both industries were roughly the same in May 1971—about $170. However, while the $150-to-$199 earnings interval surrounding the median contained about

two-fifths of the mining workers, it accounted for only one-fifth of the construction workers. In other words, the median earnings for the mining industry was fairly representative of the actual earnings of the "typical" worker in the industry, but the median for the construction industry was comparatively less representative of the true earnings situation for most construction workers.

Usual weekly earnings by demographic group and industry of employment are shown in table 8. An examination of the data in this table shows that women earn considerably less than men in every industry and that Negro workers earn less than white workers in practically every industry.

White-Negro differences in earnings

The usual weekly earnings of Negro workers are generally lower than those of whites, but the pattern is strikingly different for men than for women and varies significantly from one occupation group to another. For Negro men working full-time, the median usual weekly earnings from the May 1971 survey was $123 (table 5). This was equivalent to only 73 percent of the usual weekly earnings for white men ($168). The median weekly earnings for Negro women working full time was $88, or about 85 percent of the average for white women ($103). In short, Negro women did not trail white women in terms of earnings as much as Negro men trailed white men.

One of the reasons for the relatively large gap in earnings between Negro men and white men is that Negro men generally work fewer hours than do white men. During 1971, for example, Negro men on full-time schedules in nonfarm wage and salary jobs worked an average of 41.4 hours a week, compared with a 43.9 average for white men. For Negro women on full-time schedules, the average workweek (39.3 hours) did not differ as much from the average workweek of white women (40.0).

When the earnings comparison is made on an occupational basis, it becomes apparent that the earnings gap between white and Negro women is surprisingly small. Indeed, in many occupational groups Negro women earn about as much as white women. In the white-collar field, for example, this was the case both in the clerical occupations (where about 650,000 Negro women were employed on a full-time basis in May 1971) and in the professional and technical occupations (where about 350,000 Negro women were employed on a full-time basis). Negro

Table 5. Medians of usual weekly earnings of full-time[1] wage and salary workers by color, sex, and occupation, May 1971

Occupation	Medians of usual weekly earnings[2]				
	All persons	White		Negro	
		Male	Female	Male	Female
Total	$139	$168	$103	$123	$88
White-collar workers	153	199	114	156	115
Professional and technical workers	189	[3] +200	157	186	154
Managers, officials, and proprietors	[3] +200	[3] +200	125	186	----
Clerical workers	115	153	106	137	107
Salesworkers	142	178	80	----	----
Retail sales	95	135	74	----	----
Other sales	189	198	120	----	----
Blue-collar workers	137	152	88	120	81
Craftsmen and foremen	167	171	103	136	----
Operatives	121	141	87	121	80
Nonfarm laborers	117	123	84	107	----
Service workers	91	132	72	105	70
Private household workers	38	----	34	----	43
Other service workers	97	132	76	105	77
Protective services	163	165	----	140	----
Waiters, cooks, and kindred	76	117	65	117	65
All other services	91	115	81	96	79
Farmworkers	74	80	68	61	58

[1] The full-time worker definition used for the purposes of this table, as well as table 8, differs slightly from the definition used in all the other tables. It does not cover persons working less than 35 hours because of economic reasons. However, since the number of such persons is very small relative to the total for full-time workers (one million out of 58 million), their exclusion has only a minimal effect on the medians for the various groups.

[2] Median not shown where number of workers is less than 75,000.

[3] Exact median not computed where it fell above $200.

Table 6. Comparison of weekly earnings data from household and establishment surveys

Industry	"Usual" weekly earnings of full-time workers, from May 1971 Current Population Survey		"Actual" weekly earnings of production and nonsupervisory workers, from May 1971 Establishment Survey	
	Number of workers (in thousands)	Median earnings	Number of workers (in thousands)	Mean earnings
Total	57,642	$138	47,708	$125
Agriculture	910	80	----	----
Mining	517	168	472	171
Construction	3,788	170	2,717	209
Manufacturing	17,607	140	13,441	142
Durable goods	10,525	148	7,634	153
Nondurable goods	7,082	124	5,807	127
Transportation and public utilities	4,464	161	3,894	164
Wholesale and retail trade	9,578	118	13,375	100
Wholesale trade	2,313	152	3,190	145
Retail trade	7,265	109	10,185	86
Private household work	642	42	----	----
Finance, insurance, and real estate	3,240	130	2,974	122
Miscellaneous services	12,908	132	10,835	101
Public administration	3,988	165	----	----
Postal	659	161	----	----
Other Federal	1,441	182	----	----
State	593	147	----	----
Local	1,295	156	----	----

NOTE: Dashes indicate data are not available.

women working in the services field were also earning about as much as white women, while those in blue-collar and farmwork were earning somewhat less than white women.

In general, it might be said that Negro women do not fare badly in earnings relative to white women in the same occupation. However, since Negro women tend to be more concentrated in the low-skilled occupations, their overall earnings average is still significantly lower than that for white women.[13] Black men, on the other hand, trail white men in terms of weekly earnings in nearly every occupation; the gap is particularly wide in the craftsmen and foremen field.

On an industry basis, the Negro-white differential in male earnings is also evident in practically every field (table 8). Earnings of Negro men, relative to the earnings of white men, tend to be particularly low in the construction industry and in the finance, insurance, and real estate industry. In both industries, the median earnings of Negro men were only two-thirds as high as the median for white men. Of all the major industries, public administration was the one in which Negro men had by far the highest earnings—$156 a week—and where they trailed the earnings of white men ($183) by the smallest relative amount—about 15 percent.

Employment in the public administration field, where racial discrimination has probably been abated more than in any other field, is also rewarding for Negro women. Their median weekly earnings in this industry are equivalent to the earnings of white women in the same field. The relatively well-paid status of Negro women in the public administration field is probably the main factor behind their apparent earnings parity with white women in white-collar work.

Occupational and industry data (tables 5 and 8) show that the earnings of Negro women in private household work, though low relative to the earnings of Negro women in other occupations, are significantly higher than those of white women in the same field. The probable explanation is that for many Negro women household work represents a lifetime occupation, whereas for white women it tends to be a much more marginal occupation.

Table 7. Usual weekly earnings of full-time wage and salary workers, by industry, May 1971

Industry	Number of workers (in thousands)	Percent distribution by earnings						Median earnings
		Total	Under $60	$60–99	$100–149	$150–199	$200 or more	
Total	57,642	100.0	6.3	20.4	30.0	21.0	22.3	$138
Agriculture	910	100.0	27.9	35.7	24.8	6.8	4.8	80
Mining	517	100.0	1.2	9.9	24.0	41.2	23.8	168
Construction	3,788	100.0	2.3	13.1	25.5	21.5	37.5	170
Manufacturing	17,607	100.0	2.3	20.2	23.9	22.5	21.1	140
Durable goods	10,525	100.0	1.7	14.5	34.7	25.8	23.2	148
Nondurable goods	7,082	100.0	3.1	28.7	32.6	17.6	17.9	124
Transportation and public utilities	4,464	100.0	1.7	11.0	30.4	30.2	26.7	161
Trade	9,578	100.0	10.4	26.7	28.6	16.8	16.6	118
Wholesale	2,313	100.0	2.6	16.6	29.7	23.0	28.1	152
Retail	7,265	100.0	12.8	31.2	28.3	14.8	13.0	109
Private household work	642	100.0	70.5	20.7	5.7	1.2	1.7	42
Finance and insurance	3,240	100.0	4.3	24.2	31.4	16.3	23.8	130
Miscellaneous service [1]	12,908	100.0	8.7	22.5	28.3	18.6	21.9	132
Business repair	1,489	100.0	4.5	19.0	33.2	18.2	25.1	139
Personal service	1,204	100.0	22.4	39.5	22.1	8.8	7.1	84
Entertainment and recreation	314	100.0	13.1	21.4	24.9	12.8	27.8	126
Professional service	9,843	100.0	7.6	21.0	28.4	20.1	23.0	137
Medical	978	100.0	8.8	38.2	30.4	12.4	10.2	104
Hospitals	2,291	100.0	6.6	32.2	34.1	15.7	11.4	114
Welfare, religion	694	100.0	15.9	18.9	32.6	19.6	13.0	120
Educational service	4,913	100.0	7.5	13.9	25.6	23.5	29.5	156
Other professional	967	100.0	3.2	14.1	24.3	21.1	37.3	169
Public administration	3,988	100.0	2.4	8.6	30.2	29.2	29.6	165
Postal	659	100.0	2.4	3.3	34.4	44.2	15.6	161
Other Federal	1,441	100.0	1.8	6.6	24.4	26.5	40.7	182
State	593	100.0	2.2	13.3	36.0	25.7	22.8	147
Local	1,295	100.0	3.1	11.2	32.1	26.2	26.4	156

[1] Includes forest and fisheries, not shown separately.

Table 8. Medians of usual weekly earnings of full-time [1] wage and salary workers, by color, sex, and industry, May 1971

Industry	Medians of usual weekly earnings [2]				
	All persons	White		Negro	
		Male	Female	Male	Female
Total	$139	$168	$103	$123	$88
Agriculture	80	89	-------	63	-------
Mining	168	173	-------	-------	-------
Construction	171	181	119	120	-------
Manufacturing	141	165	99	125	86
Durable goods	149	167	108	132	95
Nondurable goods	127	160	91	113	81
Transportation and public utilities	161	178	114	131	108
Wholesale and retail trade	119	150	83	110	79
Wholesale trade	153	174	107	116	-------
Retail trade	110	141	80	109	77
Private household work	40	-------	35	-------	44
Finance, insurance, and real estate	131	193	103	118	100
Miscellaneous services [3]	132	173	116	123	92
Business and repair	139	163	110	123	-------
Personal services	85	123	71	92	76
Entertainment, recreation	128	169	89	-------	-------
Professional services	137	182	122	132	99
Medical, except hospitals	104	169	101	-------	79
Hospitals	114	145	110	127	92
Welfare, religon	120	141	108	-------	-------
Educational services	156	189	141	132	120
Other professional services	170	[4] +200	117	-------	-------
Public administration	165	183	127	156	131
Postal	161	165	-------	156	-------
Other federal	182	[4] +200	140	149	122
State	148	172	122	-------	-------
Local	156	174	114	165	124

[1] The full-time worker definition shown in this table, as well as in table 5, differs slightly from the definition used in all the other tables in this article. It does not cover persons working less than 35 hours a week because of economic reasons. However, since the number of such persons is very small relative to the total for full-time workers (1 million out of 58 million), their exclusion has only a minimal effect on the medians for the various groups.

[2] Medians not shown where number of workers is less than 75,000.

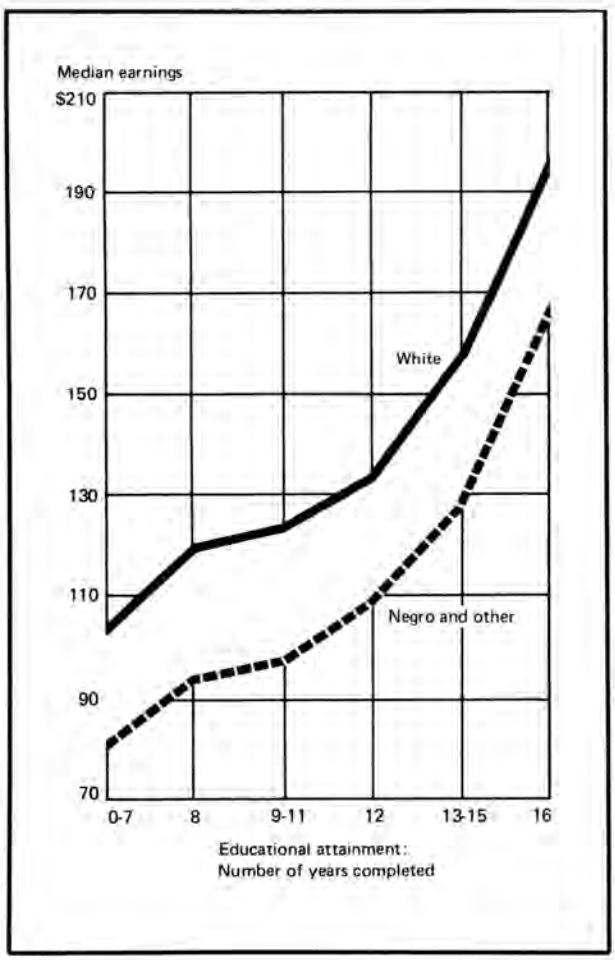
[3] Includes forestries and fisheries, not shown separately.

[4] Exact median not computed where it fell above $200.

In general, the May 1971 data indicate that, although Negro workers as a group have reached earnings parity with white workers in many fields, they (particularly Negro men) still have a long way to go to reach complete parity. There are, however, several factors (in addition to the work-week differences already cited) that ought to be kept in mind in any objective comparison of the earnings of Negroes with those of whites. It should be noted that a much larger proportion of the Negro than of the white labor force is concentrated in the South, where the wages in many occupations tend to be below the national average. Also, Negroes are relatively new entrants in some occupations; as such, many of them have not yet acquired the skill specialization and seniority necessary for the highest wages in their occupational groupings.

However, the lack of equal opportunities for Negroes in terms of education and training or in the advancement toward higher paying occupations cannot be ruled out as a major factor. While it has often been suggested that the payoff from education is relatively limited for Negroes, the earnings data from the May 1971 survey tend to refute this contention. As chart 2 shows, every additional year of education, particularly at the college level, adds significantly to the weekly earnings of both white and Negro workers. In absolute terms, the gap in weekly earnings between white and Negro workers was approximately the same ($25-$30) at each level of educational attainment. In proportional terms, however, the gap narrowed as education rose.

Chart 2. Usual weekly earnings of full-time workers, by race and educational attainment, May 1971



It should be noted, however, that Negro full-time workers not only earn less per week than white full-time workers, but have a somewhat smaller probability of working the entire year. Of all wage and salary workers who held a job at some time during 1970, exactly 50 percent of the Negro, compared with 55 percent of the white, managed to become year-round full-time workers. In terms of annual earnings, therefore, Negroes tend to lag behind white workers even more than they do in terms of weekly earnings.[14]

Earnings of part-time workers

In examining the weekly earning patterns of the approximately 10 million part-time workers, it must be kept in mind that the composition of this group is vastly different from that of the full-time work force. About two-thirds of the persons who usually work part-time, but only one-third of those who work full-time, are women. Part-time workers are also much more likely to be either under 20 or over 60 years of age; this is particularly the case for men. In terms of racial composition, however, there is little difference between the part-time and full-time work force; Negroes make up about one-tenth of both.

Another obvious handicap in making any meaningful intergroup comparisons in terms of weekly earnings derived from part-time work is the fact that the usual workweek for these workers could range from 1 to 34 hours. While data on the usual hours of part-time workers are not available, the data on the actual number of hours that these persons worked during the reference week for the May 1971 survey may be used as a reasonable proxy. According to these data, the 10 million wage and salary workers who usually worked part time averaged about 18 hours of work a week. Workers in the central age

groups tended to work a slightly longer workweek, while those at the two extremes of the age spectrum tended to fall under the average. Low-skill, part-time workers were likely to work fewer hours than the norm, while those in the high-skill categories tended to exceed the average.

Relatively large proportions of the part-time work force are found in such industries as services, agriculture, and retail trade. Their occupational distribution leans more heavily toward the low-skill, and thus low-paying, jobs than that of full-time workers.

Because of all these factors, the usual weekly earnings of part-time workers were obviously much lower than those of full-time workers. In fact, the median earnings for all part-time workers was only $34 a week, about one-fourth of the median for full-time workers ($138). About one-third of the part-time workers were earning less than $25 a week in the spring of 1971, while only one-fifth of them were earning more than $60 a week. (See table 9.) In contrast, about 94 percent of the full-time workers reported usual weekly earnings in excess of $60.

Not surprisingly, part-time workers derive the highest weekly earnings from the same industries and occupations as full-time workers. However, contrary to the pattern among full-time workers, it is the women who earn more than the men among part-time workers. This reflects the fact that most of the women working part-time are in the prime of their working lives, whereas men working part-time tend to be either very young (16 to 19) or very old (65 years and over). For many women, particularly those with large families, part-time work may be a way of life; for most men, it is probably only a temporary, stopgap arrangement. □

Table 9. Usual weekly earnings of part-time wage and salary workers, by sex, age, and occupation, May 1971

Characteristic	Number of workers (in thousands)	Percent distribution by earnings						Median earnings
		Total	Under $25	$25–59	$60–99	$100–199	$200 or more	
Total	10,021	100.0	34.6	44.1	13.3	6.2	1.8	$34
Male	3,494	100.0	37.3	43.9	9.5	5.8	3.5	32
16 to 24 years	2,390	100.0	44.5	44.8	7.3	2.8	.5	28
16 to 19 years	1,709	100.0	51.3	43.1	4.8	.6	.1	24
20 to 24 years	681	100.0	27.3	49.0	13.8	8.3	1.6	39
25 or more years	1,102	100.0	22.2	41.9	13.7	12.3	9.9	44
25 to 34 years	233	100.0	14.4	33.6	21.4	18.8	11.8	61
35 to 44 years	99	100.0	16.8	28.4	16.9	18.9	18.9	66
45 to 54 years	141	100.0	18.2	30.6	16.0	17.5	17.5	61
55 to 64 years	192	100.0	25.4	37.9	15.7	13.5	7.6	41
65 or more years	440	100.0	27.4	53.7	7.5	5.7	5.7	34
Female	6,528	100.0	33.1	44.1	15.4	6.5	.9	36
16 to 24 years	2,212	100.0	49.7	39.7	7.3	3.2	.1	25
16 to 19 years	1,448	100.0	58.8	37.1	3.6	.7	------	21
20 to 24 years	764	100.0	32.6	44.7	14.3	7.9	.4	36
25 or more years	4,316	100.0	24.5	46.6	19.3	8.2	1.3	43
25 to 34 years	1,033	100.0	21.8	45.4	19.9	10.9	1.8	46
35 to 44 years	1,174	100.0	20.7	48.8	21.4	8.1	.9	45
45 to 54 years	1,061	100.0	22.9	47.7	20.4	8.0	.9	45
55 to 64 years	686	100.0	25.5	44.1	18.3	9.4	2.6	40
65 or more years	357	100.0	45.8	43.9	6.5	3.7	.3	27
OCCUPATION								
White-collar workers	4,495	100.0	25.2	44.7	17.7	9.5	2.9	40
Professional and technical workers	1,078	100.0	21.5	28.6	23.5	18.9	7.4	59
Managers, officials, and proprietors	177	100.0	22.3	27.4	24.6	13.4	12.3	60
Clerical workers	2,139	100.0	23.3	50.1	18.5	7.3	.7	41
Salesworkers	1,100	100.0	32.9	52.5	9.3	4.1	1.2	33
Blue-collar workers	1,913	100.0	35.0	45.1	12.6	5.5	1.8	34
Craftsmen and foremen	281	100.0	19.6	47.7	15.3	12.5	5.0	44
Operatives	800	100.0	27.2	49.6	16.9	4.6	1.8	39
Nonfarm laborers	832	100.0	47.7	40.0	7.6	4.0	.7	26
Service workers	3,378	100.0	45.0	43.6	8.4	2.4	.6	17
Private household workers	849	100.0	73.4	24.0	1.9	.4	.2	17
Other service workers	2,528	100.0	35.4	50.2	10.6	3.1	.7	32
Farmworkers	237	100.0	61.9	30.5	4.2	3.4	------	20

FOOTNOTES

[1] There were actually 70.3 million persons employed as wage and salary workers in May 1971. However, 2.7 million of these had not performed any work during the reference week for the Current Population Survey and thus were not asked to supply any information on their weekly earnings. These persons—classified as "employed, with a job but not at work"—were temporarily absent from their place of work because of illnesses, labor disputes, bad weather, or other reasons.

[2] The "full-time worker" definition refers not only to those wage and salary workers who actually work 35 hours or more during the reference week, it embraces even those workers who were temporarily limited to less than 35 hours because of personal reasons (such as a brief illness) or unfavorable economic factors (for example, a shortage of materials). This "full-time" definition does not, however, include those workers who, although "wanting" a full-time job, were more or less permanently confined to part-time schedules. The "part-time worker" definition used for the purposes of this article covers all the wage and salary workers who were *usually* working less than 35 hours a week when interviewed, regardless of whether they were satisfied with their part-time status or, instead, wanted full-time work. (In the traditional analysis of labor force activity, on the other hand, persons who want full-time work are regarded as full-time workers, even if they are more or less permanently confined to part-time work.)

[3] The term "usual" as applied to weekly earnings is, admittedly, somewhat vague. The reference period to which the term applies is not a specific calendar week as in the case of the earnings data collected regularly from payroll records, but an unspecified period perceived by the Current Population Survey respondents as the proper one for determining how much they or the other persons for whom they are responding usually earn per week (at their principal job) before deductions. Nevertheless, a careful

comparison of the usual weekly earnings data collected in May 1971 with similar data collected in previous years, as well as with weekly payroll data collected the same month, indicates that the respondents had in mind a rather current reference period, probably not extending beyond the previous 2 or 3 months.

While earnings data from the Current Population Survey could theoretically be collected for a specific reference week, a respondent reporting for another person is much less likely to know what that person made in a specific week than what that person usually makes. In addition, a historical comparison of usual weekly earnings data is less likely to be distorted by unusual developments (labor disputes, bad weather) than is data for a specific week each year.

[4] The term "Negro" as used throughout this article refers to persons of all races other than white. About 92 percent of such persons are Negro.

[5] The data most widely used in support of the claims to the contrary are those on "spendable weekly earnings for a worker with three dependents" derived from the monthly establishment survey. It should be noted, however, that the earnings series from which these data are calculated is an arithmetic average of weekly earnings on all production and nonsupervisory jobs, including part-time jobs, in the private economy. This average is therefore lower than that of full-time wage earnings. In addition, it should be noted that the actual earnings of a male household head working full-time tend to be higher than even those of the average full-time worker, as household heads are generally older and more experienced, and thus likely to command higher hourly wage rates.

Several recent articles have dealt with trends in earnings and purchasing power of workers. See, for example, Paul M. Schwab, "Two measures of purchasing power contrasted," *Monthly Labor Review*, April 1971, pp. 3–13, and the group of articles on "Blue-collar/white-collar pay trends" in the June 1971 *Monthly Labor Review*.

[6] See Victor R. Fuchs, "Differences in hourly earnings between men and women," *Monthly Labor Review*, May 1971, pp. 9–15.

[7] In addition to the Fuchs article, see John E. Buckley, "Pay differences between men and women in the same job," *Monthly Labor Review*, November 1971, pp. 36–40. See also, "Components of Income Differences Between Men and Career Women," paper presented by Larry E. Suter and Herman P. Miller at the September 1971 meetings of the American Sociological Association at Denver, Colo.

[8] See John Fenlon, "Recent trends in overtime hours and premium pay," *Monthly Labor Review*, August 1971, pp. 29–35.

[9] A precise dollar adjustment of the male-female differences in the length of the full-time workweek and in the frequency of premium pay for overtime work cannot be made, partly because the earnings data discussed in this article refer only to earnings in the primary job, whereas the workweek data generally available by demographic group apply to hours worked in all jobs. However, it can be roughly calculated that if the length of the workweek and frequency of overtime pay were the same for men and women, the usual weekly earnings of women would be about 10 percent higher than reported. The May 1971 median for women would thus rise from $100 to about $110, and it would then correspond to 68 percent of the median for male full-time workers, rather than 62 percent as computed on the basis of the weekly earnings as reported and 60 percent as computed by Fuchs on the basis of 1959 hourly earnings.

[10] Only about 15 percent of the persons whose longest job in 1970 was as farm laborers and foremen managed to become year-round full-time workers. In contrast, about 54 percent of all persons who held a job in 1970 worked year round full time. See *Income in 1970 of Families and Persons in the United States, October 1971: Current Population Reports, Consumer Income*, Series P-61,, No. 80 (U.S. Bureau of the Census), table 55.

[11] Data on the dispersion patterns of wages and earnings by industry are available only from special surveys conducted by the Office of Wages and Industrial Relations of the Bureau of Labor Statistics. These data, however, cannot be cross-classified by detailed demographic characteristics.

[12] In comparing the weekly earnings data by industry from the household survey (Current Population Survey) with those from the establishment survey, several important factors should be noted: (1) the Current Population Survey data refer to usual weekly earnings, while the establishment data refer to earnings in a specific week; (2) the household survey data are presented separately for full-time and part-time workers, while those from the establishment survey refer to an average for both full-time and part-time workers; (3) the household survey data refer to all wage and salary workers, while the establishment data refer only to production and nonsupervisory workers in private industry; (4) the average weekly earnings levels from the household survey are medians, while those from the establishment survey are arithmetic means; (5) the industry breakdown for the household survey data is significantly different from that for the establishment data.

[13] For data on the occupational progress of Negroes, see *Employment in Perspective: The Negro Employment Situation* (BLS Report 391, 1971).

[14] For a detailed study of Negro-white differences in terms of annual earnings see Arnold Strasser, "Differentials and overlaps in annual earnings of blacks and whites," *Monthly Labor Review*, December 1971, pp. 16–26.

New BLS study examines employment effects of past minimum wage changes and possible effects of a lower rate for teenagers

Youth unemployment and minimum wages

THOMAS W. GAVETT

OVER THE PAST 20 YEARS, unemployment among youths age 16–19 has been higher than that for adults. Since 1948, teenage [1] unemployment rates have varied from a low of 7.6 percent in the last year of the Korean War (1953) to a high of 17.2 percent in 1963. By contrast, the unemployment rate for adults over age 24 ranged from a low of 2.3 percent in 1968 to 5.6 percent in 1958.

As might be expected, there is a similarity between fluctuations in the unemployment rates for teenagers and for adults, because general business conditions affect the employment of all groups within the population. Yet the unemployment rate of teenagers has, in the 1960's, increased relative to the rate for adults.

Although, between the recession of the early 1960's and the full employment of the last few years, the unemployment rate for both adults and teenagers has decreased, the relative decline was much smaller for teenagers than for adults. The adult rate dropped almost 5 percent in the first 4 years of the decade to 2.5 percent in the last 3 years; for teenagers, from about 16 percent to 13 percent. Thus, from 1948 to 1962, the teenage rate was 3 times the adult rate; but in the last few years it was 5 times as high (table 1).

Many developments of the last 20 years could have contributed to the persistently high rates of unemployment for teenagers and the increase relative to adults in the 1960's. A substantial growth in the size of the teenage population relative to adults—from about 9 percent in the mid-1950's to 13 percent in the last few years—has compounded problems of job placement. The proportion of teenagers enrolled in school has increased from 50 to 70 percent. While school takes some teenagers out of the labor market, an increasing proportion of those enrolled in school are also in the labor market seeking jobs—jobs that fit in with the requirements of school attendance with respect to location, hours, and so on.

The movement of families from farm to city and the decline in farm employment has also meant that a smaller proportion of teenagers are employed in agriculture—a decrease from 18 percent in 1948 to 7 percent last year. Many teenagers had been employed on family farms; now they must compete in the urban labor market. Potentially compounding all these developments has been the effect of the military draft and its attendant uncertainties.

Another development of major significance to policymakers is the Federal minimum wage. According to economic theory, a wage set higher than the rate normally prevailing in the market will mean that some workers will not be able to find jobs. Probably those workers who are less productive—either because they are untrained or inexperienced or have inadequate tools to work with—will have special employment problems. A legal minimum wage might, therefore, help explain the unemployment problems of some teenagers.

In 1950 the Federal minimum wage under the Fair Labor Standards Act (FLSA) was 75 cents an hour. In the years following, the minimum was raised until, at the end of 1969, it stood at $1.60 for most workers covered by the law.[2] Of course, prevailing market wages have been increasing at the same time. Relative to average hourly earnings, the minimum wage in 1968, as indicated in chart 1, was not much different from its relative level in 1950. (See table 2.)

Perhaps more significant have been the expansions of coverage under FLSA into the retail trade and service sectors in the 1960's. Trade and service industries employ disproportionately large num-

---

This is the summary chapter of *Youth Unemployment and Minimum Wages*, a Bureau of Labor Statistics study prepared under the direction of Thomas W. Gavett, Assistant Commissioner for Wages and Industrial Relations. The full study is being published as BLS Bulletin 1657.

bers of teenagers. Further, there are many low wage sectors in those two industry divisions. In 1968, for example, average hourly earnings were $2.16 in retail trade compared with $3.01 in manufacturing and $2.85 for the private nonfarm economy. (See chart 2.)

In examining past relationships between minimum wages and the high unemployment rates of youth, certain general questions must be investigated: (1) Have changes in the level of minimum wages and coverage of minimum wage laws contributed to the problem of youth unemployment? (2) Do employers avoid hiring teenagers because the wage that must be paid them is not low enough to offset the disadvantages of inexperience or lack of maturity, or are other reasons more important in inhibiting their employment? (3) Do teenagers expect wages so high that minimum wage rates are irrelevant or are their expectations high due to the minimum wage?

In addition to questions concerning past experience, two others require examination: (4) Regardless of whether or not the legal minimum wage has significantly contributed to the problem of youth unemployment, would a differential minimum wage for youth reduce that problem in the future? (5) Would any significant problems be caused by a youth differential, such as reduced family incomes or a shift in the incidence of unemployment from teenagers to other groups?

The evidence from time series

Studies of the relationship between minimum wages and teenage unemployment rates completed over the past several years have not arrived at a uniform set of conclusions. The econometric analysis undertaken for this report used several approaches to analyze data. Basically, quarterly data for 1954 through 1968 were examined for different sex-color-age groups within the teenage population. Variations in the proportion of teenagers employed and the proportion unemployed were compared with variations in the minimum wage, controlling other relevant variables. These variables included the adult unemployment rate, the proportion of teenagers employed in agriculture, the relative size of the teenage population, the school enrollment rate, and the relative size of the Armed Forces. A similar analysis of the employment experience of teenagers as a whole through a more extended period, 1948 to 1968, used annual data.

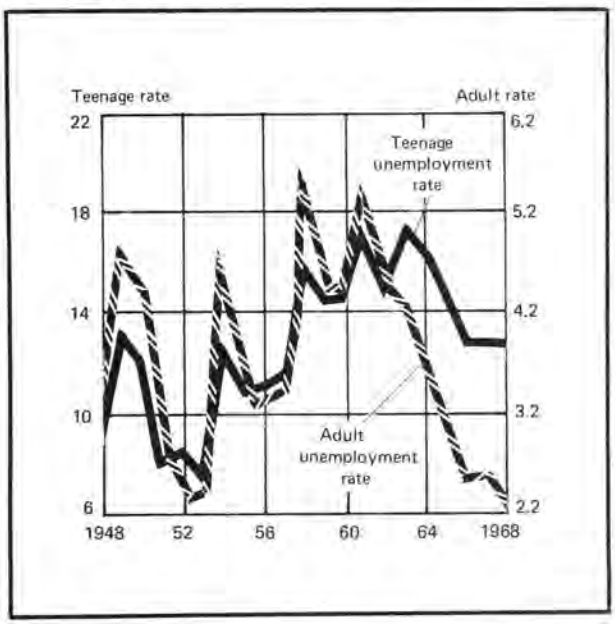
Table 1. Teenage unemployment rates and ratios

Year	Unemployment rates, 16- to 19-year-olds			Ratio of unemployment rates, 16 to 19 years, to rate for 25 years and over		
	Total	White	All others	Total	White	All others
1948	9.2	8.9	11.2	3.17	3.30	2.49
1949	13.4	13.0	16.9	2.79	2.89	2.35
1950	12.2	11.8	15.3	2.77	2.95	1.96
1951	8.2	7.8	11.0	2.93	3.00	2.44
1952	8.5	8.3	10.5	3.54	3.77	2.33
1953	7.6	7.5	8.8	3.17	3.41	2.26
1954	12.6	12.1	16.6	2.68	2.88	1.91
1955	11.0	10.4	15.6	3.06	3.25	2.08
1956	11.1	10.1	18.1	3.36	3.48	2.66
1957	11.6	10.6	19.1	3.41	3.42	2.98
1958	15.9	14.4	27.4	2.84	2.82	2.63
1959	14.6	13.1	26.1	3.32	3.36	3.00
1960	14.7	13.5	24.3	3.27	3.46	2.89
1961	16.8	15.3	27.7	3.11	3.19	2.66
1962	14.7	13.3	25.3	3.34	3.50	2.84
1963	17.2	15.5	30.3	4.00	4.08	3.70
1964	16.2	14.8	27.3	4.26	4.35	3.79
1965	14.8	13.4	26.5	4.63	4.62	4.49
1966	12.8	11.2	25.4	4.92	4.87	5.18
1967	12.8	11.0	26.2	4.92	4.58	5.57
1968	12.7	11.0	24.9	5.52	5.24	6.23

Note: For more detail, see chapter 1.

These analyses concluded that it was not possible to adequately separate out the effects of minimum wage changes from other developments. A demonstrable relationship exists between minimum wages and youth unemployment rates if other variables are *excluded* from the analysis, but when other variables such as population and school

Chart 1. Fluctuations in adult and teenage unemployment rates, 1948–68



enrollment changes are taken into account, the effect of changes in the minimum wage upon teenage unemployment becomes obscure.

The study indicated that extensions of coverage of the minimum wage had more of an effect than changes in the relative level of the minimum wage; that Federal manpower programs which produce employment for teenagers may have offset, to some degree, the disemployment effects of minimum wage legislation; and that minimum wage legislation may have had greater adverse effects upon 16- and 17-year-old than upon 18- and 19-year-old youths.

The analysis concluded on the cautious note that, "While there are hints of adverse effects of minimum wages in available data, no firm statements can be made about the magnitude of such effects."

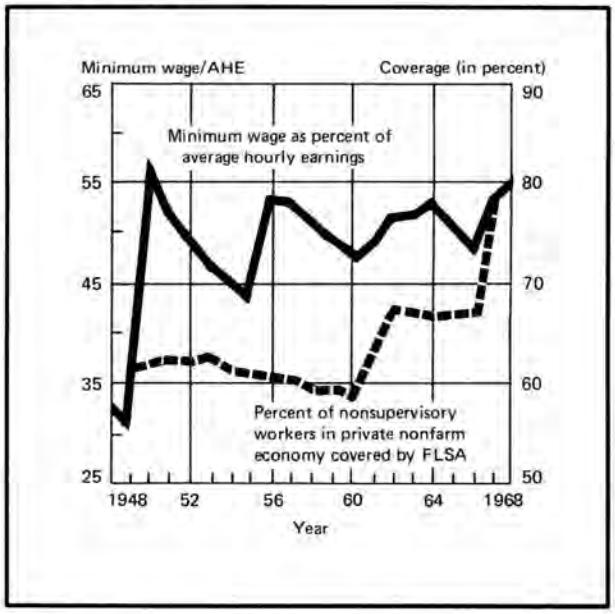
Another survey undertaken for this report differs significantly in approach from other recent studies. It traces the employment experience of an identical group of young males, 15 to 25 years of age, during a time when the Federal minimum wage was increased from $1.25 in 1966 to $1.40 in 1967 and coverage was expanded significantly. For the teenagers, as well as for older groups, the analysis showed mixed results.

Table 2. Proportion of earnings covered by the Federal minimum wage

Year	Basic minimum wage effective at end of year	Basic minimum wage as a percent of		Minimum wages as a percent of average hourly earnings weighted by industry total employment and proportion covered, private nonfarm	Minimum wages as a percent of average hourly earnings weighted by industry teenage employment and proportion of total employment covered, private nonfarm
		Average hourly earnings, private nonfarm	Total compensation per man-hour, private nonfarm		
1947	$0.40	35.4	31.3	20.3	
1948		32.7	28.7	19.1	
1949		31.4	27.9	18.0	
1950	.75	56.2	49.6	32.3	
1951		51.7	45.5	30.1	
1952		49.3	43.1	28.4	
1953		46.6	40.8	26.9	
1954		45.5	39.5	25.8	18.2
1955		43.4	38.1	24.8	17.6
1956	1.00	53.2	46.0	30.7	21.0
1957		52.9	43.4	29.8	20.2
1958		51.3	41.9	28.3	18.4
1959		49.5	40.1	27.3	18.1
1960		47.8	38.5	26.2	17.8
1961	1.15	49.1	40.9	28.3	21.0
1962		51.8	43.1	32.8	27.7
1963	1.25	51.9	42.9	32.5	27.1
1964		53.0	43.3	33.4	27.7
1965		51.0	41.8	32.5	27.1
1966		48.8	39.5	31.5	26.7
1967	1.40	53.8	41.5	39.2	36.9
1968	1.60	55.6	44.0	42.6	40.1

Note: For explanations, see table 1.6 in chapter 1. Dashes indicate data not available.

Chart 2. Coverage of minimum wage law and changes in minimum rates as a percentage of average hourly earnings, 1948–68



Those teenagers already earning $1.40 or more in 1966 were not directly affected by the new minimum. If the minimum wage had any effects, it would be expected to lead to more time unemployed or more time spent out of the labor force by the low wage teenagers. Contrary to this expectation, table 3 shows that the average number of weeks low wage teenagers were unemployed not only declined between 1966 and 1967 but declined more than among high wage teenagers. On the other hand, the average number of weeks spent out of the labor force fell *less* among low wage than high wage teenagers, a result that is in line with expectations.

Looking at only those teenagers who were employed during the 1966 survey week, a greater proportion of low wage than high wage employees were out of the labor force a year later. However, the proportion of low wage employees who were unemployed a year later is in one case ($1 to $1.39) about the same and in another case (less than $1) below the proportion of high wage employees who were unemployed a year later.[3]

The analysis is, as the authors note, biased against finding adverse employment effects because the sample had "aged" 1 year between survey

periods, thus increasing the employability of the group; further, the data tell nothing about youth entering the labor force for the first time during this period. There was some evidence of adverse employment effects among 15- to 17-year-old students who were Negroes and had limited labor market information and among those students employed as service workers. There was, however, no evidence of a general tendency for the minimum wage increase of 1967 to create relatively more unemployment among low wage young workers. As the analysis concludes, "If the minimum wage increases did indeed create unemployment among youth, the effect was not a pronounced one."

The employers' response

In the survey of employer hiring standards in 10 cities, included in chapter 4, the most frequently cited consideration affecting employer decisions to employ teenagers under age 18 was restrictions on employment of teenagers in hazardous occupations. Chapter 9, dealing with experience under State minimum wage laws, also stresses hazardous work restrictions as well as restrictions on hours of work, the cumbersome machinery of work certificates, union restrictions, and problems of transportation as factors curbing the employment of teenagers. The uncertainty of the military draft was the reason most frequently cited by employers in weighing their decision to hire 18- and 19-year-olds, a problem underscored in the study of experience in local public employment offices in 23 areas (chapter 5). The belief that teenagers are unwilling to work for low wages is not uncommon among employers (see further discussion below). The extent to which the legal authority to pay a wage lower than the minimum would offset such problems is uncertain.

About BLS Bulletin 1657

Youth Unemployment and Minimum Wages, to be published this spring, will be available for purchase from the Bureau's regional offices or from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Following is a list of chapters and of persons primarily responsible for preparing them:

1. *Introduction* reviews the changes in labor force experience of youth and in the minimum wage in the postwar period and provides the analytic framework for the study (Thomas W. Gavett).
2. *Experience of the Past: The National Minimum* provides econometric analyses of relationships between the employment and unemployment experience of teenagers and changes in the minimum wage (Hyman B. Kaitz).
3. *Effects of Changes in the Federal Minimum Wage on Employment of Young Men, 1966–67* traces changes in the employment experience of young men in a national sample during a time when the minimum rate rose and coverage was expanded (Karl Egge, Andrew I. Kohen, John R. Shea, Fred A. Zeller).
4. *Survey of Hiring Requirements and Youth Employment* studies changes between 1966 and 1969, in 10 cities, in employer hiring standards and attitudes toward hiring teenagers (Norman J. Samuels).
5. *Employment Service Local Office Experience in Serving Teenagers* describes various obstacles encountered by public employment offices in 23 areas in placing teenage workers (Irvin F. Wingeard).
6. *Wage Expectations* compares wages expected by unemployed teenagers and wages actually earned by employed teenagers (Harvey R. Hamel, Melvin Goldberg, Thomas W. Gavett).
7. *Teenage Earnings and Family Income* analyzes the importance of teenager earnings to family income (Thomas W. Gavett).
8. *Study of Full-Time Student and Learner Certification Program Under the Fair Labor Standards Act* reports the history and development of the certification program and analyze the results of a special survey of the reasons why employers did not fully use their authority to hire students and learners at special below-minimum wage rates (Clara F. Schloss).
9. *State Experience With Minimum Wage Differential Rates for Youth and Their Effect on Youth Employment* describes experience under State minimum wage laws that have differential minimums for youth (Juliet F. Kidney).
10. *Youth Wage Rate Schemes in Western Europe and Canada and Their Effect on Youth Unemployment* reviews the relevance to the United States of foreign experience (John W. Piercey).
11. *Youth Employment and Wages in Postwar Japan* reports on reasons for the high rates of overall employment and intense demand for new school graduates, along with low wages for youth (Solomon B. Levine, Gerald G. Somers).
12. *Summary and conclusions.*

Table 3. Change in labor force status, 1966–1967, men 15–19 years of age with work experience in 1966

Hourly rate of pay (dollars) in 1966	Total number with work experience in 1966 (thousands)	Change in mean weeks unemployed [1] (weeks)	Change in mean weeks out of labor force [2] (weeks)	Total number employed in 1966 survey week (thousands)	Disemployment rate (into unemployment) [3] (percent)	Disemployment rate (out of labor force) [4] (percent)
Total or average [5]	5,854	−1.9	−4.1	3,311	6.5	19.3
Less than $1.00	688	−1.3	−4.6	492	5.3	20.3
$1.00–1.39	1,941	−2.3	−3.9	1,210	6.5	21.7
$1.40 or more	1,591	−1.0	−5.5	1,165	6.4	16.1

[1] Mean number of weeks unemployed during the 12 months preceding the 1967 survey minus the mean number of weeks unemployed during the 12 months preceding the 1966 survey.
[2] Mean number of weeks out of the labor force during the 12 months preceding the 1967 survey minus the mean number of weeks out of the labor force during the 12 months preceding the 1966 survey.
[3] Proportion of those employed during the 1966 survey week who were unemployed during the 1967 survey week.
[4] Proportion of those employed during the 1966 survey week who were out of the labor force during the 1967 survey week.
[5] Total includes young men not classified by wage rate.
Note: For further discussion, see chapter 3.

Among the small number of establishments which raised age or educational hiring requirements between 1966 and 1969 in the 10-cities survey of hiring standards, the reason most frequently cited by employers for doing so was higher costs of training and hiring teenagers. Experience under State laws and experience of the public employment offices also indicate lack of education and training to be an important reason for employers not hiring teenagers for full-time jobs. Dissatisfaction with teenagers' absenteeism, unreliability, and performance on the job is common.

In principle, the lower quality of teenage labor could be offset, in the employer's calculations, by paying them a lower wage. However, under the Fair Labor Standards Act, establishments holding full-time student certificates have the legal authority to hire youth at 85 percent of the minimum wage. As reported in the study of utilization of that authority (chapter 8), only 10 percent used the certificate authority fully, and 55 percent used less than half of their authorized man-hours. Seventeen percent of the establishments holding such certificates claimed they had not fully used it because students were unsatisfactory workers (table 4). Apparently for some employers at least a 15-percent "discount" was not enough to offset the poorer quality of student help.

All this does not mean that wages—and the legal minimum wage in particular—are ever irrelevant. Although local employment service offices generally said minimum wages were not an important reason for the difficulty in placing teenagers in full-time jobs, minimum wages were cited as a problem more frequently in the case of 16- to 17-year-olds (table 5). The minimum wage was the second most common reason for employers raising hiring standards between 1966 and 1969, though such companies represented less than 5 percent of all employers in every city covered and less than 1 percent in most cities. The relatively tight labor market for adults in the last 3 years, however, probably kept most employers from raising their hiring standards. A minority of employers covered in the survey of hiring standards did consider the minimum wage an important factor affecting their decision to hire teenagers (table 6). Employers located in small towns cited the minimum wage more frequently than employers located in large cities and more frequently with reference to 16- to 17-year-olds than 18- to 19-

Table 4. Numerical distribution of establishments not utilizing or not fully utilizing full-time student certificates by degree of utilization and reasons for less than full utilization of certificates

[Data relate to certificates in effect on April 30, 1969, and reflect utilization during the period May 1, 1968, to April 30, 1969]

Degree of utilization	Number of establishments with certificates	Number of establishments not utilizing or not fully utilizing certificates	Reasons for not utilizing or not fully utilizing certificates												
			Fully staffed	Certificate restrictions	Recordkeeping	Full-time students unwilling to work at subminimum wages	Full-time students unsatisfactory workers	Prefer to hire regular workers	Company policy to pay minimum wages	Legal restrictions	Temporary operational problems	Self-imposed restrictions	Delay in school verification student status	Union restrictions	Other reasons
Total	4,615	4,163	2,168	799	881	868	788	600	504	396	356	332	223	120	39
Less than 20 percent	1,484	1,484	564	321	425	339	199	243	282	111	189	49	136	80	14
20 percent to 49 percent	1,085	1,085	641	198	212	211	236	151	98	114	82	78	50	36	12
50 percent or more	2,046	1,594	963	280	244	318	353	206	124	171	85	205	37	4	13

Note: For further discussion, see chapter 8.

Table 5. Rank importance of reasons for difficulty in placing teenagers based on local office experience during fiscal year 1969, average, all areas

[Rating Scale: Very important = 3; Important = 2; Unimportant, irrelevant, or not true = 1]

Reason	Full-time jobs		Part-time jobs	
	16–17 years	18–19 years	16–17 years	18–19 years
1. Level of the minimum wage has caused employers to seek older, more experienced workers for jobs	1.77	1.54	1.66	1.52
2. Unwillingness of teenagers to accept wages usually offered for jobs they are qualified to take	1.79	2.10	1.64	1.87
3. Uncertainty over the draft makes employers reluctant to hire teenagers	1.32	2.44	1.18	1.48
4. Legal restrictions on hours of work, hazardous work, or other working conditions for teenagers	2.75	1.41	2.71	1.45
5. Hiring specifications of employers with respect to education and experience are so high that most teenagers are excluded	2.28	1.95	1.96	1.54
6. Employers' hiring specifications with respect to age exclude teenagers	2.44	1.56	2.23	1.47
7. Employer fear of higher cost of workman's compensation and other insurance when teenagers are employed	2.19	1.59	2.09	1.48
8. Employers believe teenagers are not reliable	2.54	2.10	2.30	1.95
9. High labor turnover among teenagers	2.31	2.14	2.22	2.01
10. State laws require too much paper work, such as work permits	1.85	1.07	1.59	1.05
11. High cost of hiring and training teenagers	1.65	1.58	1.57	1.41
12. Union contract provisions	1.63	1.40	1.72	1.38

year-olds. Further, employers—as did the public employment offices—cited the minimum wage as an important factor more frequently in the case of younger teenagers. A modest number of establishments did apply for full-time student and learner certificates under the FLSA, though less than half the authorized time was actually used.

The evidence suggests, therefore, that some employers would be willing to hire more teenagers at lower wage rates. However, legal restrictions on the employment of youth and apprehension over the quality of teenagers as employees are probably even more important impediments to the employment of youth.

Expectations of youth

Throughout the Nation, a commonplace belief among employers and others is that young workers expect unduly high wages and are disinclined to accept low status (frequently equated to low wage) jobs. Close to 20 percent of the employers holding full-time student certificates under FLSA claimed they did not fully utilize the authority because students were unwilling to work at subminimum rates. Certainly there is much anecdotal material on the alleged unreasonableness of teenagers.

However, a 1967 survey of young men throughout the Nation indicated that the *average* wage expected by unemployed teenagers was less than the average wage actually earned by those who were employed (table 7). Further, large numbers of teenagers, both unemployed and out of the labor force, did indicate they would accept jobs at less than the $1.40 legal minimum in 1967.

Findings from the Urban Employment Survey (UES), a survey of residents of selected poverty areas of six large cities, suggest that average earnings expectations of currently unemployed teenagers did not exceed average hourly earnings actually received by employed teenagers. In the July 1968–June 1969 survey period, the median wage expected by unemployed teenage boys and girls was less than the wage actually received by those employed.

The reported proportion of unemployed young men willing to accept employment in 1967 at wages below the Federal minimum was less, however, than the proportion of teenagers actually employed at lower wages. The same was true of teenagers, especially the males, in the Chicago and New York poverty areas in 1968–69. These bits of evidence lend some support to the supposition that the unemployment of some teenagers can be attributed to high wage expectations.

The average duration of unemployment for teenagers is short. While this is partially attributable to their ability to withdraw from the labor force, it suggests also that high wage or status expectations of teenagers are not enduring.

Table 6. Percentage of establishments covered by FLSA reporting the minimum wage as a factor in the decision to hire teenagers, by city and age group

City	Under 18			18 and 19		
	Very important	Important	Not important	Very important	Important	Not important
Atlanta	14	21	65	9	18	73
Detroit	16	24	60	11	18	71
Cleveland	10	17	73	9	16	75
Baltimore	10	20	70	9	18	73
Milwaukee	11	16	73	8	11	81
Los Angeles	8	14	78	6	11	83
Battle Creek	23	23	54	13	19	67
Auburn	20	28	52	13	31	56
Galveston	19	24	57	13	20	67
El Paso	31	25	44	25	28	47
Unweighted average:						
6 large areas	11.5	18.7	69.8	8.7	15.3	76.0
4 small areas	23.2	25.0	51.8	16.0	24.5	59.3

Note: For further discussion, see chapter 4.

Table 7. Rate of pay required to induce youth to accept employment or to enter labor force, and hourly rate of pay for those employed, by age and color, 1967

Age and 1967 labor force status	Total number (thousands)	Less than $1.40	$1.40 to $1.99	$2.00 to $2.99	$3.00 or more	Mean pay required or earned
	Whites					
Age 15–17:						
Out of labor force	808	51.1	44.5	3.9	0.5	$1.32
Unemployed	400	43.0	50.9	4.8	.0	1.35
Employed	1,968	47.5	37.9	9.9	4.7	1.95
Age 18–19:						
Out of labor force	196	13.8	57.2	23.0	6.0	1.69
Unemployed	141	18.0	46.1	29.7	6.2	1.76
Employed	1,493	25.2	33.6	30.9	10.3	1.93
	All others					
Age 15–17:						
Out of labor force	161	64.8	30.5	3.3	1.3	$1.30
Unemployed	99	58.8	33.5	7.7	.0	1.30
Employed	297	51.6	35.6	9.4	3.4	1.53
Age 18–19:						
Out of labor force	19					
Unemployed	42	28.8	48.1	20.5	2.6	1.61
Employed	212	37.6	29.8	22.3	10.3	1.75

Note: For further discussion, see chapter 6. Dashes indicate data not available.

The available evidence indicates that teenagers are knowledgeable about prevailing wage levels and adjust their expectations according to differences in levels between areas and overtime. There is some evidence that unemployed teenagers are disinclined to accept the lower wage jobs. Minimum wages may be a factor influencing these expectations. These expectations contribute, at least in the short run, to unemployment problems, but do not appear to be a major obstacle to reducing teenage unemployment.

A youth differential

Whether or not the minimum wage has been a significant factor in causing youth unemployment, the question of the effects of a youth differential is a different issue. There has been only limited experience with these differentials in the United States. They currently exist in Federal minimum wage legislation in the form of the certification programs under FLSA and also in a variety of forms in State laws. In other countries—in Western Europe, Canada, and Japan (chapters 10 and 11)—youth differentials exist by law, contract, or custom to a much greater extent than in the United States.

The certification programs cover a limited number of workers and establishments. Employer interest in the certification programs has increased at times of minimum wage law changes, though trend data on issuance of certificates do not necessarily measure usage. The study of these programs points out that the authority to hire young workers at rates below the minimum does not automatically mean the opportunity will or can be fully used by employers to increase employment of youth; the modest abatement of rates provided in those programs was, by itself, inadequate. The full-time student certification rates were less meaningful in the South where wage levels are generally low, the student rate thus providing a smaller incentive to hire youth.

Differential rates in State minimum wage laws—commonly 80 percent of the adult rate—have had limited effects on unemployment rates. State laws are not relevant where the Federal law applies if the State minimum is below the Federal. In a number of States, small establishments and certain occupations where teenagers are employed are exempt from State law. Further, entry wage rates in some areas are far above the State minimums.

Over 40 percent of the local employment service offices believed employers would hire appreciably more 16- and 17-year-old teenagers if it were possible to pay less than the Federal minimum, but only 26 percent of the offices believed this would be true of 18- and 19-year-olds. About 90 percent of those offices which believed it would make a difference, thought the reduction in the minimum wage that would be necessary would not exceed 40 cents.

The studies of the certification program, State experience, and the survey of local employment offices suggest that if a youth differential is to be meaningful, it would need to be a fairly substantial differential— perhaps at least 20 percent below the adult rate—and that the relationship of the adult minimum to average wage levels could not be far below the historic ratio.

The evidence from abroad indicates that low wages for youth are an inducement to employers to seek young workers eagerly. The relatively low youth unemployment rates abroad (table 8) are partially a reflection of the fact of low wages for youth. In the United Kingdom, the Netherlands, and Japan, young workers start work at about one-third the adult rate. In the United States in 1967, 15- to 17-year-old boys received a wage which averaged about 70 percent of the average wage paid those 20 to 25 years old. Much of this difference reflects a different mix of jobs and job status in the two age groups.

One element of the Japanese experience—low wages for youth—cannot be divorced from other parts of Japanese institutions. For example, the

Table 8. Unemployment rates and the youth-adult unemployment ratio for selected countries

Countries	Adult unemployment rate		Youth unemployment rate (15–19 years)		Youth-adult unemployment ratio [1]	
	1960–64	1967–68	1960–64	1967–68	1960–64	1967–68
Germany (1961–67)	0.3	1.1	0.3	1.1	1.0	1.0
Canada (1962–66) [2]	6.9	4.0	14.7	9.7	2.4	2.6
Netherlands (1960)	0.9		1.4		1.8	
United Kingdom (1961–67)	[3] 1.3	[3] 2.0	[3] 0.9	[3] 2.2	[3] 0.6	[3] 1.1
	[4] 1.7		[4] 2.3		[4] 1.4	
Sweden (1964–67)	1.7	2.2	3.9	5.5	2.6	3.4
France (1960)	1.5		6.6		4.4	
Belgium (1960)	2.5		4.0		1.7	
Italy (1961–67)	3.4	3.5	9.3	11.4	4.9	5.7
United States (1960–68)	5.5	3.6	[3] 14.7	[5] 12.7	3.3	5.5
Japan (1962) [6]	0.9		1.4		1.6	

[1] Ratio of youth unemployment rate to adult unemployment rate for adults 25 and over.
[2] Ostry, Sylvia, **Unemployment in Canada, 1968**, males only, ratio: youth-all ages.
[3] Labor Ministry data from unemployment insurance records.
[4] Census data for April 1961.
[5] Youth unemployment data relate to 16- to 19-year-olds.
[6] Levine and Somers, **Youth Employment and Wages in Postwar Japan.** Ratio: youth-all ages.

nenkō system with its virtual lifetime guarantee of employment within the firm and high wages in later years offsets low wages in youth.

Low wage rates for youth in Europe cannot be separated from the extensive apprenticeship programs in Britain, Germany, and the Netherlands. These programs help to channel children from school to work. Moreover, the nenkō system in Japan and the apprenticeship system in Europe are undergoing change, or at least attack, with possible ramifications for youth differentials in those countries.

In the Soviet Union, young workers by law have a shorter workday, a longer annual vacation, and higher wage rates than adults doing the same type of work—just the opposite of experience in western Europe and Japan. The 16- and 17-year-old works 7 hours a day and 5 days a week; 15-year-old apprentices work 5 hours a day. The young worker gets the same daily or monthly basic pay that an adult gets for working 8 hours a day at the same type of work. There have been reports in the Soviet press that many managers of establishments have been reluctant to hire young workers because of the extra cost involved. To combat this practice by employers, a joint party-government decree of February 2, 1966, established quotas of jobs for youth, the size of the quotas varying among branches of the national economy.[4]

In the United States, the overwhelming proportion of teenagers belong to a part-time, part-year labor force. Almost three-fourths of the teenagers are enrolled in school. Experience in foreign countries having institutions different from those in the United States has a limited application to American teenagers who are much less likely to be looking for a "permanent" job.

The employment advantage of a youth differential would be restricted by the fact that many teenagers are available for only part-time employment and have a limited geographic mobility. It would also be restricted by American wage-setting institutions which emphasize a wage for a job, not an age-wage relationship, and further limited by legal restrictions on the employment of youth.

The effects of differential rates

The analysis of the relationship between teenage earnings and family income (chapter 7) points out that very few teenagers contribute a significant share of family income. Since 73 percent of the teenagers who worked in 1966 earned less than $1,000 per year, their low earnings are more affected by the number of hours of work they find than by the wage rate. Wages paid teenagers are, of course, not solely dependent on the minimum wage.

Reports from abroad do not indicate that adult employment has been affected adversely by lower minimum rates for teenagers. However, the European countries and Japan have had very low overall levels of unemployment. Thus, experience abroad does not provide a clear test of the effects of introducing a system of youth differentials. Past experience in the United States is no sure guide, since differential rates for youth have been used to only a limited extent.

Youth differentials are common in most State laws with no apparent evidence of adverse effects. State minimum wage levels are not, however, always meaningful relative to prevailing wage levels. About 40 percent of the local employment service offices believed that a lower Federal minimum wage for teenagers would have adverse effects on employment of other groups; this was, however, only an informed judgment. Available materials do not permit any firm conclusions about adverse effects of a youth differential minimum wage.

Conclusions

1. Increases in the level and coverage of the Federal minimum wage may have contributed to the employment problems of teenagers, but it is difficult to disentangle such effects from numerous other influences.

Prior to the 1960's, relatively few teenagers were employed in establishments covered by the Fair Labor Standards Act. Prior to 1966, agriculture (where teenagers are employed as family workers) was totally exempt; domestic service still is. Services and trade were generally excluded from the law prior to 1961, and even now small establishments are exempt. The longrun rise in the unemployment rate of teenagers relative to that of adults—especially marked since 1962—appears to have been associated with many factors. Compounding problems have been the increase in the relative size of the teenage population, the increase in the proportion of youth enrolled in school, and the shift of employment out of agriculture. Although neither of the latter two factors may explain much of the relative rise in teenage unemployment, they do mean that one easy-access labor market, namely, the family farm, is available to a smaller proportion of youth and that the types of employment sought by teenagers (outside school hours) cover a restricted range of existing employment opportunities. The increase in the number of teenagers in school has, on the other hand, taken some of them out of the labor force.

The magnitude of the employment effects of minimum wage legislation probably has been small, as the studies included in this report underline, and, consequently, difficult to measure precisely. It should be kept in mind, however, that (1) many teenagers have, until very recent years, been employed in sectors of the economy not covered by FLSA, (2) minimum wage levels have not been markedly high relative to prevailing wage levels, judging by historical ratios, and (3) the importance of minimum wages, in the periods between Congressional action, has been partially offset by increases in money wages, tending to make any disemployment effects a shortrun phenomenon. Also, as the econometric study included in this report points out, adverse employment effects of the minimum wage may have been, in recent years, offset by Federal manpower programs.

The high unemployment rates of teenagers have not brought about a drop in the relative wage paid teenagers and, hence, an increase in their employment opportunities. Certainly, a legal minimum wage, on its face, means wages are inflexible downward. Because minimum wages have been periodically increased to maintain about the same level of parity with average earnings, any tendency for the spread between lower and higher rates to increase has been offset, except in the shortrun.

Not all sectors of the economy have been covered by FLSA; other labor market institutions, including union contracts, have also affected wage levels and wage rigidity. Unlike Britain, France, or Japan, American wage-setting institutions have generally developed the practice of setting a wage rate for a job regardless of who holds the job. In other countries a young clerk, for example, may receive less than an adult doing the same work in the same company simply because he is young, but this has not been the practice in the United States. Rather, any wage differences associated with age are usually attributable to young people holding different types of jobs than adults. Longevity or seniority increases are less important than occupational wage differentials; further, longevity increases are a function of length of service on a particular job, not chronological age *per se*. A company's demand for workers to do a particular job within the company is limited. Except to the degree that almost all persons holding a particular job in a company are teenagers, the nature of American wage-setting institutions would reduce (but not eliminate) the possibility of a relative decline in wages paid teenagers even if there were no minimum wage legislation.

A cautionary note should be added. If the minimum wage as a percent of average hourly earnings was more than the 50-percent range prevailing in the postwar period or if coverage was extended to new areas, past experience would not serve as an accurate guide to future employment effects.

2. Employer attitudes—as reflected in both the survey of employers and the response of the public employment offices—experience under the certification programs, and experience in other countries suggest that a substantial differential between youth and adult rates would increase the employment of teenagers. The incentive of a large differential would help to overcome the apprehensions employers have indicated over the quality of teenagers as employees. The evidence indicates the differential would especially affect the decisions of employers to hire 16- and 17-year-old teenagers and particularly employers located outside the large urban centers. The effect of a youth differential

would depend on the size of the difference between the youth and adult minimums, the relation of the adult minimum to the current average hourly earnings of rank-and-file workers, and the simplicity of the regulations. Even then, the effect of the differential would be restricted by conditions unique to the American scene.

If a youth differential were instituted in the 1970's, it would be difficult to evaluate its effects without better data, especially frequency distributions of wages of workers in the American economy along with demographic information on the workers. The effects of a youth differential must be separated from other developments. During the coming decade, the teenage population will increase 12 percent, compared with 40 percent in the 1960's. Assuming no major decline in economic activity, this slower rate of growth, alone, should help ease problems of absorbing teenagers into the employed labor force. □

FOOTNOTES

[1] Throughout the study, the terms "youth," "teenagers," and "young people" have been used interchangeably. Unless otherwise specified, the terms refer to 16- to 19-year-olds.

[2] See chart 2 and table 2 for some additional detail.

[3] More sophisticated statements of tests and further data can be found in chapter 3. If columns 2 and 3 of table 3 are added, the expected adverse pattern appears. This is not true, however, when data are controlled by school enrollment status. See table 3.6 in chapter 3.

[4] *Sovetskie profsoyuzy* [Soviet Trade Unions], No. 12 (June 1967), p. 47.

Trends in overtime hours and pay, 1969-74

Special Labor Force Report shows that persons who usually work overtime are less likely to collect premium pay than those whose overtime is only occasional

DIANE N. WESTCOTT

A 40-HOUR WEEK is hardly the limit for many workers. In May 1974, about 16.1 million workers, or one out of every five employed persons reported working more than 40 hours in his or her principal job. About half of the overtime workers were working 1 to 8 hours in excess of the "standard" workweek; another third from 9 to 19 extra hours; and a fifth 20 or more extra hours a week. Of those who worked overtime, only 6.7 million received premium pay for their efforts.

This article examines (1) the recent trends in overtime work, (2) the impact of overtime work on earnings, and (3) the current and past composition of the overtime work force.[1] The study is based mostly on data collected through the Current Population Survey in May of 1969 through 1974.[2]

1969–74 trends

Not all work in excess of 40 hours can be regarded as "overtime" in the sense in which this term is used by workers who punch a clock upon starting and ending their daily work and who would generally receive a premium rate for more than 40 hours of work a week. In fact, as shown in table 1, one-half of the persons on extended workweeks are white-collar workers. Only one-fifth of white-collar workers, however, receive premium pay for work over 40 hours.[3] Blue-collar workers account for only two-fifths of the persons on extended workweeks, but nearly three-fourths of the blue-collar workers on overtime receive premium pay, either time and a half or double time, for working more than 40 hours.

Overall trends in overtime reveal the contrasting movements of white- and blue-collar workers. Whether because their extended workweeks seldom entail the payment of any premium pay or whether because of other factors, the number of white-collar workers on extended workweeks does not show much sensitivity to changes in general economic conditions. On the other hand, the number of blue-collar workers putting in more than 40 hours has shown large cyclical fluctuations in recent years. Table 1 shows the number of such workers dropped from nearly 6.8 million in May 1969 to 5.6 million in May 1971. It then rose to a peak of 7.2 million in May 1973, before receding to 6.5 million by May of 1974. Also illustrative of this cyclical trend are the data in the same table on overtime in manufacturing, which has been historically regarded as one of the most sensitive indicators of the current, as well as the prospective, demand for labor resources.

While the Current Population Survey data on overtime provide considerable information on the *number and characteristics of workers* receiving premium pay for overtime work, they cannot measure with any precision the *average number of overtime hours* worked in any industry. For manufacturing industries, however, the average overtime

Table 1. Persons working overtime by major occupation and industry classifications

[Numbers in thousands]

Occupation and industry	May 1969	May 1970	May 1971	May 1972	May 1973	May 1974
Total	15,810	14,554	14,611	15,717	16,828	16,144
Occupation						
White collar	7,280	7,059	7,219	7,692	7,906	7,988
Blue collar	6,757	5,870	5,648	6,338	7,200	6,503
Service	1,316	1,210	1,361	1,339	1,338	1,208
Farm	455	416	383	348	384	444
Industry						
Goods producing [1]	6,832	5,942	5,632	6,246	7,118	6,567
Manufacturing	5,303	4,472	4,158	4,833	5,478	4,957
Service producing [2]	8,978	8,612	8,979	9,471	9,710	9,577

[1] Goods-producing industries include agriculture, mining, construction, manufacturing, and forestry and fisheries.

[2] Service-producing industries include transportation and public utilities, finance, insurance, and real estate, service, public administration, and trade.

Diane N. Westcott is an economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

hours worked by production workers are available from another source—the BLS establishment survey, which is based on payroll records of employers.[4] The latter measurement has moved in tandem with the CPS data, both during the 1969–71 decline and in the subsequent recovery of economic activity.

Over the long term, there are, of course, many considerations other than the cyclical changes in the demand for a firm's products which govern an employer's use of overtime work. Such considerations include the alternative costs of hiring and training new workers, the effects of legislation dealing with overtime, and the treatment of overtime in union-management agreements. The effect of government regulations, largely the Fair Labor Standards Act, has generally been to require the payment of premium pay for overtime in more and more industries and occupations. The 1974 amendments to the act, in fact, extended coverage to an additional 7.4 million workers in May 1974; the largest segment to fall under protection were additional public employees.[5] Of the Nation's 77 million wage and salary workers, approximately 57 million are presently subject to the act's provisions concerning overtime. The most notable exceptions are executives, administrative and professional workers, a few public employees, agricultural workers, outside salesmen, and most drivers.

The impact of union-management agreements on overtime work generally has been to make it ever more rewarding for workers and more costly for employers. These agreements may thus be regarded as incentive for the employer to limit the use of overtime and, instead, to hire more workers. Recently, there have also been strong efforts by unions to gain the right for workers to turn down overtime work in cases where overtime has been considered excessive and where workers did not previously possess that right. This issue was one of the most crucial in the recent negotiations between the United Automobile Workers and the auto producers. The settlements in the industry in October 1973, for the first time, gave workers the right, under certain conditions, to refuse further overtime work after a given number of overtime hours in a week.

The fact that over the past 6 years there has been relatively little growth in the number of persons working overtime, despite substantial growth in total employment, is an indication of the increased value workers place on shorter workweeks rather than additional income.[6]

Premium pay for overtime

The principle that workers should be paid a premium rate for overtime hours is well entrenched in labor law and collective bargaining agreements. It supports the idea that a reasonable work period exists and that any work over that limit, whether at night, on the weekend, holidays, or anytime outside of the regularly scheduled hours, is subject to a higher rate.

Of the 16.1 million wage and salary workers on extended hours in May 1974, only 6.7 million were reported as receiving extra compensation for their overtime work. Receipt of premium pay, however, was much more prevalent among persons who worked overtime only occasionally than among those for whom overtime work was a general routine. Only one-third of the persons who usually worked overtime received premium pay, compared with two-thirds of those for whom overtime work was only an occasional practice. (See table 2.) The person most likely to work more than 40 hours a week is also least likely to collect premium pay. The probability of receiving premium pay for extra hours also declines as the number of hours increases; while more than one-half of persons usually working 41 to 48 hours a week received compensation, only one-fifth of the jobholders who usually worked 60 hours or longer received premium pay.

These relationships, however, largely result from occupational differences. They reflect the fact that a particularly large proportion of the people who usually work overtime, and of those who put in the longest workweeks, are in white-collar occupations where the payment of premium pay for overtime work is the exception. Of the persons who reported working extra hours in May 1974, over three-fourths of the white-collar workers but less than two-thirds of the blue-collar workers reported they usually worked overtime.

Weekly earnings

When the earnings distributions of workers with overtime pay and of average full-time workers are compared, it becomes evident that workers with overtime pay are more concentrated in the middle-earning brackets, those between $100 and $300 a week. Apparently overtime wages raise workers' income from the lowest level, but are not sufficiently large to push them into the uppermost brackets. (See

Table 2. Proportion of overtime workers receiving premium pay, by hours worked

(Numbers in thousands)

Hours worked	May 1969		May 1970		May 1971		May 1972		May 1973		May 1974	
	Total worked overtime	Percent receiving premium pay	Total worked overtime	Percent receiving premium pay	Total worked overtime	Percent receiving premium pay	Total worked overtime	Percent receiving premium pay	Total worked overtime	Percent receiving premium pay	Total worked overtime	Percent receiving premium pay
Total who worked 41 hours or more	15,810	43.1	14,554	41.0	14,611	37.4	15,717	40.9	16,828	42.7	16,144	41.5
Usually worked 41 hours or more	12,050	37.3	11,061	33.6	10,956	30.1	11,743	33.3	11,957	31.9	11,645	32.3
Did not usually work 41 hours or more	3,759	61.6	3,492	64.5	3,655	59.4	3,974	63.2	4,870	69.3	4,499	65.5
Worked 41 to 48 hours	7,960	51.9	7,266	51.1	7,254	48.5	7,627	53.1	7,924	54.4	7,504	53.6
Usually worked 41 hours or more	5,276	44.8	4,782	42.4	4,638	39.8	4,836	44.6	4,574	41.0	4,428	42.3
Did not usually work 41 hours or more	2,684	65.8	2,484	67.8	2,616	64.0	2,791	67.8	3,350	72.7	3,077	69.8
Worked 49 to 59 hours	4,913	40.5	4,579	37.1	4,524	32.1	5,036	34.9	5,602	39.1	5,439	37.0
Usually worked 41 hours or more	4,148	37.1	3,820	32.4	3,774	28.0	4,180	30.4	4,431	32.5	4,387	32.0
Did not usually work 41 hours or more	765	59.1	759	60.2	750	52.4	856	56.8	1,171	64.1	1,052	57.9
Worked 60 hours or more	2,937	23.4	2,709	20.6	2,833	17.5	3,053	20.3	3,302	20.7	3,200	21.0
Usually worked 41 hours or more	2,627	22.5	2,459	18.2	2,544	15.5	2,727	17.9	2,952	16.7	2,831	16.9
Did not usually work 41 hours or more	310	31.3	250	44.0	289	35.6	327	40.4	350	54.0	369	52.3

table 3.) This tends to explain why the median weekly earnings of both male and female workers with overtime pay are not significantly different from the earnings of the average full-time workers of the same sex.

Not only is the proportion of women working overtime relatively small, but their weekly earnings, even with overtime pay, remain relatively low. About two-thirds of the women on overtime in May 1974 were earning less than $150 weekly. Only 12 percent of the women workers receiving premium pay earned $200 or more per week. By contrast men working overtime averaged $209 a week.

Since men (whose earnings exceed women's by a wide mark) comprise over four-fifths of all persons receiving some overtime pay, the earnings average for the entire group of overtime workers (men and women combined) exceeds that for all full-time workers. It is for the same reason that the average earnings of all whites and of all blacks with overtime pay exceed those of the average full-time worker of their respective racial group.

Only among black men do workers receiving premium pay for overtime have substantially higher median earnings ($179) than the full-time workers of the same sex-color group not receiving overtime pay ($160). The greater concentration of black men in low skill blue-collar and service occupations, where premiums are more often paid, is the principal explanation for this. By comparison, white men are more heavily represented in white-collar occupations, where overtime premiums are seldom paid but regular salaries are relatively high.

Demographic characteristics

Male workers are almost three times as likely as women workers to work overtime. The proportion of men with some overtime has averaged close to 30 percent in recent years; in contrast, only one-tenth of the women workers put in 41 hours or more a week. However, the proportion receiving premium pay for working overtime was not much different—42 percent for men, 40 percent for women in May 1974. (See table 4.)

Of the 16 million persons working overtime in May 1974, about 13.1 million persons, or 81 percent were men, age 25 to 54. Only 3.5 percent of all wage and salary workers on extended workdays were teenagers because extensive overtime among them is prevented by labor and school attendance laws. It should also be noted that the percentages of men and women age 55 years and over working overtime have declined steadily since 1969, from 28.7 to 23.3 percent among men and from 14.1 to 9.8 percent for women.

As shown in table 4, the probability of receiving premium pay for overtime is inversely related to a worker's age. Such a relationship stems largely from occupational differences. Younger workers are generally concentrated in production and nonsupervisory jobs where the probability of receiving premium pay

for overtime hours is greatest. By contrast, many of the adults on overtime are supervisory or administrative staff, which typically does not receive such premiums. For teenagers and young adults (20–24) combined, the proportion receiving premium pay in May 1974 was 56 percent; this figure compares to 38 percent for those workers 25 years and over.

Though white men are more likely to work over 40 hours than blacks, black men have generally been more likely to receive premium pay for their extended hours. Among women, on the other hand, racial differences in the frequency of overtime work or the likelihood of receiving premium pay have not been as pronounced or consistent.

The proportion of women working overtime is about the same among the married as among the single—around 9 percent in May 1974. Among men, 32 percent of the married workers but only 17 percent of the single were working overtime. A greater proportion of single men received premium pay as opposed to those men who were married, while among the women the married ones were more likely to receive extra compensation for their overtime work than the single ones.

Union membership

Beginning in 1973 questions on union membership were included in the Current Population Survey for May. Of the 16.1 million workers on overtime, about 1 in 5 reported belonging to a labor union. Although relatively few of the workers on extra long workweeks belong to a union, the data show that union members were more likely to receive premium pay. Of the union members working 41 to 48 hours a week, 8 out of 10 received premium pay. Only 6 out of 10 union members who worked 60 hours or more received premium pay. (See table 5.)

About 24 percent of the men and 13 percent of the women on extended workweeks in May 1974 were union members. These workers were much more likely to receive premium pay than the average worker on overtime. In fact, two-thirds of all union members who usually worked overtime were reported as receiving premium pay for overtime hours.

As shown in table 5, union members comprise a greater proportion of the overtime work force in the goods-producing industries—31 percent—as compared with 15 percent in the service-producing sector.[7] Receipt of premiums was high in both sectors; nevertheless, the proportion of union workers receiving premium pay in the goods-producing industries was 91 percent, substantially above the 56 percent which received premiums in the service sector. In comparison, about half the percentage of nonunion workers in both the goods- and service-pro-

Table 3. Weekly earnings of persons with overtime pay and of all full-time workers, May 1974

[Percent distribution]

Earnings	Total	Male	Female	White			Negro and other races		
				Total	Male	Female	Total	Male	Female
	Overtime workers receiving premium pay								
Number (in thousands)	6,705	5,480	1,225	6,308	5,083	1,138	483	397	86
Median earnings (in dollars)	187	203	128	189	205	129	170	179	117
Percent earning—									
Under $100	7.0	3.8	21.7	7.0	3.4	21.2	11.6	8.1	27.9
$100–$149	22.5	17.3	45.9	22.4	16.8	45.7	28.4	23.9	48.8
$150–$199	26.0	27.3	20.4	26.0	27.3	20.9	24.6	26.7	15.1
$200–$299	32.8	37.8	10.8	33.0	38.4	11.0	26.3	30.2	8.1
$300–$399	8.7	10.4	1.1	8.8	10.6	1.2	6.2	7.6	0
$400 or more	2.8	3.5	0	2.8	3.5	0	2.9	3.5	0
	All full-time workers								
Number (in thousands)	50,238	32,477	17,852	44,634	29,174	15,460	5,695	3,302	2,392
Median earnings (in dollars)	169	204	124	173	209	125	140	160	117
Percent earning—									
Under $100	14.3	6.4	28.6	13.2	5.6	27.5	23.0	14.1	35.3
$100–$149	25.3	18.4	37.7	24.3	17.1	37.8	32.8	29.6	37.2
$150–$199	22.0	23.2	19.9	22.1	23.0	20.5	21.3	25.1	16.1
$200–$299	25.7	33.4	11.6	26.7	34.5	11.9	17.7	23.8	9.2
$300–$399	8.3	12.0	1.6	8.9	12.8	1.6	3.8	5.5	1.5
$400 or more	4.4	6.5	.6	4.8	7.1	.6	1.4	1.9	.5

Table 4. Percent working overtime and receiving premium pay by sex, age, race, and marital status

[In percent]

Characteristics	May 1969		May 1970		May 1971		May 1972		May 1973		May 1974	
	Working overtime	Receiving premium pay	Working overtime	Receiving premium pay	Working overtime	Receiving premium pay	Working overtime	Receiving premium pay	Working overtime	Receiving premium pay	Working overtime	Receiving premium pay
MALES	32.0	44.2	29.4	42.5	28.3	38.5	29.6	41.4	29.8	43.3	28.3	41.9
Age: 16–19 years	10.2	52.3	11.5	51.6	10.5	48.0	10.4	52.5	11.4	52.2	11.4	58.4
20–24 years	29.7	58.9	25.6	59.1	26.7	53.8	29.6	56.1	27.1	55.0	28.2	58.0
25–54 years	35.4	43.4	32.8	41.7	31.8	36.9	32.9	39.3	33.7	41.2	31.7	38.1
55 years and over	28.7	36.5	25.3	32.0	24.2	31.9	25.6	36.7	25.3	41.3	23.2	41.3
Race: White	32.9	43.5	30.2	41.8	29.6	38.0	30.8	40.5	31.3	42.7	29.7	41.3
Negro and other races	24.0	52.4	21.9	50.7	17.5	45.5	19.3	54.7	17.1	51.7	16.2	50.9
Marital status: Married, spouse present	35.1	44.2	32.0	42.2	31.4	38.4	33.1	40.6	33.1	42.6	31.6	40.2
Single	18.2	43.4	17.4	43.5	16.9	38.6	17.2	47.7	17.7	47.0	17.1	51.0
Other	29.0	44.9	30.0	44.1	24.5	39.0	26.7	40.8	28.1	45.1	26.0	46.4
FEMALES	12.2	38.5	10.5	34.7	10.9	33.1	11.1	38.5	10.9	40.3	9.9	40.1
Age: 16–19 years	5.0	61.5	3.8	43.0	4.4	40.7	3.8	52.4	4.6	45.3	4.3	57.6
20–24 years	12.2	43.0	10.1	46.0	9.8	37.6	10.8	44.3	10.7	49.2	10.1	47.5
25–54 years	12.7	41.2	10.9	35.8	11.6	34.8	12.1	39.6	11.5	40.6	10.7	39.9
55 years and over	14.1	21.7	13.6	21.8	13.3	22.6	12.6	26.4	12.9	30.6	9.8	27.0
Race: White	12.3	39.3	10.8	34.9	11.3	33.4	11.4	38.6	11.2	40.2	10.3	40.7
Negro and other races	11.3	32.4	8.6	33.7	8.0	29.9	9.0	38.6	8.5	41.3	6.5	33.3
Marital status: Married, spouse present	11.4	42.1	9.7	37.4	10.4	36.1	10.5	40.6	9.7	45.5	9.4	41.7
Single	11.6	32.5	9.4	27.0	10.0	27.6	10.0	32.4	9.7	32.8	8.4	33.9
Other	15.3	35.8	14.6	35.4	13.3	31.1	14.5	39.4	16.3	36.2	12.9	41.7

ducing industries received such compensation.

In every industry except services, and finance, insurance, and real estate, over 45 percent of unionized workers on extended workweeks received premium wages. However, the percentage of workers on extended workweeks who are union members differed widely from industry to industry, ranging from a low of 8 percent in trade to a high of 47 percent for transportation and public utilities.

While occupational data again supported the finding from the 1974 survey that a greater percentage of union overtime workers received premium pay than nonunion workers, the percentage of union members working extra hours was sometimes low. Less than one-tenth of union workers holding white-collar jobs and less than one-fifth of those engaged in service occupations worked overtime; however, among those that did almost one-half received compensation.

Unionized blue-collar workers were the union members most likely to be working extra hours. In addition, 88 percent received extra benefits for overtime work. On the other hand, farmworkers were least affected by union membership; even among the few who were unionized, only a handful who worked overtime received extra benefits.

Industry variations

Significant differences in the use of overtime and in the payment of a premium for it are found when interindustry comparisons are made. The likelihood of a person working overtime was not much different in the goods-producing (24 percent) and the service-producing (19 percent) sectors; however, the payment of premium pay in the two sectors differed widely. In the goods-producing industries, over three-fifths of the overtime workers received extra compensation; in comparison hardly more than one quarter of the overtime workers in the service-producing industries received extra compensation. (See table 6.)

The proportion of workers in the construction industry receiving premium pay for overtime work shows wide cyclical fluctuation. (See table 6.) From a 60-percent level in 1969 and 1970, this proportion fell substantially during the next 2 years—in May 1972 it averaged only 49 percent—but rebounded a

bit in 1973 only to dip once more in 1974.

The trend in the receipt of premium pay for overtime work in manufacturing shows a high degree of uniformity. In May 1974, 24 percent of the workers put in extra hours, a decline over the percentage working overtime in 1972 and 1973; however, the proportion receiving premium pay remained close to 70 percent over the same 3-year period.

In the service and finance industry—which has posted large gains in employment over the past few years—the percentage of employees working overtime has edged down, while the percentage receiving premium pay has moved up gradually since May 1969. (See table 6.) The Fair Labor Standards Act, which requires premium pay for overtime for certain groups of workers, was extended in 1967 to large segments of the service-producing industries. The slow, secular decline of the average workweek in services is due to the increasing use of part-time workers; a corresponding decline in the percentage working overtime in trade has taken place for the same reason.

Table 5. Union-nonunion differences in extent of overtime work and receipt of premium pay, May 1974

(In percent)

Characteristic	Overtime union workers as a percent of all workers	Union members who worked overtime and received premium pay	Nonunion workers who worked overtime and received premium pay
Total who worked 41 hours or more:			
Number (in thousands)	3,509	2,662	4,043
Percent	21.7	75.9	32.0
Usually worked overtime	16.4	65.9	25.7
Worked 41 to 48 hours	27.0	81.7	43.2
Worked 49 to 59 hours	19.6	71.5	28.6
Worked 60 hours or more	12.9	58.7	15.4
OCCUPATION			
White collar	9.6	46.1	19.2
Professional and technical	12.4	22.5	17.3
Manager and administrator	5.5	35.6	9.4
Sales	3.4	42.9	11.1
Clerical	17.6	87.7	55.3
Blue collar	38.8	87.6	59.7
Craft and kindred	34.0	89.5	55.1
Operative, except transport	45.0	94.0	77.9
Transport	40.4	66.3	46.9
Nonfarm laborer	37.4	92.4	50.0
Service	18.0	47.0	25.8
Farm	1.4	----	5.9
INDUSTRY			
Goods-producing	31.0	90.5	49.2
Agriculture	1.6	----	8.2
Forestry, fishing, and mining	26.9	89.2	54.6
Construction	24.5	77.3	45.9
Manufacturing	35.3	92.4	55.9
Service-producing	15.4	55.8	22.4
Transportation and public utilities	47.0	73.7	36.0
Trade	8.1	72.6	24.8
Finance and service	10.3	26.1	17.1
Public administration	29.3	46.2	29.5

Occupational patterns

The proportion of employees working long hours with premium pay also varies widely among the major occupation groups. The percentage of workers in white-collar occupations in May 1974 was about 21 percent, a level that has held fairly consistently since May 1969; however, the proportion receiving premium pay, at 22 percent, has shown a modest rise since May 1971, returning to a prerecession level. (See table 7.)

About 40 percent of managers and administrators were working extended hours in May 1974, yet only a tenth were compensated with premium pay. In general, these workers tend to be influenced by advancement possibilities and long-run monetary goals rather than the immediate payment of premiums for extra hours. Nearly a quarter of the professional and technical workers put in long hours but only 18 percent were compensated for the overtime.

Among sales persons, 22 percent worked extra hours in May, but only 12 percent received special remuneration. Of course, some sales persons receive a commission in addition to their regular salary or wage; this type of pay scheme can be viewed as a substitute for overtime premiums. The average retail clerk, however, would tend to view overtime work as an important additional source of income, but few have the opportunity to work more than 40 hours a week. (Large numbers are part-time employees.)

The experience of clerical workers with premium pay provides a sharp contrast to that of the rest of the white-collar workers. Though less than 10 percent of all clerical workers were on extended workweeks, three-fifths of those that did work overtime received premium pay, mostly because overtime legislation, along with union contracts, are likely to require such payments to clerical workers.

As already mentioned, a higher proportion of blue-collar workers on overtime received overtime compensation than did any other occupational group; in May 1974, as has been the case in other recent years, almost one quarter were on overtime, with 70 percent of them receiving premium pay. (See table 7.)

Within the blue-collar group, the most likely recipients of premiums were operatives of machines

Table 6. Industry differences in percentages of overtime workers and in receipt of premium pay

[In percent]

Industry	Workers with overtime						Overtime workers receiving premium pay					
	May 1969	May 1970	May 1971	May 1972	May 1973	May 1974	May 1969	May 1970	May 1971	May 1972	May 1973	May 1974
Goods-producing industries	28.6	25.5	25.3	27.3	28.3	25.8	64.2	61.5	59.1	62.7	64.9	61.9
Agriculture	40.7	40.7	39.8	36.3	37.5	37.9	4.9	8.4	6.5	9.4	6.7	8.1
Forestry, fisheries, and mining	34.7	33.3	35.9	30.9	34.5	35.9	58.9	60.7	59.8	64.9	61.7	64.1
Construction	21.2	20.8	19.6	19.0	19.8	18.8	60.9	59.9	52.7	48.5	56.6	53.6
Manufacturing	26.9	23.0	22.9	26.0	27.0	24.0	70.7	67.6	66.4	69.7	71.5	68.8
Service-producing industries	27.5	26.0	26.1	29.9	26.2	25.0	27.0	26.8	23.8	26.5	26.4	27.5
Transportation and public utilities	26.0	24.9	23.1	24.7	22.6	21.9	58.0	59.4	50.7	52.9	54.9	53.7
Trade	26.9	24.9	25.6	25.5	25.1	23.5	28.6	26.6	24.2	28.1	26.7	28.6
Service and finance	19.9	18.1	18.3	18.1	17.3	16.8	15.4	15.1	15.2	15.9	16.6	18.1
Public administration	13.6	13.1	13.7	15.6	14.3	14.7	32.9	38.2	28.8	34.7	38.0	34.4

Table 7. Occupational differences in percentages of overtime workers and in receipt of premium pay

[In percent]

Occupation	Workers with overtime						Overtime workers receiving premium pay					
	May 1969	May 1970	May 1971	May 1972	May 1973	May 1974	May 1969	May 1970	May 1971	May 1972	May 1973	May 1974
White collar	23.0	21.5	22.0	22.8	22.0	21.3	22.5	21.2	18.1	21.0	20.7	21.8
Professional and technical	27.8	26.1	25.4	25.8	23.8	24.0	16.1	15.7	13.9	15.2	15.3	17.9
Manager and administrator	40.3	38.6	41.8	43.8	42.2	40.4	12.0	11.9	8.9	10.8	11.1	10.8
Clerical	10.8	9.3	8.6	9.6	9.5	9.3	60.3	59.0	56.0	62.3	60.5	60.9
Sales	25.9	23.4	24.8	26.7	25.6	22.4	12.9	10.9	12.2	12.4	11.2	12.1
Blue collar	26.8	23.5	23.3	24.8	25.6	23.1	71.5	70.8	67.7	69.9	72.2	70.5
Craft and kindred	31.0	28.2	26.1	27.6	29.1	27.0	67.9	66.4	63.7	65.6	66.4	66.8
Operative [1]	26.6	22.0	23.9	25.8	25.3	22.5	75.5	74.3	71.5	73.8	78.0	74.8
Nonfarm laborer	16.7	16.8	14.5	15.1	17.8	15.0	64.7	72.6	64.9	67.8	69.0	65.9
Service	15.6	14.2	14.1	13.4	12.8	11.5	24.2	24.5	24.2	26.1	24.7	28.6
Farm	42.3	43.8	41.7	38.8	39.2	42.1	4.2	4.8	3.8	8.1	3.9	5.9

[1] Represents the sum of operatives except transport and transport equipment operatives.

other than transportation equipment,[8] with 85 percent receiving premium pay for their extra hours in May 1974. Transportation equipment operatives, on the other hand, were far below the average blue-collar worker in the receipt of premium pay—only 55 percent reported receiving premiums. This probably results from a large proportion of these workers being drivers of trucks and taxicabs, for whom long hours are often an accepted part of the normal routine.

In May 1974, 27 percent of all craft and kindred workers put in extra hours, and, of these, approximately two-thirds received premium pay. In the remaining blue-collar group, the premium pay experience for nonfarm laborers is similar to that of most other blue-collar workers; although only a small percentage, 15 percent, put in long workweeks, two-thirds of those who did received premiums.

Even though many service workers are likely to be employed by small establishments that are seldom unionized, overtime statutes have broadened somewhat, enabling more of these workers to receive premium pay. Of the service workers on extra hours, only 15 percent received premium pay in 1967 but by May 1974 this figure had almost doubled. However, the proportion working overtime has been gradually declining, from 16 percent in May 1969 to 12 percent in May 1974. In the last major group to be considered, wage and salary farmworkers, the proportion receiving premium pay for overtime work has not reached one-tenth in recent years.

THE OVERTIME PATTERN is a complex one, subject to the needs of both employee and employer. Through time, this work pattern has reflected and will continue to reflect changes in product demand, the resources and technology for production, and the working practices that have developed to meet personal, employer, and union interest and pressures. □

FOOTNOTES

[1] For articles on overtime hours, premium pay, and related material, see James R. Wetzel, "Long hours and premium pay," *Monthly Labor Review*, September 1965, pp. 1083–88; James R. Wetzel, "Overtime hours and premium pay, May 1965," *Monthly Labor Review*, September 1966, pp. 973–77; James R. Wetzel, "Overtime hours and premium pay," *Monthly Labor Review*, May 1967, pp. 41–45; John Fenlon, "Patterns in overtime hours and premiums," *Monthly Labor Review*, October 1969, pp. 42–46; and John Fenlon, "Recent trends in overtime hours and premium pay," *Monthly Labor Review*, August 1971, pp. 29–35.

[2] Data on the overtime work force and receipt of premium pay are collected each May as a supplement to the monthly Current Population Survey, which is conducted by the Bureau of the Census for the Bureau of Labor Statistics. This information applies to all wage and salary workers with one job who worked 41 hours or more on their primary job during the reference week. These survey data are obtained by asking, in brief: (1) Did (this person) work over 40 hours last week?; (2) Did (this person) work for one employer last week?; (3) Did (this person) get a higher rate of pay, such as time and a half or double time for the hours he worked over 40?; (4) How many hours per week does (this person) usually work at this job?; and (5) Does (this person) belong to a labor union?

[3] All hours in excess of 40 are referred to interchangeably as either "overtime," "extra," "extended," or "long" hours. The terms "premium pay," "extra compensation," "extra pay," and "premiums," are used interchangeably to refer to the receipt of a higher rate of pay, such as time and a half or double time, for hours worked over 40 during the reference week.

[4] The household survey measures hours actually worked, whereas the payroll survey measures hours paid for by employers. In the latter survey, the average overtime hours are computed by dividing the total overtime hours by the total number of production workers, including those with no overtime work. For a further explanation of concepts and methods used in these surveys, consult any recent issue of *Employment and Earnings*.

[5] For a detailed discussion of the major revisions in the Federal minimum wage law, see Peyton Elder, "The 1974 amendments to the Federal minimum wage law," *Monthly Labor Review*, July 1974, pp. 33–37.

[6] See Geoffrey H. Moore and Janice Neipert Hedges, "Trends in labor and leisure," *Monthly Labor Review*, February 1971, pp. 3–11.

[7] Goods-producing industries include agriculture, mining, construction, manufacturing, and forestry and fisheries. Service-producing industries include transportation and public utilities, finance, insurance and real estate, service, public administration, and trade.

[8] In 1972, the operatives category was split into two occupational groups: (1) operatives, except transport and (2) transport equipment operatives.

Occupational rankings for men and women by earnings

The 1970 census confirms that skill, sex, and age are likely to determine the worker's position on the pay ladder

DIXIE SOMMERS

THE BEST PAID American workers are in the medical and legal professions. Eight of the 10 top-earning occupations for men are practitioners or teachers in these fields: physicians, dentists, judges, lawyers, college teachers of law and health specialties, optometrists, and veterinarians.

Actuaries and airplane pilots are also among the top 10. Other high-earning groups are college teachers of other subjects, scientists, engineers, and managers. Railroad workers and metalworking craftsmen also rank relatively high.

In general, earnings data from the 1970 census contain few surprises. Skill, sex, and age are likely to determine your position on the pay ladder.

Medicine and law do not dominate the top-paying occupations for women, as they do for men. Physicians rank seventh, dentists 84th (one of the surprises), lawyers 16th, and judges 17th. The highest ranking occupations for women tend to be engineering and craft occupations with very few female workers.[1] Only one occupation in the top 10—physicians—has a substantial number of women.

The lowest paying occupations for both sexes are generally unskilled occupations—cooks, charwomen, farm laborers, busboys, and child care workers. Other relatively low-paying occupations include library attendants, school monitors, religious workers except clergymen, teacher aides, and waiters and waitresses.

The middle range of the earnings ladder is composed primarily of clerical and operative occupations—secretaries, payroll clerks, keypunch operators, and machine tool operators. Some craft and service occupations fall in this range, such as bookbinders, plasterers, sheriffs and bailiffs, and practical nurses. A few professional and managerial occupations are also in the middle—for women, dieticians, health technologists, and private elementary schoolteachers, and for men, librarians, private secondary schoolteachers, archivists, and clinical laboratory technologists.

These observations are based on rankings of recently published 1969 earnings data from the 1970 census[2] presented in tables 1 and 2. Occupations are ranked by median earnings for male and female workers. Data on worker characteristics which affect earnings are also shown, including age, education level, percent who worked a full year in 1969, and the percent who were women.

A unique data source

The census data provide a unique opportunity to compare earnings for a large number of occupations. Most other earnings data are not suitable for making such comparisons because they come from a variety of sources, varying by method of collection, geographic and industrial coverage, occupational definition, and earnings concept.

The census data also have limitations, primarily resulting from classification and reporting problems. Occupational classifications are based on limited information reported by individuals and result in misclassification of some workers. Errors in reporting earnings may result from respondents' misunderstanding the census questionnaire, or reports based on memory instead of records. Also, the earnings data are for 1969, while occupation refers to activity in April 1970. Census coding procedures were devised to minimize reporting and classification errors.

Median earnings data are also subject to sampling variability. Standard errors of the medians are significantly greater in occupations with few workers than in occupations with many workers. Each median earnings estimate was computed from a sample including at least 400 cases.[3]

Earnings among various occupations can be com-

Dixie Sommers is a labor economist in the Division of Manpower and Occupational Outlook, Bureau of Labor Statistics.

Table 1. Selected occupations of men, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
Top decile								
1	Physicians, medical and osteopathic	25,000+	44.3	17+	99.7	97.3	74.5	9.0
2	Dentists	21,687	45.5	17+	99.4	96.0	56.2	3.0
3	Judges	21,529	56.8	17+	92.8	75.5	86.8	5.1
4	Lawyers	18,749	42.8	17+	99.3	94.1	83.1	4.8
5	College and university teachers, law	18,161	40.6	17+	99.3	97.9	61.5	6.6
6	College and university teachers, health specialties	17,844	40.7	17+	99.5	96.2	73.7	47.4
7	Optometrists	17,398	47.6	17+	97.3	85.5	80.8	4.1
8	Airplane pilots	17,206	37.5	14.2	94.4	27.7	82.8	1.0
9	Veterinarians	16,505	40.8	17+	98.3	95.4	86.2	5.7
10	Actuaries	15,629	35.0	16.7	99.5	87.3	81.9	28.3
11	Physicists and astronomers	15,242	35.9	17+	99.3	90.3	87.6	4.3
12	Aeronautical and astronautical engineers	14,888	40.2	16.4	97.4	63.9	90.0	1.5
13	Managers and administrators, nec.—salaried: Durable goods manufacturing	14,829	44.6	14.1	86.0	35.9	92.5	3.5
14	Podiatrists	14,787	49.2	17+	98.6	84.1	70.0	9.5
15	Sales managers, except retail trade	14,526	42.9	14.5	90.9	37.0	92.2	3.5
16	Dental hygienists	14,291	47.2	12.7	69.3	14.4	85.1	93.2
17	College and university teachers, education	14,248	42.2	17+	99.6	96.9	57.5	29.3
18	Mathematicians	14,241	33.0	17+	99.9	89.7	82.9	24.5
19	College and university teachers, psychology	14,220	37.0	17+	99.7	97.4	60.5	29.7
20	Managers and administrators, nec.—self employed: Finance, insurance, real estate	14,155	52.0	14.5	84.8	37.7	82.3	10.6
21	Managers and administrators, nec.—salaried: Nondurable goods manufacturing	14,028	45.4	13.9	84.0	36.6	91.8	6.2
22	Chemical engineers	14,004	39.0	16.8	98.4	86.9	87.9	1.1
23	Life and physical scientists, nec.	13,997	37.7	17+	98.3	86.2	87.0	20.9
24	School administrators, college	13,938	44.0	17+	95.3	79.8	82.6	23.0
25	Atmospheric and space scientists	13,901	44.4	16.3	97.0	57.9	92.5	10.1
26	College and university teachers, engineering	13,898	38.4	17+	99.2	92.0	67.6	6.0
27	Economists	13,780	37.9	16.7	97.8	75.1	84.9	11.5
28	Geologists	13,641	41.1	17+	99.2	90.3	68.4	3.6
29	Metallurgical and material engineers	13,619	39.9	16.5	97.7	69.2	88.3	.8
30	Political scientists	13,588	34.7	17+	97.1	79.9	79.8	26.1
31	Petroleum engineers	13,572	39.8	16.6	96.9	77.5	90.1	.9
32	Stock and bond salesmen	13,565	39.5	16.2	92.7	55.9	82.7	8.7
33	Mechanical engineers	13,488	41.4	16.2	92.3	58.0	87.1	1.0
34	Electrical and electronic engineers	13,417	38.3	16.3	96.6	60.8	89.4	1.7
35	Sales engineers	13,328	41.4	16.1	95.7	52.5	90.3	.7
36	Managers and administrators, nec.—salaried: Finance, insurance, real estate	13,322	43.3	15.1	90.3	43.0	90.3	14.6
37	School administrators, elementary and secondary	13,191	44.0	17+	98.7	93.8	64.3	26.9
38	Architects	13,188	40.7	17.0	95.1	74.4	82.6	3.7
39	Marine scientists	13,188	38.5	17.0	98.6	76.7	91.1	4.6
40	Air traffic controllers	13,021	37.3	12.7	91.3	6.7	92.4	4.8
41	Flight engineers	12,981	37.3	13.3	92.8	27.0	81.9	1.8
42	College and university teachers, economics	12,925	37.8	17+	99.8	98.9	58.4	8.6
Ninth decile								
43	Psychologists	12,884	36.7	17+	98.9	95.7	69.9	35.9
44	Computer specialists, nec.	12,873	34.2	15.9	98.5	49.3	91.8	13.2
45	Managers and administrators, nec.—salaried: Construction	12,795	45.1	12.5	66.1	14.1	84.8	1.8
46	Civil engineers	12,790	40.9	16.3	93.7	60.4	88.4	1.5
47	Engineers, nec.	12,783	40.0	16.2	95.2	54.9	87.8	1.7
48	Managers and administrators, nec.—salaried: Communications, utilities, and sanitary services	12,741	45.1	13.0	85.0	26.7	93.0	10.7
49	College and university teachers, chemistry	12,693	35.2	17+	99.9	97.0	64.1	11.6
50	College and university teachers, agriculture	12,660	43.2	17+	99.1	95.0	79.9	4.9
51	Computer systems analysts	12,600	33.3	16.1	97.5	51.6	90.0	13.9
52	Managers and administrators, nec.—salaried: Wholesale trade	12,464	45.8	12.9	81.2	23.8	91.4	4.6
53	Managers and administrators, nec.—salaried: Business and repair services	12,393	41.6	13.5	82.7	32.6	88.7	11.5
54	College and university teachers, social science, nec.	12,248	37.6	17+	99.8	97.0	48.9	20.9
55	College and university teachers, biology	12,192	37.0	17+	99.6	96.1	59.0	21.8
56	College and university teachers, business and commerce	12,120	38.5	17+	99.8	95.4	54.3	31.8
57	Industrial engineers	12,089	41.3	15.7	94.0	47.9	89.4	3.0
58	Health administrators	12,087	46.1	16.1	89.7	51.6	89.8	44.8
59	Pharmacists	12,065	43.1	16.6	97.1	75.5	84.5	12.0
60	Mining engineers	12,025	41.2	16.4	91.4	64.5	84.6	1.1
61	Managers and administrators, nec.—self-employed: Communications, utilities, and sanitary services	11,971	48.7	12.2	55.1	11.8	77.6	7.7

Table 1. Continued—Selected occupations of men, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
62	College and university teachers, physics	11,958	34.5	17+	99.1	89.5	60.3	4.3
63	Chiropractors	11,957	46.7	16.8	97.5	83.9	79.8	8.0
64	Managers and administrators, nec.—salaried: All other industries	11,907	44.3	15.2	85.3	45.1	83.5	20.1
65	College and university teachers, atmospheric, earth, marine, and space sciences	11,834	34.6	17+	99.9	94.8	57.1	11.4
66	Bank officers and financial managers	11,742	40.1	15.0	94.8	41.2	90.3	17.5
67	Public relations men and publicity writers	11,713	42.0	15.9	93.9	49.2	83.9	26.6
68	Chemists	11,570	38.9	16.7	95.9	72.7	78.3	11.9
69	Urban and regional planners	11,544	35.9	17.0	97.7	75.1	82.1	10.5
70	Locomotive engineers	11,530	51.8	12.0	51.5	1.2	81.4	.9
71	Operations and systems researchers and analysts	11,453	38.6	14.6	93.1	38.0	90.5	9.1
72	Personnel and labor relations workers	11,449	40.7	15.4	92.0	45.9	88.5	31.5
73	Managers and administrators, nec.—salaried: Nondurable goods manufacturing	11,427	45.4	12.7	76.5	16.6	90.6	11.7
74	Officials of lodges, societies, and unions	11,397	46.9	12.8	72.7	25.9	86.4	16.5
75	Officials and administrators, Federal public administration and postal service	11,352	48.2	13.9	85.5	35.6	91.0	18.8
76	Designers	11,155	37.5	14.1	89.8	30.4	83.0	24.1
77	Sales representatives, manufacturing	11,124	41.0	13.6	85.9	29.0	85.8	8.8
78	College and university teachers, sociology	11,097	36.7	17+	99.1	98.3	55.6	24.6
79	Statisticians	10,985	38.6	16.4	96.1	62.6	84.4	40.3
80	Clerical supervisors, nec	10,865	45.6	12.9	85.9	22.5	92.0	43.0
81	College and university teachers, history	10,833	35.9	17+	99.7	98.3	48.9	17.9
82	Authors	10,823	40.9	15.9	95.9	49.2	74.1	30.5
83	Railroad conductors	10,801	51.5	12.1	56.5	1.2	80.5	1.0
84	Advertising agents and salesmen	10,789	40.6	14.4	90.5	34.1	79.4	20.7
Eighth decile								
85	Farm management advisors	10,779	42.1	16.9	98.3	90.0	92.4	11.6
86	Real estate appraisers	10,765	46.5	14.9	92.4	39.9	87.1	4.2
87	College and university teachers, miscellaneous	10,757	37.1	17+	99.6	96.1	48.0	27.3
88	College and university teachers, mathematics	10,743	33.4	17+	99.8	94.5	50.2	18.2
89	College and university teachers, art, drama, and music	10,735	38.2	17+	99.1	90.9	45.0	34.8
90	Accountants	10,677	39.8	16.1	96.2	52.9	85.1	25.5
91	Social scientists, nec	10,670	38.5	17+	96.3	74.6	75.8	26.2
92	Officers, pilots, and pursers, ship	10,635	44.8	11.4	45.5	6.3	59.5	2.0
93	Biological scientists	10,623	36.1	17+	97.9	88.1	84.0	35.3
94	Editors and reporters	10,618	39.1	16.2	95.6	55.6	78.6	40.2
95	Purchasing agents and buyers, nec	10,616	44.3	13.3	87.6	25.6	90.4	13.7
96	Managers and administrators, nec.—self-employed: Nondurable goods manufacturing	10,615	49.9	12.7	73.0	19.4	87.3	14.1
97	College and university teachers, coaches and physical education	10,584	33.8	17+	99.4	88.7	60.8	26.0
98	Stenographers	10,512	41.6	12.9	91.7	10.4	79.6	93.5
99	Tool programers, numerical control	10,507	32.4	13.4	94.3	18.1	93.2	17.7
100	Mechanical engineering technicians	10,505	40.7	12.8	83.3	14.4	88.4	3.1
101	College and university teachers, English	10,499	36.8	17+	99.7	97.3	44.6	41.8
102	Office managers, nec	10,431	43.2	13.4	90.3	24.8	91.5	40.4
103	Photoengravers and lithographers	10,399	39.9	12.4	71.4	3.2	83.1	12.8
104	Mathematical technicians	10,331	35.7	13.4	92.0	25.1	85.7	4.9
105	Managers and administrators, nec.—self-employed: Wholesale trade	10,324	51.0	12.5	65.8	13.0	85.6	7.3
106	Sociologists	10,278	30.7	17+	95.1	83.0	77.7	33.2
107	Real estate agents and brokers	10,265	50.0	13.2	82.8	25.3	75.3	32.5
108	Vocational and educational counselors	10,248	37.1	17+	98.2	82.9	56.1	44.7
109	College and university teachers, foreign language	10,237	38.7	17+	99.2	92.7	46.4	46.8
110	Tool and die makers	10,107	43.1	12.3	65.5	1.3	81.6	2.0
111	Postmasters and mail superintendents	10,101	52.0	12.7	84.3	9.8	93.6	30.7
112	Pattern and model makers, except paper	10,075	45.3	12.3	63.3	1.5	80.8	4.8
113	Data processing machine repairmen	10,052	29.9	12.8	94.4	5.4	88.9	2.4
114	Foremen, nec	10,018	44.2	12.2	59.8	6.3	88.4	8.2
115	Insurance agents, brokers, and underwriters	10,015	41.5	13.4	88.0	26.9	84.3	12.6
116	Computer programers	9,993	29.4	15.0	97.6	39.0	84.2	22.9
117	Buyers, wholesale and retail trade	9,987	43.6	12.8	78.2	18.7	88.3	29.6
118	College and university teachers, subject not specified	9,958	34.6	17+	98.3	86.6	52.4	31.1
119	Agricultural scientists	9,882	42.5	16.4	88.8	60.7	86.3	8.7
120	Estimators and investigators, nec	9,859	41.4	13.3	86.5	24.3	85.6	38.4
121	Managers and administrators, nec.—self-employed: Construction	9,799	45.8	12.2	55.7	7.1	69.7	1.4
122	Millwrights	9,781	46.0	11.5	44.7	.5	77.7	1.2
123	Auctioneers	9,775	45.3	12.2	57.9	5.2	79.8	5.2
124	Electroplaters and stereotypers	9,770	43.6	12.1	55.4	1.8	83.5	5.4
125	Power station operators	9,763	44.6	12.4	68.6	1.7	88.5	3.9
126	Managers and administrators, nec.—self-employed: Durable goods manufacturing	9,698	48.9	12.3	59.9	11.2	80.1	5.6

Table 1. Continued—Selected occupations of men, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
Seventh decile								
127	Research workers, not specified	9,661	33.0	17+	97.2	74.0	73.3	25.4
128	Managers and administrators, nec.—self-employed: Transportation	9,631	47.6	12.1	52.0	7.1	80.5	10.5
129	Locomotive firemen	9,615	37.2	12.3	65.1	1.8	76.2	1.7
130	College and university teachers, theology	9,603	41.2	17+	99.9	97.1	62.7	17.0
131	Sales representatives, wholesale trade	9,585	42.2	12.8	79.4	17.5	84.8	6.6
132	College and university teachers, trade, industrial, technical	9,550	42.3	17+	99.3	60.3	63.8	20.1
133	Inspectors, except construction, public administration	9,545	47.1	12.7	79.4	16.5	89.8	7.0
134	Sales managers and department heads, retail trade	9,508	38.7	12.7	80.0	15.7	88.5	24.4
135	Adult education teachers	9,469	38.1	15.1	90.3	43.4	71.8	46.7
136	Painters and sculptors	9,454	39.3	13.7	88.8	27.0	73.6	36.8
137	Managers and administrators, nec.—self-employed: Business and repair services	9,448	47.1	12.4	64.1	14.4	84.7	10.8
138	Structural metal craftsmen	9,431	39.3	11.6	46.1	.9	55.9	1.3
139	Firemen, fire protection	9,423	38.4	12.4	73.2	1.4	91.6	1.3
140	Industrial engineering technicians	9,382	37.2	12.7	86.2	9.0	87.4	12.8
141	Funeral directors	9,368	45.8	13.8	87.2	14.5	89.4	6.9
142	Electrical and electronic engineering technicians	9,361	33.8	12.8	89.4	5.5	84.7	5.9
143	Asbestos and insulation workers	9,355	36.8	11.7	46.9	.8	66.4	2.2
144	Writers, artists, and entertainers, nec	9,350	37.8	14.0	84.1	30.9	67.6	26.5
145	Electric power linemen and cablemen	9,344	35.4	12.3	64.9	.7	84.5	1.2
146	Managers and administrators, nec.—salaried: Retail trade	9,332	41.2	12.6	74.9	12.8	88.2	13.3
147	Credit men	9,330	37.9	14.0	92.4	26.9	89.2	27.8
148	Electricians	9,325	40.2	12.3	63.6	1.4	76.7	1.8
149	Managers and administrators, nec.—self-employed: All other industries	9,323	48.7	12.6	66.5	18.7	75.2	17.9
150	Secondary school teachers, public	9,247	34.1	17+	99.4	94.5	41.7	48.4
151	Salesmen of services and construction	9,236	40.8	12.9	79.1	18.6	77.6	35.1
152	Insurance adjustors, examiners and investigators	9,198	37.4	15.2	93.9	42.8	85.0	25.7
153	Aircraft mechanics	9,189	39.9	12.4	69.6	1.6	85.4	3.2
154	Heaters, metal	9,184	48.5	10.4	31.9	.5	79.1	2.7
155	Railroad brakemen	9,163	41.6	12.1	57.0	1.3	74.9	1.3
156	Construction inspectors, public administration	9,151	51.4	12.5	72.5	6.9	88.9	1.0
157	Policemen and detectives, public	9,051	35.5	12.6	80.9	5.9	88.1	3.1
158	Rollers and finishers, metal	8,990	44.4	10.8	37.9	.7	77.1	6.9
159	Plumbers and pipefitters	8,985	42.3	11.9	49.2	1.1	71.3	1.0
160	Telephone installers and repairmen	8,985	33.4	12.5	85.6	1.1	85.5	3.4
161	Boilermakers	8,944	45.4	11.1	40.7	.8	67.2	1.3
162	Managers and administrators, nec.—salaried: Personal services	8,883	47.0	12.6	70.3	13.6	83.6	34.1
163	Airline stewards	8,857	38.2	12.5	73.4	4.4	78.8	96.2
164	Technicians, except health, engineering and science, nec	8,786	37.1	12.7	84.1	8.8	84.3	19.6
165	Conductors and motormen, urban rail transit	8,780	43.3	12.1	55.8	.8	78.7	3.7
166	Stationary engineers	8,737	47.5	12.1	53.0	3.5	86.4	1.6
167	Expediters and production controllers	8,736	39.4	12.6	77.9	9.5	84.9	22.4
168	Job and die setters, metal	8,694	42.5	11.1	40.4	.6	81.2	2.6
Sixth decile								
169	Draftsmen	8,679	31.7	12.9	91.9	9.5	80.2	8.1
170	Ticket, station, and express agents	8,676	35.4	12.7	84.3	8.1	85.3	36.7
171	Sheetmetal workers and tinsmiths	8,671	40.0	12.1	53.3	.8	71.7	2.3
172	Railroad switchmen	8,637	41.9	12.2	57.4	1.3	77.5	1.9
173	Photographers	8,551	39.6	12.7	80.4	11.2	76.9	14.3
174	Forgemen and hammermen	8,506	41.4	10.6	35.2	.5	76.4	5.2
175	Engineering and science technicians, nec	8,503	33.9	12.9	86.5	12.0	79.4	18.0
176	Dispatchers and starters, vehicle	8,454	43.1	12.3	62.2	3.8	82.7	18.7
177	Chemical technicans	8,452	33.2	13.1	88.0	20.2	82.7	14.7
178	Cranemen, derrickmen, and hoistmen	8,442	43.0	10.4	33.6	.4	72.6	1.3
179	Pressmen and plate printers, printing	8,424	36.0	12.2	61.4	1.1	79.3	8.3
180	Social workers	8,414	35.5	16.6	94.9	71.4	75.5	62.9
181	Compositors and typesetters	8,380	40.0	12.3	67.5	2.3	79.4	14.3
182	Elementary school teachers, public	8,366	33.0	17.0	98.9	92.0	40.2	83.6
183	Heat treaters, annealers, and temperers	8,362	43.8	11.0	40.8	.4	81.5	2.1
184	Postal clerks	8,354	44.6	12.5	77.3	4.6	83.8	30.4
185	Proofreaders	8,348	45.2	12.8	79.8	19.6	67.1	73.9
186	Machinists	8,332	41.9	12.1	54.0	.8	80.5	3.2
187	Inspectors, nec	8,317	45.4	12.3	62.5	6.1	84.2	7.8
188	Restaurant, cafeteria, and bar managers	8,242	43.2	12.4	64.6	8.6	80.9	34.0
189	Precision machining operatives, nec	8,236	39.3	11.9	48.6	.6	75.5	11.3
190	Shipfitters	8,216	42.5	11.8	48.1	.8	75.9	1.8
191	Air conditioning, heating, and refrigeration mechanics	8,205	40.3	12.0	52.1	1.3	79.1	.9

Table 1. Continued—Selected occupations of men, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
192	Radiologic technologists and technicans	8,185	32.2	13.0	90.4	11.7	78.7	68.4
193	Heavy equipment mechanics, including diesel	8,162	42.0	11.6	46.1	.7	81.2	1.9
194	Opticians and lens grinders and polishers	8,149	40.9	12.4	67.8	4.9	82.9	22.9
195	Demonstrators	8,142	36.4	12.7	72.1	10.1	68.6	90.8
196	Telegraph operators	8,132	41.9	12.5	74.8	4.5	82.7	28.8
197	Buyers and shippers, farm products	8,113	47.5	12.3	59.5	8.5	84.3	2.1
198	Mail carriers, post office	8,113	44.0	12.5	75.8	2.9	86.1	7.9
199	Glaziers	8,082	38.4	11.7	46.7	.9	76.9	3.8
200	Assessors, controllers, and treasurers, local public administration	8,069	54.6	12.8	78.8	17.0	84.3	38.5
201	Lathe and milling machine operatives	8,061	39.1	12.0	51.3	.7	77.6	5.6
202	Drywall installers and lathers	8,050	32.6	11.1	39.4	.7	51.5	1.0
203	Grinding machine operatives	8,038	41.7	11.3	43.5	.6	73.9	6.1
204	Foresters and conservationists	8,014	39.8	13.7	75.6	41.3	79.5	3.9
205	Managers and administrators, nec.—self-employed: Personal services	8,004	53.5	12.3	59.7	8.1	88.2	34.8
206	Health practitioners, nec	7,957	59.5	16.6	81.3	55.3	50.0	42.9
207	Statistical clerks	7,956	40.7	12.7	77.9	11.5	79.4	64.7
208	Checkers, examiners, and inspectors, manufacturing	7,955	41.1	12.2	59.8	2.6	77.0	49.0
209	Managers and administrators, nec.—self-employed: Retail trade	7,945	50.0	12.2	58.9	7.3	89.4	19.9
210	Dental laboratory technicians	7,879	41.4	12.4	66.2	5.4	82.5	23.2
Fifth decile								
211	Bookbinders	7,867	36.9	12.1	53.1	1.7	76.0	56.5
212	Furnacemen, smelters and pourers	7,855	41.5	10.5	34.5	.9	74.6	4.2
213	Therapists	7,851	32.3	16.0	93.2	50.3	73.2	63.9
214	Salesmen, retail trade	7,839	42.9	12.5	68.6	6.9	78.7	13.0
215	Payroll and timekeeping clerks	7,834	42.1	12.6	78.2	5.8	81.2	69.1
216	Telephone linemen and splicers	7,789	29.4	12.5	82.0	.4	82.7	1.3
217	Stationary firemen	7,786	47.2	10.7	38.5	.6	81.8	9.0
218	Brickmasons and stonemasons	7,758	40.4	10.7	37.1	.7	41.6	1.3
219	Motormen, except urban rail transit	7,748	45.0	8.9	21.0		73.6	3.0
220	Office machine repairmen	7,740	32.5	12.5	77.7	1.4	85.0	2.1
221	Secondary schoolteachers, private	7,740	30.2	17.0	98.7	89.1	42.9	52.9
222	Librarians	7,727	33.6	17.0	96.3	64.1	53.7	81.5
223	Plasterers	7,679	43.8	10.3	31.6	.6	46.5	1.6
224	Railroad and car shop mechanics	7,669	46.6	11.1	42.0	.3	82.5	.9
225	Welders and flame cutters	7,624	38.4	11.0	40.3	.4	70.9	6.0
226	Longshoremen and stevedores	7,621	44.3	9.9	29.9	1.0	50.3	1.7
227	Winding operatives, nec	7,607	36.3	12.0	49.5	.1	75.1	52.4
228	Miscellaneous mechanics and repairmen	7,593	39.5	12.2	57.1	1.7	77.9	4.6
229	Meat cutters, and butchers, manufacturing	7,587	38.6	10.3	35.5	.5	77.2	27.7
230	Excavating, grading, and road machine operators, except bulldozer	7,560	41.6	10.2	32.6	.5	61.4	1.1
231	Archivists and curators	7,537	34.5	15.8	91.5	48.7	70.0	30.9
232	Secretaries	7,536	42.1	12.9	83.4	21.7	77.6	97.7
233	Meat cutters and butchers, except manufacturing	7,516	41.0	11.9	48.9	1.0	80.6	5.7
234	Computer and peripheral equipment operators	7,482	27.0	12.8	92.7	5.7	76.5	29.4
235	Oilers and greasers, except auto	7,480	43.3	10.4	36.2	.8	66.2	3.7
236	Tilesetters	7,474	39.6	11.1	40.6	.8	58.5	1.4
237	Legal secretaries	7,457	38.3	13.7	89.9	27.0	71.5	98.5
238	Keypunch operators	7,454	29.8	12.6	83.8	5.0	76.8	89.5
239	Managers and superintendents, building	7,419	52.2	12.5	65.3	16.4	80.4	40.8
240	Household appliance and accessory installers and mechanics	7,407	40.5	12.1	56.7	1.4	80.9	2.2
241	Bookkeepers	7,401	41.1	12.8	82.8	14.3	79.2	82.1
242	Surveyors	7,387	32.1	12.7	82.5	7.5	74.6	3.4
243	Drillers, earth	7,369	38.7	10.8	38.7	1.1	64.2	6.5
244	Radio and television repairmen	7,366	39.1	12.4	68.1	2.4	78.9	4.0
245	Sheriffs and bailiffs	7,346	42.7	12.4	67.7	4.3	86.4	6.1
246	Molders, metal	7,327	39.4	10.4	33.8	.4	75.2	12.2
247	Craftsmen and kindred workers, nec	7,312	38.4	11.7	47.5	1.4	68.8	9.2
248	Radio operators	7,289	40.2	12.5	73.3	4.8	77.3	26.6
249	Mine operatives, nec	7,253	38.8	10.5	37.2	1.3	68.9	2.9
250	Truckdrivers	7,246	40.0	10.5	33.6	.6	70.8	1.5
251	Clinical laboratory technologists and technicians	7,242	30.8	14.7	93.0	35.3	73.7	71.8
252	Blasters and powdermen	7,225	41.8	9.7	31.5		65.2	4.5
253	Clerical workers, miscellaneous and not specified	7,225	38.2	12.7	76.8	11.5	74.1	72.0
Fourth decile								
254	Punch and stamping press operatives	7,202	36.9	11.0	40.5	.5	70.5	31.6
255	Agriculture and biological technicans, except health	7,187	34.8	12.8	80.3	14.6	76.2	32.8
256	Automobile body repairmen	7,180	34.9	11.1	40.9	.5	76.0	1.0

Table 1. Continued—Selected occupations of men, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
257	Embalmers	7,180	34.7	13.9	91.1	18.4	74.1	4.0
258	Blacksmiths	7,171	48.8	10.3	37.0	.6	74.9	3.2
259	Furriers	7,159	56.8	11.2	44.2	1.8	63.2	17.5
260	Engravers, except photographers	7,132	37.0	12.1	56.2	1.8	69.4	29.0
261	Marshals and constables	7,130	47.3	12.3	63.2	5.0	82.3	4.1
262	Floor layers, except tilesetters	7,102	40.0	11.2	42.0	1.4	61.3	1.8
263	Jewelers and watchmakers	7,100	49.1	12.1	55.0	3.7	76.4	11.7
264	Metal platers	7,084	36.6	11.1	40.8	.8	75.2	9.1
265	Drill press operatives	7,070	36.8	11.4	44.1	.5	68.5	22.7
266	Carpenters	7,025	44.0	10.8	39.6	1.1	53.3	1.3
267	Photographic process workers	7,021	32.9	12.5	70.2	5.2	72.4	46.8
268	Carpet installers	7,018	30.1	11.8	47.9	.6	63.3	1.6
269	Registered nurses	7,013	38.8	13.5	84.1	22.7	71.1	97.4
270	Policemen and detectives, private	6,989	42.1	12.4	65.7	9.3	70.6	17.1
271	Assemblers	6,988	33.0	11.9	49.0	.9	64.4	50.0
272	Weighers	6,979	42.7	11.6	46.3	1.3	73.8	30.5
273	Health technologists and technicians, nec	6,976	33.1	14.6	88.8	37.7	72.1	56.1
274	Radio and television announcers	6,974	28.3	13.8	91.9	18.7	69.6	6.4
275	Therapy assistants	6,959	37.5	12.9	75.7	33.7	82.0	69.7
276	Teachers, except college and university, nec	6,941	37.3	13.8	83.0	30.7	58.6	70.4
277	Cement and concrete finishers	6,922	40.5	9.4	26.7	.7	40.5	1.6
278	Bakers	6,895	43.2	10.5	36.1	1.0	75.4	29.5
279	Miscellaneous and not specified operatives	6,895	36.9	11.3	43.2	.9	71.6	29.7
280	Billing clerks	6,880	34.8	12.6	78.2	5.6	76.9	81.8
281	Boatmen and canalmen	6,867	43.2	10.2	34.9	1.7	60.6	7.9
282	Automobile mechanics	6,862	37.6	11.3	42.9	.7	77.3	1.4
283	Bulldozer operators	6,853	40.9	9.9	30.3	.5	58.4	1.4
284	Elementary schoolteachers, private	6,843	29.6	16.7	96.5	81.0	40.7	85.5
285	Forklift and tow motor operatives	6,819	35.9	10.6	36.1	.4	73.0	1.7
286	Actors	6,816	35.1	14.5	88.0	34.6	25.7	41.9
287	Loom fixers	6,814	45.6	8.9	19.2	----	86.0	1.2
288	Tailors	6,782	48.5	9.8	31.5	1.1	70.7	32.1
289	Mixing operatives	6,741	38.5	11.0	40.3	.9	74.7	4.2
290	Hairdressers and cosmetologists	6,731	35.3	12.3	68.1	2.6	73.5	90.1
291	Busdrivers	6,717	46.0	11.3	43.0	1.4	63.8	28.4
292	Painters, manufactured articles	6,708	36.7	10.5	34.1	.5	68.4	15.4
293	Decorators and window dressers	6,696	36.1	12.6	72.2	9.2	74.5	58.5
294	Cutting operatives, nec	6,692	39.1	10.7	37.7	.7	70.7	27.1
295	Automobile accessories installers	6,690	33.1	11.5	43.8	1.6	67.2	5.1
Third decile								
296	Meter readers, utilities	6,679	34.0	12.3	67.7	1.0	79.9	2.9
297	Solderers	6,637	37.8	10.7	38.6	.5	61.8	84.0
298	Paperhangers	6,595	51.0	10.7	36.7	2.6	44.6	10.1
299	Deliverymen and routemen	6,582	35.3	11.9	48.6	1.0	70.9	3.2
300	Cabinetmakers	6,516	44.0	10.9	40.6	1.8	70.6	5.2
301	Collectors, bill and account	6,471	30.6	12.8	78.7	10.5	72.9	36.4
302	Telephone operators	6,469	35.4	12.5	74.8	5.4	67.9	94.5
303	Bottling and canning operatives	6,435	39.9	10.7	38.4	.7	67.6	40.0
304	Sailors and deckhands	6,435	41.5	10.5	35.8	2.1	38.7	1.6
305	Farm managers	6,431	45.4	12.2	55.3	11.6	87.8	4.1
306	Shipping and receiving clerks	6,427	37.1	12.1	52.1	1.8	73.6	14.5
307	Warehousemen, nec	6,420	36.6	12.1	52.1	1.2	71.7	4.0
308	Filers, polishers, buffers, and sanders	6,388	40.2	10.1	31.4	.6	66.7	20.7
309	Sign painters and letterers	6,358	48.0	12.0	51.0	2.6	65.9	9.2
310	Motion picture projectionists	6,350	46.6	12.0	51.2	2.5	61.4	3.8
311	Tabulating machine operators	6,343	27.1	12.7	85.9	3.6	70.1	52.4
312	Calculating machine operators	6,305	27.3	12.8	85.4	7.6	63.0	90.9
313	Bookkeeping and billing machine operators	6,302	30.8	12.7	81.7	7.1	68.1	89.6
314	Stock clerks and store keepers	6,288	35.3	12.2	58.5	3.1	69.9	22.9
315	Athletes and kindred workers	6,273	30.1	12.9	74.4	17.6	52.7	28.3
316	Clergymen	6,249	41.3	17+	92.1	73.3	86.4	2.9
317	Inspectors, scalers, and graders, log and lumber	6,150	44.3	10.8	39.2	1.8	71.4	11.7
318	Stonecutters and stonecarvers	6,146	42.0	10.4	37.1	1.5	64.3	7.8
319	Upholsterers	6,110	42.7	10.5	34.6	.8	73.1	16.7
320	Recreation workers	6,101	26.1	14.7	86.1	36.2	58.5	41.7
321	Painters, construction and maintenance	6,077	23.0	10.2	32.7	1.1	49.4	3.9
322	Roofers and slaters	6,076	35.5	10.2	29.9	.6	43.7	1.5
323	Farm implement mechanics	6,056	39.9	11.5	46.4	1.0	78.7	1.1
324	Dieticians	6,037	40.9	12.7	66.0	29.8	69.7	92.2
325	Religious workers, nec	6,029	42.1	16.5	89.8	57.6	75.1	55.7
326	Typists	6,025	29.9	12.6	79.9	6.0	66.0	94.2
327	Riveters and fasteners	5,984	33.1	10.9	39.7	.6	62.6	45.8
328	Millers, grain, feed, and flour	5,945	45.4	9.3	30.6	.8	82.5	3.7
329	Guards and watchmen	5,891	52.0	11.3	44.7	2.5	70.5	5.0

Table 1. Continued—Selected occupations of men, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
330	Knitters, loopers, and toppers	5,861	38.2	10.0	28.8	1.1	65.1	62.4
331	Medical secretaries	5,861	33.0	13.1	83.6	9.8	64.9	98.9
332	Health record technologists and technicians	5,852	34.0	14.5	97.3	30.5	68.9	93.8
333	Furniture and wood finishers	5,786	44.0	10.6	38.2	2.2	68.6	18.1
334	Housekeepers, except private household	5,777	38.9	12.6	65.4	8.8	61.7	72.6
335	Piano and organ tuners and repairmen	5,771	49.1	12.3	61.5	9.8	64.9	4.0
336	Farm foremen	5,754	45.0	10.6	41.0	6.2	81.1	6.6
337	Bank tellers	5,749	28.2	12.8	89.1	8.9	70.3	86.2
Second decile								
338	Practical nurses	5,745	38.8	12.4	65.9	2.5	70.4	96.3
339	Barbers	5,686	45.5	11.4	44.8	.8	74.8	4.6
340	Freight and material handlers	5,660	33.2	10.9	39.3	1.1	60.4	7.4
341	Bartenders	5,656	46.3	12.0	50.6	3.8	66.2	21.4
342	Graders and sorters, manufacturing	5,635	38.1	10.5	37.0	1.3	65.6	68.1
343	Weavers	5,589	40.9	9.1	20.8	.2	77.1	53.6
344	Hucksters and peddlers	5,569	42.8	12.3	60.3	9.7	58.1	78.9
345	Farm service laborers, self-employed	5,566	44.6	11.4	45.0	1.2	59.7	15.1
346	Welfare service aides	5,487	34.9	12.7	71.8	25.4	65.2	76.0
347	Sales clerks, retail trade	5,482	35.5	12.4	63.3	6.8	64.7	65.2
348	Dyers	5,425	37.2	10.2	31.7	1.0	74.6	8.4
349	Clothing ironers and pressers	5,387	45.8	9.6	26.7	.5	63.0	74.5
350	Kindergarten teachers, private	5,382	33.9	14.4	74.9	39.1	50.5	98.4
351	Packers and wrappers, except meat and produce	5,336	32.3	10.9	38.6	1.1	61.5	62.5
352	Elevator operators	5,329	54.1	8.9	24.4	1.2	71.7	27.1
353	Counter clerks, except food	5,317	34.1	12.5	67.8	6.2	63.9	67.5
354	Duplicating machine operators	5,270	28.2	12.4	69.2	4.8	60.4	56.8
355	Office machine operators, nec	5,248	28.0	12.4	66.3	4.6	61.6	67.8
356	Construction laborers, except carpenters helpers	5,213	37.1	9.8	30.2	.9	46.9	1.7
357	Textile operatives, nec	5,184	37.6	9.7	27.6	.6	74.3	48.8
358	Taxicab drivers and chauffeurs	5,172	45.6	11.0	40.1	2.7	57.3	6.0
359	Sewers and stitchers	5,149	41.3	9.3	26.7	.9	59.1	93.8
360	Dressmakers and seamstresses, except factory	5,110	46.3	9.8	34.1	3.0	61.0	95.6
361	Spinners, twisters, and winders	5,078	33.7	9.5	26.2	.3	74.9	64.6
362	Shoe repairmen	5,070	52.6	9.0	28.4	.5	75.0	20.1
363	Kindergarten teachers, public	5,068	30.7	16.4	92.5	66.8	38.8	97.9
364	Shoemaking machine operatives	5,014	36.9	9.3	23.9	.4	70.3	62.0
365	Garbage collectors	4,981	37.6	9.3	23.8	.7	68.6	1.4
366	Teamsters	4,977	38.4	9.2	26.7	.6	49.0	3.8
367	Carding, lapping, and combing operatives	4,974	41.9	8.3	14.3	.5	77.6	26.1
368	Sawyers	4,972	41.4	9.0	26.3	.6	62.4	8.3
369	File clerks	4,952	27.6	12.5	72.7	6.6	56.4	82.1
370	Miscellaneous and not specified laborers	4,938	36.3	10.1	32.0	.8	57.7	10.8
371	Mail handlers, except post office	4,937	28.6	12.3	64.2	3.2	59.5	43.6
372	Laundry and drycleaning operatives, nec	4,830	42.7	10.6	36.0	1.4	67.2	63.3
373	Farmers, owners and tenants	4,816	51.0	10.7	42.9	3.5	85.8	4.8
374	Janitors and sextons	4,771	48.2	9.9	30.2	1.1	65.6	12.7
375	Chainmen, rodmen, and axmen, surveying	4,706	25.4	12.3	61.6	2.9	49.4	1.4
376	Musicians and composers	4,668	28.9	12.9	74.4	18.5	37.9	34.0
377	Fishermen and oystermen	4,623	40.9	9.5	27.9	1.6	45.3	4.1
378	Enumerators and interviewers	4,606	30.8	13.5	87.3	25.0	45.1	79.8
379	Dancers	4,421	29.0	12.9	77.7	23.2	38.7	81.6
380	Nursing aides, orderlies, and attendants	4,401	31.8	12.2	55.9	4.2	64.3	84.7
Bottom decile								
381	Health aides, except nursing	4,354	28.0	12.3	58.5	8.9	60.2	84.0
382	Receptionists	4,281	29.4	12.9	77.2	10.2	53.6	94.7
383	Boarding and lodging house keepers	4,256	58.1	12.2	54.1	10.5	79.9	73.9
384	Dental assistants	4,094	29.4	12.6	73.0	20.8	60.3	97.9
385	Cooks, except private household	4,076	31.3	10.9	35.7	1.4	52.6	62.5
386	Cleaners and charwomen	4,063	41.7	9.8	26.3	1.1	56.6	56.9
387	Attendants, personal service, nec	3,983	44.8	11.9	48.7	5.3	53.7	62.5
388	Animal caretakers, except farm	3,942	32.1	11.1	40.3	3.3	61.4	32.7
389	Child care workers, except private household	3,936	38.5	12.2	56.4	7.7	61.1	93.1
390	Lumbermen, raftsmen, and woodchoppers	3,835	37.0	8.8	23.3	.6	41.6	2.3
391	Gardeners and groundskeepers, except farm	3,792	42.8	9.7	28.6	1.6	51.5	3.0
392	Baggage porters and bellhops	3,746	36.8	11.7	46.4	3.2	54.6	2.2
393	Carpenters helpers	3,692	30.2	9.8	28.7	1.0	36.5	2.3
394	Vehicle washers and equipment cleaners	3,629	26.4	10.4	29.0	.7	49.3	10.8
395	Cooks, private household	3,552	54.0	9.8	30.4	2.7	67.7	94.2
396	Parking attendants	3,388	33.1	11.0	40.0	2.5	51.0	3.2
397	Meat wrappers, retail trade	3,300	22.5	11.2	38.5	.7	54.1	93.4
398	Chambermaids and maids, except private household	3,296	38.3	9.9	28.9	1.8	57.2	95.2

Table 1. Continued—Selected occupations of men, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
399	Cashiers	3,154	23.4	12.3	58.0	3.6	50.5	84.1
400	Housekeepers, private household	3,151	50.1	9.8	33.6	3.7	55.3	96.7
401	Messengers	3,029	28.9	11.4	43.8	2.9	46.3	20.9
402	Produce graders and sorters, except factory and farm	2,959	38.4	8.9	23.9	.8	38.6	75.5
403	Waiters	2,894	27.7	11.7	47.2	3.7	40.6	89.2
404	Garage workers and gas station attendants	2,668	22.0	11.1	35.8	.9	44.3	2.8
405	Crossing guards and bridgetenders	2,620	64.5	9.1	27.3	1.2	42.8	59.3
406	Laundresses, private household	2,596	54.9	10.0	34.3	4.2	67.8	95.8
407	Farm laborers, wage workers	2,493	36.7	8.7	21.9	1.2	51.4	14.3
408	Health trainees	2,413	22.9	12.5	61.1	12.4	48.8	93.9
409	Stock handlers	2,114	19.5	11.3	38.5	.9	43.3	17.6
410	Attendants, recreation and amusement	1,923	23.9	12.0	49.8	3.6	36.4	24.5
411	Food service workers, n.e.c., except private household	1,917	21.9	10.8	32.7	1.5	37.3	75.5
412	Teacher aides, except school monitors	1,769	23.0	13.6	78.2	18.9	24.4	89.6
413	Maids and servants, private household	1,631	48.6	8.9	21.2	1.5	49.2	96.6
414	Library attendants and assistants	1,546	21.9	13.9	79.8	19.1	31.0	78.8
415	Food counter and fountain workers	1,413	19.2	11.1	35.6	1.1	30.9	76.0
416	Dishwashers	1,238	19.4	10.5	26.3	.9	25.7	37.8
417	Bootblacks	1,176	52.6	8.2	14.5	.8	47.8	8.3
418	School monitors	1,153	21.3	12.9	66.9	7.6	28.2	91.0
419	Farm laborers, unpaid family workers	1,100	20.3	10.8	34.0	1.4	63.4	41.3
420	Busboys	943	17.9	10.8	24.0	.9	20.6	14.1
421	Ushers, recreation and amusement	895	17.9	11.0	29.0	2.2	17.8	31.2
422	Newsboys	795	17.7	10.7	20.7	1.8	60.1	16.1
423	Child care workers, private household	687	19.8	10.6	24.1	.4	21.5	98.0

pared by ranking several different types of data. Median annual earnings of all workers are available for the complete range of detailed occupations. However, annual earnings depend not only on the occupation's wage or salary level, but also on the prevalence of part-year and part-time work. Earnings in some occupations may be low because a large proportion of the workers are employed part year or part time, either because full-year or full-time work is not available, or because workers, particularly women and youth, choose to work only part year or part time.

Mean annual earnings of full-year workers are also available for all the detailed occupations, and median annual earnings of full-year workers are available for a limited range of occupations. However, these data still do not account for part-time work, and no data are available on the characteristics of full-year workers such as age and educational attainment.

Rankings presented here are based on median annual earnings of all workers because of the limitations in other data. However, a comparison of two types of earnings data indicates that the inclusion of part-time and part-year workers does not significantly affect an occupation's relative earnings level. Median earnings of full-year full-time workers were ranked for the occupations for which data are available, 60 for men and 45 for women.[4] These rankings were compared with rankings of the same occupations by median earnings of all workers, resulting in a rank correlation coefficient of .94 for men and .84 for women. The lower coefficient for women is primarily the result of extremely different rankings for library attendants and assistants, and enumerators and interviewers. If these two occupations are excluded, the coefficient increases to .95.

Divided into deciles

To facilitate comparisons of the rankings for men and women, and discussion of the relationship between the rankings and worker characteristics, tables 1 and 2 were divided into 10 equal groups or deciles. The top decile in each table includes the top-ranking 10 percent of the occupations, the ninth decile includes the next highest 10 percent, and so forth.

Occupations with specific characteristics, such as median age of 40 years or more, are shown in tables 3 and 4 as they appear in the earnings deciles. Because the data are not weighted by the number of workers in each occupation, the distributions show only the characteristics of the occupations, not of the workers. In table 3, for example, 11.9 percent of the occupations, not 11.9 percent of the workers,

Table 2. Selected occupations of women, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
Top decile								
1	Sales engineers	13,181	45.3	16.0	95.2	49.7	86.0	0.7
2	Mechanical engineers	11,377	36.9	15.6	91.9	46.6	73.4	1.0
3	Locomotive engineers	11,063	51.4	12.1	57.2	.....	90.8	.9
4	Aeronautical and astronautical engineers	10,448	39.6	15.0	83.2	42.7	74.3	1.5
5	Chemical engineers	10,023	24.5	16.6	96.2	81.5	77.7	1.1
6	Electrical and electronic engineers	9,813	40.4	15.2	91.8	46.5	82.4	1.7
7	Physicians, medical and osteopathic	9,788	40.4	17+	97.3	81.6	64.5	9.0
8	Millwrights	9,725	43.7	11.5	45.0	4.3	78.9	1.2
9	College and university teachers, physics	9,589	34.1	17+	99.9	87.8	41.6	4.3
10	Engineers, nec	9,528	34.6	15.9	91.2	49.4	75.3	1.7
11	Civil engineers	9,363	36.4	16.1	95.5	53.9	75.7	1.5
12	Managers and administrators, nec.—salaried: Construction	9,344	47.5	12.5	69.6	9.5	83.2	1.8
13	Airplane pilots	9,240	38.8	13.9	95.8	13.8	73.0	1.0
14	Physicists and astronomers	9,071	36.4	17.0	99.9	83.6	74.3	4.3
15	College and university teachers, education	9,018	42.1	17+	99.0	95.6	35.6	29.3
16	Lawyers	8,980	44.5	17+	97.5	75.1	69.4	4.8
17	Judges	8,883	51.2	13.7	82.5	41.1	72.6	5.1
18	Computer systems analysts	8,852	29.7	14.9	93.3	43.4	80.6	13.9
19	College and university teachers, social science, nec	8,843	39.7	17+	98.4	94.7	46.7	20.9
20	Industrial engineers	8,831	44.1	15.1	87.3	28.3	84.8	3.0
21	College and university teachers, economics	8,725	37.8	17+	99.9	95.6	36.4	8.6
22	Operations and systems researchers and analysts	8,473	39.2	14.0	93.1	36.0	81.5	9.1
23	Mathematicians	8,348	29.7	16.5	99.1	73.7	69.0	24.5
24	Psychologists	8,342	38.1	17+	98.5	89.0	42.9	35.9
25	Railroad conductors	8,239	44.7	12.1	55.9	.....	77.1	1.0
26	College and university teachers, psychology	8,212	36.6	17+	99.9	97.6	35.1	29.7
27	Vocational and educational counselors	8,076	41.0	17+	96.8	76.3	32.3	44.7
28	College and university teachers, health specialties	8,063	38.4	17+	97.0	76.7	43.4	47.4
29	Chemists	8,062	33.3	16.6	97.0	75.5	72.4	11.9
30	Managers and administrators, nec.—salaried: Durable goods manufacturing	7,989	46.7	12.7	81.3	16.5	83.7	3.5
31	School administrators, elementary and secondary	7,949	48.9	17+	94.8	76.8	42.4	26.9
32	Firemen, fire protection	7,809	39.0	12.4	71.6	2.5	76.7	1.3
33	Structural metal craftsmen	7,769	41.8	10.8	38.2	.....	54.6	1.3
34	College and university teachers, home economics	7,603	44.3	17+	95.0	87.9	34.5	92.3
35	School administrators, college	7,574	45.4	16.8	95.4	65.5	65.4	23.0
36	Computer programers	7,537	26.6	16.0	98.1	50.9	68.6	22.9
37	Air traffic controllers	7,453	40.3	12.7	84.7	10.1	86.7	4.8
38	Managers and administrators, nec.—self-employed: Construction	7,349	46.3	12.4	63.8	14.5	66.7	1.4
39	College and university teachers, miscellaneous	7,316	36.8	17+	99.1	91.8	31.8	27.3
Ninth decile								
40	Sales managers, except retail trade	7,313	41.7	12.8	87.1	14.0	77.1	3.5
41	Computer specialists, nec	7,277	33.3	13.9	94.9	30.0	76.2	13.2
42	Managers and administrators, nec.—salaried: Wholesale trade	7,268	47.9	12.7	79.4	11.5	78.3	4.6
43	Railroad and car shop mechanics	7,230	51.0	11.8	48.6	.....	85.4	.9
44	Economists	7,228	35.2	16.1	95.9	53.5	67.8	11.5
45	Plumbers and pipefitters	7,205	43.2	11.7	47.4	.7	67.2	1.0
46	College and university teachers, coaches and physical education	7,188	32.1	17+	99.1	85.0	23.2	26.0
47	Managers and administrators, nec.—salaried: Communications, utilities, and sanitary services	7,174	40.4	12.7	87.3	16.3	83.6	10.7
48	Biological scientists	7,163	31.7	16.5	97.5	70.9	65.8	35.3
49	Health administrators	7,149	49.4	13.5	83.6	30.4	81.4	44.8
50	Statisticians	7,118	39.1	14.1	93.2	36.3	74.5	40.3
51	Officials and administrators, public administration, nec	7,071	47.1	12.8	89.2	17.9	81.1	18.8
52	Home management advisors	7,052	35.6	16.5	90.6	76.4	58.7	97.3
53	College and university teachers, chemistry	7,050	32.0	17+	99.9	92.5	45.5	11.6
54	Aircraft mechanics	7,010	43.1	12.1	55.1	1.2	67.2	3.2
55	Architects	6,995	38.8	17.0	94.0	73.5	68.7	3.7
56	Clerical supervisors, nec	6,995	44.9	12.6	86.9	6.3	84.6	43.0
57	Secondary school teachers, public	6,975	34.8	16.8	99.1	93.0	20.9	48.4
58	Air conditioning, heating, and refrigeration mechanics	6,925	34.3	11.6	46.8	.....	66.8	.9
59	Officers, pilots, pursers, ship	6,921	47.1	12.7	81.3	.....	55.4	2.0
60	Purchasing agents and buyers, nec	6,889	45.2	12.7	86.5	8.1	83.7	13.7
61	Elementary schoolteachers, public	6,883	38.5	16.6	98.6	86.3	20.5	83.6
62	College and university teachers, English	6,860	35.9	17+	99.5	94.8	26.9	41.8
63	Managers and administrators, nec.—salaried: Nondurable goods manufacturing	6,847	46.3	12.6	74.5	16.1	79.1	6.2
64	Postmasters and mail superintendents	6,820	55.1	12.4	71.3	4.8	85.2	30.7
65	Farm management advisors	6,806	29.2	16.4	97.7	77.1	60.0	11.6

Table 2. Continued—Selected occupations of women, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
66	Cranemen, derrickmen, and hoistmen	6,734	42.0	10.9	41.6	.....	53.8	1.3
67	Urban and regional planners	6,726	28.1	16.9	99.9	83.3	55.1	10.5
68	Tool programers, numerical control	6,705	28.9	15.9	92.9	49.4	56.5	17.7
69	Managers and administrators, nec.—salaried: Business and repair services	6,695	41.8	12.9	85.3	19.6	76.3	11.5
70	Personnel and labor relations workers	6,681	41.2	12.9	89.3	24.3	73.2	31.5
71	Managers and administrators, nec.—salaried: Finance, insurance, real estate	6,669	45.2	12.7	85.6	12.6	82.3	14.6
72	College and university teachers, business and commerce	6,654	38.3	17+	99.9	93.2	32.7	31.8
73	College and university teachers, sociology	6,631	33.4	17+	98.5	92.0	36.0	24.6
74	Telephone linemen and splicers	6,625	29.5	12.3	65.4	.....	85.1	1.3
75	Railroad switchmen	6,609	38.6	12.3	66.0	.....	64.2	1.9
76	Managers and administrators, nec.—salaried: All other industries	6,604	45.8	14.0	86.7	36.6	69.0	20.1
77	Office managers, nec	6,532	45.9	12.7	89.2	7.8	84.2	40.4
78	Social workers	6,475	37.1	16.4	93.6	66.2	64.2	62.9
Eighth decile								
79	Optometrists	6,455	50.9	16.8	99.9	76.3	74.5	4.1
80	Funeral directors	6,406	53.2	12.9	85.3	21.2	87.7	6.9
81	Officials of lodges, societies, and unions	6,405	46.1	13.6	84.5	33.4	71.3	16.5
82	Bulldozer operators	6,398	43.8	9.4	27.1	.....	55.1	1.4
83	Stationary engineers	6,373	40.3	12.0	50.1	3.5	78.1	1.6
84	Dentists	6,351	38.8	15.8	94.2	48.5	49.2	3.0
85	Excavating, grading, and road machine operators, except bulldozer	6,331	42.9	9.7	27.5	1.2	61.0	1.1
86	College and university teachers, history	6,304	35.3	17+	99.4	93.7	30.5	17.9
87	Plasterers	6,282	34.6	12.1	52.3	.....	39.9	1.6
88	Electrical and electronic engineering technicians	6,280	38.7	12.5	74.7	5.6	74.6	5.9
89	College and university teachers, biology	6,271	33.7	17+	98.4	90.2	37.9	21.8
90	Bank officers and financial managers	6,241	42.1	12.7	89.6	9.7	81.6	17.5
91	Sociologists	6,237	31.2	17+	99.9	83.0	58.4	33.2
92	Actuaries	6,235	29.1	15.8	99.9	47.8	61.8	28.3
93	Electric power linemen and cablemen	6,223	34.3	12.0	50.8	1.4	65.0	1.2
94	Job and die setters, metal	6,216	40.2	10.9	37.8	1.2	72.2	2.6
95	Electricians	6,215	37.9	12.1	57.1	.7	65.8	1.8
96	Librarians	6,203	44.0	16.6	95.9	63.7	43.4	81.5
97	Ticket, station, and express agents	6,194	28.4	12.8	91.4	9.3	70.1	36.7
98	Public relations men and publicity writers	6,133	39.8	14.7	92.0	37.9	63.9	26.6
99	Airline stewardesses	6,123	24.0	14.0	97.9	17.0	59.3	96.2
100	College and university teachers, mathematics	6,106	33.5	17+	98.6	86.8	24.5	18.2
101	Sheetmetal workers and tinsmiths	6,079	40.8	11.3	42.7	.....	62.5	2.3
102	Real estate appraisers	6,075	49.4	12.6	89.6	13.7	69.2	4.2
103	Kindergarten teachers, public	6,073	37.5	16.4	93.4	69.0	25.4	97.9
104	Inspectors, except construction, public administration	6,058	44.1	12.5	71.6	12.1	72.0	7.0
105	Longshoremen and stevedores	5,973	46.1	10.7	36.1	.....	47.5	1.7
106	Telephone installers and repairmen	5,949	35.8	12.5	77.9	1.7	76.1	3.4
107	Social scientists, nec	5,907	32.8	16.4	96.1	56.5	55.0	26.2
108	Stock and bond salesmen	5,899	41.9	12.9	89.8	24.9	71.9	8.7
109	Railroad brakemen	5,894	38.5	11.5	45.3	.....	63.0	1.3
110	Automobile body repairmen	5,856	39.4	10.8	37.7	1.7	56.0	1.0
111	College and university teachers, foreign language	5,824	32.9	17+	98.6	90.1	26.0	46.8
112	Cement and concrete finishers	5,815	39.9	8.9	23.2	.....	36.3	1.6
113	Heavy equipment mechanics, including diesel	5,808	41.1	11.5	44.5	.3	69.2	1.9
114	Geologists	5,797	35.2	16.5	97.2	75.0	42.0	3.6
115	Accountants	5,796	42.0	12.8	90.5	13.7	70.2	25.5
116	Industrial engineering technicians	5,739	34.1	12.7	76.6	11.7	71.6	12.8
117	Postal clerks	5,721	40.1	12.5	76.1	1.8	64.1	30.4
Seventh decile								
118	Dental hygienists	5,704	29.0	14.9	98.8	26.1	43.4	93.2
119	Archivists and curators	5,691	45.5	16.0	93.6	50.9	66.7	30.9
120	Health record technologists and technicians	5,687	43.6	14.0	93.6	32.1	69.3	93.8
121	Veterinarians	5,641	34.5	17+	90.9	66.7	62.6	5.7
122	Pattern and model makers, except paper	5,635	43.4	12.2	57.9	1.0	65.3	4.8
123	Draftsmen	5,630	32.5	12.8	91.6	11.8	67.4	8.1
124	Tool and die makers	5,616	43.3	12.1	57.2	.9	62.0	2.0
125	Chemical technicians	5,606	33.9	12.9	83.9	18.6	63.4	14.7
126	Registered nurses	5,603	39.9	13.3	90.6	15.7	57.1	97.4
127	Policemen and detectives, public	5,582	39.1	12.5	73.3	6.1	66.4	3.1
128	Pharmacists	5,565	39.1	16.4	93.1	63.2	67.0	12.0
129	Managers and administrators, nec.—self-employed: Wholesale trade	5,564	51.1	12.8	71.8	12.1	73.5	7.3

Table 2. Continued—Selected occupations of women, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
130	Office machine repairmen	5,563	34.7	12.5	77.6	9.5	70.7	2.1
131	Clinical laboratory technologists and technicians	5,560	29.7	14.6	94.2	36.5	64.4	71.8
132	Technicians, nec.	5,547	37.7	12.9	88.1	16.1	64.6	19.6
133	Data processing machine repairmen	5,543	34.5	12.5	74.7	6.1	67.9	2.4
134	Forklift and tow motor operatives	5,534	34.1	11.0	39.5	----	61.3	1.7
135	Editors and reporters	5,530	35.8	15.7	93.7	48.0	61.2	40.2
136	Buyers, wholesale and retail trade	5,518	45.7	12.7	79.0	13.7	75.4	29.6
137	Furnacemen, smelters, and pourers	5,489	42.7	10.6	36.7	.4	68.8	4.2
138	Designers	5,461	36.1	13.7	85.9	29.7	53.7	24.1
139	Miscellaneous mechanics and repairmen	5,455	41.0	12.1	55.1	2.3	66.4	4.6
140	Managers and administrators, nec.—salaried: Transportation	5,454	41.7	12.9	89.1	11.6	67.4	11.7
141	Authors	5,451	42.8	16.2	97.0	58.0	53.7	30.5
142	Heat treaters, annealers, and temperers	5,404	48.8	11.6	47.2	----	73.1	2.1
143	Therapists	5,384	31.9	16.3	92.4	58.3	48.7	63.9
144	Legal secretaries	5,379	32.0	12.7	94.4	4.9	71.9	98.5
145	Automobile mechanics	5,366	39.5	11.5	45.6	1.9	72.1	1.4
146	Grinding machine operatives	5,361	41.0	10.9	35.2	----	60.0	6.1
147	Foremen, nec	5,360	45.3	12.1	53.3	3.4	77.2	8.2
148	Sheriffs and bailiffs	5,328	43.3	12.5	72.3	1.6	73.5	6.1
149	Expediters and production controllers	5,297	38.2	12.5	77.9	4.7	72.5	22.4
150	Computer and peripheral equipment operators	5,287	29.4	12.6	88.3	3.1	72.7	29.4
151	Truckdrivers	5,261	38.7	11.0	39.8	1.1	61.6	1.5
152	Telegraph operators	5,258	38.3	12.5	80.1	3.4	62.6	28.8
153	Creditmen	5,248	43.3	12.6	85.4	4.6	78.9	27.8
154	Power station operators	5,248	36.0	12.5	80.0	3.7	76.0	3.9
155	Forgemen and hammermen	5,247	38.9	10.4	32.7	----	70.0	5.2
156	Stenographers	5,246	35.0	12.6	92.7	2.8	72.1	93.5
Sixth decile								
157	College and university teachers, art, drama, and music	5,242	39.8	17+	99.0	81.4	25.2	34.8
158	Engineering and science technicians, nec.	5,241	31.6	12.8	82.5	17.8	63.9	18.0
159	Managers and administrators, nec.—self-employed: Finance, insurance, real estate	5,235	55.7	12.9	77.3	14.6	76.8	10.6
160	Insurance adjustors, examiners and investigators	5,232	29.8	12.8	92.6	12.9	69.3	25.7
161	Carpet installers	5,219	42.0	11.2	40.4	2.5	48.4	1.6
162	Managers and administrators, nec.— self-employed: Transportation	5,219	50.3	12.7	77.8	10.2	76.4	10.5
163	Tabulating machine operators	5,203	32.3	12.4	78.8	1.3	69.6	52.4
164	Payroll and timekeeping clerks	5,202	40.7	12.5	83.7	2.1	74.6	69.1
165	Insurance agents, brokers, and underwriters	5,194	41.7	12.6	84.4	8.9	71.4	12.6
166	Atmospheric and space scientists	5,170	40.6	12.8	81.4	22.3	54.0	10.1
167	College and university teachers, engineering	5,130	41.9	16.6	96.1	62.6	36.1	6.0
168	Research workers, not specified	5,113	28.1	16.5	96.4	64.4	50.7	25.4
169	Tilesetters	5,069	37.1	9.5	19.5	----	51.2	1.4
170	Carpenters	5,057	39.6	11.1	41.6	2.9	45.5	1.3
171	College and university teachers, trade, industrial, technical	5,047	36.4	15.6	88.0	46.0	41.2	20.1
172	Lathe and milling machine operatives	5,043	42.7	11.2	41.2	.2	59.7	5.6
173	Advertising agents and salesmen	5,024	35.6	12.9	85.7	15.7	58.5	20.7
174	Actors	5,021	34.8	13.8	90.9	24.8	18.7	41.9
175	Radiologic technologists and technicians	5,017	26.5	12.7	93.6	2.8	64.5	68.4
176	Floor layers, except tilesetters	5,000	41.6	11.2	41.9	----	66.9	1.8
177	Brickmasons and stonemasons	4,995	38.7	11.3	42.8	2.0	50.5	1.3
178	Roofers and slaters	4,975	34.0	9.5	19.2	2.0	50.1	1.5
179	Drywall installers and lathers	4,973	35.0	10.4	28.3	4.5	57.1	1.0
180	Managers and administrators, nec.—self-employed: Business and repair services	4,942	50.0	12.7	78.6	13.6	76.2	10.8
181	Managers and administrators, nec.—salaried: Retail trade	4,937	46.2	12.4	68.6	6.9	73.9	13.3
182	Photoengravers and lithographers	4,932	37.0	12.3	67.0	.9	64.4	12.8
183	Statistical clerks	4,887	38.7	12.5	83.7	4.7	68.2	64.7
184	Secondary schoolteachers, private	4,879	35.6	16.8	98.9	88.5	21.5	52.9
185	Rollers and finishers, metal	4,863	45.1	10.7	31.7	----	61.3	6.9
186	Podiatrists	4,859	54.6	15.7	92.9	47.4	69.0	9.5
187	Radio and television repairmen	4,820	41.7	12.1	56.9	.7	63.5	4.0
188	Secretaries	4,803	33.8	12.7	91.8	4.9	66.3	97.7
189	Sales managers, department heads, retail trade	4,798	45.2	12.4	67.6	6.5	75.0	24.4
190	Warehousemen, nec.	4,793	39.1	11.9	48.9	.8	63.7	4.0
191	Adult education teachers	4,761	37.5	16.1	87.8	51.7	37.1	46.7
192	Machinists	4,733	39.1	11.5	44.8	.7	62.4	3.2
193	Mail carriers, post office	4,717	36.7	12.4	74.8	1.9	55.2	7.9
194	Calculating machine operators	4,713	41.8	12.4	78.5	1.2	64.9	90.9
195	Medical secretaries	4,701	34.8	12.8	92.6	4.7	68.9	98.9

Table 2. Continued—Selected occupations of women, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
Fifth decile								
196	Agricultural and biological technicians, except health	4,699	37.0	12.6	74.3	13.4	60.5	32.8
197	Asbestos and insulation workers	4,669	33.0	10.9	37.8	----	45.6	2.2
198	Estimators and investigators, nec	4,662	37.1	12.6	85.5	7.7	67.1	38.4
199	Weavers	4,622	42.6	9.9	23.0	----	69.3	53.6
200	Drill press operatives	4,602	43.0	10.6	33.4	.3	53.1	22.7
201	Keypunch operators	4,597	27.7	12.5	86.5	1.2	61.6	89.5
202	Meter readers, utilities	4,572	39.2	12.2	60.8	----	63.6	2.9
203	College and university teachers, subject not specified	4,561	33.5	17+	97.8	71.4	30.6	31.1
204	Welders and flamecutters	4,554	37.4	11.2	41.0	.2	55.5	6.0
205	Household appliance and accessory installers and mechanics	4,507	38.6	12.0	51.8	1.4	65.5	2.2
206	Oilers and greasers, except auto	4,503	42.6	10.2	29.8	----	58.1	3.7
207	Writers, artists, and entertainers, nec	4,490	36.8	13.5	84.3	30.0	46.9	26.5
208	Garbage collectors	4,480	43.0	9.6	27.3	1.9	67.0	1.4
209	Bookkeepers	4,477	41.7	12.5	83.9	3.4	70.3	82.1
210	Health technologists and technicians, nec	4,473	30.5	12.8	84.1	14.1	63.9	56.1
211	Assessors, controllers, treasurers, local public administration	4,472	49.4	12.5	82.2	4.4	74.2	38.5
212	Dieticians	4,462	43.8	12.9	70.6	38.6	61.0	92.2
213	Elementary schoolteachers, private	4,430	37.1	16.4	97.5	70.6	21.4	85.5
214	Sailors and deckhands	4,402	33.2	11.5	46.2	9.5	42.5	1.6
215	Engravers, except photographers	4,396	40.9	11.8	48.0	.8	53.8	29.0
216	Drillers, earth	4,385	41.6	10.7	33.3	----	60.5	6.5
217	Punch and stamping press operatives	4,385	41.1	10.7	33.3	.3	53.5	31.6
218	Checkers, examiners, and inspectors, manufacturing	4,359	42.9	11.3	42.2	.4	60.5	49.0
219	Billing clerks	4,340	35.6	12.5	82.3	2.1	64.9	81.8
220	Precision machining operatives, nec	4,337	39.6	10.6	33.9	----	51.5	11.3
221	Pressmen and plateprinters, printing	4,320	39.0	12.1	54.4	.7	60.1	8.3
222	Managers and administrators, nec.—self employed: Nondurable goods manufacturing	4,319	51.0	12.5	73.2	13.5	69.5	14.1
223	Bookkeeping and billing machine operators	4,312	31.1	12.5	84.7	1.4	63.8	89.6
224	Solderers	4,273	39.4	11.3	41.7	.7	53.0	84.0
225	Metal platers	4,267	38.4	11.8	48.2	.9	61.9	9.1
226	Real estate agents and brokers	4,261	48.0	12.7	83.3	11.2	52.5	32.5
227	Telephone operators	4,241	33.1	12.4	75.7	.8	59.0	94.5
228	Carding, lapping, and combing operatives	4,236	44.3	9.2	20.2	----	69.3	26.1
229	Stock clerks and storekeepers	4,232	40.3	12.3	66.4	2.0	64.2	22.9
230	Winding operatives, nec	4,226	40.0	11.4	43.5	.3	54.4	52.4
231	Practical nurses	4,205	40.6	12.4	70.2	.9	58.5	96.3
232	Opticians, lens grinders and polishers	4,204	37.6	12.2	60.8	1.2	66.5	22.9
233	Construction laborers, except carpenters helpers	4,181	39.7	9.8	27.8	.9	43.2	1.7
234	Bank tellers	4,179	32.6	12.6	89.1	2.2	66.2	86.2
Fourth decile								
235	Assemblers	4,146	38.8	11.6	45.1	.4	52.1	50.0
236	Duplicating machine operators	4,125	35.0	12.4	74.0	2.2	58.0	56.8
237	Clerical workers, miscellaneous and not specified	4,118	37.7	12.5	79.6	3.8	61.2	72.0
238	Meat wrappers, retail trade	4,117	40.5	11.5	43.2	.1	60.5	93.4
239	Proofreaders	4,110	41.7	12.6	81.8	11.0	56.6	73.9
240	Molders, metal	4,106	38.5	11.1	39.0	----	58.7	12.2
241	Dental laboratory technicians	4,105	32.3	12.5	76.0	3.1	60.8	23.2
242	Mine operatives, nec	4,062	39.7	10.9	40.2	1.2	58.9	2.9
243	Bookbinders	4,055	43.2	11.2	41.2	.4	56.1	56.5
244	Collectors, bill and account	4,043	39.4	12.5	79.5	3.4	62.6	36.4
245	Typists	4,042	29.4	12.5	86.0	2.4	55.7	94.2
246	Mixing operatives	4,036	40.5	11.2	41.9	1.2	55.8	4.2
247	Spinners, twisters, and winders	4,014	41.6	9.5	21.5	.1	62.3	64.6
248	Chiropractors	3,985	60.3	16.1	95.1	53.9	63.2	8.0
249	Shipping and receiving clerks	3,977	40.3	12.2	58.5	1.2	63.8	14.5
250	Compositors and typesetters	3,972	36.9	12.3	68.1	2.1	59.1	14.3
251	Craftsmen and kindred workers, nec	3,949	37.8	11.4	43.0	1.7	58.5	9.2
252	Painters and sculptors	3,946	35.8	13.9	90.8	27.3	48.3	36.8
253	Managers and administrators, nec.—self-employed: Personal services	3,938	52.4	12.2	58.0	4.4	81.4	34.8
254	Radio operators	3,921	36.6	12.4	76.7	1.8	69.2	26.6
255	Glaziers	3,917	29.9	12.1	55.5	2.3	60.1	3.8
256	Agricultural scientists	3,906	42.5	12.8	83.1	23.9	50.6	8.7
257	Inspectors, nec	3,906	42.9	11.5	45.3	1.9	56.0	7.8
258	Painters, construction and maintenance	3,906	41.6	11.8	48.2	4.7	48.0	3.9
259	Managers and administrators, nec.—self employed: All other industries	3,900	48.9	12.7	77.4	15.9	62.8	17.9
260	Office machine operators, nec	3,893	36.9	12.4	70.7	1.5	57.9	67.8
261	Dispatchers and starters, vehicle	3,885	38.6	12.3	68.0	1.4	61.3	18.7
262	Clerical assistants, social welfare	3,848	39.1	12.6	77.0	8.0	65.5	74.1
263	Weighers	3,823	41.3	11.4	43.5	1.3	49.2	30.5

Table 2. Continued—Selected occupations of women, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
264	Restaurant, cafeteria, and bar managers	3,819	48.2	12.0	51.6	2.9	56.7	34.0
265	Therapy assistants	3,800	37.3	12.6	73.4	9.2	54.3	69.7
266	Managers and administrators, nec.—salaried: Personal services	3,755	50.2	12.1	54.4	3.8	69.7	34.1
267	Painters, manufactured articles	3,750	36.8	11.0	39.0	1.2	51.3	15.4
268	Filers, polishers, sanders, and buffers	3,747	38.7	10.4	32.5	.2	51.8	20.7
269	Miscellaneous and not specified operatives	3,732	40.1	10.9	37.2	.5	52.0	29.7
270	Photographic process workers	3,728	36.5	12.3	63.7	2.4	52.6	46.8
271	Sales representatives, manufacturing	3,721	43.0	12.4	68.2	8.0	57.5	8.8
272	Freight and material handlers	3,708	37.4	11.0	38.7	.4	51.4	7.4
273	Cabinetmakers	3,707	37.5	10.5	35.7	.6	45.7	5.2
Third decile								
274	Guards and watchmen	3,687	43.9	12.1	55.4	1.8	55.8	5.0
275	Sawyers	3,686	38.9	10.4	31.4	----	54.4	8.3
276	Sales representatives, wholesale trade	3,684	42.3	12.4	66.8	5.8	57.3	6.6
277	College and university teachers, theology	3,682	40.1	17.0	99.9	79.8	29.4	17.0
278	Photographers	3,655	36.5	12.6	78.1	11.9	54.3	14.3
279	Textile operatives, nec	3,652	38.2	10.3	29.9	.1	57.1	48.8
280	Riveters and fasteners	3,651	39.2	10.9	37.5	.2	49.5	45.8
281	Knitters, loopers, and toppers	3,629	39.7	10.1	27.0	----	51.9	62.4
282	Dyers	3,622	39.5	10.9	34.5	----	54.0	8.4
283	Managers and administrators, nec.—self-employed: Retail trade	3,603	52.3	12.2	57.7	5.0	77.9	19.9
284	Farm foremen	3,593	46.6	12.0	49.7	6.6	57.8	6.6
285	Policemen and detectives, private	3,588	41.7	12.3	63.9	1.3	49.3	17.1
286	Shoe repairmen	3,574	43.5	10.1	30.7	.7	58.3	20.1
287	Jewelers and watchmakers	3,540	38.6	11.9	49.1	3.1	52.3	11.7
288	Packers and wrappers, except meat and produce	3,516	40.5	10.7	34.5	.4	47.7	62.5
289	Stationary firemen	3,504	39.1	10.5	35.9	.4	57.7	9.0
290	Managers and administrators, nec.—self-employed: Durable goods manufacturing	3,498	51.9	12.4	65.3	8.8	68.3	5.6
291	Shoemaking machine operatives	3,497	41.0	10.1	29.8	.1	57.0	62.0
292	Dancers	3,469	23.7	12.3	62.3	4.7	25.5	81.6
293	Furriers	3,465	49.6	10.3	33.2	----	44.6	17.5
294	Health aides, except nursing	3,460	35.3	12.3	62.6	3.4	59.4	84.0
295	Cutting operatives, nec	3,454	41.6	10.2	30.4	.4	50.4	27.1
296	Upholsterers	3,449	43.0	11.0	38.7	.2	55.7	16.7
297	File clerks	3,430	28.0	12.4	73.0	2.5	48.9	82.1
298	Tailors	3,422	48.4	10.4	34.1	.9	58.3	32.1
299	Dental assistants	3,405	26.5	12.5	81.7	1.7	54.7	97.9
300	Inspectors, scalers and graders, log and lumber	3,405	40.7	10.7	32.1	----	49.8	11.7
301	Furniture and wood finishers	3,401	41.2	10.5	36.2	.7	54.3	18.1
302	Barbers	3,382	41.2	12.1	55.7	1.3	56.5	4.6
303	Sewers and stitchers	3,379	42.5	10.1	29.9	.4	48.3	93.8
304	Receptionists	3,376	31.9	12.6	82.3	3.5	52.1	94.7
305	Stone cutters and stone carvers	3,372	42.6	10.2	31.6	----	72.7	7.8
306	Mail handlers, except post office	3,311	34.2	12.4	68.5	2.0	48.7	43.6
307	Meatcutters and butchers, except manufacturing	3,220	41.9	10.8	36.5	.6	54.9	5.7
308	Foresters and conservationists	3,217	38.4	12.1	54.9	10.5	55.5	3.9
309	Welfare service aides	3,192	41.9	12.1	55.1	7.2	50.4	76.0
310	Meatcutters and butchers, manufacturing	3,178	39.3	9.9	26.2	.4	49.5	27.7
311	Housekeepers, except private household	3,142	49.6	12.1	53.3	4.6	52.6	72.6
312	Milliners	3,108	55.7	10.7	37.5	1.0	48.7	90.8
Second decile								
313	Graders and sorters, manufacturing	3,103	43.1	10.2	30.7	.2	40.0	68.1
314	Salesmen, retail trade	3,092	44.8	12.3	64.3	3.9	54.9	13.0
315	Elevator operators	3,071	46.4	10.7	34.2	.7	61.6	27.1
316	Hairdressers and cosmetologists	3,041	33.3	12.3	66.2	.4	52.9	90.1
317	Clergymen	3,020	48.0	13.3	76.8	33.6	73.6	2.9
318	Bartenders	3,008	41.5	11.6	45.2	.8	55.7	21.4
319	Clothing ironers and pressers	2,980	43.6	9.7	24.6	.2	56.9	74.5
320	Nursing aides, orderlies and attendants	2,969	38.1	11.8	47.7	.7	53.7	84.7
321	Radio and television announcers	2,963	37.9	13.4	91.4	27.4	52.9	6.4
322	Managers and superintendents, building	2,942	52.6	12.3	60.2	6.8	70.5	40.8
323	Miscellaneous and not specified laborers	2,942	39.5	10.4	34.1	.9	44.5	10.8
324	Counter clerks, except food	2,938	38.2	12.3	62.5	1.8	51.9	67.5
325	Decorators and window dressers	2,923	42.7	12.5	70.1	7.1	52.6	58.5
326	Boarding and lodging housekeepers	2,852	58.9	12.1	42.5	3.9	81.1	73.9
327	Deliverymen and routemen	2,844	37.0	12.0	50.0	1.8	48.8	3.2
328	Vehicle washers and equipment cleaners	2,801	36.4	10.1	26.0	.4	44.3	10.8
329	Bakers	2,798	48.5	11.1	40.5	.5	44.9	29.5

Table 2. Continued—Selected occupations of women, ranked by 1969 median earnings

Rank	Occupation	Median annual earnings	Median age	Median school years completed	Percent completing at least 4 years of high school	Percent completing at least 4 years of college	Percent employed the full year	Percent of women in the occupation
330	Laundry and drycleaning operatives, nec	2,789	45.5	10.0	28.2	0.5	57.7	63.3
331	Stock handlers	2,755	37.7	11.5	44.3	.4	50.9	17.6
332	Carpenters helpers	2,746	29.6	10.7	37.6		39.1	2.3
333	Farm managers	2,744	48.5	12.2	56.7	7.1	72.6	4.1
334	Taxicab drivers and chauffeurs	2,702	42.0	11.7	46.8	1.3	40.9	6.0
335	Farm service laborers, self-employed	2,679	44.9	11.6	45.2	10.3	40.3	15.1
336	Dressmakers and seamstresses, except factory	2,664	53.6	10.8	40.0	1.8	50.0	95.6
337	Bottling and canning operatives	2,626	43.5	10.0	28.5	.2	30.7	40.0
338	Lay midwives	2,626	43.4	12.3	63.4	2.2	53.0	76.5
339	Lumbermen, raftsmen, and woodchoppers	2,605	40.4	10.0	28.4	3.0	48.0	2.3
340	Attendants, personal service, nec	2,576	42.7	12.1	54.1	4.7	40.2	62.5
341	Surveyors	2,510	36.8	12.6	76.1	9.1	40.3	3.4
342	Recreation workers	2,476	29.0	13.7	83.0	26.1	41.7	41.7
343	College and university teachers, atmospheric, earth, marine, and space	2,471	24.9	17+	99.9	87.7	30.4	11.4
344	Parking attendants	2,458	37.8	11.3	41.3	4.0	28.3	3.2
345	Cleaners and charwomen	2,445	48.5	9.4	22.8	.4	56.3	56.9
346	Cashiers	2,431	32.9	12.1	56.7	1.0	45.0	84.1
347	Religious workers, nec	2,405	46.8	14.7	88.7	39.9	59.6	55.7
348	Janitors and sextons	2,404	48.9	9.8	27.9	.8	56.6	12.7
349	Sign painters and letterers	2,315	28.8	12.2	57.7	4.0	51.5	9.2
350	Salesmen of services and construction	2,256	37.0	12.3	63.7	5.4	42.7	35.1
351	Garage workers and gas station attendants	2,241	29.4	11.1	37.1	1.0	46.9	2.8
Bottom decile								
352	Sales clerks, retail trade	2,208	43.2	12.2	57.7	2.0	46.7	65.2
353	Farmers, owners and tenants	2,173	51.0	11.4	46.2	4.2	78.6	4.8
354	Cooks, except private household	2,157	48.1	10.5	32.8	.4	40.4	62.5
355	Messengers	2,110	23.4	12.3	65.1	2.1	39.3	20.9
356	Animal caretakers, except farm	2,060	31.2	12.1	55.5	3.1	44.5	32.7
357	Library attendants and assistants	2,058	29.8	13.1	85.2	18.5	41.3	78.8
358	Chambermaids and maids, except private household	2,048	44.9	9.7	24.8	.5	46.7	95.2
359	Produce graders and packers, except factory and farm	1,982	44.6	9.6	25.7	.8	22.3	75.5
360	Teachers, except college and university, nec	1,936	41.3	14.5	87.7	37.5	30.2	70.4
361	Kindergarden teachers, private	1,898	38.1	14.4	89.6	33.9	19.1	98.4
362	Gardeners and groundskeepers, except farm	1,875	43.5	10.4	35.5	1.9	38.7	3.0
363	Busdrivers	1,862	39.2	12.1	57.0	.6	12.1	28.4
364	Fishermen and oystermen	1,842	38.7	10.0	28.9	1.1	35.5	4.1
365	Food service workers, nec., except private household	1,839	44.0	10.9	37.1	.5	33.6	75.5
366	Teacher aides, except school monitors	1,672	37.3	12.6	80.7	5.0	12.9	89.6
367	Motion picture projectionists	1,669	23.6	12.9	87.5	7.3	37.7	3.8
368	Waitresses	1,662	31.6	11.5	43.2	.9	34.8	89.2
369	Athletes and kindred workers	1,650	27.9	12.9	77.9	17.5	28.4	28.3
370	Cooks, private household	1,599	55.2	8.7	18.6	.5	58.1	94.2
371	Newsboys	1,529	38.6	12.0	51.1	1.2	55.4	16.1
372	Crossing guards and bridgetenders	1,494	44.1	12.0	50.0	.7	9.4	59.3
373	Enumerators and interviewers	1,440	39.1	12.7	87.0	11.7	22.8	79.8
374	Musicians and composers	1,395	37.5	13.6	84.5	27.4	38.6	34.0
375	Food counter and fountain workers	1,382	35.1	11.5	43.1	.7	25.6	76.0
376	Child care workers, except private household	1,375	40.7	12.0	51.2	3.7	37.5	93.1
377	Paperhangers	1,330	53.1	11.6	46.3	3.5	21.3	10.1
378	Housekeepers, private household	1,318	53.5	8.9	22.6	.6	51.3	96.7
379	Demonstrators	1,266	35.1	12.4	71.7	4.4	26.0	90.8
380	Dishwashers	1,235	40.2	10.0	28.6	.2	32.0	37.8
381	Maids and servants, private household	1,093	51.2	8.8	18.5	.6	45.3	96.6
382	Farm laborers, wage workers	992	37.5	8.9	21.1	.8	24.2	14.3
383	Attendants, recreation and amusement	979	23.4	12.2	55.2	3.1	26.9	24.5
384	Hucksters and peddlers	956	39.0	12.3	67.0	3.2	32.0	78.9
385	Busboys	925	19.8	10.9	31.4	.6	22.2	14.1
386	Health trainees	871	21.8	13.4	90.4	4.1	17.0	93.9
387	Ushers, recreation and amusement	781	19.0	11.9	48.8	4.3	15.9	31.2
388	Farm laborers, unpaid family workers	768	44.5	12.0	50.5	1.3	77.4	41.3
389	Laundresses, private household	756	56.0	8.7	18.8	1.0	50.4	95.8
390	Child care workers, private household	671	32.1	10.7	33.7	1.4	21.6	98.0
391	School monitors	647	40.0	12.4	70.7	3.6	7.5	91.0

with median age of 40 or more are found in the highest earnings decile.

Comparison by sex

Earnings of men were generally much higher than earnings of women, for specific occupations or for earnings deciles. Men earned more than women in every occupation, except public kindergarten teachers. As tables 1 and 2 show, median earnings for the top-ranking occupation for women were about half the earnings for the top-ranking occupation for men.[5]

Furthermore, only one occupation in the top decile for women, sales engineers, falls within the top earnings range for men. Of the remaining occupations in the top decile for women, only two fall in the earnings range of the second decile for men, five fall in the range of the fourth, fifth, and sixth deciles.

Among occupations with the lowest earnings, the range of the bottom decile for men, $687 to $4,354, would accommodate nearly all the occupations in the bottom half of the rankings for women. Therefore, if the tables were combined into one ranking, most occupations for women would be concentrated at the lower end of the scale.

Although earnings of women are much lower, the occupations are generally ranked in similar order for men and women. The rank correlation coefficient for the 385 occupations which appear in both tables 1 and 2 is .82. There are 49 occupations in greatly different rank (by 100 places or more). The occupations that rank for men much higher than for women were largely high-paid professional, sales, and managerial occupations, including podiatrists, real estate agents and brokers, and self-employed managers in finance, insurance, and real estate. Occupations where the rankings for women were much higher were craft and operative occupations with very few women, such as millwrights, and professional and clerical occupations dominated by women, such as registered nurses and medical secretaries.

Effect of age

For men, occupations with the highest earnings tended to have a median age of 40 years or more.[6] As indicated in table 3, the proportion of occupations with median age of 40 years or more generally tends to decline as earnings decline.

For women, the proportion of occupations with median age of 40 years or more did not vary greatly by earnings level, except for the second and third earnings deciles. (See table 4.) These two low deciles contained a relatively large proportion of occupations with median age of 40 years or more.

Effects of education

As might be expected, occupations with large proportions of workers having less than a high school education are generally found in the low earnings levels. The distributions of occupations with fewer than 60 percent[7] of the workers completing high school are heavily skewed toward the low earnings deciles, with 50.3 percent of those occupations falling in the bottom three deciles for men, and 48.9 percent for women.

For men, 39 occupations with fewer than 60 percent high school graduates, 21.8 percent of all occupations, appear in the top two deciles. Only three—self-employed managers and administrators in communications, utilities, and sanitary services, railroad engineers, and railroad conductors—appear in the top two earnings deciles. These occupations are generally managerial or highly skilled and highly unionized craft or machine operative jobs, primarily in metalworking trades. Many workers in these occupations receive apprenticeship or informal training not counted as school years completed.

For women, 45 occupations with fewer than 60 percent high school graduates, or 27.0 percent of the total, are found in the top five earnings deciles, somewhat higher than the percentage for males. All are craft and operative occupations with fewer than 10 percent female workers—most have less than 2 percent women.

Table 3. Percent distribution of occupations with selected characteristics, by earnings decile for men

Earnings decile for men	Median age of 40 years or more	Less than 60 percent workers completed high school	60 percent or more completed college	65 percent or more employed the full year	40 percent or more workers are female
Top	11.9	----------	41.4	12.3	1.8
Ninth	12.9	1.7	24.3	11.6	2.7
Eighth	11.9	3.9	18.6	11.3	5.4
Seventh	10.4	6.1	5.7	13.0	2.7
Sixth	13.4	10.1	2.9	13.3	7.1
Fifth	9.9	12.8	2.9	11.9	11.6
Fourth	7.4	15.1	1.4	10.2	9.8
Third	8.4	14.0	1.4	9.6	14.3
Second	8.9	15.6	1.4	5.8	21.4
Bottom	4.9	20.7	----------	1.0	23.2
Total	100.0 n=202	100.0 n=179	100.0 n=70	100.0 n=293	100.0 n=112

Table 4. Percent distribution of occupations with selected characteristics, by earnings decile for women

Earnings decile for women	Median age of 40 years or more	Less than 60 percent workers completed high school	60 percent or more completed college	65 percent or more employed the full year	40 percent or more workers are female
Top	10.4	2.4	36.0	20.3	2.6
Ninth	10.4	3.0	26.0	18.8	7.8
Eighth	9.3	7.8	18.0	13.3	3.4
Seventh	8.2	6.6	4.0	18.8	6.9
Sixth	8.7	7.2	8.0	10.9	8.6
Fifth	9.3	11.4	4.0	7.8	12.1
Fourth	9.3	12.7	----	3.1	10.3
Third	12.6	16.9	2.0	2.3	12.9
Second	12.0	15.7	2.0	3.1	14.7
Bottom	9.8	16.3	----	1.6	20.7
Total	100.0 n=183	100.0 n=166	100.0 n=50	100.0 n=128	100.0 n=116

Occupations with large proportions of college graduates are concentrated in the highest earnings level. The bulk of the occupations with 60 percent [8] workers or more who completed 4 years of college or more are in the top earning levels, with 84.3 percent for males and 80.0 percent for females in the top three earnings deciles. Most of these are professional, managerial, and highly skilled technical and craft occupations.

Significantly, for men the bottom half of the earnings ladder contains only five occupations with more than 60 percent college graduates: private secondary schoolteachers, librarians, private elementary schoolteachers, clergymen, and public kindergarten teachers. These occupations are traditionally low paying, and, except for clergymen, traditionally female occupations. It should be noted that, except for clergymen, these occupations fare much better in the rankings for women, although the absolute earnings levels for women are generally lower than for men.

The bottom half of the rankings for women contains only four occupations with more than 60 percent college graduates: college teachers of unspecified subjects, private elementary schoolteachers, college teachers of theology, and college teachers of atmospheric, earth, marine, and space sciences. The reason for the relatively low earnings in these occupations is not clear. A partial explanation is that few women in these occupations worked a full year. The proportion working 50–52 weeks a year varied from 30.4 percent for college teachers of unspecified subjects to 21.4 percent for private elementary teachers, compared with 52.4 percent and 40.7 percent for men, respectively.[9] Also, the median age of less than 25 years for atmospheric, earth, marine, and space science teachers suggests that a large number of graduate assistants are likely to be included, pulling the earnings level down significantly.

Effect of full-year employment

The percent of workers in an occupation employed the full year (50–52 weeks) in 1969 is related to the occupation's earnings ranking. Because this percentage reflects both the workers' desire for and the difficulty in finding continuous employment, it is likely to be lowest in occupations with traditionally high unemployment rates and in those with large proportions of women, youth, and older workers. The measure of full-year employment does not, however, account for hours of work and therefore does not distinguish between full- and part-time workers.

Occupations with large proportions of women or youth are likely to have low percentages of full-year workers, and therefore relatively low earnings. These workers tend to be voluntary part-year workers who combine jobs with school or family responsibilities. A low percentage of full-year workers may also reflect high unemployment rates for certain occupations or for certain groups of workers. Unemployment and voluntary part-year work are related—a large proportion of the unemployment among women and youth stems from their recent entrance and reentrance into the labor market.[10]

Occupations with 65 percent or more of the workers employed the full year [11] are more likely to be found at the higher earnings levels. For men, the bottom two earnings deciles include only 6.8 percent of the occupations with 65 percent or more workers employed the full year. Occupations in these deciles are primarily low-skill service and laborer occupations which characteristically have

high unemployment levels and little job security. The low earnings of workers represent the combined effects of low wage levels and prevalence of part-year employment.

The pattern for women is much the same, although the distribution is more strongly skewed toward the higher earnings deciles. The top two deciles contain 39.1 percent of the occupations having 65 percent or more full-year workers, compared with 23.9 percent for men. Occupations in which most women work year round are more likely to be found in the high earnings deciles, than those in which most men work year round. However, the percentage of women working the full year is generally lower than the percent for men in the same occupation.

Proportion of women

Another characteristic which is associated with an occupation's earnings level is the proportion of workers who are women. The relationship between earnings and sex reflects a number of other relationships mentioned earlier, such as the greater tendency of women to work part year and part time, and higher unemployment rates and lower educational attainment of women. Women are also more likely than men to leave the labor force in their late 20's and early 30's, a crucial period in the career development of highly paid professional and managerial workers.[12] The lower earnings of women are probably also the result of discriminatory hiring, promotion, and salary policies.

Women are concentrated in relatively few occupations: the five largest occupations contain about one-fourth of all female workers, compared with about one-seventh of male workers in the five largest occupations.[13] Concentration may tend to oversupply the markets in occupations dominated by women and thus depress earnings levels. It is likely, therefore, that women in occupations dominated by men, while earning less than men, will earn more than women in other occupations. Conversely, men in occupations dominated by women, while earning more than women, are likely to earn less than men in other occupations.

The evidence in tables 3 and 4 supports these conclusions firmly. For women, only about three-tenths of all occupations with 40 percent or more [14] women workers are found in the top half of the earnings rankings. Only three are in the top decile: vocational and educational counselors, college teachers of health specialities (including nursing), and college teachers of home economics. The bulk of the other occupations in the top decile are dominated by men, most with less than 10 percent female workers. On the other hand, the bottom earnings decile for women contains more than 20 percent of the occupations with 40 percent or more female workers.

For male workers, the opposite pattern appears and is somewhat stronger than the pattern for women. The chances of an occupation falling in a high earnings decile for men are greatly decreased as the proportion of female workers increases. Only about one-fifth of the occupations with 40 percent or more female workers are found in the top half of the earnings rankings for males. Of these, only two are in the top decile: college teachers of health specialties and dental hygienists.[15] The bottom two deciles, however, each contain more than one-fifth of these occupations. □

FOOTNOTES

[1] The high earnings of many of these occupations is partially the result of the large sampling error in the median earnings estimates for small occupations. (See footnote 3.) Seven of the top 10 occupations for women have less than 2,000 workers. Physicians is the highest ranking occupation for women which includes a relatively large number of workers, about 25,000.

[2] U.S. Bureau of the Census, Census of Population, 1970, Subject Reports, Final Report PC(2)–7A, *Occupational Characteristics*, 1973. The tables list 423 occupations for men and 391 for women, including all the detailed occupations for which data are available, except apprentices and allocated categories. In addition, major industry and class of worker detail (private, public, self-employed, and salaried) are included for several occupations. The abbreviation "n.e.c.," as used in tables 1 and 2, means "not elsewhere classified."

A similar table for men using 1960 census data appeared in Max A. Rutzick, "A ranking of U.S. occupations by earnings," *Monthly Labor Review*, March 1965, pp. 249–55. Direct comparison between that table and the tables appearing here is not possible because of the different numbers of occupations listed, and because of changes in the occupational classification system for the 1970 census.

[3] A method for estimating the sampling variability of median earnings and other estimates is presented in *Occupational Characteristics*, appendix D. This method indicates, for example, that the upper and lower limits of the con-

fidence interval at the 95-percent level of confidence are $6,889 and $6,901 for the largest occupation for men, Miscellaneous and Not Specified Operatives, with median earnings of $6,895 for 1,857,928 persons with earnings. Limits for the smallest occupation, Health Practitioners, not elsewhere classified, were $4,683 and $18,773 about a median of $7,957 for 412 persons with earnings.

[4] Data are from *Occupational Characteristics*, table 15, and are subject to the same limitations as other census data. In addition, weekly hours information pertains to the census reference week, while weeks worked is for 1969.

[5] Because medians of more than $25,000 are not published, comparison with the earnings of physicians is difficult. However, the actual median is probably much higher than the reported $25,000.

[6] Median age of 40 years or more was chosen because it approximates the actual median reported by the census for the total experienced civilian labor force: 40.1 years for men and 39.3 years for women.

[7] The 60 percent approximates the 60.3 percent of the experienced civilian labor force who were high school graduates in 1969. Occupations with fewer than 60 percent high school graduates are therefore below average in terms of education of the workers.

[8] The 60 percent approximates the 56.0 percent of all professional workers who have completed at least 4 years of college.

[9] Although the proportion of college teachers working 50–52 weeks a year is expected to be small, the proportion for these low-paying specialties is less than the proportion in the highest paying specialties, where generally 35 to 45 percent of the women worked a full year.

[10] For elaboration on this problem, see Curtis L. Gilroy, "Job losers, leavers, and entrants: traits and trends," *Monthly Labor Review*, August 1973, pp. 3–15.

[11] The 65 percent approximates the 65.2 percent of the total experienced civilian labor force who worked 50–52 weeks in 1969. The percentages of 72.6 for men and 52.6 for women indicate a greater tendency for women to be part-year workers.

[12] For information on female unemployment and labor force participation rates, see 1969 *Handbook on Women Workers* (U.S. Department of Labor, Women's Bureau, Bulletin 294, 1969), and Elizabeth K. Waldman, "Changes in the labor force activity of women," *Monthly Labor Review*, June 1970, pp. 10–18.

[13] The five largest occupations for women include 25.4 percent of the female labor force: secretaries, sales clerks in retail trade, bookkeepers, public elementary schoolteachers, and waitresses. The five largest occupations for men include 14.4 percent of the male labor force: miscellaneous and not specified operatives, foremen, truckdrivers, farmers, and janitors and sextons.

[14] The 40 percent approximates the 38.1 percent of the total experienced civilian labor force in 1969 who were women.

[15] The extraordinarily high earnings for male dental hygienists, $14,291, compared with $5,704 for females, is probably the result of classification difficulties compounded by the small number of men (1,201) in the occupation. The classification includes hygienists in institutions such as mental hospitals and prisons. Some of these individuals may be dentists, causing a severe bias in the earnings data for male hygienists.

Measuring employee compensation in U.S. industry

BLS studies trace growth of wage supplements which now total more than 20 cents of each compensation dollar

ALVIN BAUMAN

SCARCELY FOUR DECADES AGO, compensation for American workers consisted almost entirely of a wage for time worked or units produced. At that time, a worker's average straight-time hourly earnings were indicative of his total compensation.

For some few workers, there was a paid vacation or paid holidays, or a company pension plan. Even for these privileged few, however, such programs were genuine "fringe" benefits, serving as an ornament to the wage but having little economic significance either to the individual worker or his employer, and having little effect on the magnitude of the return to labor.

During the 1930's, employer payments to or on behalf of their employees, in addition to wages for time worked or units produced, began to balloon in importance and they continue to expand today. No longer are average hourly earnings a satisfactory measure of a worker's compensation for his labor; no more are payments beyond wages for time worked mere "fringe" benefits. Today's worker receives a compensation package which includes not only his pay envelope, but also smaller bundles which have great importance to him and which constitute items of significant cost to his employer.

Today, American employers pay about four-fifths of total compensation as straight-time wages and salaries for actual time worked or units produced. The remaining one-fifth is spent primarily for (1) vacations, holidays, and other types of paid leave; (2) protection against economic hardship resulting from unemployment, retirement, disability, illness, or death of workers or their dependents; and (3) premium pay for overtime, weekend, holiday, or late shift work. Details of the level and structure of these expenditures in 1968, the latest year for which data are available, are shown in table 1.[1]

Since 1959, the Bureau of Labor Statistics has maintained a continuing program of studies to measure the components of the compensation package that American employers provide their workers. The importance of the various elements of compensation relative to the total package is shown in chart 1. The magnitude of this expenditure attains even greater significance when viewed in historic perspective.

Evolution

The American compensation structure as it exists today is almost entirely a development of the middle third of this century. Prior to 1935, the burden of providing an economic shield against the hazards of life and of work—sickness, accident, unemployment, old age—lay almost fully on the shoulders of the worker. Society and the individual accepted this as a fact of life. What the worker was able to skim from his wages to lay away for hard times was frequently insufficient to carry himself and his dependents through any lengthy period of loss of earning capacity. For some workers, there were labor union insurance plans that provided aid. Others had to turn to family, public welfare, or benevolent associations for survival.

A number of programs, publicly or privately sponsored and financed, provided workers with a modicum of protection or assistance in time of need. Workmen's compensation laws were widespread by the end of the 1920's, but they offered little in the way of protection. Private pension plans have been in existence since the last fourth of the 19th century; their coverage and benefits, however, were narrowly limited. Furthermore, many private benefits were not part of formal plans, but were doled out to loyal and faithful employees as an act of charity at the employer's

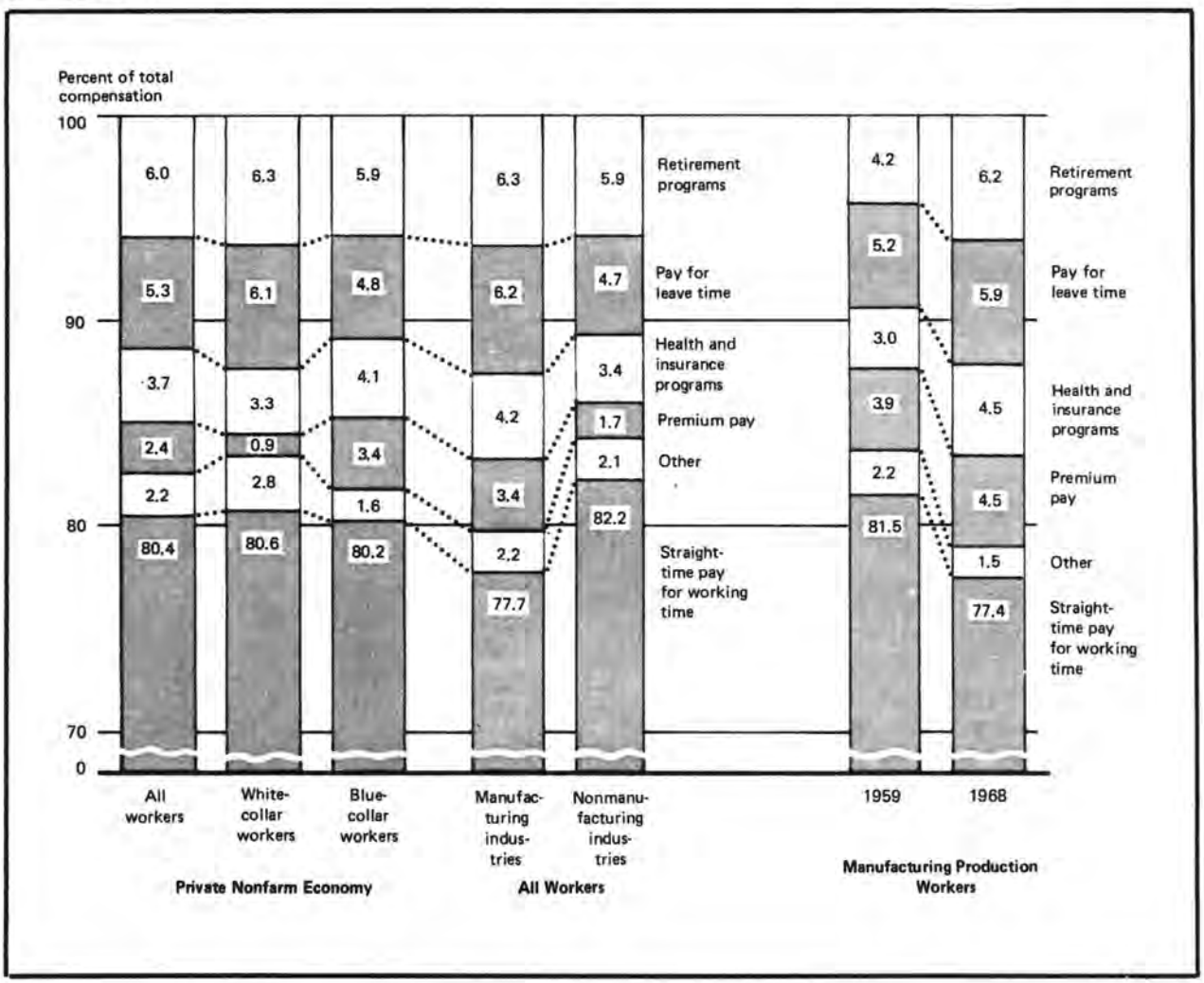
Alvin Bauman is Director of Employee Compensation Studies, Bureau of Labor Statistics.

whim. They were not viewed as an earned entitlement.

For many workers during the first third of the century, paid leisure was something only to be dreamed about. However, this benefit was not unknown, especially for white-collar salaried workers. Some progressive corporations looked upon paid vacations for wage earners as economically sound and socially desirable. In most of the business and industrial community, however, paid leisure was not an established part of labor policy during the first third of this century. And during the depression, paid leave programs were abolished in many companies that had provided them.

The economic upheaval of the early 1930's brought with it a quiet revolution in society's approach to economic security. Federal agencies and programs were created to solve the economic and social problems of the Nation and to insure against future catastrophes. Americans were now consciously aware, perhaps suddenly and painfully, that in modern industrial society the individual was not able to carry the full burden of providing himself and his dependents with security. Passage of the Social Security Act in 1935 provided many workers with a measure of security against two hazards—loss of income stemming from inability to work because of old age, and loss of income because of temporary unemployment. From their inception, both the old age security and unemployment programs have been treated as insurance programs in which participation was a right acquired by working. In effect, the spirit,

Chart 1. The structure of compensation, selected worker groups and industries, 1968, and manufacturing production workers, 1959–68



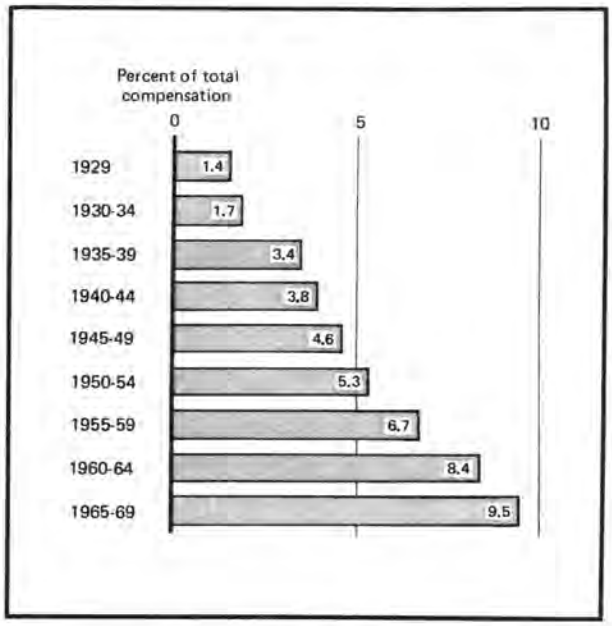
if not the fact, of worker self-sufficiency was maintained.

Workers' ability to provide for their economic security was enhanced by the passage of the National Labor Relations Act of 1935 (Wagner Act), which guaranteed their right to join labor unions and to bargain collectively with their employers. Some union leaders had feared that employer-financed welfare programs would tend to "buy" worker loyalty and impede organization of workers. The mass organization of workers dissipated most of these fears. Unions began to deviate significantly from the traditional scope of collective bargaining—wages, hours, and working conditions—and began to negotiate plans that would give workers more and better protection than that provided by legally required programs. However, not until 1948 did the courts interpret the Wagner Act to require employers to bargain over pension and retirement plans (*Inland Steel* v. *NLRB*), and not until 1949 did they make the same decision regarding health and insurance plans (*W. W. Cross & Co.* v. *NLRB*).

The Second World War brought with it labor shortages and competition among employers for workers. The War Labor Board limited the amount of increase in cash wages, and employers were encouraged to turn to other forms of labor compensation that were "noninflationary." Employees were offered insurance and pension coverage, paid vacations and holidays, and similar forms of compensation that were not part of their cash wages for time worked or units produced. After the war, such items of compensation became part of "package" settlements negotiated by labor and management. These items soon became part of the compensation picture for employers and workers outside the collective bargaining framework as well. By early 1951, the existence of a new compensation system was generally recognized. This is evident in the enunciation by the Wage Stabilization Board of its short-lived policy of applying increases in wages and "fringe benefits" against a predetermined maximum increase in total compensation. Thus, in a decade and a half (1935–50) today's form of labor compensation had evolved.

The growth since 1929 in the importance of compensation over and above straight-time pay for time worked or units produced is partially reflected in data from the National Income Accounts, summarized in chart 2. The chart shows the proportion of employee compensation accounted for by employer expenditures for legally

Chart 2. Supplements to wages and salaries[1] as a percent of total compensation of employees, 1929–69



[1] Includes employer payments for legally required social insurance (e.g., social security, unemployment insurance), and for privately financed health and welfare programs (pensions, life and health insurance, etc.), as well as a few minor items. Excludes pay for working time, paid leave, bonuses, and similar payroll items.

Source: U.S. Department of Commerce.

Other estimates of total compensation

Total compensation is estimated by several sources besides BLS. The National Income Accounts, maintained by the Office of Business Economics, U.S. Department of Commerce, have aggregate national data on compensation of employees, wages and salaries, and employer payments for social insurance (social security, unemployment insurance, and so on) and private pension, health, and welfare plans for each year since 1929. The Chamber of Commerce of the United States has, since 1947, conducted surveys of employer expenditures for employee compensation beyond pay for time worked. The American Iron and Steel Institute has data, beginning with 1940, on hourly employment cost, both total and by component, for production workers in the iron and steel industry.

required and privately financed insurance and welfare programs. In 1968, employer expenditures for these programs represented about one-half of the expenditure for compensation beyond straight-time pay for work; the remainder consisted of pay for leave, premium pay, bonuses, and similar payroll items.

The economic problems of the depression gave impetus to the growth of legislated social insurance programs. Similarly, the policies of the War Labor Board acted as a catalyst to the growth of privately sponsored programs for worker security and leisure. Had these unusual circumstances not existed, over the long term the social atmosphere of the Nation coupled with increasing affluence probably would have brought about a similar, although more gradual, growth in such public and private programs. Workers in the growing urban centers, faced with insecurity engendered by rapid technological change, have pressed for programs providing security. Increasing affluence has given workers the ability to substitute future protection for current income and has increased the demand for leisure time in which to enjoy this affluence. These attitudes and desires are reflected in actions and proposals that have been prominent in the last decade: in the public sector, liberalization of benefits under the Social Security Act, the institution of Medicare, efforts to further improve unemployment insurance programs, and proposals for a national health care scheme; in the private sector, the continuing emphasis on supplementary compensation under collective bargaining. Between 1961 and 1969, about half the workers covered by major collective bargaining agreement settlements (that is, those covering at least 1,000 workers) received new or improved pension plan coverage; about half received a new or improved vacation program; and nearly 2 out of 3 got new or improved health and insurance programs.[2] There is little reason to doubt that public and private decisions will provide continued improvement of existing programs and the establishment of new ones in the future.

The compensation structure is still undergoing change and is not found uniformly among all employees or in all industries. As it exists today in American industry in general, it consists of three major elements: (1) Pay for time worked or units produced; (2) insurance paid for, at least in part, by the employer to mitigate worker loss of income or financial hardship resulting from sickness, accident, loss of employment, or old age (these benefits may be legally required, such as social security and workmen's compensation, or optional, such as health insurance and private pension plans); and (3) pay for vacations, holidays, and other types of time off.

Early BLS studies

The significance of the changes taking place during the 1940's in the structure of employee compensation was reflected in various BLS studies of worker pay, which also covered employer practices regarding insurance, paid leave, and other elements of compensation not included in hourly earnings. Recognizing that the existence and growth of these practices tended to reduce the meaningfulness of hourly earnings as a measure of worker compensation, the Bureau began to collect and analyze data on the costs of these practices.

The first BLS attempt to measure the costs of "supplementary wage benefits" was made in conjunction with a wage survey in the basic iron and steel industry in 1951.[3] Data were collected on employer expenditures for two types of benefits: (1) Direct benefits, consisting of pay for overtime and for work on holidays and late shifts, pay for holidays not worked and vacations, sick leave, severance pay, and nonproduction bonuses; and (2) indirect benefits, consisting of legally required and voluntary insurance and retirement pension plans (although it was deemed impractical to collect expenditures for the pension plans adopted by a large segment of the industry in late 1949 and early 1950). Expenditures were expressed in terms of cents-per-man-hour and related to production workers only.

The Bureau's inexperience at that time in the area of compensation expenditures is evident in its struggle with terminology in its first report on the subject. In a few printed pages we find reference to employer expenditures on "selected supplementary benefits," "selected supplementary or 'fringe' benefits," "supplementary wage benefits," and "fringe benefits." Nonetheless, this first sally into the field was reasonably successful, due in large measure to cooperation from the industry, which had actively solicited the study and which maintained excellent records on expenditures for labor compensation.

In 1953, BLS undertook "to explore the availability of records, the willingness and ability of

industry to provide data, the quality of expenditure data, and other matters of methodology and definition" [4] necessary to measure employer "expenditures on selected items of *supplementary employee remuneration*." The study was conducted among establishments engaged in manufacturing, but was not intended to produce data relating to all manufacturing. Neither was it intended to delve into all types of supplementary employee remuneration. Rather, it was limited in its inquiry to expenditures for the following items: (1) Paid vacations; (2) paid holidays; (3) paid sick leave; (4) premium pay for overtime, weekend, holiday, and late shift work; (5) pension plans; (6) insurance, health, and welfare plans; and (7) legally required payments. These items were selected because they were among the most common, represented a large part of all expenditures for supplementary remuneration, were either required by law or subject to collective bargaining, and were reasonably susceptible to measurement. The Bureau disavowed any implications that these items were being defined as "fringe benefits" or even as benefits, or that they represented all items of labor cost. Since 1953, additions and changes have been made in the selected items, but the basic concept underlying their selection still applies. Another basic concept adopted in the 1953 study and carried through to the present was that of "expenditures," defined as money outlays made by an employer either directly to employees or on behalf of employees to an insurance company, trustee, or government agency to provide selected types of supplementary remuneration. "Expenditures" do not measure total actual costs; most practices incur administrative costs, and many provide offsetting benefits to the company (such as increased worker productivity resulting from vacations). Furthermore, expenditures for insurance and pension plans reflect anticipated costs, which may be higher or lower than actual cost. For these reasons, and others, actual cost measurement is virtually impossible.

Three basic measures of expenditures were utilized: (1) Percent of payroll; (2) cents per payroll hour (that is, per hour paid for); and (3) cents per adjusted payroll hour (that is, per hour worked). These measures were used in the program for 13 years before undergoing modification. The 1953 study points up several problems involved in collecting expenditure data: lack of employer response to the mail questionnaire used to collect data, lack of employer records, incompatibility between employer records and Bureau data requirements, and others which, for the most part, are still with us. The significance of the 1953 study lay in its demonstration of the practicality and the feasibility of collecting expenditure data for most major "supplementary remuneration practices" among a group of employers having diverse characteristics.

Four years elapsed before the next BLS venture into the measurement of supplementary remuneration. As part of a pay survey in the electric and gas utility industry,[5] expenditures for the same items of supplementary remuneration covered by the 1953 study were collected for 1956. This was the first study of supplementary remuneration in a nonmanufacturing industry.

A related study was conducted in 1958.[6] It focused on the composition of payroll hours for production workers in manufacturing—that is, the proportion of all hours for which employees were paid that was accounted for by hours spent at work and the proportion accounted for by hours spent away from work on various types of paid leave.

The Bureau's current full-scale program of studies of compensation began with a survey bearing the cumbersome (but precise) title, *Employer Expenditures for Selected Supplementary Remuneration Practices for Production Workers in Manufacturing Industries, 1959*.[7] This survey was a natural outgrowth of the 1953 feasibility study and had generally the same conceptual framework. Many of the caveats voiced in the 1953 study were repeated—the survey did not purport to measure labor costs; the list of practices for which expenditures were being measured was not all-inclusive; and the selected practices did not constitute a definition of "fringe benefits." The list of practices was expanded to include some items which were new to the economy or had grown in importance since 1953, such as supplemental unemployment benefits and civic and personal leave. Expenditures were measured in cents-per-hour paid for and per plant man-hour, and as a percent of gross payroll and of straight-time payroll. The last was a new measure.

The 1959 survey stands as the Bureau's first measurement of expenditures for selected elements of compensation in a major segment of American industry, and the beginning of a continuous program of studies focusing on compensation expendi-

tures. The results serve as a base from which trends in these expenditures are measured today.

The program moved along. A 1960 survey in mining covered production workers.[8] One in 1961 related to the finance, insurance, and real estate industries.[9] The nature of their work force made this the first study in which white-collar workers were included. Also, the survey covered virtually all of the industries' work force except outside salespeople. Supervisory employees, who had been omitted from previous surveys, were included.

Expansion of the survey program

In 1962, another survey of manufacturing production workers was made, with little change in coverage or conceptual framework from the 1959 survey.[10] The following year, however, saw another expansion in the scope of the program. A special survey was conducted, designed primarily to meet the needs of the Federal Government for data on expenditures for "supplementary remuneration" in a segment of private industry.[11] Just as the 1961 study in finance, insurance, and real estate marked a broadening of employee coverage, the 1963 survey marked a broadening of industry coverage to a wide segment of the economy—manufacturing; transportation and utilities; trade; finance, insurance, and real estate; and a limited group of service industries. In terms of employee coverage, the survey was limited, by the data required, to clerical, professional, administrative, and technical personnel—the same group for which salary data were gathered to meet other Federal needs.

Surveys conducted during 1964 and 1965 covered a number of manufacturing and nonmanufacturing industries.[12] The items of expenditure measured by the survey remained unchanged. However, the program's analytic framework was shifted to the one now being used, which is described below. In 1966, the Bureau surveyed the entire private nonfarm economy,[13] as the first survey in the current program designed to study the entire private sector biennially and selected manufacturing and nonmanufacturing industries in intervening years.

The shift in the analytic framework, alluded to above, was significant. From measuring expenditures for pay supplements and relating them to gross payroll, the Bureau moved, in 1964, to measuring total employer expenditures for the compensation of employees and relating expenditures for each compensation practice to total expenditures for compensation. The new approach was based, in essence, on the idea that the elements of compensation are interchangeable, to some extent, in theory and practice. In relating supplementary compensation to gross payroll rather than relating each element of compensation (straight-time pay, pensions, health insurance, and so on) to outlays for total compensation, trends in the various elements of compensation could be obscured or distorted.

This is illustrated by an examination of two hypothetical establishments, each having the same compensation items and each making the same expenditure for them. The level of compensation expenditures per hour of work is the same in each establishment and each allocates the same percent of gross payroll to provide supplementary compensation. Each establishment decides to increase worker compensation, but each allocates the increase to a different element of compensation. The first allocates the increase to straight-time pay. Thus, gross payroll is increased; with no absolute change in expenditures for supplementary compensation, they become a smaller proportion of gross payroll. The second allocates the increase to improve its pension plan. This does not change gross payroll expenditures, but expenditures for supplementary compensation increase absolutely and become a larger proportion of gross payroll. The differences in expenditures for supplements as a percent of payroll thus created between the establishments are misleading; both establishments have increased compensation, although the increase has been allocated differently. Clearly, such situations, which are common in American industry, are best accommodated by using total compensation expenditures as the base for comparison.

Total compensation was defined within the existing conceptual framework of the program of studies measuring expenditures for selected compensation practices. Expenditures for the selected practices, plus straight-time pay for the job, constitute total expenditures for employee compensation. Couched in other terms, total compensation expenditures consist of all payments made by an employer to his workers subject to Federal income tax withholding, and all payments made by the employer to a government agency, insurance company, or trusteeship for legally required or privately provided insurance and welfare programs.

This definition does not include all forms of employee compensation found in the United States today. Expenditures that provide direct income to the worker or provide him with security against economic hardship are included; however, those that are a form of indirect compensation, such as employee discounts, company car for business and personal use, and tuition grants, are excluded. Employee compensation is only part of total labor cost; the latter also includes such labor-associated expenses as those of the personnel department; cost of providing meals or dining facilities, rest areas, in-plant medical care; and the cost of administering insurance and pension plans.

Table 1 presents both the level and structure of employer expenditures for employee compensation in the private nonfarm economy in 1968.

In addition to these data, the survey program in the private economy develops data for two broad industry aggregates—manufacturing and nonmanufacturing. Data are produced separately for office and nonoffice workers in both the economy-wide and selected industry studies. Three measures of expenditures are calculated for each compensation item: percent of compensation, dollars per hour paid for, and dollars per hour worked.

Table 1. Level and structure of employer expenditures for employee compensation, private nonfarm economy, 1968

Compensation practice	All employees	
	Percent of compensation	Dollars per hour of work
Total compensation	100.0	$3.89
Pay for working time	82.8	3.22
Straight-time pay	80.4	3.13
Premium pay	2.4	.09
Overtime, weekend, and holiday work	2.1	.08
Shift differentials	.3	.01
Pay for leave time (except sick leave)	5.3	.21
Vacations	3.1	.12
Holidays	2.0	.08
Civic and personal leave	.1	.01
Employer payments to vacation and holiday funds	.1	(1)
Employer expenditures for retirement programs	6.0	.24
Social security	3.3	.13
Private pension plans	2.7	.11
Employer expenditures for health and insurance programs [2]	3.7	.15
Life, accident, and health insurance	2.2	.09
Sick leave	.6	.03
Workmen's compensation	.9	.03
Employer expenditures for unemployment benefit programs	.9	.04
Unemployment insurance	.8	.03
Severance pay	.1	(1)
Severance pay funds and supplemental unemployment benefit funds	(1)	(1)
Nonproduction bonuses	1.0	.04
Savings and thrift plans	.2	.01

[1] Less than 0.05 percent or $0.005.
[2] Includes other health benefit programs, principally State temporary disability insurance not presented separately.

Averages are provided, along with tabulations showing the distribution of employees among establishments by establishment level of expenditure for each item. Data are presented by certain establishment characteristics, such as employment size or unionization, when possible. Information is also developed on the proportions of employees in establishments with and without each of the various compensation practices.

Information is also published on the proportion of all hours paid for that are work hours and the proportions that are paid vacation, holidays, or other types of paid leave hours. In addition to average percentages, distributions of workers by establishment, according to the percentage of paid hours allocated by the establishment between work and leave time, are tabulated. Data are also published on the proportions of workers who actually received paid vacations of various durations, as well as the proportion who received no paid vacations.

These studies are conducted primarily by means of a questionnaire mailed to a representative sample of the Nation's business establishments. The method of survey for each such study is described in the summary report or comprehensive bulletin in which the Bureau publishes and analyzes the results of the survey.

The future

The BLS program of studies of compensation expenditures goes into the 1970's with a broader focus than that which characterized it in the early 1960's. For all its improvements, much remains to be done.

Data on the compensation of public employees, other than those working for the Federal Government, are scarce. Information for this increasingly important sector of the economy will be in growing demand.

Many intriguing questions remain to be answered—What factors influence the choice between current income and future security? What influence do public security programs have on private decisions in the same area? What is the relationship between employer expenditures and benefits accruing to employees? What are employer expenditures for other items of labor cost? We hope to begin to answer some of these questions in this decade. □

——FOOTNOTES——

[1] Information on employee compensation in 1968 is from a BLS survey, the results of which were summarized in a U.S. Department of Labor press release (USDL 11–197). A comprehensive BLS bulletin on the survey findings is now being prepared.

[2] *Current Wage Developments*, April 1, 1970, table 10.

[3] *Wage Structure, Basic Iron and Steel, January 1951* (BLS Series 2, No. 81).

[4] *Problems in Measurement of Expenditures on Selected Items of Supplementary Employee Remuneration, Manufacturing Establishments, 1953* (BLS Bulletin 1186, 1956).

[5] *Wage Structure, Electric and Gas Utilities, September 1957* (BLS Report 135, 1958).

[6] *Composition of Payroll Hours in Manufacturing, 1958* (BLS Bulletin 1283, 1960).

[7] BLS Bulletin 1308, 1962.

[8] *Employer Expenditures for Selected Supplementary Remuneration Practices for Production Workers in Mining Industries, 1960* (BLS Bulletin 1332, 1963).

[9] *Employer Expenditures for Selected Supplementary Remuneration Practices: Finance, Insurance, and Real Estate Industries, 1961* (BLS Bulletin 1419, 1964).

[10] *Employer Expenditures for Selected Supplementary Compensation Practices for Production and Related Workers: Composition of Payroll Hours, 1962* (BLS Bulletin 1428, 1965).

[11] *Supplementary Compensation for Nonproduction Workers, 1963* (BLS Bulletin 1470, 1966).

[12] The 1964 surveys were in the following transportation industries, and their results were published in: *Compensation Expenditures and Payroll Hours, Pipelines* (BLS Bulletin 1528, 1967); *Motor Passenger Transportation Industries* (1561, 1967); *Air Transportation* (1571, 1967); and *Water Transportation* (1577, 1967). The 1965 surveys covered 11 industries and the results were summarized in *Employee Compensation and Payroll Hours, 1968* (BLS Reports 335–1 to 335–11).

[13] *Employee Compensation in the Private Nonfarm Economy, 1966* (BLS Bulletin 1627, 1969).

Measuring annual earnings of household heads in production jobs

Gross median annual earnings increased an average of 5.3 percent a year from 1963 to 1972; real, after-tax earnings, 1.6 percent annually

ROBERT L. STEIN AND PAUL M. RYSCAVAGE

ONE OF THE MOST OBJECTIVE INDICATORS and one of the most crucial determinants of a worker's welfare is his earnings from a job. This article reports on annual earnings of household heads in production and nonsupervisory jobs, a group most commonly thought of as the rank and file of American workers. Although other members of a family may contribute to the family's income and there may be sources of family income other than earnings, in the families of most wage earners, the earnings of the household head most often determines the basic economic status of the household.

Earnings data for this analysis were derived from the Current Population Survey data base. Because this survey cross classifies workers by occupation, sex, and other characteristics, this data base can be restructured to assess worker welfare in terms of a number of variables. Data on workers' earnings are presented here both before and after Federal taxes and cover the period 1963–72.

The gross median annual earnings of family heads in production jobs advanced from $5,300 in 1963 to $8,500 in 1972. This represented a 5.3-percent annual rate over the period. In constant dollars, after taxes, the annual increase was 1.6 percent.

Data base

The earnings statistics from the Current Population Survey data base are useful in assessing worker welfare because they can be linked to other attributes of the workers.[1] First, it is possible to associate workers' annual earnings with important social characteristics, including position in the family (husband, wife, adult relative, child), the type of family (both husband-wife present, father not present, mother not present) and the number of members in the family.

Second, annual earnings can be cross-classified with important economic characteristics, such as occupation and work experience. It is possible, for example, to obtain earnings statistics for all occupation groups or for a selected grouping (such as semiskilled factory workers, clerical workers, and service workers) and relate these earnings to the amount of employment (weeks worked and whether full time or part time) during the calendar year.[2]

Third, the estimation of after-tax earnings is possible with these data. The Current Population Survey data base contains the major data elements needed to estimate Federal income tax liability, such as type of household (husband-wife, single individual, adult head without a spouse) and size of family. Moreover, separate earnings data are available for family heads by size of family, for wives, unrelated individuals, and so on.

And fourth, with the Current Population Survey data base it is possible to combine the earnings of husbands and wives into a single measure, or relate the earnings of any member of the family to that of any other member or to the income of the family as a whole.

This data base, however, has some limitations. Some of these limitations exist because the earnings data are derived from a relatively small household survey (1 in 1,000). Sampling and response error preclude use of detailed earnings statistics by industry and area. In addition, this error limits the ability to interpret the year-to-year changes of some subgroups of workers who make up only a small part of the total, for example, production workers with three dependents.

Robert L. Stein is chief, and Paul M. Ryscavage an economist, in the Division of Economic Studies, Bureau of Labor Statistics.

From the *Review* of April 1974

Other limitations arise because annual earnings data are collected only once a year in the Current Population Survey. Obviously, the data do not reflect short-term fluctuations in business activity and cannot be used in current analysis. Rather, the data are most useful as long-term indicators of the earning power of various groups of American wage earners.

Design of the new data

The new earnings data are designed to relate only to household heads. The head of household, as defined in this article, is either the head of a family—a group of two or more persons residing in the same dwelling unit and related to each other by blood, marriage, or adoption—or an unrelated individual—a person living alone or with persons unrelated to him. The head of a family is the person so designated by the survey respondent. However, by long-standing Census Bureau practice, the husband in a husband-wife family is designated as the head. In the vast majority of such families, the husband is the primary wage earner and is also the person most strongly and continuously attached to the labor force. The data are not restricted to husband-wife families of four persons or to any particular family type. Instead data are presented for all heads and, separately, by family size and type. In March 1973 (the latest date for which data are available) there were 71.2 million heads of households—54.4 million family heads and 16.8 million unrelated individuals. Of the total, 54.4 million were men, 16.8 million were women. However, because of other restrictions, described below, fewer than half of the household heads are included in the universe for the new earnings statistics.

The second step in defining the universe to be studied involved decisions about the types of workers to be included. It was decided that the focus should be on wage earners in the private nonfarm economy who were in production or nonsupervisory jobs. Professional, managerial, and household workers were excluded. This universe parallels that used by the Bureau of Labor Statistics in the weekly earnings series from its Current Employment Statistics program. [3] This definition was adapted to the Current Population Survey data.

All those with any work experience during the previous calendar year were to be included, with separate data provided for year-round full-time workers. Employees were classified by occupation on the basis of their longest job during the year.

The tabulation below shows the number (in millions) of production workers in 1972, as defined in the Current Population Survey, and the breakdown in terms of position in the family, type of household, and family size. It is noteworthy that only slightly more than half of all production workers are household heads and fewer than 10 percent head a family of four. The discussion in this report focuses on the earnings of the 29.3 million household heads.

Position in family	*Number (in millions)*
Production workers, total	55.8
Household heads	29.3
Heads of husband-wife families	21.2
Two persons in family	6.1
Three persons in family	4.9
Four persons in family	4.6
Five persons in family	2.8
Six persons in family	1.4
Seven or more persons in family	1.3
Other male family heads	.6
Female family heads	2.3
Male unrelated individuals	2.7
Female unrelated individuals	2.6
Other household members	26.5
Wives	13.6
Male relatives	7.7
Female relatives	5.2

A third key decision was that the basic measure would be the gross annual wage and salary earnings of the household head. These earnings are summarized in terms of medians. One section of the report presents median earnings data separately for working couples and contrasts these data with the earnings of husbands whose wives did not work.

A fourth element in the creation of the new earnings data from the Current Population Survey was the development of after-tax earnings data. As in the case of the regularly published Current Employment Statistics series on net spendable earnings, the Federal income tax liability and social security tax were calculated and deducted from gross earnings. (Available data did not permit the deduction of State and local income taxes.) In deriving the Federal income tax liability, it was assumed that husbands filed joint returns, other male family heads and female

family heads filed as head of household, and unrelated individuals filed as single individuals. A further simplifying assumption was that the standard deduction was taken. The specific number of exemptions was determined by family size, that is, it was assumed that all members of the head's family were claimed as tax exemptions. The social security deduction is based on a flat percentage tax rate of earnings up to a taxable maximum. The after-tax earnings data are also presented on a constant-dollar basis for the total and selected subgroups. The Bureau of Labor Statistics All-Items Consumer Price Index (1967=100) was used as the deflator.

Summary of findings

The gross median annual earnings of family heads in production jobs advanced from $5,300 in 1963 to $8,500 in 1972. This represented a 5.3-percent compounded annual rate of increase over the period. (See table 1.)

Of the 24.1 million family heads studied, 4.6 million were married and had 3 dependents. The gross median annual income of this group of production workers moved up from $5,800 in 1963 to $9,800 in 1972. The rate of annual increase in these earnings—6.1 percent—was greater than for all families combined.

On a weekly basis, average earnings for all 24.1 million family heads were $163 in 1972, and the 4.6 million husbands in four-person families earned about $189. These figures compared with 1972 weekly earnings of $136 for 49 million production workers as measured from payroll reports in the Current Employment Statistics program.[4] The average from the payroll series, however, reflects the earnings of all workers, not just family heads. Family heads usually earn more than other workers because they typically have more training, are in more highly skilled jobs, and have more work experience, more seniority, and more hours of work on both a weekly and an annual basis.

Production or nonsupervisory workers, regardless of family type or size, earned considerably more if they worked year round at a full-time job. The 17.4 million family heads who did so had gross annual earnings of $9,600 in 1972, about $1,100 more than for all family heads. In 1972, then, these workers earned $184 a week, $21 more than did all family heads. Furthermore, earnings of these workers increased slightly faster between 1963 and 1972—5.7 percent annually as compared to 5.3 percent for all family heads.

Table 1. Gross median earnings of selected production and nonsupervisory workers, 1963–72

Year	All workers			Full time, year round		
	All family heads	Husbands in four-person families	Unrelated individuals	All family heads	Husbands in four-person families	Unrelated individuals
1963	$5,298	$5,796	$3,403	$5,815	$6,137	$4,283
1964	5,521	6,081	3,320	6,037	6,356	4,310
1965	5,733	6,401	3,502	6,247	6,685	4,493
1966	6,029	6,778	3,741	6,544	7,017	4,703
1967	6,323	7,021	3,901	6,840	7,315	4,873
1968	6,764	7,621	4,115	7,470	7,916	5,188
1969	7,236	8,205	4,220	7,961	8,591	5,625
1970	7,455	8,400	4,498	8,405	8,949	6,015
1971	7,828	9,032	4,686	8,843	9,566	6,244
1972	8,455	9,829	4,933	9,569	10,413	6,734
Annual rate[1]	5.3	6.1	4.2	5.7	6.1	5.2

[1] Annual rate of change (compounded), 1963–72.

More detailed information on the gross earnings of family heads in terms of type and size of family, as well as for unrelated individuals, is presented in table 2. As shown in the table, there was a wide disparity in the median annual wages of production workers among different demographic groups. Even among year-round full-time workers, family heads earned more than unrelated individuals; male heads more than female; and heads of families with four to six persons earned more than heads of larger or smaller families.

After-tax earnings. For the head of a family, about 87 percent of the production worker's average earnings were retained after deductions for Federal income and social security taxes in 1972. (See table 3.) This was only 1 percentage point less than it had been in 1963.

For all family heads, after-tax annual wage and salary earnings rose from $4,600 in 1963 to $7,300 in 1972. This represented a 5.2-percent compound annual rate of growth, as contrasted with 5.3 percent on a gross basis.

As in the case of gross earnings, the increase in after-tax earnings was greatest among husbands in families of four to seven persons. The deduction of Federal income and social security taxes did not materially affect the disparity in earnings levels among groups. (See table 4.)

Additional data are provided in tables 5 and 6

Table 2. Gross median earnings for all production workers and full-time year-round production workers by family type and size, 1963–72

Group	All workers				Full time, year round			
	Median		Annual percent change	Number of persons (in thousands)	Median		Annual percent change	Number of persons (in thousands)
	1963	1972			1963	1972		
Total family heads and individuals	$5,040	$7,823	5.0	29,310	$5,645	$9,167	5.5	20,227
Family heads	5,298	8,455	5.3	24,057	5,815	9,569	5.7	17,359
Husbands in husband-wife families	5,418	8,947	5.8	21,202	5,921	9,888	5.9	15,745
Two in family	4,889	7,691	5.2	6,115	5,575	9,098	5.6	3,985
Three in family	5,396	8,771	5.5	4,876	5,776	9,602	5.8	3,663
Four in family	5,796	9,829	6.1	4,633	6,137	10,413	6.1	3,744
Five in family	5,788	10,059	6.3	2,838	6,244	10,654	6.1	2,278
Six in family	5,610	9,681	6.3	1,445	5,975	10,381	6.3	1,113
Seven or more in family	5,193	9,130	6.5	1,295	5,947	9,824	5.7	962
Other male family heads	4,686	7,613	5.5	594	5,428	9,093	5.9	411
Female family heads	2,685	4,058	4.7	2,261	3,440	5,555	5.5	1,203
Unrelated individuals	3,403	4,933	4.2	5,253	4,283	6,734	5.2	2,868

NOTE: Percent change is compounded annual rate of change. In columns 4 and 8, the count of production workers is for the year 1972.

which show after-tax annual earnings, in constant 1967 dollars, of household heads who were production workers. The data in these tables point up the overriding importance of inflation in eroding workers' buying power. Real after-tax earnings of all family heads rose at a compound annual rate of only 1.6 percent over the 1963–72 period. Real earnings of husbands in four-person families rose at an annual rate of 2.3 percent.

The real spendable earnings series derived from the Current Employment Statistics program rose at an annual rate of 1.3 percent. In this series, social security taxes and Federal income taxes are deducted from real gross average weekly earnings of all production and nonsupervisory workers. Federal income taxes are based on the tax rates and exemptions for a married worker with three dependents who files a joint return and takes the standard deduction.

Earnings of working couples. The earnings statistics described thus far reflect the wage and salary earnings of only one earner—the head of a household. Two or more earners in a family, however, are becoming more common; in fact, the Bureau of the Census reported there were 1.65 earners per family in 1972.[5] From the standpoint of worker welfare, therefore, it would be realistic to consider the combined earnings of all family members, or at least of husbands and wives since it is the wife who usually contributes most of the supplementary earnings in families.

With the Current Population Survey data, it is possible to add the earnings of any or all members of a family to those of the head. The wage and salary earnings of wives in any type of job were combined, therefore, with those of the husbands in husband-wife families for the year 1972.[6] These totals, on a gross, after-tax, and real after-tax basis, are presented in table 7. In addition, these earnings measures are presented for those families in which only the husband worked.

Table 3. After-tax median earnings of selected production and nonsupervisory workers, 1963–72

Year	All workers			Full time, year round		
	All family heads	Husbands in four-person families	Unrelated individuals	All family heads	Husbands in four-person families	Unrelated individuals
1963	$4,639	$5,059	$2,778	$5,068	$5,338	$3,455
1964	4,906	5,394	2,782	5,350	5,624	3,562
1965	5,130	5,716	2,960	5,571	5,956	3,752
1966	5,298	5,932	3,128	5,728	6,134	3,880
1967	5,527	6,124	3,246	5,973	6,370	4,001
1968	5,820	6,525	3,375	6,291	6,758	4,190
1969	6,145	6,943	3,426	6,727	7,256	4,480
1970	6,352	7,184	3,615	7,156	7,636	4,792
1971	6,758	7,786	3,866	7,605	8,232	5,070
1972	7,324	8,484	4,197	8,234	8,973	5,543
Annual rate[1]	5.2	5.9	4.7	5.5	5.9	5.4
After-tax:[2]						
1963	87.6	87.3	81.6	87.2	87.0	80.7
1972	86.6	86.3	85.1	86.1	86.2	82.3

[1] Annual rate of change (compounded), 1963–72.
[2] After-tax earnings as a percent of gross earnings.

NOTE: After-tax earnings for all family heads were derived by weighting the median after-tax earnings of workers in specific family-type, family-size groups by the number of workers in each group.

Table 4. After-tax median earnings for all production and nonsupervisory workers and full time, year round production workers by family status and size, 1963–72

Group	All workers				Full time, year round			
	Median		Annual percent change	Number of persons (in thousands)	Median		Annual percent change	Number of persons (in thousands)
	1963	1972			1963	1972		
Total family heads and individuals	$4,385	$6,763	4.9	29,310	$4,889	$7,852	5.4	20,227
Family heads	4,639	7,324	5.2	24,057	5,068	8,234	5.5	17,359
Husbands in husband-wife families	4,741	7,730	5.6	21,202	5,162	8,501	5.7	15,745
Two in family	4,075	6,505	5.3	6,115	4,638	7,589	5.6	3,985
Three in family	4,611	7,465	5.5	4,876	4,922	8,147	5.8	3,663
Four in family	5,059	8,484	5.9	4,633	5,338	8,973	5.9	3,744
Five in family	5,172	8,819	6.1	2,838	5,546	9,318	5.9	2,278
Six in family	5,146	8,640	5.9	1,445	5,446	9,231	6.1	1,113
Seven or more in family	5,019	8,409	5.9	1,295	5,663	9,010	5.3	962
Other male family heads	3,988	6,521	5.6	594	4,583	7,669	5.9	411
Female family heads	2,427	3,728	4.9	2,261	3,022	4,932	5.6	1,203
Unrelated individuals	2,778	4,197	4.7	5,253	3,455	5,543	5.4	2,868

NOTE: In columns 3 and 7, change refers to compounded annual rates of change. After-tax earnings for all family heads were derived by weighting the median after-tax earnings in specific family-type family-size groups by the number of workers in each group. Husbands with 7 or more family members were presumed to have 8 members in their families for computing the Federal income taxes; other male family heads and female family heads with 5 or more family members were presumed to have 6 members in their families.

In those families in which both the husband and wife worked, combined gross earnings were $12,100; in families where only the husband worked, the average was $9,500.

This gross earnings difference between families in which wives did and did not have earnings varies according to the number of persons in the family. While precise earnings for wives are not presented, it is evident that women without children contribute more than those with youngsters. The combined earnings of a working couple was $3,900 more than earnings of a family of similar size in which only the husband worked. This difference declines as family size increases reflecting the presence of children and the pressures of family responsibilities.

The higher earnings of a family with a working wife is also reflected in the after-tax and real after-tax earnings statistics. In 1972, for example, the combined after-tax earnings of a working husband and wife with two other dependents was $10,800 and in real dollars, $8,600; in contrast, the after-tax earnings of a family of similar size in which the husband was the only earner was $8,900 and $7,100 in real terms. This economic advantage amounts to about $485 per family member after taxes, and $385 in real after-tax earnings.

Quality of the data

Besides the Current Population Survey, information on workers' earnings comes from many sources including payroll reports, household surveys, and administrative records. Perhaps the most widely used earnings statistics in this country are those based on establishment payroll records. The major sources of data are the Bureau of Labor Statistics Area Wage Survey program, which presents data on wages in particular occupations, industries, and metropolitan areas; the Bureau's Current Employment Statistics program which provides survey information from establishment payrolls on average hourly and weekly earnings of production and nonsupervisory workers;[7] and the Bureau of Economic Analysis

Table 5. Real after-tax median earnings of selected production and nonsupervisory workers, 1963–72

[1967 dollars]

Year	All workers			Full time, year round		
	All family heads	Husbands in four-person families	Unrelated individuals	All family heads	Husbands in four-person families	Unrelated individuals
1963	$5,059	$5,517	$3,029	$5,527	$5,821	$3,768
1964	5,281	5,806	2,995	5,759	6,054	3,834
1965	5,429	6,049	3,132	5,895	6,303	3,970
1966	5,451	6,103	3,218	5,893	6,311	3,992
1967	5,527	6,124	3,246	5,973	6,370	4,001
1968	5,585	6,262	3,239	6,037	6,486	4,021
1969	5,597	6,323	3,120	6,127	6,608	4,080
1970	5,462	6,177	3,108	6,153	6,566	4,120
1971	5,571	6,419	3,187	6,270	6,787	4,180
1972	5,845	6,771	3,350	6,571	7,161	4,424
Annual rate[1]	1.6	2.3	1.1	1.9	2.3	1.8

[1] Annual rate of change (compounded), 1963–72.

Table 6. Real after-tax median earnings for all production workers and full-time year-round production workers by family status and size, 1963–72

(1967 dollars)

Group	All workers				Full time, year round			
	Median		Percent change	Number of persons (in thousands)	Median		Percent change	Number of persons (in thousands)
	1963	1972			1963	1972		
Total family heads and individuals	$4,782	$5,397	1.4	29,310	5,332	$6,267	1.8	20,227
Family heads	5,059	5,845	1.6	24,057	5,527	6,571	1.9	17,359
Husbands in husband-wife families	5,170	6,169	2.0	21,202	5,629	6,785	2.1	15,745
Two in family	4,444	5,192	1.7	6,115	5,058	6,057	2.0	3,985
Three in family	5,028	5,958	1.9	4,876	5,368	6,502	2.2	3,663
Four in family	5,517	6,771	2.3	4,633	5,821	7,161	2.3	3,744
Five in family	5,640	7,038	2.5	2,838	6,048	7,437	2.3	2,278
Six in family	5,612	6,895	2.3	1,445	5,939	7,367	2.4	1,113
Seven or more in family	5,473	6,711	2.3	1,295	6,176	7,191	1.7	962
Other male family heads	4,349	5,204	2.0	594	4,998	6,121	2.3	411
Female family heads	2,647	2,975	1.3	2,261	3,296	3,936	2.0	1,203
Unrelated individuals	3,029	3,350	1.1	5,253	3,768	4,424	1.8	2,868

NOTE: Change is compounded annual rate of change.

series on aggregate wages and salaries which is a component of its personal income estimate.[8] While these data have been extremely useful in labor negotiations, business decisions, and economic policymaking, they have been less useful in the analysis of worker welfare because they cannot be related directly to the family responsibilities of individual workers. As might be expected, these data are not strictly comparable with the data we have used in this article.

The Current Population Survey earnings information is derived from a sample survey of respondents in 47,000 households across the country. A consequence of relying on household respondents for earnings information is that the data may reflect some underreporting because of lapses of memory. This is part of the reason the Current Population Survey aggregate of all wages and salaries received by workers is somewhat lower than the Bureau of Economic Analysis' figure, which is developed from various administrative and payroll records.

In 1972, for example, the Bureau of Economic Analysis estimate of all wages and salaries disbursed was $627.3 billion compared with an estimate from the Current Population Survey of $597.1 billion. While some of this difference is due simply to the different sources of earnings information, a part of it can also be attributed to the different income concepts of the Bureau of Economic Analysis and the Current Population Survey. In the latter only money income is reported, but in the former estimate, nonmoney income, such as clothing allowances, room and board, and other wages in kind—all of which are payments for productive services—are included.[9]

To account for this conceptual difference, and yet to be able to use the Bureau of Economic Analysis' estimate of wages and salaries as a benchmark or control total, the Census Bureau makes certain adjustments to this estimate.[10] After the adjustment is made, the Bureau of Economic Analysis figure is more comparable to the Current Population Survey estimate of money wages and salaries. The Current Population Survey household survey is relatively comprehensive

Table 7. Median earnings of working couples in families in which the husband is a production or nonsupervisory worker, 1972

Status	Gross earnings	After-tax earnings	Real after-tax earnings
Husband-wife families in which the wife had earnings of $1 or more	$12,096	[1] $10,291	$8,213
Two persons in family	11,677	9,735	7,769
Three persons in family	11,965	10,132	8,086
Four persons in family	12,575	10,786	8,608
Five persons in family	12,606	10,955	8,743
Six persons in family	12,469	10,982	8,765
Seven persons or more in family	11,133	10,136	8,089
Husbands-wife families in which the wife had no earnings	9,537	[1] 8,142	6,498
Two persons in family	7,816	6,595	5,263
Three persons in family	9,331	7,925	6,325
Four persons in family	10,270	8,853	7,065
Five persons in family	10,592	9,266	7,395
Six persons in family	9,950	8,866	7,076
Seven persons or more in famiy	9,590	8,810	7,031

[1] Weighted medians.

in its collection of wage and salary information and these data are actually the best reported income item in the Current Population Survey.[11] Throughout the 1963 to 1972 period, the Current Population Survey aggregate of wages and salaries as a percent of the Bureau of Economic Analysis' adjusted estimate ranged from 94 to 98 percent. The following tabulation presents aggregate wages and salaries in billions of dollars as estimated by both sources:

Year	BEA total	BEA control	Actual CPS
1963	311.1	300.3	293.3
1964	333.7	322.7	313.6
1965	358.9	346.7	330.0
1966	394.5	379.7	357.7
1967	423.1	407.0	385.5
1968	464.9	446.9	425.4
1969	509.7	489.4	474.8
1970	541.9	526.8	508.2
1971	573.5	556.9	539.8
1972	627.3	607.7	597.1

Data derived from the Current Population Survey which related to production workers also were compared with the data for production and nonsupervisory workers from the Current Employment Statistics program. There are major differences in concepts and survey methods and these differences are reflected in a comparison of aggregate wages and salaries, employment, and average earnings levels from both surveys (table 8).[12] For example, the Current Population Survey aggregate is somewhat lower than the Current Employment Statistics figure, because of underreporting; the Current Population Survey reports more production workers because it includes everyone who had wage and salary earnings during the year, while the Current Employment Statistics count is an average of 12 monthly observations; and Current Population Survey average earnings are lower since they are affected by those who become unemployed or drop out of the labor force unlike the Current Employment Statistics earnings figures which reflect only the weekly earnings of those actually employed.

Despite these conceptual and survey differences, which precluded detailed comparisons of the data from the two sources, there were certain broad similarities in the earnings trends and levels. Aggregate earnings and, particularly, average earnings, from these two sources rose by similar yearly rates for the period 1964–72. Moreover, the Current Population Survey aggregate (derived from household reports and excluding earnings over $25,000) was still 90 percent that of the Current Employment Statistics aggregate which was derived from payroll records. It was concluded, therefore, that the vast majority of production worker earnings was being reported in the Current Population Survey and that the data base was adequate for the development of the new series despite the evidence of some underreporting.[13]

Table 8. Aggregate wage and salary earnings, employment, and average earnings per worker for production workers, CPS, and production and nonsupervisory workers, CES, 1964 to 1972

Year	Current Population Survey			Current Employment Statistics		
	Aggregate (in billions)	Employment (in thousands)	Average earnings	Aggregate (in billions)	Employment (in thousands)	Average earnings
1964	$162.0	42,880	$3,778	$192.8	40,589	$4,750
1965	180.7	46,216	3,910	209.1	42,309	4,942
1966	193.8	47,245	4,102	227.5	44,281	5,138
1967	211.3	49,721	4,250	239.2	45,169	5,296
1968	231.3	51,025	4,533	260.4	46,476	5,603
1969	254.9	53,547	4,760	286.6	48,105	5,958
1970	264.4	53,248	4,965	297.8	47,950	6,211
1971	284.8	54,578	5,219	315.2	47,766	6,599
1972	311.7	55,615	5,605	347.6	49,223	7,061
Year-to-year change:						
64–65	11.5	7.8	3.5	8.5	4.2	4.0
65–66	7.2	2.2	4.9	8.8	4.7	4.0
66–67	9.0	5.2	3.6	5.1	2.0	3.1
67–68	9.5	2.6	6.7	8.9	2.9	5.8
68–69	10.2	4.9	5.0	10.1	3.5	6.3
69–70	3.7	— .6	4.3	3.9	— .4	4.2
70–71	7.7	2.5	5.1	5.8	— .4	6.2
71–72	9.4	1.9	7.4	10.3	3.1	7.0
Compounded annual rate of change, 1964–72	8.5	3.3	5.1	7.6	2.5	5.1

NOTE: The aggregate employment and earnings levels are based on all CPS production workers with wage and salary earnings below $25,000. Average annual earnings for BLS production and nonsupervisory workers have been derived by multiplying average weekly earnings by 52 weeks.

Another limitation of the Current Population Survey earnings data, which is inherent in any sample survey, is the sampling error associated with each estimate.[14] Some examples of the extent of this error on Current Population Survey median wage and salary earnings are presented in the following tabulation of standard error, which relates median earnings to the number of earners:

Median earnings	1 million earners	5 million earners	25 million earners
$5,000	±$200	±$ 90	±$40
7,500	± 300	± 135	± 60
10,000	± 400	± 180	± 80

What these figures indicate is that at one

standard error, the chances would be 2 out of 3 that the true median earnings for 25 million workers, estimated to have median earnings of $5,000 a year, would fall between $4,960 and $5,040. For comparatively smaller groups of workers the error is considerably larger. The standard error of the difference between two earnings estimates for consecutive years, would be about the same as the error associated with an earnings level for 1 year. Consequently, it is difficult to precisely measure year-to-year changes in earnings of small groups of workers. (This illustration assumes that earnings are uniform throughout each earnings interval.)

A third limitation of the Current Population Survey earnings statistics, which is related to the structure of the survey itself, is that these data can only be produced on an annual basis and with a certain time lag. After the earnings and income information is collected by census enumerators in March of each year, a period of several months is required before the Census Bureau can release the necessary information. This is a significant limitation for those requiring the most current and up-to-date earnings information.

Summary

Data on the annual earnings from the Current Population Survey have been used to depict trends in the economic well-being of production workers and their families for the period 1963–72. Earnings reflect only one aspect of economic welfare, but an important aspect, since earnings largely determine a worker's command over goods and services.

The Current Population Survey was used for this purpose because (1) it provides separate earnings data for household heads; (2) a universe approximating that of production and nonsupervisory workers can be identified; (3) the data lend themselves to the calculation of after-tax earnings measures; and (4) the earnings of husbands and wives can be combined.

The Current Population Survey data revealed that gross median annual earnings of 24.1 million family heads employed in production jobs was $8,500 in 1972. This was up from $5,300 in 1963, or an average 5.3 percent annual rate of increase.

On a weekly basis, family heads earned an average of $163 in 1972. Family heads generally earn more than other workers because, on the average, they are older and have more job experience, more seniority and tenure, longer weekly hours, and more continuous periods of employment. For the 49 million production or nonsupervisory workers reported on payrolls in the Bureau of Labor Statistics Current Employment Statistics program, mean weekly earnings were $136 in 1972.

For the head of a family, almost 87 percent of the production workers' average earnings were retained after deductions for Federal income taxes and social security taxes in 1972. This was 1 percentage point less than in 1963. Thus, increases in Federal taxes played only a minor role in holding down the worker's after-tax earnings during this period. On the other hand, inflation has been a very serious factor in undermining increases in the worker's buying power despite sizable increases in gross earnings. The real after-tax earnings (deflated by the Bureau of Labor Statistics All-Items Consumer Price Index) of all family heads rose at an annual rate of only 1.6 percent over the 1963–72 period.

In slightly over half of all husband-wife families where the husband was in a production job, the wife had some earnings. In those families in which both the husband and wife had earnings, the combined median was $12,100; in families where only the husband had earnings, the average was $9,500. □

——FOOTNOTES——

ACKNOWLEDGMENT: Rowena Lipscomb and Daniel Glazer were responsible for developing the special tabulations for this paper.

[1] The Current Population Survey is a monthly sample of 47,000 households throughout the Nation used primarily for obtaining employment and unemployment information. Each March, additional information is obtained concerning the income and work experience of each household member for the previous year. The statistics derived from this survey are reported each year in the Bureau of the Census, *Current Population Reports, Consumer Income*, Series P–60.

[2] A full-time worker is a person who worked 35 hours or more a week during the majority of the weeks worked in the preceding calendar year; a part-time worker is one who worked less than 35 hours a week in a majority of the weeks worked.

[3] Hours and earnings information in the Current Employment Statistics program is derived from payroll reports for production and related workers in manufacturing and mining, construction workers in contract construction, and nonsupervisory employees in the remaining industries of the private nonfarm sector. For a fuller description of the Bureau of

Labor Statistics concept of production and nonsupervisory workers, as well as the earnings series, see *Employment and Earnings*, January 1973, pp. 178–80.

[4] Median earnings are here being compared to mean earnings. Even if mean earnings were readily available from the Current Population Survey, the Current Population Survey earnings would still be considerably higher, since means are typically greater than medians in most earnings distributions.

[5] *Money Income in 1972 of Families and Persons in the United States, Current Population Reports, Consumer Income*, Series P–60, No. 90 (Bureau of the Census, 1973), p. 27.

[6] Future research efforts will be directed toward examining more fully the impact of wives' earnings on total family income as well as the impact of other earners in the family.

[7] See *BLS Handbook of Methods for Surveys and Studies*, Bulletin 1711 (Bureau of Labor Statistics, 1971), pp. 17 and 123. The Bureau of Labor Statistics also publishes a series on the annual earnings and employment patterns of private nonagricultural employees. These data are based on the administrative records of the Social Security Administration and Railroad Retirement Board, and relate to all workers—whether household heads, wives, other relatives of the head, or nonrelatives of the head—whose earnings are covered under the Social Security Act and Railroad Retirement Act. Information on race, sex, and industry of employment, is provided in this series. For more information see *Annual Earnings and Employment Patterns of Private Nonagricultural Employees, 1966–67*, Bulletin 1765 (Bureau of Labor Statistics, 1973).

[8] See *Survey of Current Business*, U.S. Department of Commerce.

[9] See *Money Income in 1972 of Families and Persons in the United States, Current Population Reports, Consumer Income*, Series P–60, No. 90 (Bureau of the Census, 1973), pp. 16–17.

[10] The adjustment involves subtracting from the Bureau of Economic Analysis' estimate, military nonmoney income, military family allotments, civilian nonmoney wages in kind, the wages and salaries of persons who die during the year, and the civilian wages and salaries of Armed Forces personnel. Added to this result is the military pay of reservists and the fees of financial directors.

[11] Underreporting is more common for such income items as public assistance and property income; in 1972, only 70 percent of the former and 45 percent of the latter were reported. See *Money Income in 1972 of Families and Persons in the United States, Current Population Reports, Consumer Income*, Series P–60, No. 90 (Bureau of the Census, 1973), p. 24.

[12] Average weekly earnings from the CES have been annualized by multiplying by 52 weeks. Workers from the CPS with earnings in excess of $25,000 a year were excluded from this comparison; such workers, prior to 1972 were reported as having earnings of $25,000 and over. Although this exclusion biases the comparison, the effect is minimal since few production and nonsupervisory workers have earnings of this magnitude. In 1972, for example, 55.6 million out of 55.8 million total production workers had earnings of less than $25,000 a year while nearly all had earnings below $50,000.

[13] It is likely that much of the underreporting takes place among household members other than heads because the earnings of the former group is more likely to be small and irregular and therefore more difficult to remember.

[14] *Money Income in 1972 of Families and Persons in the United States, Current Population Reports, Consumer Income*, Series P–60, No. 90 (Bureau of the Census, 1973), pp. 18–23.

Chapter VII. Income Distribution and Purchasing Power

Two measures of purchasing power contrasted

Recent divergent trends in real net spendable earnings and real per capita disposable income point up differences in coverage, and price and tax adjustments

PAUL M. SCHWAB

Two of the more widely used statistical series on purchasing power, real net spendable earnings and per capita real disposable personal income, have shown particularly divergent trends in the last 5 years. Real per capita income has continued to rise over the period while real net spendable earnings have remained largely unchanged. Each series measures different aspects of purchasing power and should not be expected, consequently, to yield consistent results. However, the current gap between them has sparked questions about the actual course of purchasing power during the recent period of strong inflationary pressures.

This article attempts to place these series in perspective by examining the conceptual and other major differences between them. It also discusses the specific trends shown by real net spendable earnings and per capita real disposable personal income and quantifies the major factors which have influenced movements of the series. Major uses and limitations of the two series are discussed in the conclusion.

Concepts and differences

The net spendable earnings series (NSE) of the Bureau of Labor Statistics is a much narrower measure of after-tax income than is the per capita disposable personal income series of the Office of Business Economics, U.S. Department of Commerce. The earnings series measures the take-home pay of the average production and nonsupervisory worker on private nonfarm payrolls. More specifically, it reflects only regularly recurring payments to the average wage earner, after deduction of Federal income and social security taxes. The series makes partial allowance for the effect of marital status and number of dependents on the amount of Federal tax liability incurred. Consequently, data are calculated for two groups of workers—a single person with no dependents and a worker who is the sole support of a spouse and two children. Since users of the spendable earnings series are generally concerned with the take-home pay and purchasing power of the married wage earner with a family, this article focuses on the worker with three dependents. Because changes in consumer prices directly affect the earner's ability to command goods and services, spendable earnings are also computed in constant (1967) dollars by deflating the series with the Consumer Price Index.[1]

Disposable personal income (DPI), on the other hand, is derived from an overall estimate of personal income. Developed by the Office of Business Economics as part of the national income and product statistics of the United States, it is the most comprehensive measure of buying power available—one that includes the actual current income receipts of all persons from all sources after deduction for all personal tax and nontax payments (fees, fines, penalties, and so on). In the DPI framework, "persons" include not only individuals but also nonprofit institutions and private trust and welfare funds. To remove the effect of price level changes, the DPI series is converted into constant (1958) dollars by deflating the data with the Implicit Personal Consumption Expenditures Deflator. The real disposal income totals are then divided by the Nation's total population to yield the series in per capita terms.

INCOME COVERAGE. The major difference between the two series lies in income coverage. Spendable earnings estimates are based on gross average weekly earnings of production and nonsupervisory workers. These are obtained on a monthly

Paul M. Schwab is a labor economist in the Division of Employment and Unemployment Analysis, Bureau of Labor Statistics.

From the *Review* of April 1971

basis from sample surveys covering a 1-week pay period each month. The data are drawn from employers' reports of gross payroll and corresponding paid man-hours for full- and part-time production workers, construction workers, and nonsupervisory employees (depending on the industry). They are derived by multiplying average weekly hours by average hourly earnings.[2] The earnings reflect not only changes in hourly basic and incentive wage rates, but also such variables as premium pay for overtime and late-shift work, and changes in output of workers paid on an incentive basis. Weekly earnings are affected not only by changes in gross average hourly earnings, but also by the length of the workweek, part-time work, work stoppages, labor turnover, and absenteeism.

Personal disposable income estimates are based on all income received by "persons." These include wages, salaries, fringe benefits, proprietors' income, rental income, dividends, personal interest income, and transfer payments. (See tables 1 and 2.) Wage and salary disbursements, which constitute about two-thirds of the personal income estimates in the national income accounts, consist of the monetary remuneration of all employees for the whole month rather than a single mid-month pay period and include executive compensation, commissions, bonuses, tips, and payments in kind which represent income to the recipients. Unlike the relatively unified source of gross payroll, wage and salary disbursements are based on a variety of data. Estimates of wages and salaries are prepared separately for each industry and are based primarily on payroll data from State unemployment insurance statistics, carriers' reports to the Interstate Commerce Commission, and payroll estimates of the Civil Service Commission, the Office of Management and Budget, and the Statistical Reporting Service of the U.S. Department of Agriculture.[3]

In addition to wages and salaries, the personal income estimate includes employer contributions to private pension, health, unemployment and welfare funds; compensation for injuries; director's fees; and pay of the military reserve.

These differences in income coverage strikingly illustrate the dissimilarities of the two series. On one hand, gross payroll can be considered a "micro" measure of income, restricted only to certain earnings received by rank-and-file workers in the Nation's private nonfarm sector of the economy. In contrast, personal income represents a "macro" measure of income, concerned with all forms of income received by persons.

PERSONS COVERED. Consistent with its micro orientation, the BLS series covers only earnings received by production and nonsupervisory

Table 1. Major characteristics of the real net spendable earnings series and the per capita real disposable personal income series

Characteristic	Real net spendable earnings (3 dependents)	Per capita real disposable personal income
Major use	As indicator of trends in real take-home pay of the average wage-earner in the private nonfarm economy.	A measure of trends in real income per person.
Income coverage	Gross average weekly earnings or regularly recurring wage and salary payments—product of average weekly hours and gross average hourly earnings.	All actual income from all sources (wages and salaries and other labor income, proprietors' income, rental income, dividends, personal interest income, and transfer payments).
Source of income data	Data based on payroll reports, including gross payroll and corresponding paid man-hours, from monthly sample of establishments in the private nonfarm economy.	Variety of sources, including State unemployment insurance information, payroll and other income estimates prepared by Government agencies, sample of corporate dividend payments. See explanatory notes in **Business Statistics—1969** (Office of Business Economics, U.S. Department of Commerce).
Income recipients	Production and related workers in manufacturing and mining, construction workers, and nonsupervisory employees in the remaining private nonfarm industries.	Nation's total population, including nonprofit institutions and private trust and welfare funds.
Tax deductions	Federal income and social security taxes	All personal tax and nontax payments, as well as all personal contributions for social insurance.
Price conversion	Deflated by the Consumer Price Index (1967 base).	Deflated by the Implicit Personal Consumption Expenditures Deflator (1958 base).
Frequency of publication	Monthly	Quarterly.
Agency developing measure and publication.	Bureau of Labor Statistics, U.S. Department of Labor—**Employment and Earnings.**	Office of Business Economics, U.S. Department of Commerce—**Survey of Current Business.**

Table 2. Sources of personal income, 1970

Components	Billions of dollars	Percent distribution
Personal income	$801.0	100.0
Wage and salary disbursements	540.1	67.4
Other labor income	30.4	3.8
Proprietors' income	67.6	8.4
Rental income of persons	22.7	2.8
Dividends	25.2	3.1
Personal interest income	65.3	8.2
Transfer payments	77.5	9.7
Less: Personal contributions for social insurance	27.8	3.5
Less: Personal tax and nontax payments	116.4	14.5
Equals: Disposable personal income	684.7	85.5

SOURCE: **Economic Report of the President**, February 1971, pp. 214, 216, and 217, tables C–15 and C–17.

workers in manufacturing and mining, in contract construction, and nonsupervisory employees in the remaining private nonfarm economy. It should be noted, however, that the BLS estimates of payroll employment, which are used to obtain these earnings, represent a count of jobs rather than of workers. Thus, the estimates of employment are overstated to the extent that persons who worked in more than one establishment during the survey period are counted each time their names appear on a payroll.[4]

Gross weekly earnings reflect the average pay of all persons, single and married, and full- and part-time workers. The take-home pay estimates, therefore, represent earnings received by a hypothetical wage earner and may, for example, differ substantially from actual earnings of a married male with three dependents, who works full time in the private nonfarm sector.

In 1970, production and nonsupervisory workers accounted for four-fifths (47.9 million) of all employees in private nonfarm industries and for approximately 60 percent of the Nation's total civilian labor force. The latter, in turn, which averaged 82.7 million in 1970, is limited to persons 16 years of age and over who are either working or actively looking for work. Consequently, it excludes many of the Nation's potential income recipients.

By contrast, the disposable income series includes the income of all persons, as well as nonprofit institutions and private trust and welfare funds. Unlike the earnings series, therefore, the income series includes income received by managerial, supervisory, and professional employees; nonsupervisory workers in all industries; the self-employed; other members of the civilian labor force; and all other individuals receiving some form of income.

As calculated, the persons-covered base of net spendable earnings is the estimate of employment of production and nonsupervisory workers in the nonfarm private economy; the per capita DPI denominator, in contrast, is the Nation's total population (which differs from the income recipients in the series). Since fluctuations in employment are sensitive to economic events while movements in total population are not, the spendable earnings base has a greater tendency to vary from 1 year to the next. The impact of this characteristic upon the trends of the two earnings series will be explored later in the article.

TAX ADJUSTMENTS. Tax deductions estimated in each series also differ substantially. The spendable earnings series is adjusted for the most important personal taxes for which deductions occur at standard rates nationwide—Federal income and social security taxes. Major taxes that vary considerably by jurisdiction, such as State and local income taxes, are excluded from the earnings methodology. Net spendable earnings are computed by the direct application to gross weekly earnings (multiplied by 52 weeks) of annualized deductions, exemptions, and applicable rates of the Federal income tax and social security taxes.[5] The appropriate tax is applied to the average figure for each industry group.

For Federal income tax estimates, the net spendable earnings series assumes that workers use standard optional deductions. Since many workers have total deductions which exceed the standard deductions, this assumption may tend to overstate taxes and thus understate the level of spendable earnings and increases in these earnings as well. As earnings rise, more workers are likely to have deductions in excess of the standard deductions. In 1968, 33 million (or 44 percent) of the 74 million individual income tax returns filed used itemized deductions.[6]

In general, the tax levy estimated for the disposable income series is much broader in scope. It includes all personal contributions for social insurance and all personal tax and nontax payments. Social insurance contributions include all payments to social security, Federal and State unemployment insurance, railroad retirement and unemployment insurance, and government retirement programs. In 1969, the only social security taxes estimated by BLS—old age, survivors, disability, and health insurance payments—accounted

for two-thirds of the overall OBE estimate of social insurance contributions.

Personal tax and nontax payments in the OBE framework include all taxes (other than social insurance contributions) and nontax payments made by individuals to all levels of government. The major levies are income, personal property, and inheritance taxes. Principal nontax payments consist of passport fees, fines, donations, and penalties.[7] Although income taxes accounted for nearly all tax and nontax payments to the Federal Government in 1969, approximately one-fifth of the total tax category did consist of payments made to State and local governments (excluded from spendable earnings coverage).

PRICE CONVERSION. As indicated earlier, both series are expressed in real terms (constant dollars) by applying the Consumer Price Index (CPI) to the spendable earnings series and the Personal Consumption Expenditure Implicit Deflator (PCED) to the disposable income series.

These two price indexes differ significantly in their respective weighting techniques. The CPI is a Laspeyres-type index in that it uses fixed quantities derived from a base year to insure that the index reflects only price changes. The weights are revised periodically, however, to maintain correspondence with changing demand patterns. Derived from direct price collection, the CPI measures price changes over time for a fixed specific "market basket" of goods and services that represents the average expenditures of urban wage earners and clerical workers, both families and single persons. Prices paid by other population groups for goods and services may be reflected by the CPI if their general expenditure patterns resemble those of urban workers' families and they buy in the same outlets.

By contrast, the consumption expenditures deflator uses current weights (conceptually a Paasche price index). As such, it reflects the influence of both price change and changes in quantity. Accordingly, it is weighted according to the proportion of income consumers currently spend on various groups of goods and services. Rather than being derived from direct price collection, the deflator is the quotient (multiplied by 100) of current consumer expenditures divided by constant dollar consumer expenditures. Consequently, the deflator is implicit in the deflation process.[8]

Table 3. Comparison of Consumer Price Index and Implicit Personal Consumption Expenditures Deflator (annual averages)

[Base year: 1957–59 = 100 (CPI); 1958 = 100 (PCED)]

Year	Consumer price index	Expenditures deflator	Year	Consumer price index	Expenditures deflator
1947	77.8	77.9	1959	101.5	101.3
1948	83.8	82.3	1960	103.1	102.9
1949	83.0	81.7	1961	104.2	103.9
1950	83.8	82.9	1962	105.4	104.9
1951	90.5	88.6	1963	106.7	106.1
1952	92.5	90.5	1964	108.1	107.4
1953	93.2	91.7	1965	109.9	108.8
1954	93.6	92.5	1966	113.1	111.5
1955	93.3	92.8	1967	116.3	114.4
1956	94.7	94.8	1968	121.2	118.5
1957	98.0	97.7	1969	127.7	123.5
1958	100.7	100.0	1970	135.3	129.2

SOURCE: **Economic Report of the President**, February 1971, pp. 200 and 249, tables C–3 and C–45.

In addition to these differences, the two indexes also differ significantly in coverage. Given the focus of the CPI upon the spending patterns of moderate-income city dwellers, certain items such as luxury goods and foreign travel are excluded from price coverage. Similarly, several items that cannot be purchased in retail markets are excluded from the CPI but are included in the deflator because they represent a claim upon resources (for example, the expense of handling life insurance and services furnished free by financial intermediaries).[9]

Despite these major differences, however, these two indexes have paralleled each other quite closely since 1947. (See table 3.) This relationship is not too surprising in that a major portion of personal consumption expenditures is deflated with CPI components. Nevertheless, the use of two essentially different price indexes has also contributed to divergent movements in data on real spendable earnings and per capita real disposable income, a point to which we will shortly return.

Trends in purchasing power

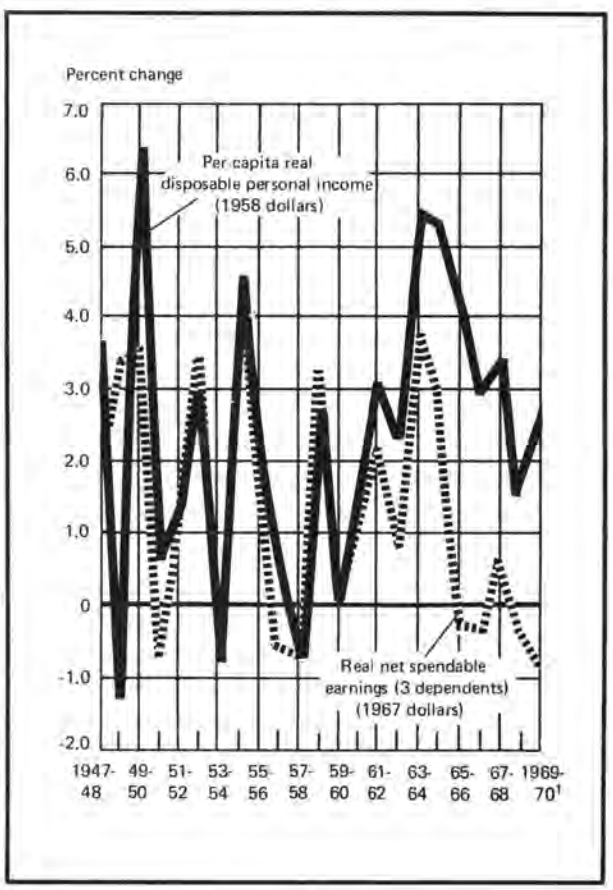
Although quite different in concept and coverage, the two series have nonetheless exhibited similarities in growth patterns throughout most of the post-World War II period. (See chart 1.) The following sections briefly summarize these major trends and present comparisons between the two series in terms of gross, after-tax, and real dollar estimates.

EARNINGS OF PRODUCTION AND NONSUPERVISORY WORKERS. The gross payroll of the Nation's

production and nonsupervisory workers in private nonfarm industries rose from $1.5 billion a week in 1947 to $5.7 billion in 1970 (an increase of 270 percent). During the early 1960's, annual percent increases in these earnings approximated those registered prior to the 1960's; since 1965, however, the annual rate of increase has been considerably higher. Adjustment of gross payroll for changes in employment, however, presents a somewhat different picture.

Although the average weekly earnings of the typical production and nonsupervisory worker have risen sharply since 1947 (from $46 to $120, or 165 percent), the annual rate of increase in these earnings has shown some signs of slowing down. Between 1947 and 1960, for example, the annual increase averaged 4.5 percent (compounded), compared with 3.4 percent between 1960 and 1967. However, the annual gain in gross weekly earnings has accelerated somewhat beginning in 1967, reflecting tight labor market conditions, as well as higher wage demands in response to rising living costs in recent years.

Chart 1. Percent change in per capita real disposable personal income and real net spendable earnings, 1947–70



The annual percentage change (compounded) in gross payroll and gross average weekly earnings of production and nonsupervisory workers, for selected time spans, was as follows:

	1947–70	1947–60	1960–70	1960–65	1965–70
Gross payroll	5.9	5.6	6.3	5.3	7.4
Gross average weekly earnings	4.3	4.5	4.0	3.3	4.7

The major factor contributing to the steady postwar advance in gross earninge has been the increase in average hourly earnings. Dips in the rate of increase of gross weekly earnings have generally reflected cyclical variations in the length of the average workweek. By contrast with earnings trends, there has been a secular downtrend in the workweek, in large part reflecting increased proportions of part-time workers. (See chart 2.)

Taxes, of course, have moderated the large increases in workers' earnings in recent years. Gross average weekly earnings, for example, rose by 3.3 percent a year in the 1960–65 period and by 4.7 percent in the 1965–70 period. After allowance for tax increases (and reductions in 1964), however, average spendable earnings rose in the two periods at more similar rates—3.4 and 4.0 percent, respectively.

The proportion of gross earnings deducted for Federal income taxes rose steadily between 1947 and 1964, reflecting the progressive aspects of such taxes. In 1964, however, the Revenue Act reduced the tax burden markedly and boosted the level of spendable earnings by over 2 percent. Consequently, gross and spendable earnings rose at about the same pace between 1960 and 1965. During the latter part of the 1960's, however, the income tax ratio again rose sharply, due in part to the tax surcharge enacted in 1968. The income tax liability of the production worker, therefore, rose by $3.85 a week (or 70 percent) between 1965 and 1970, compared with a slight increase per week between 1960 and 1965.

Rising social security taxes, meanwhile, have played a significant role in reducing workers' spendable earnings. This has been the case particularly since 1965, as sharp increases have occurred both in the tax rate and in the level of maximum taxable earnings. Consequently, social security taxes for the married production worker advanced from $3.45 per week in 1965 to $5.75 in 1970, an

increase of nearly 70 percent (compared with a 40-percent increase between 1960 and 1965).

The take-home pay of the average production worker with three dependents (that is, his net spendable earnings in current terms) has nevertheless risen steadily since 1947, increasing from $45 to $105 a week. This advance has chiefly resulted from the continuous rise in gross earnings and has occurred despite deductions of increasingly large proportions of income for social security and Federal income taxes. Taxes incurred by the married wage earner with three dependents have climbed from 20 cents out of every $10 earned in 1947 to $1.25 in 1970.

Despite a 135-percent increase in take-home pay, however, real spendable earnings for the average wage earner with three dependents have risen by only 35 percent since 1947 because of rising consumer prices in the last 20 years. Table 4

Chart 2. Trends in average hourly earnings and average weekly hours for production and nonsupervisory workers, annual averages, 1947-70

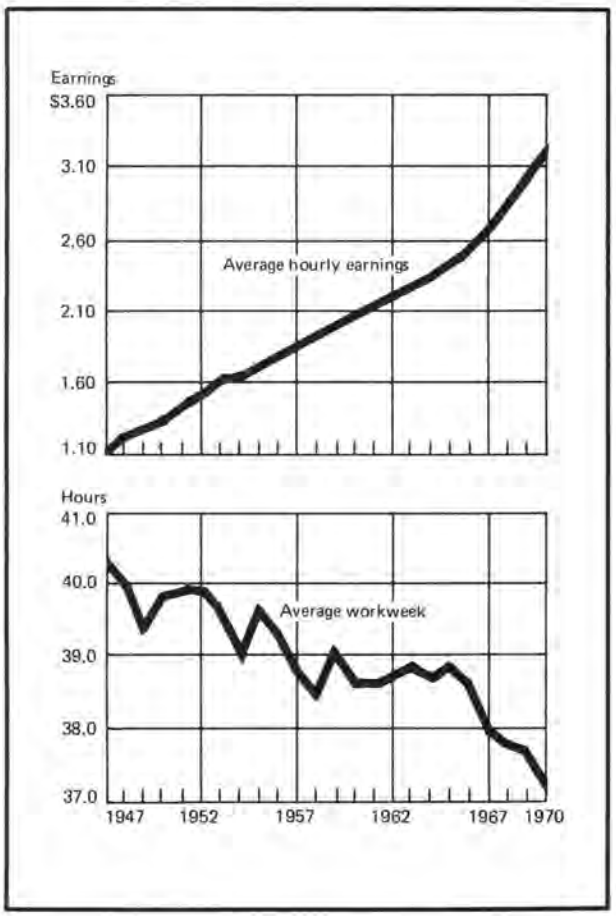


Table 4. Effects of changes in taxes and prices on gross weekly earnings of production and nonsupervisory workers with 3 dependents, 1947, 1960, 1965, and 1970

Disposition of gross weekly earnings	1947	1960	1965	1970
Gross average weekly earnings	$45.58	$80.67	$95.06	$119.78
Minus social security taxes	.46	2.42	3.45	5.75
Minus Federal income taxes	.48	5.29	5.31	9.17
Equals net spending weekly earnings	44.64	72.96	86.30	104.86
Minus price effect (1967 base)	(22.09)	(9.29)	(5.02)	14.54
Equals real net spendable weekly earnings	66.73	82.25	91.32	90.32

shows the divergence between the worker's take-home pay and purchasing power has widened considerably in recent years, as the Consumer Price Index has increased at a faster pace.

As these data clearly show, production worker's purchasing power has dropped slightly since 1965. Although reflecting in part higher taxes, this situation has primarily resulted from increases in consumer prices.[10] As shown in table 5, almost all groups of workers, with the exception of mining, construction, and service wage earners, have experienced losses in average purchasing power during these years.

INCOME RECEIVED BY ALL PERSONS. Over the last two decades, personal income has risen from $191.3 billion in 1947 to $801.0 billion in 1970, an increase of over 300 percent. Although most major components of personal income have shown rapid gains since 1960, varying rates of increase have resulted in a significant shift in the distribution of personal income. (See table 6.) Although wage and salary disbursements accounted for approximately two-thirds of personal income since 1947, a considerably larger proportion of this component is now made up of disbursements of the service industries and government. Similarly, the shares of personal interest income, transfer payments, and other labor income have also increased substantially in recent years. Since 1965, transfer payments have registered the sharpest rate of increase among personal income components, largely reflecting income flows from medicare, social security, and veterans' benefits.

Since the Nation's population has risen steadily over the last two decades, the advance in per capita personal income since 1947 has been somewhat less rapid than the gain in personal income unadjusted for population change. Nonetheless, per capita personal income registered a substantial gain since 1947, rising to $3,900 in 1970, an increase of

Table 5. Percent change in real net spendable earnings (1967 base), by major industry division, 1960–65 and 1965–70

Industry	Percent change	
	1960–65	1965–70
Total private	11.0	−1.1
Mining	11.4	3.2
Contract construction	16.3	9.9
Manufacturing	13.4	−2.5
Trade	8.8	−1.7
Finance, insurance, and real estate	11.1	−0.3
Transportation and public utilities	----	−2.7
Service	----	3.9

NOTE: Dashes indicate data not available.

SOURCE: Economic Report of the President, February 1971, tables C-32 and C-33; and unpublished data of the Bureau of Labor Statistics.

190 percent. The annual rate of increase in per capita personal income, moreover, was significantly greater during the last decade than in earlier years. Between 1947 and 1960, for example, the annual advance averaged 4.0 percent compared with 5.8 percent since 1960. In the most recent period, 1965 to 1970, per capita personal income rose at a pace nearly double that registered before the 1960's, as the following tabulation of the annual percent change (compounded) shows:

	1947–70	*1947–60*	*1960–70*	*1960–65*	*1965–70*
Personal income	6.4	5.9	7.2	6.1	8.2
Per capita personal income	4.8	4.0	5.8	4.5	7.1

Despite increasing proportions of Federal income and social security taxes, as well as sharply increased State and local tax collections, per capita disposable personal income has also made substantial gains since 1947, rising from $1,178 to $3,333 over the last two decades—an increase of

Table 6. Percent distribution of personal income, 1947, 1960, and 1970

Component	Percent distribution		
	1947	1960	1970
Personal income:			
Dollars (billions) [1]	$193.4	$410.3	$828.8
Percent	100.0	100.0	100.0
Wage and salary disbursements	63.6	66.0	65.2
Commodity industries	28.1	27.4	24.3
Manufacturing	22.0	21.9	19.2
Distributive industries	18.2	16.6	15.5
Service industries	8.3	10.1	11.7
Government	9.0	11.9	13.8
Other labor income	1.2	2.9	3.7
Proprietors' income	18.4	11.3	8.2
Rental income	3.7	3.9	2.7
Dividends	3.3	3.3	3.0
Personal interest income	3.9	5.7	7.9
Transfer payments	6.0	6.9	9.4

[1] For comparability purposes, personal contributions for social insurance have been added back into personal income.

SOURCE: Economic Report of the President February 1971, pp. 216–217, table C-17.

180 percent. The annual rate of increase, furthermore, has continued to accelerate during the last 10 years; since the mid-1960's, for example, annual increases in per capita disposable income have consistently exceeded the series' historical rate. However, the 1968–69 advance in per capita disposable income, at 5.8 percent, was almost the smallest annual increase registered during the last 6 years. This development partly reflected the tax surcharge of 1968 being in effect for all of 1969. In addition, 1969 tax payments were unusually high due to underwithholding of taxes in 1968.

Between 1947 and 1970, real income per person rose by 70 percent (from $1,513 to $2,579). Although annual increases in real per capita disposable income since 1960 have generally exceeded those of prior years, steadily rising prices in recent years have had the effect of dampening the advance in purchasing power. Between 1960 and 1965, for example, the average annual rate of increase in real per capita disposable income was 3.5 percent, compared with 2.9 percent between 1965 and 1970 as shown in the following tabulation of the annual percent change (compounded):

	1947–70	*1947–60*	*1960–70*	*1960–65*	*1965–70*
Per capita disposable personal income	4.6	3.9	5.6	4.7	6.5
Real per capita disposable personal income (1958 base)	2.3	1.7	3.2	3.5	2.9

Factors affecting comparability

Although net spendable earnings and real per capita disposable income rose at about the same pace between 1947 and 1960, there have been quite diverse movements in the annual percent change (compounded) since 1960, particularly during the last 5 years:

	1947–60	*1960–65*	*1965–70*
Real per capita disposable personal income (1958 base)	1.7	3.5	2.9
Real net spendable earnings (1967 base)	1.6	2.1	−0.2

Variations in the average annual rates of change in these two measures can be quantitatively explained by examining differences in the factors which affect them. The relevant factors are (1) personal income versus gross payroll (the numerator); (2) total population versus the number of production and nonsupervisory workers (the denominator); (3) tax ratios: disposable income as

Table 7. Factors affecting spread between per capita real disposable personal income and real net spendable earnings (worker with 3 dependents), selected time-spans from 1947 to 1970

Income items and factors	Average annual percent change (compounded)		
	1947–60	1960–65	1965–70
Per capita real disposable personal income (1958 dollars)	1.7	3.5	2.9
Real net spendable earnings (worker with 3 dependents) (1967 dollars)	1.6	2.1	−0.2
Spread between changes in the series	0.1	1.4	3.1
Factors accounting for the spread:			
1. Reduced income coverage—regular recurring earnings	0.3	0.7	0.8
2. Reduced group of income recipients in denominator—production and nonsupervisory workers	−0.7	0.4	1.3
3. Effect of different tax coverage and methodology	0.5	0.1	0.2
4. Effect of use of CPI rather than PCED	0	0.2	0.7

NOTE: See text footnote 11 for the method of estimating the figures in this table.

a percent of personal income versus net spendable earnings as a percent of average gross weekly earnings; and (4) Implicit Personal Consumption Expenditures Deflator versus the Consumer Price Index. Variations in the annual percent changes of real net spendable earnings and real per capita disposable income reflect the net effect of differing movements registered by each of these factors.[11] (See table 7.)

During the past 5 years in particular, the gap between the measures can largely be explained by different movements of total population and production worker employment. In brief, the denominator of the spendable earnings series has risen much more rapidly than the respective disposable income denominator. Since 1960, the only exceptions to this have occurred in periods of economic downturns when total population continued to increase, while the number of production and nonsupervisory workers declined (1960–61) or remained virtually unchanged (1969–70). Between 1947 and 1960, in contrast, the average annual increase in the Nation's total population exceeded average yearly gains in production worker employment (percent change, compounded):

	1947–60	1960–65	1965–70
Total population	1.8	1.5	1.1
Employment of production and nonsupervisory workers	1.0	1.0	2.5

Several factors account for these different movements in the denominators of the two series. The 1960's, particularly the last 5 years, have been relatively free of the severe recessions of the middle and late 1950's and, consequently, have experienced an almost uninterrupted advance in employment. In addition, rising participation rates among women and the entry into the labor market of youths—the post-World War II baby boom—have also accompanied rapid employment advances in the 1960's.[12] Associated with this has been an increasing proportion of part-time workers, which reduces the rate of increase in average weekly earnings.

Another important factor explaining divergences between real spendable earnings and real per capita disposable income is the relationship between personal income and gross payroll. Although their movements over the last 20 years have been similar, personal income has generally increased at a more rapid yearly pace than gross payroll. As a result, the numerator of the disposable income series has increased faster than the respective spendable earnings numerator, contributing to divergences between the two series (annual percent change, compounded):

	1947–60	1960–65	1965–70
Personal income	5.9	6.1	8.2
Gross payroll	5.6	5.3	7.4

It should be noted that adding personal contributions for social insurance back into personal income changes the average annual gains to 6.0 percent (1947–60), 6.1 percent (1960–65), and 8.5 percent (1965–70).

With the exceptions of 1962 and 1968, personal income has risen at a more rapid pace during the 1960's, partly reflecting the movements of several of the fastest growing components of personal income during these years which are completely excluded from coverage in the net spendable earnings series. For example, personal interest income and transfer payments, which together account for slightly more than a sixth of personal income, rose by roughly 10 percent a year between 1960 and 1970, compared with a 7-percent average increase for total personal income. "Other labor income," another component excluded from coverage in the earnings series, also rose by 10 percent yearly during the 1960's.

Wage and salary disbursements, as estimated in the personal income series, have also increased at a rate exceeding that of gross payroll. To some

extent, this difference may reflect the exclusion from spendable earnings coverage of income received by nonproduction workers, such as managers and professionals. It also reflects differences in industries covered by the two series. Over the past two decades, for example, the fastest growing sectors have been government (particularly State and local) and service industries. Between 1960 and 1970, income gains in these sectors combined averaged 9 percent yearly. Wages and salaries received by government workers, as indicated earlier, are excluded from the spendable earning series. It is likely that a large portion of service workers' income gains has been in commissions and tips, income items also excluded from this series.[13]

As table 5 indicates, the price deflation procedures used in the two series also help explain the divergent movements of the measures since 1965 (and, to a lesser extent, during the early 1960's). Although the two price indexes have paralleled each other quite closely since 1947, the Consumer Price Index has generally risen at a faster pace than the Personal consumption expenditures deflator. Partly due to conceptual differences such as the treatment of automotive and housing components, this has been the case in every year since 1960.[14] To some extent, moreover, this relationship between the two may also reflect the different weighting structures used in the two indexes.[15] The following shows relative trends between 1947 and 1970 in the annual percent change (compounded):

	1947–60	*1960–65*	*1965–70*
Consumer Price Index (1967 base)	2.2	1.3	4.2
Implicit Personal Consumption Expenditures Deflator (1958 base)	2.2	1.1	3.5

A fourth factor that might account for discrepancies between the two series is the differing proportion of taxes deducted from each. On balance, however, the impact of this factor over the last decade has been negligible. (See table 7.)

The proportion of taxes deducted in estimates of the spendable earnings of workers with three dependents has consistently been lower than the proportion of taxes deducted from personal income to obtain the disposable personal income series. Despite the exclusion of State and local taxes in net spendable earnings, however, its tax ratio has generally risen at a faster pace than that in the other series, tending to reduce differences between the tax adjustments. Partly responsible for this development has been the sharp rise in recent years of nontaxable income items which are included only in the disposable income series. The U.S. Department of Commerce estimates that roughly one-fifth of the personal income estimate in 1968 (or $137.3 billion) was either not taxable or taxable on a different accounting basis than that used in recording personal income.[16] Quite significantly, the largest segment of the nontaxable portion—transfer payments—has registered one of the sharpest annual increases of all personal income components in recent years.

Table 8. Comparison of disposable personal income with net spendable earnings of a worker with 3 dependents, selected years between 1947 and 1970

Year	Net spendable earnings as percent of gross weekly earnings (1)	Disposable income as percent of personal income (2)	Difference, column (1)–column (2)
1947	97.9	88.8	9.1
1954	94.3	88.7	5.6
1958	92.0	88.3	3.7
1960	90.4	87.3	3.1
1961	90.2	87.4	2.8
1962	89.6	87.1	2.5
1963	88.8	86.9	1.9
1964	90.4	88.1	2.3
1965	90.8	87.8	3.0
1966	89.7	87.2	2.5
1967	89.2	86.8	2.4
1968	88.4	85.8	2.6
1969	87.2	84.3	2.9
1970	87.5	85.5	2.0

SOURCE: Economic Report of the President February 1971, pp. 214 and 234, tables C–15 and C–32.

Although this trend in tax ratios has characterized most of the last 20 years, it has not generally been the case since 1964. Possibly reflecting the effects of the Revenue Act of 1964, the difference between the tax ratios in the two series has widened somewhat during the last 5 years. (See table 8.)

In sum, all four major factors have contributed to the divergence between the two series. Since 1965, however, the widening gap between them has chiefly reflected more rapid increases in the employment of production and nonsupervisory workers than in the Nation's total population. In addition, the use of different price indexes and the different income coverages of the two series have also had important effects on the recent movements.[17]

Summary and conclusions

As shown, purchasing power statistics published in the real net spendable earnings series do vary from figures and trends exhibited by the per

capita real income series. Although certain factors have been isolated in this study which account for these differences, the fact remains that the two series have been designed to measure different aspects of the individuals' purchasing power.

Despite its relatively narrow scope, the spendable earnings series provides a rough guide to the trend of take-home pay (expressed in current and real terms) of a particular average group of wage and salaried workers (total and by industry). As a result, the series can be quite functional in union-management wage negotiations, in developing nationwide wage policies, and in studying current economic trends, when allowance is made for its characteristics.

It is important to remember, however, that the spendable earnings data measure the take-home pay of only those workers whose pay approximates average gross weekly earnings, have the specified number of dependents, and use the standard deduction option. The series is concerned with estimating the regularly recurring pay received by the average rank-and-file worker in the private nonfarm sector of the economy when only major taxes and the effect of prices are taken into consideration. However, the series also reflects changes in the length of the workweek (as well as movements in average hourly earnings) so attention must also be focused on the impact of the workweek on earnings—which reflects, among other factors, the increasing proportion of part-time workers.[18] The average for all nonfarm industries is also affected by the changing industrial and occupationl composition of employment. Relatively greater growth occurred in such industries as trade and services, with lower-than-average earnings, which had the effect of reducing the rate of increase in the all-industry average.

To properly assess the economic well-being of the general population, however, there are a number of reasons users of the spendable earnings series should also examine other important economic indicators as well. Personal income, the starting point for the estimation of per capita real disposable income, represents a much broader income measure. Although part of the national income and product statistics of the United States, it differs from the national income aggregate in that it excludes several income items that accrue in production but are not received by persons and includes certain income that constitutes personal receipts but does not arise in current productive activity. In view of the comprehensiveness of its coverage, the after-tax counterpart of personal income—disposable personal income—represents the closest statistical approximation to overall current consumer buying power. Unlike the spendable earnings series, furthermore, both income estimates have been developed for geographical areas, thus providing a useful approximation of the dimensions of geographic markets for consumer goods and services.[19]

Despite the broad scope of disposable income estimates and their usefulness in determining trends in real income per person, these data have limited applicability in determining developments concerning the economic well-being of average wage earners. Although subdivided by industry, personal income estimates are not available by status of workers (for example, production or nonsupervisory workers). Furthermore, the inclusion of nonrecurring income items in these estimates (for example, bonuses) presents difficulties in attempting to evaluate year-to-year changes in average payroll received of production workers. It should also be pointed out that several components of disposable personal income estimates are not even available for actual spending, such as imputed income items.

In conclusion, the two series—real net spendable earnings and per capita real disposable personal income—should be viewed as separate and distinct indicators of purchasing power to be used for different purposes. In effect, the "best series" to be used depends on the purpose for which the data are needed. Although factors can be quantified which

Measuring real compensation

In addition to the series on real spendable earnings, the Bureau of Labor Statistics publishes another measure of payments to labor: real compensation per man-hour for all persons in the private economy. A companion article being prepared by Jack Alterman, Director of Economic Growth Studies, Office of Economic and Social Research, Bureau of Labor Statistics, examines real compensation per man-hour and compares that series with real spendable earnings.

account for divergence of the series, these movements are not necessarily inconsistent. In the light of developments in recent years, users of the data should be particularly aware of differences in coverage and concepts, methodology, and limitations. □

FOOTNOTES

[1] By the end of 1971, most price indexes prepared by the Government will be revised to more recent base year periods. The Consumer Price Index, for example, is now prepared using a 1967 base period, rather than 1957–59. At this time, plans are also being made to update the 1958 base period of the implicit Personal Consumption Expenditure Deflator. All information in this article that is expressed in constant dollars has been weighted according to base-year weights in use in January 1971. Trends discussed in this article will not be affected by future revisions.

[2] Average weekly hours are computed on an individual industry basis, as are average hourly earnings. Estimates of hours and earnings for the total private nonagricultural sector are averages (weighted by employment for hours and by aggregate man-hours for hourly earnings) of the figures for industries.

[3] The payroll data are dollar amounts reported on the quarterly contribution reports of private employers covered by State unemployment insurance laws. In most instances, the total compensation reported includes bonuses, the cash value of meals and lodging (when supplied), and tips and other gratuities. See "Nature, Sources, Uses, and Limitation of the Data," *Employment and Wages* (Manpower Administration, U.S. Department of Labor), Fourth Quarter 1967 and Annual Summary, pp. 92–100.

[4] Between 1956 and 1969, the number of persons holding two jobs or more ranged between 3 and 4 million and the multiple jobholding rate ranged between 4.5 and 5.7 percent. See Vera C. Perrella, "Moonlighters: their motivations and characteristics," *Monthly Labor Review*, August 1970, pp. 57–64, reprinted as Special Labor Force Report No. 123.

[5] Changes in Federal income taxes imposed by the 1970 Tax Reform Act are reflected in the formulas which were computed on a 1970 annual basis—personal exemptions raised to $625 and the surtax lowered to 2.5 percent. For a more detailed discussion of the net spendable earnings methodology, see Carol M. Utter, "The Spendable Earnings Series: A Technical Note on its Calculation," *Employment and Earnings*, February 1969, pp. 6–13.

[6] *Statistics on Income—Preliminary 1968, Individual Income Tax Returns* (Internal Revenue Service, March 1970), page 31. This point is raised in "What's Happening to Take Home Pay?" *Business Conditions* (Federal Reserve Bank of Chicago, May 1969), pp. 2–6.

[7] Unlike the formula methodology used in the calculation of net spendable earnings, the Federal sector of the disposable personal income tax aggregate is based largely on data reported by the Internal Revenue Service. For estimates of Federal personal nontax payments, Bureau of the Budget information is chiefly used. Estimates of State and local tax collections are obtained from information compiled by the Census Bureau.

[8] For a discussion of how personal consumption expenditures (purchases of goods and services by individuals and nonprofit institutions and the value of food, clothing, housing, and financial services received by them as income in kind) are developed, see "Explanatory Notes to the Statistical Series," *Business Conditions—1969 Edition* (Office of Business Economics, U.S. Department of Commerce, September 1969).

[9] The treatment of housing and automotive components (particularly used cars) represents a significant conceptual difference between the PCED and CPI. For example, the CPI treats home purchases as a consumption item and, for any particular year, current purchase prices are used. In OBE's personal consumption expenditures category, an imputed rental value for owner-occupied homes is included, as well as rent paid by tenants. Home construction (current output), rather than home purchase, is included in the Gross National Product accounts and the expenditures are placed in the investment sector.

Only a very small proportion of used car values are included in the PCED (that which represents current demand for resources) since GNP is a measure of the value of current output only. In contrast, the CPI includes used car values in proportion to the amount consumers buy. See Geoffrey P. Faux, "Measuring Changes in the General Price Level," *Supplement Prices: A Chartbook, 1953–62* (BLS Bulletin 1351–1, September 1963).

[10] Although the purchasing power of the typical factory worker has remained unchanged since 1965, some improvement in his overall economic welfare can be argued: (1) Employee benefits have been rising sharply since 1965. (2) Although taxes have risen, so have the benefits for the tax dollar. (3) The typical worker is somewhat younger today than 5 years ago, as the composition of the labor force shifts continually.

[11] The following 3 equations can be used to quantify the impact of the four factors on the spread between movements in real net spendable earnings and real per capita disposable personal income:

a. $$\left(\frac{\Delta PI}{1}\right)\left(\frac{1}{\Delta Pop}\right)\left(\frac{\Delta DPI}{\Delta PI}\right)\left(\frac{1}{\Delta PCE}\right)=\Delta RpcDPI$$

b. $$\left(\frac{\Delta GP}{1}\right)\left(\frac{1}{\Delta Emp}\right)\left(\frac{\Delta NP}{\Delta GP}\right)\left(\frac{1}{\Delta CPI}\right)=\Delta RNSE$$

c. $$(\Delta RcpDPI)\left(\frac{\Delta GP}{\Delta PI}\right)\left(\frac{\Delta Pop}{\Delta Emp}\right)\left(\frac{\Delta NP/\Delta GP}{\Delta DPI/\Delta PI}\right)\left(\frac{\Delta PCE}{\Delta CPI}\right)=\Delta RNSE$$

where

PI = personal income
Pop = Nation's population
DPI = disposable personal income
PCE = implicit Personal Consumption Expenditures Deflator

RpcDPI=real per capita disposable personal income
GP=gross payroll
Emp=employment of production and nonsupervisory workers
NP=net payroll
CPI=Consumer Price Index
RNSE=real net spendable earnings
Δ=percent change between time periods t and $t+1$.

For the equations to be strictly comparable, personal contributions for social insurance should be added to both the PI and DPI aggregates. Using this procedure, however, does not result in data which differ significantly from those found in table 7. In computations, net spendable divided by gross spendable earnings can be substituted for $\Delta NP \div \Delta GP$.

[12] See issues of *Manpower Report of the President* (Manpower Administration, U.S. Department of Labor).

[13] Movements in gross payroll and net spendable earnings for all production and nonsupervisory workers partly reflect the industry composition of the series. The total earnings estimate is an average weighted by the employment in each industry sector.

[14] See, for example, Joel Popkin, "Price changes in the first quarter of 1969 in perspective," *Monthly Labor Review*, July 1969, p. 27.

[15] During periods of rapidly advancing prices, the use of base-year weights (CPI) generally results in some overstatements of the increase in overall prices, while the use of current-year weights (PCED) tends to have an opposite effect. For example, if the price of commodity X rises at a faster pace than the price of commodity Y, some persons may begin to shift from X to Y if the items are substitutes. Since the base-year weights assume that consumers continue to purchase X and Y in the same proportions as they did prior to the price rise, the overall price rise will be somewhat overestimated. Conversely, the current-year weighted index would give greater weight to commodity Y and thus underestimate the overall price increase.

Some evidence supporting this is contained in recent analyses undertaken by the Office of Business Economics. For example, on a quarterly basis, increases in the PCED over the last 5 years have generally been less rapid than PCED computed on a fixed weighted basis (1958). See Allan H. Young and Claudia Harkins, "Alternative Measures of Price Change for GNP," *Survey of Current Business*, March 1969, pp. 47–52, and "Alternative Measures of Price Change for GNP, 1967–70," *Survey of Current Business*, August 1970, pp. 12–13.

[16] See John A. Gorman, "The Relationship Between Personal Income and Taxable Income," *Survey of Current Business*, May 1970, pp. 19–21.

[17] The relative importance of these four factors during each of the three periods may not reflect the situation for a specific year wthin a period. In 1969–70, for example, the divergence between percent changes in the series would have been larger if total population had not increased while the number of production workers declined slightly.

[18] Examination of spendable earnings data on a weekly and an hourly basis reveals the impact of changes in the length of the workweek. Between 1965 and 1969, for example, the average workweek dropped from 38.8 to 37.7 hours (all rank-and-file workers, private economy). While real net spendable weekly earnings showed no increase during this period, real net spendable hourly earnings still managed to increase, at an annual rate of 0.7 percent.

For recent studies of trends in weekly hours, see Hazel M. Willacy, "Changes in factory workweek as an economic indicator," *Monthly Labor Review*, October 1970, pp. 25–32, and Rose N. Zeisel, "The Workweek for Production Workers in the Private Economy," *Survey of Current Business*, September 1969, pp. 21–26.

[19] See Robert B. Bretzfelder, "Geographic Trends in Personal Income in the 1960's," *Survey of Current Business*, August 1970, pp. 14–22.

Blue-collar/white-collar pay trends
Compensation per man-hour and take-home pay

JACK ALTERMAN

AMONG THE WIDE VARIETY of measures of labor compensation and earnings developed and published by the Bureau of Labor Statistics, two are of particular interest as indicators of workers' economic gains: *real compensation per man-hour* of all workers in the private economy and *real spendable weekly earnings* of production and nonsupervisory workers in the private nonfarm sector. The series on compensation per man-hour permits comparisons with productivity in the private economy to determine whether labor has shared proportionately in productivity gains. The real spendable earnings measure, from which estimates of social security and Federal income taxes have been deducted, is most often used as a close approximation of weekly take-home pay (in terms of constant purchasing power) of the rank and file worker.

These two measures have taken different paths recently. Between 1965 and 1970, real compensation per man-hour of all persons in the private sector increased about 2.6 percent a year. In contrast, average real weekly spendable earnings of production and nonsupervisory workers have actually declined over this period.

Although the two measures differ considerably in concept as well as coverage, this wide disparity of movement has aroused comment and raised questions about the reasons for the difference. The following analysis attempts to provide an explanation of the factors which cause the divergent movement. In order to put the most recent changes in perspective, similar information is provided on the factors affecting the "spread" between the two series for the 1950–65 period.

The emphasis in the article is on rates of changes in the two measures rather than on their level. However, because there is some interest in the level of the spendable earnings series as an indicator of a worker's income relative to family "needs" or "standards of living," an appendix following this article discusses some limitations of that series as a measure of the level of earnings of the production worker with a family.

Jack Alterman is Director of the Office of Economic Growth, Bureau of Labor Statistics.

Compensation measure

In order to provide meaningful information on whether labor has shared proportionately in the gains in labor productivity,[1] the labor compensation measure was developed with the same coverage as the labor productivity measure. First, both measures cover the total private economy. Government is excluded because there is no adequate measure of output and, therefore, of the productivity of government.[2] In addition, total private real output reflects the labor input of all categories of workers. Thus, the productivity measure covers the man-hours of self-employed and unpaid family workers as well as wage and salary workers. Similarly, the labor compensation measure includes an estimate of the labor compensation of self-employed and unpaid family workers in addition to that of wage and salary workers.[3] Both series are measured in terms of man-hours rather than number of workers to remove the effect of changes in hours of work on the estimates of productivity and compensation.

Several other aspects of the labor compensation measure should be mentioned before turning to a brief description of how it differs from the weekly spendable earnings series. First, in addition to the payroll of wage and salary workers and an estimate of earnings of proprietors and family workers, the labor compensation measure also includes payments by employers for social security and private pension, health, and welfare funds which are for the benefit of workers. This is done

in order to distinguish payments in behalf of labor from nonlabor payments—profits, interest, rental income, share of proprietors' income which represents return on investment, capital consumption allowances, and indirect business taxes. In addition, since the productivity measure refers to constant dollar output per man-hour, compensation per man-hour is likewise adjusted to reflect earnings in constant purchasing power.[4]

Finally, the compensation per man-hour measure is affected by shifts of workers from low paying to higher paying jobs. For example, the overall average hourly compensation measure could change even without changes in the levels of hourly compensation among component groups of workers if enough workers shifted from lower-paying to higher-paying jobs. Shifts of workers from low to high productivity jobs would have the same effect on the productivity measure.

Real spendable earnings

Like the real compensation measure, the real spendable earnings series, which provides an approximation of average take-home pay of production or nonsupervisory workers, reflects earnings after adjustment for changes in the Consumer Price Index. However, it differs in a number of ways from the compensation per man-hour measure. First, it is limited to the private nonfarm sector. Second, it covers only production and nonsupervisory wage and salary workers, thus excluding self-employed, nonproduction and supervisory workers, domestic workers, and government enterprise workers (considered part of the private economy in the national income accounts). Third, since it deals with weekly rather than hourly earnings it is affected by changes in the length of the workweek and the proportion of persons working part time. Fourth, it excludes employers' contributions to public and private pension, health, and welfare funds. Lastly, it measures income after deductions for social security and Federal income taxes. However, deductions are not made for State personal income taxes because State taxes vary so much it would not be useful to apply an "average" State tax rate. Tax deductions are developed for two different categories: a worker with no dependents and a married worker with three dependents. To simplify our analysis and because most interest is in the measure dealing with the married worker with a family, this article focuses on that spendable earnings variant.[5]

Comparison of changes

How does the trend in the real compensation per man-hour series compare with that in the real spendable earnings series? The comparison is given in table 1 which provides estimates of annual rates of change for both series, covering the most recent 5-year period, 1965–70, the earlier 1950–65 period, and 5-year subperiods within the 1950–65 period. Several conclusions emerge from the figures in table 1. First, the gains in real take-home pay have been substantially lower than those for compensation per man-hour in all periods, with the largest difference appearing during the last 5 years.

During the 1950–65 period, when the increase in real compensation per man-hour averaged about 3.1 percent a year, real spendable earnings increased on the average, by slightly more than half that rate: 1.6 percent a year. In contrast, over the past 5 years, real hourly compensation dropped to 2.6 percent a year (due to the 1969–70 slowdown), while real spendable earnings showed an actual decline in the annual rate of change: −0.2 percent. As a result, the difference between the two measures rose to 2.8 percentage points a year, almost double the earlier difference of 1.5 percentage points.

Second, there is considerably more variation in the rate of change from one subperiod to the next in the real spendable earnings series than there is in the real compensation per man-hour measure. The subperiod rates for the compensation series remain close to its long term average of about 3 percent, while the rates for the spendable earnings

Table 1. Average annual rates of change [1] in two measures of labor earnings, 1950–70

Labor earnings measures	1950–65	1950–55	1955–60	1960–65	1965–70
Real compensation per man-hour (total private economy)	3.1	3.2	3.0	2.9	2.6
Real spendable earnings (private nonfarm economy nonsupervisory workers with 3 dependents)	1.6	1.8	.8	2.1	−.2
Difference	1.5	1.4	2.2	.8	2.8

[1] Compound rate of change between first and last year of period covered.

measure seem to follow a cyclical pattern with periods of relatively high rates of increase followed by periods of sharply reduced gains. The 1.8-percent rate of increase during 1950–55 was followed by a drop to 0.8 percent a year, in the 1955–60 period. A sharp recovery to a yearly rate of 2.1 percent in the 1960–65 period was followed by a decline in real take-home pay during 1965–70.

What factors might explain the divergent behavior of the two series? Changes in consumer prices, particularly since 1965, do not offer an explanation because both series are deflated by the same measure—the Consumer Price Index.

Since the two series differ in coverage in several important respects, the lower increase in take-home pay of the rank and file worker with three dependents compared with the gain in compensation per man-hour of all workers in the private economy must be found in one or more of the following factors:

1. Hourly earnings in the farm sector may have increased more than those of production and nonsupervisory workers in the private nonfarm sector.

2. The imputed hourly earnings of self-employed and unpaid family workers may have increased more than those of production and nonsupervisory workers.

3. Employer contributions to social security and private pension and welfare funds, included in the compensation measure, may have increased more than hourly pay.

4. Hourly pay of workers included in the compensation measure but not in the spendable earnings measure (nonproduction workers, supervisory employees, domestic workers, and government enterprise workers) may have increased more than that of production and nonsupervisory employees.

5. Average weekly hours may have declined so that weekly pay increased less than hourly pay.

6. Social security deductions from employees' paychecks may have increased as a proportion of weekly pay, causing spendable (after-tax) earnings to increase less than before-tax earnings.

7. Deductions for Federal income tax may have also increased as a proportion of pay, causing after-tax earnings to increase less than before-tax earnings.

Our analysis starts with the more comprehensive measure—real compensation per man-hour—and in seven additional stages will cover successively narrower definitions of earnings finally arriving at the real take-home pay of the worker with three dependents.[6] The eight measures of earnings, arranged in descending order of coverage, are shown in table 2 with the rates of change for selected periods.

Table 2. Average annual rates of change, various measures of labor earnings, 1950–70

Labor earnings measures	1950–65	1950–55	1955–60	1960–65	1965–70
TOTAL PRIVATE ECONOMY					
Real hourly compensation—all persons	3.1	3.2	3.0	2.9	2.6
TOTAL PRIVATE NONFARM					
Real hourly compensation—all persons	2.8	3.0	2.7	2.6	2.1
Real hourly compensation—employees	2.8	3.1	2.7	2.5	2.1
Real hourly wage and salary—employees	2.5	2.9	2.3	2.2	1.8
TOTAL PRIVATE NONFARM—PRODUCTION AND NONSUPERVISORY EMPLOYEES					
Real hourly earnings	2.3	2.8	2.1	1.9	1.4
Real weekly earnings, before Federal tax	2.1	2.7	1.5	2.0	.5
Real weekly earnings, after Federal tax—					
After social security tax	2.0	2.6	1.3	1.9	.3
After social security and Federal income tax (real spendable earnings of worker with 3 dependents)	1.6	1.8	.8	2.1	−.2

The difference between the rates of change of the measures, shown in table 2, are then used to obtain estimates of how much each item included in the broader measure (but excluded from the successively narrower measures) contributed to the overall difference. The results of this analysis are shown in table 3.

1950–65 changes

The figures in table 3 are quite revealing in explaining the large disparity in movement

Table 3. Factors "explaining" spread between compensation per man-hour and real net spendable earnings, selected periods, 1950–70

Earnings measures	1950–65	1950–55	1955–60	1960–65	1965–70
Real hourly compensation—all persons, total private economy (average annual rates)	3.1	3.2	3.0	2.9	2.6
Less (in percentage points):					
Real hourly compensation, all persons, farm	.3	.2	.3	.3	.5
Real hourly compensation, self-employed, total private nonfarm	.0	−.1	.0	.1	.0
Employer contribution to social security funds, etc., total private nonfarm	.3	.2	.4	.3	.3
Real hourly wage and salary—nonproduction and supervisory employees, domestic workers, government enterprise workers	.2	.1	.2	.3	.4
Weekly hours, production and nonsupervisory employees, total private nonfarm	.2	.1	.6	−.1	.9
Social security tax deductions	.1	.1	.2	.1	.2
Federal income tax deductions	.4	.8	.5	−.2	.5
Equals (average annual rates):					
Real spendable earnings, after tax deductions, production and nonsupervisory employees (worker with 3 dependents)	1.6	1.8	.8	2.1	−.2

NOTE: Figures with no sign indicate that the change increased the gap between the earnings measures. Figures with minus sign indicate that the change in a particular factor reduced the gap, e.g., weekly hours increased rather than declined.

between the two series in the 1965–70 period compared with the earlier 5-year periods. From 1950–65, the compensation measure increased by 3.1 percent a year, the spendable earnings series by 1.6 percent, leaving a difference of 1.5 percent a year. One percentage point of the 1.5-percentage-point difference was accounted for by three factors—the increase in Federal income taxes (0.4 percentage point a year), growth relative to payrolls in employer contributions to social security and private funds (0.3 percentage point a year), and the greater increase in hourly compensation for the total private economy than for the nonfarm sector (0.3 percentage point a year).

The growth in Federal income tax as a proportion of earnings is due to a combination of the change in tax rates and the progressive nature of the tax structure (including allowances for exemptions and standard tax deductions) as income rises. For the 1950–65 period, computations based on the assumption of $100 average weekly earnings for each year indicate that the entire increase in Federal income tax deductions relative to earnings of the worker with three dependents was due to the progressive nature of the Federal income tax system, not to increased tax rates.

Regarding employer contributions to public and private pension, health, and welfare funds, and so forth, this accounted for more than the contributions of employees to social security funds alone. This result is not due to any difference in the contributions to social security funds which are shared equally by employers and employees (except for unemployment insurance funds which are paid for solely by employers), but is due primarily to the inclusion in contributions by employers of payments into private pension and welfare funds whereas the employee contributions are limited to social security funds.

The third factor is the larger increase in hourly compensation for the total private economy, which includes the farm sector, than for the private nonfarm sector. This could be due either to hourly compensation having risen faster in the farm sector than in the nonfarm sector or to enough workers having shifted out of relatively low-paying farm work into higher-paying nonfarm work, with the result that the average increase in the total is greater than that for either sector. With regard to such shifts, estimates developed by the Office of Productivity and Technology of the Bureau of Labor Statistics indicate that over the postwar period, shifts of workers from low-productivity farm jobs to higher-productivity nonfarm jobs accounted for about a tenth (0.3 percentage point) of the overall increase in productivity of about 3 percent.[7] It is highly likely that the farm-nonfarm shift also accounts for the 0.3 percent a year difference between the increase in hourly compensation in the total private sector and in the private nonfarm sector. Analysis of the underlying data supports this conclusion since estimates of farm compensation per man-hour for the 1950–65 period do not indicate a larger increase than for nonfarm compensation per man-hour.

Other factors, 1950–65. Three other factors contributed to a lesser extent (0.5 percentage point) to the overall difference between the two series. These were a reduction in weekly hours which reduced weekly pay relative to hourly pay; an increase in social security tax deductions; and an increase in the average hourly pay of all private nonfarm employees relative to the hourly pay of production and nonsupervisory workers. The latter effect may have occurred due to an increase in the proportion of nonproduction and supervisory workers, who have higher pay scales on the average. Analysis of the underlying data supports this inference since the estimates indicate a higher rate of increase in the hourly earnings of nonproduction workers only in the 1960–65 period.

The seventh and last factor, the hourly compensation of self-employed persons in the private nonfarm sector, had negligible effect in explaining the difference between the compensation and spendable earnings measures. This, however, is to be expected since the estimate of earnings for the self-employed is not based on independent data. Rather, it is based on the assumption that they get the same hourly pay as employees in their individual sectors.

Variations among subperiods, 1950–65

Of the seven items which account for the difference between the measures of earnings, most showed relatively little variation in the rate of change from one 5-year subperiod to the next. The exceptions were weekly hours of production workers and Federal income tax deductions. Both of these varied substantially from one subperiod

to the next. The contribution of the change in weekly hours to the total difference ranged from 0.6 percent a year in the 1955–60 subperiod as weekly hours declined toward the latter part of the subperiod and then picked up during 1960–65, reducing the contribution to the overall difference by −0.1 percentage point a year. (A minus sign in the analysis of the divergent trends of the earnings indicates that the particular factor reduced the gap between the measures, for example, weekly hours increased, resulting in growth in weekly earnings relative to hourly earnings.) Part of the reason for this swing in the rate of change in weekly hours was due to changing proportions of part-time and full-time workers. There has been a gradual increase of part-time work since World War II associated with increasing labor force participation of women. This has accounted for part of the long-term decline in average hours of work. However, most of the sharp changes in average weekly hours from one subperiod to the next was due primarily to changes in scheduled hours of work and overtime hours, rather than to the changing mix of the work force.

The contribution of Federal income tax deductions to the gap between the series was 0.8 percentage point a year in 1950–55. This was due in part to an increase in tax rates during the Korean War. It declined to 0.5 point a year in 1955–60 and to −0.2 point a year in 1960–65. The sharp 1960–65 decline was due to reductions in tax rates under the Tax Revenue Act of 1964, which more than offset the progressive structure of the tax system. Variations in weekly hours and Federal tax deductions accounted for much of the differences between the two earnings series during 1950–65, and, as we shall see, were also responsible for a substantial part of the decline in spendable earnings since 1965.

1965–70 changes

Turning to the more recent period, 1965–70, we find that the gap between the rates of increase in the compensation and spendable earnings measures almost doubled, going from 1.5 to 2.8 percentage points. (See table 3.) Two factors accounted for almost half of the difference (1.3 points) between the two series during 1965–70. These were the sharp decline in weekly hours of production workers, due in part to the increase in part-time workers, and the increase in Federal income tax deductions which resulted in a reduction in the take-home pay of production and nonsupervisory workers. A third factor—the increase in employee contributions for social security—also led to a decline in real take-home pay, but this factor, though more important than in earlier years, was not as important as the increase in Federal income tax deductions.

The effect of these three factors on weekly take-home pay during the 1965–70 period represents a sharp reversal of their combined effect during the previous 5 years, 1960–65. During that period, which saw a strong expansion of economic activity, weekly hours actually increased, with only a slight increase in social security taxes and a reduction in Federal income taxes. The result was that the three factors combined contributed to a reduction of the spread between the compensation and spendable earnings series during the 1960–65 period (−0.2 percentage point a year) by narrowing the gap between production worker hourly pay and spendable earnings. In contrast, they contributed an unfavorable 1.6 percentage points to the spread between the series during 1965–70, thus widening the gap between take-home pay and before-tax hourly pay. This represented a reversal of almost 2 percentage points a year in their combined effect on real spendable earnings.

Employer contributions to social security and private pension and welfare funds contributes about the same to the difference in the earnings measures in the recent period as in the earlier years: 0.3 percentage point a year.

In contrast to earlier periods, there is some indication that higher rates of increase in hourly earnings of workers other than production and nonsupervisory employees accounted for part of the widening spread between the two series. The difference between the rates of increase in real hourly compensation of all workers (including farm) in the total private economy relative to nonfarm rose from 0.3 percentage point a year in earlier periods to 0.5 percentage point a year in 1965–70. (See table 3.) The higher rate reflects faster growth in hourly earnings of farm workers (0.2 percentage point) and shifts of farm workers to nonfarm jobs (0.3 percentage point). Within the nonfarm sector, the increase in the real average hourly earnings of nonproduction workers, supervisors, domestic workers, and workers in government enterprises accounted for 0.4 percentage point a year of the

difference between the two series during 1965–70. In contrast, it accounted for only 0.2 percentage point a year of the difference during the 1950–65 period. The data indicate that the real hourly pay of nonproduction workers and supervisors rose more than that of production workers during the 1965–70 period.[8]

Our analysis of the underlying data indicates that about half of the 0.4 percentage point difference in rates of increase in hourly earnings of all workers in the private nonfarm sector, relative to production workers, is due to shifts of workers among four groups with different rates of pay: nonproduction and supervisory employees, domestic workers, government enterprise employees, and production and nonsupervisory employees. This would still leave about half of the total difference attributable to higher rates of gain in hourly earnings of nonproduction workers. The combination of the latter's higher rate of increase in earnings (0.2 percentage point) with that of farm workers (0.2 percentage point) would indicate that a small part of the disparity between the two series since 1965 was due to other workers receiving higher rates of increase in hourly earnings than production workers.

Conclusions and prospects

The explanation for the decline in real spendable earnings since 1965 relative to previous trends in the measure and to the more comprehensive measure of earnings—real compensation per man-hour of all workers in the private economy—can now be summarized.

The most important factor contributing to the decline in spendable earnings (take-home pay) was the reduction in hours of work. This factor accounted for 0.9 of a percentage point of the reduction in weekly earnings, 4 times as much as the average for the 1950–65 period and a sharp reversal from the earlier expansionary period of 1960–65 when average weekly hours increased. Part of the reduction in hours during 1965–70 was related to the increase in part-time work, but most of it was related to the decline in scheduled hours and overtime associated with a slowdown in economic activity.

A further explanation of the recent decline in spendable earnings of production workers lies in the fact that the real average earnings of all workers in the private sector increased less between 1965–70 than in the past. The longer term rate of increase for the more comprehensive compensation measure was 3.1 percent a year; the increase during the recent period dropped to 2.6 percent a year—a difference of 0.5 of a percentage point. This reduction was due entirely to the slowdown which occurred during 1969–70. This slowdown was associated with a corresponding reduction in real output per man-hour which declined from the long-term rate of 3.1 percent to 2.1 percent during 1965–70, with almost the entire reduction attributable to the poor performance of productivity during 1969 and 1970. The reduction in productivity gains was, in turn, associated with the general slowdown in economic activity toward the end of the decade.

An additional reason for the recent decline in real spendable earnings was the fact that nonproduction and other groups of workers were able to increase their earnings relative to the gains for production and nonsupervisory workers. Much of the apparent gains for the other group of workers reflected shifts in the relative distribution of workers from lower to higher paying jobs. However, even if such shifts are excluded, there is some indication that increases in earnings for production and nonsupervisory workers lagged behind those of other workers.

Part of workers' "earnings" are in the form of employers' contributions to social security and private pension and welfare funds. These continued to increase faster than payrolls and are included in total compensation but not in take-home pay. However, the contribution of this factor to the relative decline in take-home pay was no higher during 1965–70 than in the past.

The increase in employees' contributions to social security funds due to increased rates and maximum taxable earnings subject to social security tax resulted in a further reduction in take-home pay relative to before-tax earnings. The contributions of production workers to social security funds accounted for 0.2 of a percentage point of the relative decline in take-home pay. However, when this is added to an equal contribution by employers, the total contribution for social security funds accounted for 0.4 percentage point of the decline in spendable earnings relative to compensation per man-hour.

Finally, Federal income tax deductions increased somewhat compared to the average for the 1950–65 period as a whole, but represented a sharp increase

from the 1960–65 period when income tax deductions declined—in part due to the 1964 tax cut—relative to before tax earnings.

We have noted that the spendable earnings series seems to follow a cyclical pattern, in which periods of relatively good gains in take-home pay in constant dollars alternate with periods of relatively small or no gains. Much of this cyclical pattern is associated with changes in the rate of economic growth and activity, particularly as it may affect hours of work. As the economy recovers from the recent slowdown and returns, over the next few years, to a more expansionary growth path, hours of work may be expected to stabilize at their present level and then increase, following the usual pattern in recovery periods. In addition, the less-than-average growth in real compensation per man-hour in the 1965–70 period, which was associated with the less-than-average increase in both output and labor productivity may also be expected to return to the longer term growth path as output and productivity gains return to normal.

Regarding deductions for social security funds and Federal income taxes, the changes already incorporated into existing legislation are in offsetting directions. Social security deductions are scheduled to increase in 1971 and in the next few years as the tax rate will go from 4.8 percent in 1970 to 5.2 percent in 1971, with the maximum taxable income remaining at $7,800 in 1971 but increasing to $9,000 in 1972. The effect of these changes on the divergence between hourly compensation and spendable earnings is substantial since the increase in employees' deductions for social security funds is matched by employers' contributions.

Fortunately, changes in Federal income tax deductions resulting from the 1969 legislation will tend to offset part if not all of the increase in social security tax deductions. The changes in Federal income tax deductions include the elimination of the 2.5-percent surtax (annualized rate) in 1971, the increase of the personal exemption to $650 in 1971 and $750 by 1973 and the raising of the standard deduction to 13 percent with a $1,500 maximum. Although part of the effect of these changes will be nullified by the progressive tax structure as money earnings increase, the net effect should still be to reduce Federal income tax deductions as a percentage of before-tax income, or at the very least, keep it from increasing.

On balance, if the economy returns to its long-term growth path, with some recovery or at least no further declines in hours of work, and taking account of changes incorporated in social security and income tax legislation, there is a reasonably good prospect that the rate of increase in real spendable earnings of production workers will recover from its poor performance in the 1965–70 period, returning to the longer term gains of between 1.5 and 2.0 percent. □

———*FOOTNOTES*———

[1] Although there have been year-to-year and subperiod variations, the rate of increase in real compensation per man-hour has, in fact, kept up with the growth in real output per man-hour taking the last two decades as a whole. The rates are 3.1 percent a year for both, based on the "least squares" method of calculation which removes much of the effect of cyclical changes on the estimated average rates of increase over the period. The rates are somewhat lower but still close—2.9 percent for real compensation per man-hour and 2.8 percent for labor productivity—when computed by an alternative method, the compound rate of increase between the first and last years of the period. The lower rates are due largely to the slowdown in compensation per man-hour and productivity during the last 2 years. If the last 2 years are excluded, the compound rate of increase between 1950 and 1968 is the same as the "least squares" rate—3.1 percent a year for both measures.

[2] In the national accounts, productivity growth in general government is assumed to be zero; output is equated with employment.

[3] A separate measure is provided for compensation of all employees, omitting self-employed and unpaid family workers.

[4] The price deflators used to convert current dollar estimates of private output and labor compensation are not the same. Separate deflators are used consistent with the coverage and purpose of the deflation procedure. The deflator for total private output is the implicit price index in the national income accounts for goods and services produced by the private economy. The deflator used to convert weekly earnings into dollars of constant purchasing power is the BLS Consumer Price Index which covers the price change of consumer goods and services purchased by city wage earners and clerical workers. For more information on the labor productivity and real compensation per man-hour series see *Handbook of Methods for Surveys and Studies* (BLS Bulletin 1458, October 1966), and the Bureau of Labor Statistics *Quarterly Report on Productivity, Wages and Prices.*

[5] For a more detailed description of the real spendable earnings series, see Paul M. Schwab, "Two measures of purchasing power contrasted," *Monthly Labor Review,*

April 1971, and the technical note on the series in the February 1969 issue of *Employment and Earnings*.

[6] Since the difference between the two measures represents a number of items included in the more comprehensive compensation series but excluded from the more narrowly defined spendable earnings measure, the analytical procedure followed is to remove one item at a time from the compensation measure. The difference between the rates of change at each successively narrower definition of earnings provides an approximation of the extent to which each of the definitional differences has contributed to the overall disparity of movement between the measures. This approach has the advantage of implicitly taking into account both the change in the item in question, for example, social security taxes, as well as its relative importance as a component of earnings. It should be noted that the observed differences can only be considered approximations because of two factors: data for the various measures of earnings may not be entirely consistent with each other and shifts in the composition of the work force may affect the estimates at each level of the analysis.

[7] Jerome A. Mark, "Wage-Price Guidepost Statistics; Problems of Measurement," a paper presented at the American Statistical Association meetings, Pittsburgh, Pa., August 20–22, 1968.

[8] This finding must be considered tentative. It requires further investigation since the estimate of earnings of nonproduction workers and supervisors is not a direct measure, but is derived as the difference between two sources of earnings data—national income accounts data on the earnings of all employees in the private nonfarm sector, and BLS data on earnings of production and nonsupervisory employees in that sector. There were about 48 million production and nonsupervisory workers in 1970, almost four-fifths of all employees (including domestics and government enterprise workers) in the total private nonfarm sector. Although both sets of data are benchmarked to the same system—the unemployment insurance reports on employment and payrolls of covered employees—there is still some possibility of statistical differences between estimates of payrolls for the two groups by the Office of Business Economics and the Bureau of Labor Statistics. This difference could, therefore, affect the derived measure of earnings of the residual group: nonproduction and supervisory workers. The estimate for this group also includes two other smaller categories of employees—domestic workers and government enterprise workers—because they are included in the Office of Business Economics payroll estimates for all employees in the total private nonfarm economy. They are excluded, however, from the BLS payroll estimates of production workers. For more information on relative increases in the earnings of workers, classified by broad categories of occupations, see Arthur Sackley and Thomas W. Gavett, "Analysis of occupational differences," and Robert L. Stein and Janice N. Hedges, "Earnings and family income," in this issue.

APPENDIX: Earnings of the production worker with a family

ONE MEASURE of earnings published by the Bureau of Labor Statistics is the series on average spendable earnings (take-home pay) of the production or nonsupervisory worker with three dependents. This measure is used as an approximation of the take-home pay of the married rank and file worker with a wife (who is not in the labor force) and two dependents. It is computed by deducting estimates of social security and Federal income taxes from the average weekly earnings of all production and nonsupervisory workers in the private nonfarm sector of the economy.

The major interest in and use of the spendable earnings series is as an indicator of the change in the take-home pay of production workers. The article dealt with this facet of the series in analyzing the reasons for the differential rates of change in real spendable earnings and real compensation per man-hour. There is some interest, however, in the *level* of the spendable earnings measure as a basis for comparison with indicators of needs or standards of living. When used in this fashion, the spendable earnings measure needs some qualification and clarification.

The principal qualification relates to the necessity to distinguish between the average earnings of *all* production and nonsupervisory workers and the average earnings of male workers with families (wife and two dependents). The average earnings of all workers include single and married workers, female and male workers, part-time and full-time workers. For various reasons (to be discussed shortly), the average earnings of a male worker with a family are higher than the average earnings of all workers. However, because the data on average weekly earnings do not provide separate information on earnings by these categories, that is, part-time and full-time workers, the spendable earnings series is derived by using the average earnings of all production workers as the base for the computations and then making social security and Federal tax deductions appropriate for a married worker with a wife and two dependents. The deduction for social security tax is straightforward and is derived by applying the social security tax rate to the maximum amount of earnings subject to social security tax. The deduction for Federal income tax makes allowances for the number of exemptions (four), uses the standard deduction to arrive at taxable income,

and applies the appropriate tax rate for a married man (head of household) filing a joint return.

This procedure understates the level of after-tax earnings because the base for the computations—the before-tax earnings of all production workers—is lower than that of the married man with a family. It is believed, however, that the method does provide a useful indicator of the change in take-home pay relative to the change in before-tax earnings, even though the level may be too low.

However, because of the keen interest in the level of earnings of the rank and file worker with a family, this note provides such an estimate. It has already been indicated that the earnings of the married production worker with a family is higher than the average earnings of all production workers. There are at least three reasons for this:

1. He is more likely than the average to be a full-time worker. Only about 4 percent of married men in 1969 worked at part-time jobs compared with almost 19 percent for all workers.

2. The married man with a family is more likely than women or single men to be employed in higher-paying occupations or higher-paying levels within occupations.

3. The BLS estimate of average weekly earnings of all production workers refers to earnings per job, not earnings per worker. The average weekly earnings per job figure would, therefore, understate the earnings of individual workers who had more than one job. In fact, married men are somewhat more likely than the average to have a second job with the additional earnings that implies. The multiple jobholding rate of married men was about 8 percent in May 1969.[1]

Information on earnings of individual workers is collected annually by the Bureau of the Census as part of its household surveys of income of families and persons. Information from these surveys can be used to develop approximate estimates of the before-tax annual earnings of the average production worker with a nonworking wife and two dependents. Such estimates can be compared to the BLS earnings figures to determine whether the factors indicated result in a substantially higher estimate of earnings per worker than the average earnings per job of all production workers.

The estimate derived from the census income surveys can only be considered an approximation because the household surveys are based on unverified responses from individuals, not payroll records as is the case with BLS data. If this results in an error in the estimate, however, previous work on the subject suggests that it would result in too low rather than too high an estimate. In addition, the estimate is based on occupational data which do not precisely match the BLS coverage of nonfarm production and nonsupervisory employees. It is derived as the average annual earnings of all full-time year-round male workers in the following occupations: clerical workers, sales workers, craftsmen and foremen, operatives, service workers, and nonfarm laborers. Excluded are farm workers, professional and technical workers, managers, officials and proprietors. The coverage is not exactly comparable to the BLS coverage of production workers because some professional and technical workers, who were excluded, would be considered nonsupervisory workers in the nonmanufacturing divisions and should have been included, and some clerical, sales, foremen, and so on, should have been excluded. Government employees in clerical occupations and other included occupations were also left in. To be strictly comparable, they should have been excluded.

There is a final qualification of the estimates. Since the BLS series is on a weekly basis and the census information refers to annual earnings, the BLS earnings had to be multiplied by 52 weeks to derive an annual estimate of earnings. This assumption implicit in this computation is reasonably consistent with the actual situation. A survey of work experience of the population in 1968 indicated that about 85 percent of married men, wife present, in the age group 25–64 worked at full-time jobs for the full year.

It should be noted that the estimate of earnings based on the census data is limited to the earnings of the husband and does not include the earnings of a working wife. In March 1970, about 40 percent of married women had earnings, with a higher proportion (49 percent) at work if the children were 6 years or more and a lower proportion (30 percent) if the children were under 6 years. Estimates developed by Robert L. Stein and Janice N. Hedges (see the article in this issue) indicate that earnings of working wives added about 23 percent to earnings of husbands in 1969.

A comparison of the two estimates for the year 1969 indicate that the annual before-tax earnings of the year-round full-time production male worker with a family is substantially higher—about 50 percent—than the before-tax earnings per job of all production workers, on an annual basis. The estimate based on the BLS series is about $6,000, the preliminary figure derived from the census

income survey is about $9,000. The latter estimate should be considered as tentative, pending further refinement as part of continuing research on the subject. However, the difference based on this estimate is sufficiently large that it points to the conclusion that the BLS series on the average earnings of all production workers is too low as an approximation of the before-tax earnings of an average production worker with a family. It follows, that the after-tax earnings estimate—spendable earnings—is also too low although by not quite the same margin because the income tax rates go up with a higher level of earnings and would result in a more than proportionate increase in income tax deductions due to the progressive nature of the Federal income tax structure. □

FOOTNOTE

[1] In this latter connection, it should be pointed out that the BLS data on earnings are based on payroll reports of establishments. These reports cover the average number of "jobs" and their related pay, not the number of separate individuals who may have worked during the period. Under such a reporting system, a person who has more than one job would be counted separately on each of the jobs he held and his earnings would be included, not as the sum of all his earnings, but as earnings on each job. The result is that earnings per worker would, of course, be higher than earnings per job. The BLS measure of earnings per job is useful for many purposes, but should not be confused with estimates of earnings per worker. The latter type of estimates can be derived from the Bureau of the Census surveys of family and individual income, used to make estimates in this appendix.

Exploring the distribution of earned income

Analysis of Census data covering a period of steadily rising incomes shows slight but persistent trend toward inequality; some reasons examined

PETER HENLE

"WHO GETS how much and why?" This question, one that has troubled philosophers since the beginning of time, has received increasing public attention in recent years. In its modern form, it frequently becomes translated into discussions over antipoverty legislation or welfare reform, both affecting the lower end of the income scale, or tax reform, affecting particularly the upper end of the economic ladder.

In addition to the debates over the merits of such specific proposals, increasing attention has been given to the economic issues raised by the general shape of the income distribution: that is, the manner in which total income is divided among all families or individuals. Economists have tried to answer such questions as, what degree of equality should be sought? Can the distribution of income be linked to an individual's own decisions in terms of schooling, training, and effort? To what extent, on the other hand, is the distribution the product of differences in innate ability, family background and position, social and political influence, or the operation of chance? To what extent is that distribution altered by advance in technology or the operation of the business cycle? Finally, to what extent can the distribution be modified by law or institutions, including tax policy, minimum wages, or collective bargaining? [1]

Even a cursory investigation into these questions can quickly become frustrated for lack of appropriate data. For a thorough assessment, information is needed not only for the distribution of income at any one point in time, but also to follow individuals and families through their lifetimes. Yet there is little or no data on lifetime income, and while several sources provide data from which income on an annual basis can be analyzed, each has its weaknesses.[2]

This article focuses on only one aspect of the broader question. It deals with the distribution among individuals of earned income, before taxes—the sum of wages and salaries (also considered separately) and earnings from self-employment. Part I presents some new data, indicating a slow but persistent trend toward greater inequality in a period, 1958–70, of steadily rising incomes. Part II identifies three types of economic forces that could be responsible for this trend and weighs their significance.

I—Trends in Distribution, 1958–70

Through the cooperation of the Census Bureau, two types of distributions were obtained: (1) total earnings (including earnings of the self-employed) among earnings recipients, and (2) wage and salary income.[3] In an effort to concentrate attention on the compensation received for full-time employment, data were obtained for men only, both for all men and separately for year-round full-time workers, and by occupation and the industry in which the recipient worked longest during the year. Annual data were obtained covering 1958 (the first year for which such breakdowns were available) to 1970. Complete distributions of income were obtained for each year, including the proportion of income received by successive quintiles of recipients ranked by income, and the Gini index, a statistical indicator that shows how the distribution varies from true equality.[4]

These distributions were sought for two reasons. They might cast light on recent trends in the distribution of total income, since earnings constitute over 75 percent of the total. In addition, an examination of the earnings distribution itself, with separate data for occupations, industries, and those most directly involved in the employment process (male year-round full-time workers), might provide some clues to the evolving character of the American economy, and, more specifically, the nature of its distribution process.

Data results

The resulting data provide information on the structure of earnings (or wages and salaries alone)

Peter Henle is Senior Specialist, Labor, for the Library of Congress. This article was prepared while he was Federal Executive Fellow at the Brookings Institution, on leave from the U.S. Department of Labor.

at a given point in time and also on the trend in such distributions over the 1958–70 period. As might be expected, the Gini index indicates that the distribution of wages and salaries is more equal than the distribution of earnings. (See table 1.) This follows from the fact that the self-employed include major concentrations at both the low and high end of the distribution—low-earning proprietors of small retail and service establishments and high-earning professional and business men. In a somewhat similar way, the distribution for year-round full-time workers is more equal than the distribution of all workers, since the inclusion of the part-time and part-year workers adds a large group of low-income earners to the distribution.

A more unusual aspect of the data pertains to the 1958–70 trend. In three of the groups shown in table 1, there is a slow but persistent trend toward inequality: all wage and salary recipients, all year-round full-time wage and salary recipients, and all earners. The exception is the group of year-round full-time earners (as distinguished from the year-round full-time wage and salary earners)—in effect, the earnings distribution for the self-employed, although not available separately, must show a trend toward equality.[5]

More detailed data by occupation and industry tend to confirm these results. A closer look at the 1970 figures points up the variation in inequality by industry (tables 2 and 3). The industry with the most unequal distribution is agriculture, and among the occupations the two farm groups (farm managers and farm laborers) also rank as the most unequal. However, it should be noted that the omission from the data of any earnings in kind undoubtedly contributes to the apparent degree of inequality.

Among the nonfarm groups, the trade and service industries as well as the sales and service occupations show relatively unequal distributions, indicating concentrations of employees in both the lowest and highest income groups. At the other end of the spectrum, the traditional blue-collar industries and occupations indicate a more equal distribution of earnings.[6] At the lowest end of the Gini scale, the industry with the most equal distribution of wages and salaries is public administration.

For each industry and occupation, distribution was more equal when only year-round full-time employment was considered. This proved especially marked for the trade and service industries, where part-time and part-year work is extensive.

For the 1958–70 period, most of the individual occupations and industries show a decided trend toward inequality (tables 4 and 5). Only one group, the managerial occupation, showed a statistically significant trend toward equality. The trend toward inequality is most evident where manual and lesser skilled white-collar workers are involved. Thus, among year-round full-time earners, the trend toward inequality is significant in all manual occupations as well as clerical workers, but not for sales, professional, or managerial groups. Similarly, manufacturing, transportation, construction, retail trade, and public administration show the trend toward inequality, but not finance or professional services.[7]

The trend toward greater inequality can become manifest in different ways. It is most easily illustrated in terms of shares of income received by each quintile of the population ranked from the lowest 20 percent to the highest 20 percent of income receivers. A trend toward inequality is normally characterized by a loss of income at the lower two quintiles with a balancing gain at the upper two quintiles. However, in a number of cases the income share received by the lowest quintile did not change significantly. For example, considering all year-round full-time wage and salary workers, the share of income received by the lowest quintile hardly shifted over the 1958–70 period, but at the same time the shares

Table 1. Distribution of earnings and wages and salaries among male workers

Item	Earnings		Wages and salaries	
	Total	Year-round full-time	Total	Year-round full-time
1970 data:				
Income receivers (thousands)	55,821	36,132	41,945	30,834
Median income	$7,153	$9,008	$7,940	$9,150
1st quartile	3,286	6,444	5,015	6,754
3d quartile	10,789	12,808	11,505	12,782
Gini index, 1958–70:				
1958	.399	.317	.328	.254
1959	.397	.319	.325	.262
1960	.411	.325	.338	.275
1961	.420	.327	.346	.274
1962	.414	.320	.335	.270
1963	.410	.316	.342	.270
1964	.410	.320	.340	.275
1965	----	----	.341	.276
1966	.413	.318	.347	.281
1967	.412	.319	.340	.283
1968	.416	.320	.345	.281
1969	.422	.311	.350	.278
1970	.428	.315	.356	.281

NOTE: Data on earnings apply to all individuals with earnings in the specified year. Data on wages and salaries apply to all individuals employed in March of the following year who received wages or salaries in the specified year.
Dashes indicate data not available.

Table 2. Distribution of wage and salary income among male workers, by industry, all workers, 1970

Industry	Workers (in thousands)	Median income	Shares of aggregate wage and salary income						Gini index
			Lowest fifth	Second fifth	Middle fifth	Fourth fifth	Highest fifth	Top 5 percent	
Total [1]	41,945	$7,940	4.6	12.8	18.0	24.0	40.7	15.0	.356
Agriculture	934	2,989	2.2	7.4	14.7	23.4	52.2	24.3	.504
Nonagriculture, total	41,011	8,041	4.8	12.9	18.0	23.9	40.4	14.9	.351
Construction	3,497	7,959	5.5	12.6	17.9	24.3	39.8	14.1	.341
Manufacturing	13,881	8,315	6.8	13.9	18.0	23.2	38.0	14.0	.306
Transportation, communication, and public utilities	4,006	8,988	7.4	14.6	18.5	23.7	35.8	12.7	.280
Wholesale trade	2,045	8,783	5.7	12.6	17.1	23.1	41.4	15.1	.351
Retail trade	5,569	5,711	2.4	9.2	17.4	25.0	46.0	18.3	.437
Finance, insurance, and real estate	1,751	9,370	5.5	12.2	16.8	22.9	42.6	16.4	.363
Business and repair services	1,261	6,826	3.4	10.9	16.8	23.8	45.0	16.7	.412
Professional services	4,476	7,623	3.3	11.0	16.9	24.1	44.6	17.2	.408
Public administration	2,920	9,675	8.4	15.0	18.3	23.4	34.8	11.1	.260

[1] Includes mining, personal services, and entertainment and recreational services, for which separate data is not included.

SOURCE: Bureau of the Census, unpublished data.

of the second and middle quintile each dropped a percentage point. The top quintile gained the two percentage points, but the share received by the top 5 percent hardly changed. Thus a trend toward inequality is not necessarily a case of those at the very top of the distribution gaining at the expense of those at the very bottom.

Earnings in kind and fringe benefits

It is important to remember that the data from which these trends have been drawn deal only with money income received as wages, salaries, or earnings from self-employment. It is pertinent to inquire what the effect would be of including other elements of compensation, specifically earnings in kind, such as free meals or lodging and employer expenditures for various fringe benefits.

Earnings in kind is a normal part of compensation in certain low-wage occupations, including farm labor and private household work, and its inclusion in these figures would raise the income share of the lower groups in the population. On the other hand, since these occupations have been declining in number throughout the postwar period, the effect of including income in kind over the 1958–70 period might well be to reinforce the trend toward inequality.

More important, however, would be the effect of including various types of fringe benefits. These are principally of three types: employer contributions for health, welfare, and retirement plans; legally required payments by employers for social security, unemployment insurance, and workmen's compensation; and employer payments for vacation, holiday and other types of leave. Each of these yields specific benefits,[8] but it is difficult, if not impossible, to measure in dollars the value of these fringes to individual recipients. Consequently, such benefits have never been included in the basic statistics dealing with distribution of income. Yet they remain a very real part of the flow of compensation arising out of the work situation.

Inclusion of such benefits, which go mainly to middle and higher income wage earners, would almost certainly accentuate the trend toward inequality as a result of their rapid growth in recent years. Although it is natural to assume that employer expenditures for fringe benefits would be roughly proportional to the level of wages, recent studies make clear that this is not the case.

For both paid leave and welfare funds, employer expenditures form a relatively small proportion of the wage bill in establishments with lower wage levels. This proportion rises with increases in the average wage level although among establishments at the higher levels of compensation, it remains roughly stable. Paid leave expenditures, for example, averaged 6.4 percent of compensation for nonfarm employers in 1970, but this varied from 4.2 percent for the lowest compensation class (under $2.50 an hour) to 7 percent for the two highest classes (over $7 an hour). Many employers with relatively low wage levels do not have any expenditures for retirement or welfare funds.[9]

The effect of the legally required payments, it is true, operates in the opposite direction. The ceiling on wages and salaries subject to the social security

tax, for example, effectively reduces the tax impact on the employer as compensation increases. Even when this is taken into account, however, total fringe benefit expenditures make up higher proportion of compensation as the level of pay increases. If in addition the income effect of the more specialized benefits available only to higher-paid salaried personnel, such as expense account privileges, stock options, and deferred compensation, could somehow be calculated in a distribution of compensation, the statistics would undoubtedly show a further drift toward inequality.

II—Reasons For The Trend

At the outset the limitations of this inquiry should be made clear. The aim is to review various factors that affected the economy during the 1958–70 period and to attempt to determine whether they may have contributed to earnings inequality. Although some tentative conclusions are reached, no rigorous proof is offered (perhaps none is possible).

In this exploration, the essential characteristics of an income distribution must be kept in mind. Each person's earnings can be viewed as the product of two factors: time at work and payments per unit of time. A change in either will change an individual's earnings, but a general shift throughout the economy will not affect the distribution of earnings unless it has differential effects at different points along the distribution curve. Thus an increase in wage rates, for example, will not alter the distribution unless the increase is applied quite differently at different levels of earnings. At the same time, it should be noted that the distribution pattern can change without any general change in wage rates, when there is a shift in the distribution of employment among the various wage levels.

Essentially, the 1958–70 trend toward greater inequality in the distribution of earnings means that in 1970 a greater proportion of those with earnings are found at the lower and/or higher ends of the earnings distribution than in 1958. Over the 12-year period, a variety of economic forces could produce this result. They tend to fall into three categories:

1. Changes in the personal characteristics of earners that might affect their earnings ability, chiefly age and schooling. These changes can occur either as individuals with 1958 earnings acquire different characteristics (grow older or go to school) or as newcomers have different characteristics from the oldtimers they replace.

2. Changes in the characteristics of jobs that might affect the earnings ability of the jobholders. Such changes could involve, for example, a shift in the ratio of part-time to full-time jobs or shifts in the distribution of jobs among industries and occupations in response to technological advances and changing patterns of demand.

3. Changes in the rates of compensation over the 12-year period that affect differently jobs at various points in the earnings distribution.

Each type of change will be reviewed for its possible impact on earnings distribution during the 1958–70 period.

Table 3. Distribution of wage and salary income among male workers, by industry, year-round, full-time workers, 1970

Industry	Workers (in thousands)	Median income	Shares of aggregate wage and salary income						Gini index
			Lowest fifth	Second fifth	Middle fifth	Fourth fifth	Highest fifth	Top 5 percent	
Total [1]	30,834	$9,150	8.7	13.8	17.5	22.8	37.2	13.3	.281
Agriculture	469	4,469	4.8	11.1	15.3	22.0	46.8	21.5	.416
Nonagriculture, total	30,365	9,205	8.8	13.9	17.5	22.8	37.0	13.3	.279
Construction	2,223	9,091	8.2	13.3	17.6	23.4	37.6	12.7	.295
Manufacturing	10,806	9,180	9.5	14.3	17.7	22.7	35.9	12.9	.262
Transportation, communication, and public utilities	3,285	9,530	9.9	14.8	18.2	23.0	34.2	11.9	.243
Wholesale trade	1,657	9,659	8.5	13.3	16.8	22.4	39.1	14.1	.300
Retail trade	3,259	7,910	8.3	13.5	17.2	22.1	38.9	15.3	.298
Finance, insurance, and real estate	1,458	10,143	7.9	12.8	16.9	22.2	40.2	16.3	.315
Business and repair service	813	8,840	8.4	12.8	16.9	22.7	39.2	13.1	.303
Professional services	3,264	9,296	7.8	12.7	16.7	22.6	40.3	15.1	.321
Public administration	2,646	9,934	10.3	15.1	18.1	22.9	33.6	10.7	.230

[1] Includes mining, personal services, and entertainment and recreational services, for which separate data is not included.

SOURCE: Bureau of the Census, unpublished data.

Changing personal characteristics of earners

A person's earnings can be influenced by his natural endowment, his educational attainment (schooling) and his experience (age). Presumably, the distribution of natural endowment would not shift noticeably (although the degree of utilization of it might change)—and if it did, how could it be measured? The other two determinants of an individual's earnings, age and schooling, are more susceptible to analysis and measurement.

Changes in the distribution of the work force by age and schooling may well affect the distribution of income, but the direction and force of this effect is open to question. There is no simple direct link between age or schooling and inequality. In general, a person's earnings will increase with age (up to a point) and will be higher with more education, but the net effect on income distribution of retiring a cohort of older, less educated men and replacing them with newly minted college graduates is not obvious. Actually, both groups may have somewhat similar level of earnings, with the experience of the older group offsetting the higher educational attainment of the younger. Eventually, earnings of the college-trained group can be expected to rise well

Table 4. Distribution of earnings among male workers, by occupation, 1958–70

Occupation	Percent share of aggregate earnings				1958–70 trend (Gini index)
	Lowest fifth		Highest fifth		
	1958–59	1969–70	1958–59	1969–70	
All occupations:					
All workers	2.75	2.15	42.80	44.95	More unequal [1]
Year-round full-time workers	6.60	7.40	39.05	39.15	None
Professional and technical:					
All workers	5.55	4.75	41.30	41.65	None
Year-round full-time workers	8.45	8.50	39.25	38.30	None
Professional and technical, salaried:					
All workers	6.20	5.35	36.65	38.15	More unequal [2]
Year-round full-time workers	9.55	9.35	34.45	35.15	None
Farmers:					
All workers	1.80	1.20	54.75	56.55	None
Year-round full-time workers	2.00	1.60	52.25	52.75	None
Managers and officials:					
All workers	5.10	5.15	44.85	43.55	More equal [1]
Year-round full-time workers	6.35	6.60	43.75	41.95	More equal [1]
Managers and officials, salaried:					
All workers	7.55	6.85	41.45	41.60	None
Year-round full-time workers	8.80	8.15	40.60	40.35	None
Clerical:					
All workers	5.70	3.10	34.10	38.65	More unequal [1]
Year-round full-time workers	11.50	10.50	30.95	33.05	More unequal [1]
Sales:					
All workers	1.45	1.10	46.75	48.20	More unequal [2]
Year-round full-time workers	8.75	7.95	37.70	39.25	None
Craftsmen:					
All workers	6.95	6.10	33.15	35.15	More unequal [1]
Year-round full-time workers	10.90	10.05	30.55	32.15	More unequal [1]
Operatives:					
All workers	5.10	4.25	34.80	36.95	More unequal [1]
Year-round full-time workers	9.80	10.20	30.95	32.45	More unequal [1]
Service:					
All workers	2.60	1.55	40.10	47.60	More unequal [1]
Year-round full-time workers	8.55	8.45	32.90	35.50	More unequal [2]
Farm laborers:					
All workers	1.95	1.45	59.70	61.85	More unequal [1]
Nonfarm laborers:					
All workers	2.15	1.35	42.25	49.65	More unequal [1]
Year-round full-time workers	8.30	8.50	32.60	33.75	More unequal [2]

[1] Statistically significant at the 1-percent level according to the Spearman rank correlation test.

[2] Statistically significant at the 5-percent level according to the Spearman rank correlation test.

SOURCE: Bureau of the Census, unpublished data.

above average and thus contribute to greater inequality, but this process may require 10 to 20 years.

T. Paul Schultz looked closely at individuals' total earnings by both age and schooling for 1967 and concluded, "Full-time earnings inequality *does not* monotonically increase with age *within* schooling groups. . . .; inequality among men is lowest in either the 35–44 or 25–34 age group . . . Inequality does not increase systematically with levels of education." [10]

The 1958–70 period witnessed a major increase in the flow of young people into the labor force, many of them far better educated than their predecessors. To what extent can this be associated with the trend toward inequality? On balance it would appear that the most significant ingredient in this flow of young people from the standpoint of inequality was their number rather than their higher education. Most of them with more than a high school education were able to move quickly into the middle of the economic ladder. But that still left a heavy flow of less educated young people taking jobs in manual occupations at the bottom of the economic ladder. This could have been a force pushing the earnings dis-

Table 5. Distribution of wage and salary income among male workers, by industry, 1958–70

Industry	Percent share of aggregate wage and salary income				1958–70 trend (Gini index)
	Lowest fifth		Highest fifth		
	1958–59	1969–70	1958–59	1969–70	
All industries:					
All workers	5.10	4.60	38.15	40.55	More unequal [1]
Year-round full-time workers	8.80	8.70	35.50	37.00	More unequal [1]
Agriculture:					
All workers	2.55	2.35	49.10	51.30	More unequal [2]
Year-round full-time workers	4.20	5.00	42.15	44.90	None
Nonagriculture:					
All workers	5.60	4.80	37.65	40.20	More unequal [1]
Year-round full-time workers	9.20	8.85	35.25	36.90	More unequal [1]
Construction:					
All workers	5.65	5.65	37.65	39.30	None
Year-round full-time workers	8.70	8.20	35.60	37.10	More unequal [1]
Manufacturing:					
All workers	7.05	6.80	36.85	37.80	More unequal [2]
Year-round full-time workers	9.70	9.55	35.25	35.75	More unequal [2]
Transportation, communication, and public utilities:					
All workers	8.35	7.35	33.25	35.75	More unequal [1]
Year-round full-time workers	11.15	9.90	31.70	34.00	More unequal [1]
Wholesale trade:					
All workers	5.90	5.55	39.35	42.45	More unequal [2]
Year-round full-time workers	9.30	8.50	37.20	39.80	None
Retail trade:					
All workers	3.35	2.45	40.80	45.95	More unequal [1]
Year-round full-time workers	8.70	8.25	34.90	38.65	More unequal [2]
Finance, insurance, and real estate:					
All workers	5.65	5.10	42.20	43.70	None
Year-round full-time workers	7.65	7.90	40.65	41.30	None
Business and repair service:					
All workers	5.05	3.60	39.50	45.20	More unequal [1]
Year-round full-time workers	8.75	8.25	36.40	40.15	More unequal [1]
Professional services:					
All workers	3.90	3.35	43.45	43.75	More unequal [2]
Year-round full-time workers	6.80	7.60	41.00	39.35	None
Public administration:					
All workers	9.85	8.35	31.85	35.05	More unequal [1]
Year-round full-time workers	12.10	10.50	30.90	33.75	More unequal [1]

[1] Statistically significant at the 1-percent level according to the Spearman rank correlation test.

[2] Statistically significant at the 5-percent level according to the Spearman rank correlation test.

SOURCE: Bureau of the Census unpublished data.

Relation to other recent studies

Until recently the most commonly accepted view of U.S. income distribution has been that little change has taken place during the postwar period. The basic Census data on family income confirmed a movement toward equality during the 1940's as a result of economic forces associated with World War II and the end of mass unemployment, but beginning with 1950 analysts could find little that suggested any marked shift in income distribution.

This is best illustrated by the most commonly utilized set of income distribution statistics, the distribution of total income by families. Changes over the 1950–70 period are relatively slight, but they point unmistakably toward greater *equality*. This is seen most clearly in the drop in the income share going to the top 5 percent of families, as well as a modest drop in the Gini index:

Income class	*1950*	*1955*	*1960*	*1965*	*1970*
Lowest fifth	4.5	4.8	4.9	5.3	5.5
Second fifth	12.0	12.2	12.0	12.1	12.0
Middle fifth	17.4	17.7	17.6	17.7	17.4
Fourth fifth	23.5	23.7	23.6	23.7	23.5
Highest fifth	42.6	41.6	42.0	41.3	41.6
Top 5 percent	17.0	16.8	16.8	15.8	14.4
Gini index	.375	.366	.369	.360	.353

Since the data reported here, dealing with the earnings of individuals (rather than total income of families) point to different conclusions, it is important to distinguish the two types of studies and useful to turn to other recent investigations along similar lines. Several of these do conclude that changes have been taking place in the distribution of both earnings and income.

1. After a careful analysis of several sources of income data (and attempting to correct for deficiencies in the Census data), Edward C. Budd concludes that between the early postwar years and the mid-1960's there has been "a gain by the middle and upper part of the distribution, relative to the lower groups and the upper tail. The bottom group seems to encompass the first through the 40th or 50th percentiles; the middle group, from the 40th or 50th percentiles to the 94th or 96th percentile; the top group, the top 4 to 6 percent. . . . The changes in relative mean incomes are, of course, quite small, but they seem to be present in enough of the sources to suggest that these changes were characteristics of the actual world rather than simply reflecting deficiencies in our data sources." ("Postwar Changes in the Size Distribution of Income in the U.S.," *American Economic Review*, May 1970, p. 260.)

2. In a more recent study and working largely with personal income of individuals, T. Paul Schultz concludes that "income inequality . . . has apparently increased substantially among both men and women since the Second World War." A more selective look at his data for the 1958–70 period indicates a definite trend toward inequality among all men, particularly in the 20–24 age group. (*Long Term Change in Personal Income Distribution: Theoretical Approaches, Evidence and Explanations* (Santa Monica, Rand Corp., 1972), p. 11.)

3. Analyzing time series changes in income inequality from the "human capital" approach, Barry R. Chiswick and Jacob Mincer develop a model relating inequality for adult males to such variables as age, schooling, and employment. They rely on Census data for various age groups and, although they do not find any "significant secular change in income inequality," report that for males age 25 and over "there was a barely significant upward trend in observed income inequality, holding the predicted inequality constant, of less than 0.5 percent per year from 1949 to 1962, and thereafter a similar rate of decline." ("Time-Series Changes in Personal Income Inequality in the United States from 1939, with Projections to 1985," *Journal of Political Economy*, May/June 1972, Part II, p. S57.)

4. In a technical discussion of alternative methodologies for constructing Gini indexes, Joseph L. Gastwirth examines the effect of different techniques with reference to data on adjusted gross income from income tax returns. He finds a trend toward inequality for the period, 1957–69. ("The Estimation of the Lorenz Curve and Gini Index," *The Review of Economics and Statistics*, August 1972, pp. 311–312.)

5. In a newly published study of the Federal payroll tax used to finance the social security system, John A. Brittain computes Gini indexes for all earnings by individuals subject to the payroll tax, 1951–69. He concludes that inequality clearly increased during this period although part of the increase may have been the result of entry into the social security system by such high-earnings groups as self-employed physicians. (*The Payroll Tax for Social Security* (Washington, Brookings Institution, 1972), pp. 106–108.)

Thus a number of analysts, most of whom have been examining the distribution of individual rather than family income, have found evidence of a trend toward inequality during the postwar period. The major difference in trend between the traditional family income distribution and the distribution of earnings or wages and salaries (aside from technical considerations) can largely be accounted for by two factors: (1) Changes have taken place in the distribution of nonearned income; in particular, the increasing flow of government transfer payments, including social security and welfare assistance, has supported the income of many families with little or no earnings; and (2) There has been an increasing proportion of families with two earners or more. During the 1958–70 period, the proportion of wives in the labor force rose from 31 to 41 percent. Similarly, a higher proportion of teenagers have been working, mostly at part-time jobs. The result is that the proportion of families with more than one earner rose from 46 to 54 percent during the 1960's, and those with three earners or more from 11 to 15 percent. Thus, there are many more families in 1970 than in 1958 whose members considered individually would be placed in the lower earnings groups, but when considered as a unit the family falls into the middle or higher income groups.

tribution toward inequality.

However, some caution is required in associating the flow of youngsters, regardless of education, with the observable trend toward inequality. The youngsters representing the postwar "baby boom" did not start to enter the work force in large numbers until the last half of the 1960's, yet the trend toward inequality is just as strong for the period before 1965. Thus, at a minimum other causal factors were also at work.

Changes in the characteristics of jobs

Two types of changes in job characteristics that could affect the distribution of earnings are (1) changes in the proportion of part-time or part-year workers that could be reflected in corresponding changes in the proportion of low earners, and (2) changes in the distribution of jobs among occupations and industries that might shift the distribution of high and low-earning jobs.

There has of course been a gradual increase in the extent of voluntary part-time jobs during the postwar period, including 1958–70. However, most of this increase took place among women, as many wives entered or reentered the job market for part-time work. For men, two somewhat opposite trends are evident for 1958–70: some increase in voluntary part-time and part-year employment, but also, with improving economic conditions, less involuntary part-year employment. Overall, the proportion of earners working year-round full-time rose from 1958 through the middle 1960's and then declined until 1970 when the proportion was the same as in 1958. For wage and salary workers, the same pattern was evident, but the increase in the 1960's was sharper and the 1970 proportion was above that for 1958.

However, there is a substantial difference in earnings between those voluntarily working part time and those prevented by unemployment from working full time year round. Earnings for the former group (largely young people and those retired) would fall at the low end of the distribution, whereas many in the latter group would be working for most of the year with substantial earnings. Thus the increase in the first group during 1958–70, despite a comparable decline in the second, would still tilt the earnings distribution toward inequality. This undoubtedly helps to explain why, in those industries and occupations with a relatively large proportion of part-time jobs (wholesale and retail trade, service, and laborer occupations), the trend toward inequality is more pronounced among all earners than when only year-round full-time earners are considered.

Shifts in the composition of employment among occupations or industries mirror the economy's technological advances. These can also affect the earnings distribution. For the 1958–70 period, the occupational and industrial groups with higher earnings (professional and technical, managerial, professional services, finance, and insurance) grew most rapidly, thus contributing to earnings inequality. This was at least partially offset by the decline in lower paid jobs in such areas as agriculture and private households. Yet many lower paid jobs remain; in fact, while advances in technology have eliminated routine lower paid work in many parts of the economy, they simultaneously have created similar jobs in other sectors, such as services. All in all, the net effect of the shifting occupational and industrial composition of the economy seems clearly in the direction of a more elongated earnings distribution, helping to produce the trend toward inequality.

Changes in rate of compensation

Here again, available statistics do not provide any clearcut answer on the extent to which changes in compensation have added to income inequality. However, some useful insights can be obtained by examining the increases over the 1958–70 period for year-round full-time earners by specific occupations and industries (tables 6 and 7).

Among the nonfarm occupations, the three highest from the standpoint of earnings level (professional, managerial, and sales) are also the three highest in percentage increases in earnings for the 1958–70

Table 6. Increase in earnings among male year-round full-time earners, 1958–70

Occupation	Average earnings		Percent increase
	1958	1970	
Total [1]	$4,888	$9,008	84.3
Professional and technical	6,730	12,445	84.9
Farmers	1,878	3,890	107.1
Managers and officials	5,910	11,747	98.7
Clerical	4,864	8,705	79.0
Sales	5,374	9,777	81.9
Craftsmen	5,347	9,310	74.1
Operatives	4,502	7,646	69.8
Service	3,963	6,972	75.9
Nonfarm laborers	3,734	6,468	73.2

[1] Includes farm laborers, for whom separate data are not included.

period. Increases for the remaining occupations fell below average. Among the industries, the relation between level and rate of increase in compensation is not quite as close, but the three nonfarm industries with the highest wage and salary income (finance, professional services, and public administration) also experienced the highest rates of increase for the period.[11]

This pattern of greater increases for the higher compensation industrial and occupational groups would, unless offset by other factors, lead to an elongation of the earnings distribution and greater inequality. This did, in fact, occur among wage and salary recipients, but not among all earners. (As previously indicated, the difference between the two involves the distribution of earnings for the self-employed, which for this period tended to become more equal.)

When this pattern of increases in earnings is put together with the previously discussed trends in the composition of employment, it helps to explain the trend toward inequality in various industries. For manufacturing, transportation, and public administration (also to some extent trade and business services) are all industries characterized by recent rapid growth in the more highly compensated professional and managerial occupations. This growth, together with the greater increase in compensation for these occupations during this period, undoubtedly can be considered a major factor in the trend toward earnings inequality in these industries.

For one segment of the public sector—the Federal Government's classified civil service—this point can be documented. In the 1958–70 period when the total number of classified employees was rising by 35 percent, the number of employees in the upper echelons (GS-14 or higher) more than tripled. Obviously, this would have had a significant effect on the earnings distribution for classified employees, even if the relation between the top and bottom of the salary scale showed no change.

The influx of higher paid professional and managerial personnel throughout industry cannot account, of course, for any trends in the distribution of earnings within occupations. Here, it is interesting to note, it was not the professional or the managerial group whose earnings showed a trend toward inequality, but rather the blue-collar, service, and clerical occupations.

Two developments that might account for the absence of any trend toward inequality in the earnings of the professional or managerial occupations are (1) a heavy flow of college-educated youngsters entering the occupations at salaries above the low end of the distribution, or (2) a pattern of compensation increases within the occupation which provided relatively high increases for many groups toward the lower end of the distribution. The second point is supported, for example, by the very substantial increases in the basic starting salaries gained by public school teachers during the 1958–70 period.

The strong trend toward inequality among blue-collar occupations may have resulted from either of the following: (1) a flow of lesser educated youngsters to the low end of the distribution; or (2) a pattern of compensation increases within these occupations which, possibly reflecting union wage pressures, obtained greater increases for already higher paid workers.

Institutional or specialized factors may also have been responsible for developments in certain industries or occupations. The construction industry is certainly one example. Union craftsmen have been able to win wage increases markedly above those for non-union construction workers or for union workers in other industries. Since these workers already were relatively high-paid, these wage boosts undoubtedly contributed to the trend toward inequality in construction and, to a lesser extent, within the craftsmen occupation.

On the other hand, one institutional factor that would operate in the opposite direction, toward greater equality, would be the periodic increases in

Table 7. Increase in wage and salary income among male year-round full-time employees, 1958–70

Industry	Average wage and salary income		Percent increase
	1958	1970	
Total [1]	$5,042	$9,150	81.5
Agriculture	2,042	4,469	118.9
Nonagriculture, total	5,094	9,205	80.7
Construction	4,780	9,091	90.2
Manufacturing	5,318	9,180	72.6
Transportation, communication, and public utilities	5,392	9,530	76.7
Wholesale trade	5,145	9,659	87.7
Retail trade	4,310	7,910	83.5
Finance, insurance, and real estate	5,325	10,143	90.5
Business and repair services	4,882	8,840	81.1
Professional services	4,756	9,296	95.5
Public administration	5,129	9,934	93.7

[1] Includes mining, personal services, and entertainment and recreation services, for which separate data are not included.

the statutory minimum wage. However, there seems to be little evidence from this data that the 1961 or 1966 changes in the law had the effect of altering the pattern of distribution at the low end of the scale. Even for retail trade, most directly affected, the year-to-year figures do not indicate any sensitivity to changes in the minimum wage.

Implications

Over the 12-year span covered by this study, there has been a slow but persistent trend toward inequality in the distribution of earnings and in the distribution of wages and salaries. The trend is evident not only for the work force as a whole, but also for many individual occupational and industrial groups. If the effect of fringe benefits could have been included in the calculations, the trend would undoubtedly have been even more pronounced.

This limited exploration could not identify with any precision the specific economic factors responsible for this development, but the evidence leads to the following conclusions:

1. The growing importance of voluntary part-time work does contribute to the trend toward inequality for the entire work force—particularly for those occupations and industries where part-time jobs have become prevalent.

2. The flow of young people into the labor force has probably affected earnings distribution, largely in the blue-collar occupations and industries where large numbers of lesser educated youngsters have taken their places at the lower end of the economic ladder.

3. The changing occupational structure, itself the product of technological advances, has contributed to inequality generally, and more specifically in those industries experiencing rapid increases in the number of highly paid professional and managerial personnel.

4. The pattern of earnings increases, which has brought higher increases for the higher earnings occupations, has also been a factor contributing to the trend toward inequality.

What significance have these findings? Two points stand out. First, the distribution of earnings used here can be a useful source for analysis, but its limitations should be underscored. The data do provide some keys to understanding how the economic system distributes its fruits in a given year, but they cannot help to answer an equally significant question: to what extent do individuals move up (and down) the earnings ladder over their lifetime?

Is equality to be considered solely in terms of the flow of income at a specific point in time? Or is the flow of income during a person's lifetime more relevant? Many persons willingly accept more limited income during their years of training because they expect to be compensated more generously once they become fully qualified in their chosen field. Some way has to be found to take into account this and other similar situations.

Second, the distribution of earnings over time is subject to change because of changes in major economic variables over which private or public policies may have little or no control. Of the four specific factors identified above as contributing to the trend toward inequality, one—the increased flow of young people into the labor force—is purely demographic, hardly controllable in the short run, and two—growth of part-time employment and changes in occupational structure—are largely the product of technological advances and other developments that characterize a mature economy. Only one—the pattern of increases in compensation—can be said to result from the distributive arrangements under the present economic "system" and subject to some modification by private or governmental action.

THIS SUGGESTS a continuing trend toward inequality in earnings, perhaps almost inevitable in an advanced economy, as technological and organizational changes open the way for a higher proportion of the working population to attain earnings levels toward the top of the economic ladder. This does not mean that Government is helpless to influence the distribution of earnings. Such government programs as support for education, manpower training, and antidiscrimination efforts can open the way for individuals to advance up the earnings ladder. Other programs in such diverse areas as agriculture, public utilities, business practices, and wage and price stabilization can affect the level or distribution of earnings within a particular sector or throughout the economy. Yet the strength of the trend toward earnings inequality during the 1958–70 period does suggest that the Government programs most effectively related to distribution are those which operate outside the distribution of earnings—the various transfer payments (such as social security, unemployment compensation, and welfare), which provide nonearnings in-

come and the various tax programs which leave untouched the distribution of earnings, but which affect the distribution of income available for spending. Although such programs are not generally discussed in terms of income distribution, in effect they help to assure less inequality in the distribution of family spendable income than in the distribution of individual earnings. Whether and in what direction these programs should be modified remain much disputed issues of public policy. □

——FOOTNOTES——

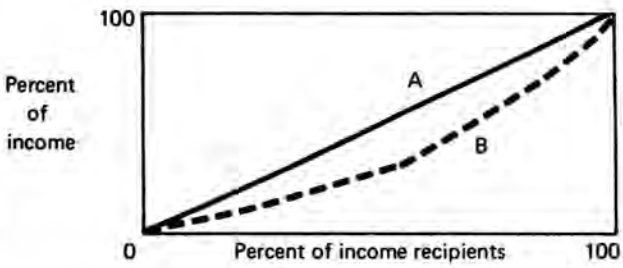
[1] See Jan Pen, *Income Distribution* (New York, Praeger Publishers, 1971); Martin Bronfenbrenner, *Income Distribution Theory* (Chicago, Aldine-Atherton, 1971); Edward C. Budd, *Inequality and Poverty* (New York, W. W. Norton & Co., 1967); Lee Soltow, editor, *Six Papers on the Size Distribution of Wealth and Income*, Studies in Income and Wealth, No. 33 (New York, National Bureau of Economic Research, 1969); Jacob Mincer, "The Distribution of Labor Incomes: A Survey With Special Reference to the Human Capital Approach," *Journal of Economic Literature*, March 1970, pp. 1–26; and Ray C. Fair, "The Optimal Distribution of Income," *Quarterly Journal of Economics*, November 1971, pp. 551–580.

[2] The Census provides decennial detail on income received the previous year and annual reports on income developed from the March survey of a household sample. The income tax system also provides annual data in a variety of forms, although the results must reflect the sometimes tortured definitions of income set forth in the Tax Code. For earnings, more complete data are available through social security records, but the distribution of income above the social security minimum taxable limit has to be estimated, and only limited information is available on the characteristics of recipients. None of these attempt to measure income in kind, income received as employer-paid fringe benefits, or the total income received through capital gains.

To be most useful, income data must be susceptible to disaggregation, for example, by type of family, by such characteristics of the head as age, sex, color, and education, and by other factors affecting income—number of earners in the family, industry and occupation of earners, and so on. Only the Census data approach this degree of disaggregation, and only the Census reports provide such disaggregation over an extended period of time. However, Census data tend to emphasize the distribution of *total* income to families. Relatively few distributions are regularly published pertaining either to total *earnings* or to total *wages and salaries*.

[3] Because of limitations of Census data, there is some difference in the procedure for identifying recipients of wage and salary income and recipients of earnings. Wage and salary recipients include all individuals who in March of the following year were reported as wage and salary workers with wage and salary income the previous year. Earnings recipients include all individuals with any earnings in the specified year, regardless of their labor force status the following March. The earnings recipients therefore include some individuals with wage and salary income in the specified year who were reported the following March as self-employed, unemployed, or out of the labor force.

[4] The Gini index (developed by an Italian statistician, Corrado Gini, 1884–1965) can best be described by the use of the following diagram. If recipients are ranked according to their income along the horizontal axis and their total income is placed on the vertical axis, Line A will represent complete equality (10 percent of income recipients received 10 percent of income, etc.) Line B may represent an actual distribution which always falls below the diagonal. Gini index is the ratio of the area between the two lines to the triangle below Line A, and is always less than 1.0. The closer the Gini index is to zero, the more equal the distribution.



[5] The question may be raised whether the reported trends in income distribution could be the result, in part or in whole, of sampling variability in the basic household survey, or of basic modifications the Census Bureau has introduced in collecting and processing the income data during the 1958–70 period.

With respect to sampling variability, an outcome from the use of the household sample survey technique, estimated standard errors for published income information are presented annually in *Consumer Income*, Consumer Population Reports, Series P-60. (See, for example, pp. 11–13 of P-60, No. 80.) Although the standard errors for the Gini coefficient are not regularly computed and published, the Census Bureau has roughly estimated that the standard error for a Gini coefficient pertaining to all families is .004 for 1958 data and .003 for 1970 data. In this study, the base for calculating the Gini coefficient is the number of male earners (55.8 million) or male wage and salary employees (41.9 million) comparable in magnitude to the figure for all families (51.9 million). The Gini coefficient for a segment of the total, such as a specified industry or occupation, should have higher standard errors. However, in each case where a trend in income distribution is reported, the difference in Gini coefficients between the beginning and end appear to be well beyond the range of sampling variability. The method used in calculating the Gini coefficients is outlined in *Trends in the Income of Families and Persons*, Bureau of the Census Technical Paper No. 17.

At irregular intervals over the period 1958 to 1970, procedures for collecting and processing income data have been

modified. These changes are discussed in the appropriate annual P-60 report. For example, beginning with 1961, missing income information was allocated, whereas previously income nonrespondents were excluded from the tabulation. (See *Consumer Income*, P-60, No. 39, p. 13, for more details.) In 1965 and 1967, the income allocation methods were improved. (See *Consumer Income*, P-60, No. 80, pp. 13–15.) In general, however, an examination of the data underlying this study does not indicate any break in the trends which can be attributed to these procedural changes.

[8] For a comparison with the results shown by the 1960 Census, see Herman P. Miller, *Income Distribution in the United States* (Washington, U.S. Bureau of the Census, 1966) chapters III, IV and V.

[7] The question might be asked, to what extent do the data reflect the influence of the business cycle? Here it should be noted that both 1958 and 1970 were recession years, so that the basic trend between the beginning and end points of the 1958–70 period must involve other considerations. A more complete year-by-year review of the data indicates that any cyclical influences were slight. Theoretically the impact of a recession would shift workers from the middle to the lower end of the distribution, thus creating a more unequal distribution (assuming comparable reductions are not taking place at the upper end of the distribution) and raising the Gini index. While such a movement can perhaps be identified in some of the series, opposite movements are also prevalent. Consider the data for manufacturing, normally cyclically sensitive. The Gini index does show an increase for 1960–61 and for 1969–70. It also drops for 1958–59 and for 1961–62. However, its sharpest increase occurs in 1965–66 when unemployment was steadily being reduced.

[5] Employer expenditures for paid leave are included in the basic wage and salary payment; the value to the employee lies in terms of hours paid for but not worked.

[9] See the forthcoming BLS Bulletin, *Employee Compensation in the Private Nonfarm Economy, 1970*, tables 6 and 13. Although this study by necessity relates employer expenditures to the level of compensation in the establishment (rather than the compensation of the individual employee), it does provide clear indication of the relation between compensation and expenditures for fringe benefits. See also William R. Bailey and Albert E. Schwenk, "Employer Expenditures for Private Retirement and Insurance Plans," *Monthly Labor Review*, July 1972, pp. 15–19. For an earlier study reaching the same conclusion, see Robert G. Rice, "Skill, Earnings, and the Growth of Wage Supplements," *American Economic Review*, May 1966, pp. 583–593.

[10] *Long Term Change in Personal Income Distribution: Theoretical Approaches, Evidence and Explanations* (Santa Monica, Calif., Rand Corp., 1972), p. 11.

[11] Data for the 1959–69 decade show roughly the same pattern. See Robert L. Stein and Janice Neipert Hedges, "Earnings and Family Income," *Monthly Labor Review*, June 1971, pp. 13–24. Also Peter Henle, "Economic Status of the Blue Collar Worker, 1959–69," *Proceedings of the Business and Economics Statistics Section 1971*, American Statistical Association, pp. 115–120.

Blue-collar/white-collar pay trends
Earnings and family income

ROBERT L. STEIN AND JANICE NEIPERT HEDGES

BY MOST MEASURES of economic well-being, the families of white-collar workers fare better than do those of blue-collar workers.[1] White-collar workers earn more money on a weekly basis, enjoy more generous fringe benefits, have a safer work environment, and are more steadily employed. Seasonal or cyclical downswings in the pace of business activity are less of a threat to their rates of pay, their weekly hours, or their job security. Moreover, opportunities for advancement and higher earnings are more abundant in the white-collar occupations, and total family income is greater.

White-collar workers drew further ahead during the 1960's. Real earnings of male heads of families rose in all occupational groups, but more so for the white-collar workers. Changes in family income, though less divergent, also favored those families headed by white-collar workers.[2]

These findings emerge from a study of the incomes of male heads of families [3] by occupation, age, educational level, and race, and by the size of their families. The study also analyzes the total income available to families by the labor force characteristics of the head and by family size. It explores the work experience of the wives and the contribution that their earnings make to family income. And it compares the experience of all nonfarm occupational groups from 1959 to 1969.

Design of the study

To provide a clearer indication of the underlying wage structure and trends, it was necessary to control for differences in the steadiness of employment. Blue-collar workers have higher rates of unemployment and a higher incidence of disability and illness than do white-collar workers. In 1969, for example, 86 percent of white-collar male heads of families but only 76 percent of blue-collar heads had year-round, full-time jobs. Therefore, the analysis focuses on year-round, full-time workers.[4] In 1969 there were 29.6 million such workers heading husband-wife families. In the discussion that follows, the term "heads of families" refers only to these male heads of husband-wife families.

The analysis of earnings and incomes was based primarily on medians. Means were used as an additional tool, however, in analyzing the relationships between the several components of family income (head's income, wife's income, and the income of other family members) and rates of change from 1959 to 1969. Analysis of the means substantiated the major findings.

The workers designated for the focus of this study are a group with comparatively high earnings. First, as noted above, they are male heads of families, and men tend to earn more than women, married men more than single men. Second, both white-collar and blue-collar workers have earnings well above those of workers in farm occupations and, except for laborers, above those of service workers. Third, the annual earnings of year-round full-time workers obviously average considerably more than those of workers who work only part year or part time. Furthermore, the wives of over half the year-round full-time workers are employed at some time during the year, and thus income in these families is further increased.

A comparison of the distribution of income for all families and for the husband-wife families covered by this study reflects one result of the selection. Of the nearly 30 million nonfarm families within the scope of the study in 1969,

---

Robert L. Stein and Janice Neipert Hedges are economists in the Office of Economic and Social Research, Bureau of Labor Statistics. Mrs. Rowena Lipscomb of the same office developed the techniques to produce the data utilized in the study.

two-thirds had annual incomes between $5,000 and $15,000; only 5 percent had incomes below $5,000 and 28 percent had incomes above $15,000. By contrast, of the 51 million families in the total population, 20 percent had incomes below $5,000 and 19 percent had incomes above $15,000.

The traditional designation of occupations as blue-collar or white-collar combines occupations that broadly resemble each other in pay structure, opportunities for advancement, and working conditions. Occupations within each of these two groups, however, may differ significantly in educational or training requirements or in other aspects.[5]

In some respects, a three-way classification of occupations into professional and managerial; clerical and sales; and craftsmen and operatives combines occupations that are more homogeneous than occurs under a white-collar/blue-collar classification. In this study the three-way classification is used as required to make the discussion more meaningful.

Table 1. Employment and median earnings in 1969 of heads of families, by major occupational group

[Numbers in thousands]

Major occupational group	1969			Percent change in median income (1969 dollars)	
	Number of workers	As a percent of all workers in occupation	Median earnings	1959–69	Average annual rate
All nonfarm occupations	29,596	80	$8,947	29	2.6
White-collar workers	14,260	86	10,446	31	2.8
Professional and managerial	10,392	88	11,325	31	2.7
Professional	4,836	86	11,804	28	2.5
Managerial	5,556	89	10,803	31	2.8
Clerical and sales	3,868	82	8,616	27	2.4
Clerical	2,139	83	8,252	26	2.3
Sales	1,729	82	9,547	31	2.7
Blue-collar workers	13,771	76	8,094	23	2.1
Craftsmen and operatives	12,566	77	8,261	23	2.1
Craftsmen	6,811	78	8,938	24	2.2
Operatives	5,755	76	7,629	23	2.1
Laborers	1,205	61	6,537	28	2.5
Service workers	1,565	76	6,754	29	2.6

NOTE: In this and subsequent tables, "heads of families" refers to male heads of husband-wife families who work year round, full time. "Major occupational group" refers to the longest job held by the head of family during the calendar year. For an explanation of the percent change in median income, see text footnote 8.

Earnings of heads of families

In 1969, the median earnings[6] of heads of families in blue-collar occupations were $8,100, approximately $2,400 below the median earnings of heads of families in white-collar occupations. The ratio of earnings—blue-collar to white-collar—was 0.77.

Craftsmen, the highest skilled and highest paid blue-collar workers, earned $8,900, about the average for all nonfarm workers in that year. Their earnings were $2,900 (24 percent) below those of professional workers—the top earners in the white-collar group—but $700 (8 percent) higher than the earnings of clerical workers—the lowest paid white-collar workers.

The middle earners in the blue-collar group, operatives, earned $7,600 and the low earners, nonfarm laborers, earned $6,500. These latter unskilled workers accounted for only 9 percent of the blue-collar group in 1969.

The white-collar group had not only substantially higher median earnings than the blue-collar group, but also a much wider range of earnings. The dispersion value[7] was 68 for professional and managerial workers and 60 for sales workers, compared with 49 for blue-collar workers. However, the dispersion value was even lower for clerical workers, 36. Lower dispersion values show a narrower range in earnings, indicating that opportunities to move up for blue-collar workers with greater ability or energy than their fellow workers are more limited than in the widely dispersed white-collar occupations.

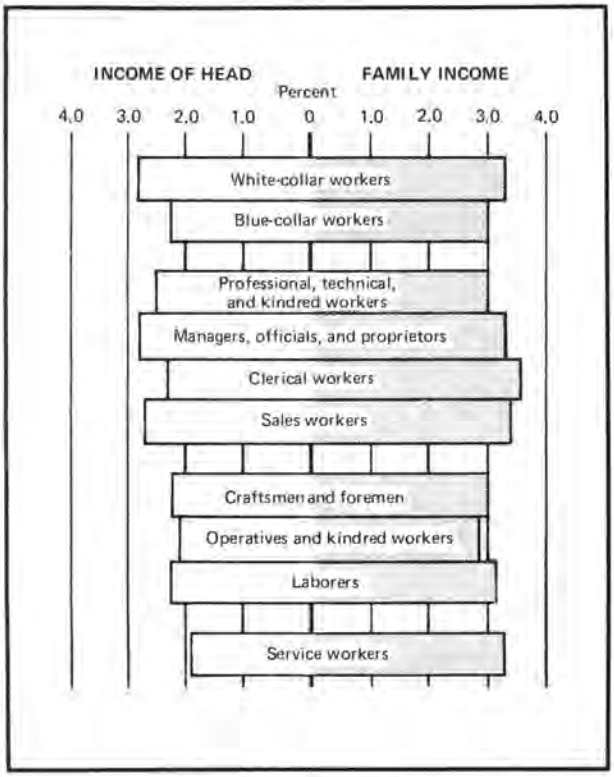
Overall trends, 1959–69

During the 1960's, the real income of male heads of families who worked year-round full-time in white-collar occupations rose at an average annual rate of 2.8 percent.[8] (See table 1 and chart 1.) This compared with an annual gain of 2.1 percent for blue-collar workers.[9]

Two factors contributed to the greater rate of increase for white-collar workers. First, incomes generally rose faster in the white-collar occupational groups than in most of the blue-collar groups. Second, composition of the white-collar group changed over the decade to include a larger proportion of professional and managerial workers, who earn more than clerical and sales workers. Professional and managerial workers accounted for 73 percent of the white-collar workers in the study group in 1969, contrasted with 69 percent in 1959.

At the beginning of the decade, the median income of blue-collar heads of families was 82 percent of the median for white-collar heads of families; by 1969, that proportion had receded to 77 percent.

Chart 1. Average annual rates of increase in income of head of family and family income, by major occupational group, 1959–69



As a result, the dollar gap widened from $1,500 to $2,500 (measured in constant 1969 dollars).

Service workers (who sometimes are included among blue-collar workers, although not in this study) had a larger rate of increase in income than any of the blue-collar occupations.

About one-third of the white-collar workers who headed families, but only one-eighth of the blue-collar heads, were either self-employed or employed by government. Restricting the comparisons to wage and salary employees in the private economy does not change the overall picture, however. The ranking of occupations by the median earnings is the same for family heads in private industry as for all heads, except for a reversal in the position of professional and managerial workers.

Total family income

Many families have income from a variety of sources or have more than one earner. Labor force participation and work experience of wives, and the contribution their earnings make to family income, are discussed in some detail in a later section. Here the concern is only with comparisons of the level of income in white-collar and blue-collar families.

In both groups, family income in 1969 averaged over one-fourth more than the earnings of the head of the family alone. (See table 2.) Income from family members other than the head substantially improves the economic well-being of many families. In both blue-collar and white-collar families, such supplementary income halved the proportion of families who, if relying only on the earnings of the head of the family, would have had incomes below $5,000 in 1969.

The income of family members other than the head also figures importantly in raising family incomes beyond the $15,000 level. In 1969, only 4 percent of the blue-collar workers who headed families had incomes above $15,000; however, 16 percent of all families headed by blue-collar workers had incomes above this amount. Among white-collar heads of families, 25 percent had incomes above $15,000, but earnings from additional workers raised the proportion to 40 percent.

Median family income in blue-collar families was $10,300 in 1969, about $3,000 below that of white-collar families. The ratio of blue-collar family income to white-collar family income was 0.77, the same as for the incomes of the heads of families.

In all major occupational groups, the incomes of husband-wife families where the husband was fully employed rose considerably faster than the increase in consumer prices. Moreover, because of increases in the labor force participation and

Table 2. Median family income in 1969, by major occupational group

Major occupational group	Median income	Percent change in median income (1969 dollars)		Ratio of family income to earnings of head
		1959–69	Average annual rate	
All nonfarm occupations	$11,519	39	3.4	1.29
White-collar workers	13,344	39	3.3	1.28
Professional and managerial	14,095	37	3.2	1.24
Professional	14,572	34	3.0	1.23
Managerial	13,675	39	3.3	1.27
Clerical and sales	11,790	42	3.5	1.37
Clerical	11,293	43	3.6	1.37
Sales	12,437	40	3.4	1.30
Blue-collar workers	10,290	35	3.0	1.27
Craftsmen and operatives	10,486	34	3.0	1.27
Craftsmen	11,161	34	3.0	1.25
Operatives	9,708	34	2.9	1.27
Laborers	8,203	36	3.1	1.25
Service workers	9,575	38	3.3	1.42

incomes of wives, family income rose more than the incomes of heads of families alone. Families headed by a white-collar worker registered a real income gain of 3.3 percent a year on the average. Gains in families headed by a blue-collar worker averaged 3.0 percent. The difference between the growth of white-collar and blue-collar family income was smaller than that recorded for heads of families alone. Nevertheless, even on the basis of total family income, the ratio of blue-collar to white-collar income declined from 0.80 in 1959 to 0.77 in 1969, and the gap in constant dollars widened from $2,000 to $3,000.

Negro-white income comparisons

Of the heads of husband-wife families in 1969 who worked in a nonfarm occupation year round full time, 27.3 million were white and 2.2 million Negro.[10] These heads of families constituted 55 percent of male white workers and 39 percent of male Negro workers.

In 1969, earnings of these Negro heads of families averaged about three-fourths that of white heads of families, in both white-collar and blue-collar occupations. On the basis of total family income, the gap was narrower; the ratio of Negro-to-white income was 0.79 for blue-collar families and 0.87 for white-collar families. The smaller difference in family income was due largely to the much higher labor force participation of Negro wives, even among families where the husband had a steady job. This pattern prevailed among both white-collar and blue-collar families.

The Negro-white income differentials for families in this study show Negro income closer to white income than the income of all Negro families compared with all white families (0.63). This reflects in part the fact that 42 percent of Negro families are husband-wife families headed by a male who was employed year round in a full-time nonfarm job, compared with 59 percent of white families. Also, blue-collar and service jobs, which have lower average wage levels, predominate among Negro male heads of families (by better than 3 to 1), while about half the whites are in higher paying white-collar occupations.

Among steadily employed nonfarm workers, the Negro-white income gap has closed somewhat since 1959. Median income of Negro workers has risen faster than that of white workers, particularly in blue-collar occupations. At the same time, the labor force participation rates and income levels of Negro wives have risen dramatically. As a result of these developments, the Negro-white family income ratio was much more favorable in 1969 than in 1959. (See table 3.)

Table 3. Ratio of Negro income to white income, by major occupational group, 1959 and 1969

Major occupational group	Income of head		Income of family	
	1959	1969	1959	1969
All nonfarm occupations	0.68	0.71	0.67	0.77
White-collar workers	.75	.77	.73	.87
Blue-collar workers	.70	.75	.70	.79
Craftsmen	(1)	.75	(1)	.81
Operatives	.78	.79	.72	.83
Laborers	.77	.88	.76	.92
Service workers	.75	.75	.76	.78

[1] Percent not shown where base is less than 200,000.

Earnings and income patterns by age

Income over the working life of the head of a family was a major concern of this study—both earnings of the head and total family income. Longitudinal data are not available, but cross-sectional data were developed by age and family size. Tabulations by 10-year age brackets for 1959 and 1969 permit the analysis of changes in income for age cohorts.

To some extent at least, the contrasting earnings patterns among age groups reflect the progress of workers in increasing their earnings as, with the passage of time, they acquire skill, experience, and seniority and can assume higher levels of responsibility. However, the cross-sectional data are necessarily an incomplete representation of work life cycle developments, since changing economic and social patterns can have a different effect on the earnings of workers in each age group. For example, changes in supply and demand have sharply altered starting salaries in a number of occupations and changes in the relative bargaining power of unions and management in various industries have affected earnings of workers, as have changes in government policy. Nevertheless, earnings patterns by age do provide some indication of the course of earnings within an occupation.

In every major blue-collar and white-collar occupation group, the earnings of heads of families are lower for the youngest men (age 20–24 years), than for men of any other age group except that 65 years and over. (See table 4.) In most occupa-

Table 4. Median earnings in 1969 of heads of families, by age and major occupational group

Major occupational group	Total, 16 and over	Age in years: 20–24	25–34	35–44	45–54	55–64
All white-collar workers	$10,446	$6,761	$9,914	$11,589	$10,931	$10,162
Professional and managerial	11,325	6,805	10,458	12,443	12,366	11,165
Clerical and sales	8,616	6,709	8,713	9,374	8,760	8,188
All blue-collar workers	8,094	6,851	8,152	8,503	8,397	7,925
Craftsmen	8,938	7,171	8,809	9,262	9,394	8,881
Operatives	7,629	6,649	7,876	7,922	7,646	7,420
Laborers	6,537	6,273	6,728	6,932	6,756	6,071
	Index of earnings, 1969 (20–24=100)					
All white-collar workers	155	100	147	171	162	150
Professional and technical	166	100	154	183	182	164
Clerical and sales	128	100	130	140	131	122
All blue-collar workers	118	100	119	124	123	116
Craftsmen	125	100	123	129	131	124
Operatives	115	100	118	119	115	112
Laborers	104	100	107	111	108	97
	Ratios of median income					
Blue collar to white collar:						
1969	0.77	1.01	0.82	0.73	0.74	0.78
1959	.82	.98	.88	.81	.76	.79
Blue collar to professional and managerial:						
1969	.71	1.01	.78	.68	.67	.70
1959	.75	.94	.80	.75	.69	.70
Blue collar to clerical and sales:						
1969	.93	1.01	.93	.91	.94	.94
1959	.96	1.01	.98	.94	.93	.96

tion groups, the general course of earnings can be described as a substantial increase for workers age 25–34, a smaller increase for those 35–44, little change for the group 45–54, and a decline for those age 55–64 years. (See chart 2.)

Some have speculated that the lesser rise in the incomes of blue-collar workers since 1959 might reflect a change in the age composition of the labor force, with a sharp increase in the number of young workers entering blue-collar occupations—at least temporarily—holding down the average wage level. This was apparently not the case, at least for male heads of families with steady full-time employment. Among these workers, the median age of blue-collar workers moved up over the decade (from 41.2 to 41.9 years), while that of professional and managerial workers declined slightly.

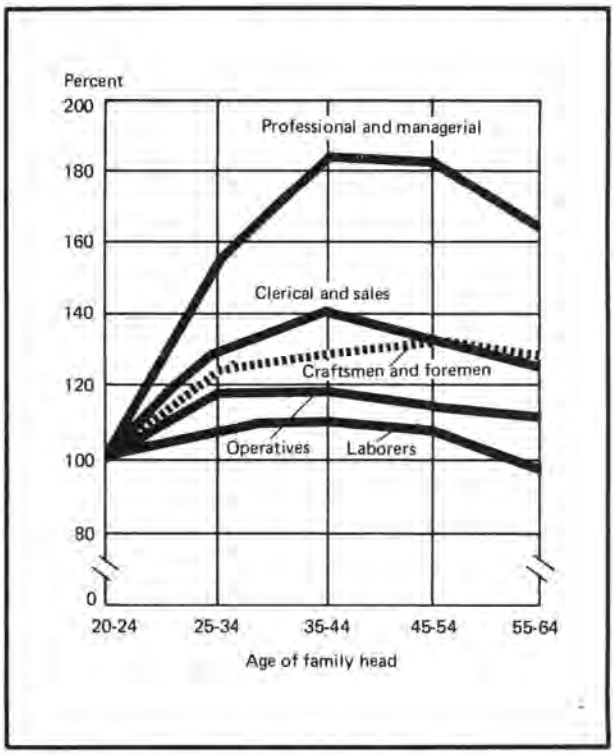
The relative difference between the incomes of the youngest workers and those in the peak income group varies widely from one occupation to another. For blue-collar occupations in 1969, the ratio of median earnings at the peak earnings age to those of the youngest workers was 119 for operatives and 131 for craftsmen. The range in earnings by age was wider in the white-collar occupations, with a ratio of peak earnings to earnings at age 20–24 of 183 for professional and managerial workers and 140 for salesmen and clerical workers.

The progressive advantage in the income position of white-collar workers relative to blue-collar workers as they move through the worklife cycle is clearly portrayed by the ratio of blue-collar to white-collar median income by age of the head of the family. At ages 20–24, their median incomes in 1969 were about the same. The blue-collar to white-collar ratio declined to 0.82 for the 25–34 year age group and to 0.73 for the 35–44 year age group, and then leveled off.

This change in ratio mainly reflects the much sharper upward path of income in professional and managerial occupations. Incomes of clerical and sales workers moved only slightly ahead of those of blue-collar workers, even in the peak earning years.

The story in dollars adds additional perspective. In the 20–24-year group, the highest paid blue-

Chart 2. Ratio[1] of median earnings of heads of families, by major occupational group and age, 1969



[1] Median earnings of 20–24 year old family heads equal 100 percent.

collar workers (craftsmen) had average earnings in 1969 about $400 higher than those of professional and managerial workers, and operatives' incomes were only $200 below those of the professional and managerial group. But among workers age 45–54, craftsmen received $3,000 less than professional and managerial workers and operatives earned $4,700 less.

These patterns reflect significant differences between blue-collar and white-collar occupations. First, the education, skills, and training acquired by mature professional and managerial workers are in great demand, thus giving these white-collar workers a high degree of job mobility. The labor market for these groups is nationwide, further enhancing their opportunities for advancement. Second, blue-collar jobs are less likely than white-collar jobs to allow for step or longevity increases to higher earnings levels on the same job. Third, most blue-collar jobs still require considerable physical stamina, even though many have been mechanized at least in part. Activities that a worker can handle in his twenties or thirties may be beyond his strength or endurance in his fifties. At that age he may be forced to shift to a less strenuous job that pays less, to cut back on overtime, to give up any extra jobs he might have held, or simply to reduce his effort and productivity.

Changes for age cohorts

The preceding cross-sectional analysis revealed income differences among age groups at fixed points in time. Cohort analysis, on the other hand, can roughly measure the change in the income of a particular group over a period of time. The validity of cohort comparisons, however, should not be exaggerated. A major limitation is the tendency of workers, especially youth, to move from one occupation to another and even between the blue-collar and the white-collar group.[11] The universe for this study—heads of families employed year round full time—further limits the validity of cohort analysis, for the marital status and work experience of significant numbers of men change over a decade.

To minimize the effects of such changes, the discussion that follows is confined to workers age 25 or over in 1959 and compares their income in 1969 with their 1959 income. Even in this age group, however, there is some uncertainty as to the extent that cohorts really represent identical workers.

Table 5. Median income in 1969 of head of family and of family, by age cohort and major occupational group

Age cohort and major occupational group	Income of head			Income of family		
	Median income	Percent change (1969 dollars)		Median income	Percent change (1969 dollars)	
		1959–69	Average annual rate		1959–69	Average annual rate
25–34 in 1959, 35–44 in 1969:						
White-collar workers	$11,845	57	4.6	$13,922	64	5.1
Professional and managerial	12,652	53	4.3	14,658	61	4.9
Clerical and sales	9,487	40	3.4	12,263	60	4.8
Blue-collar workers	8,605	30	2.6	10,636	49	4.1
Craftsmen	9,363	31	2.7	11,402	45	3.8
Operatives	8,043	26	2.3	10,044	46	3.9
Laborers	7,068	38	3.2	8,705	48	4.0
35–44 in 1959, 45–54 in 1969:						
White-collar workers	11,679	34	3.0	15,456	54	4.4
Professional and managerial	12,913	37	3.2	16,408	56	4.5
Clerical and sales	9,205	23	2.1	13,462	52	4.3
Blue-collar workers	8,603	21	2.0	11,595	44	3.7
Craftsmen	9,607	23	2.1	12,455	41	3.5
Operatives	7,794	17	1.6	10,821	43	3.7
Laborers	6,872	32	2.8	9,260	54	4.4
45–54 in 1959, 55–64 in 1969:						
White-collar workers	10,566	20	1.8	14,103	28	2.5
Professional and managerial	11,661	20	1.8	15,751	34	3.0
Clerical and sales	8,685	20	1.9	11,852	25	2.3
Blue-collar workers	8,190	22	2.0	10,469	27	2.4
Craftsmen	9,107	26	2.3	11,179	28	2.5
Operatives	7,688	21	1.9	10,084	23	2.1
Laborers	6,338	18	1.7	8,605	29	2.6

Keeping these qualifications in mind, the figures tell an interesting story of income gains from 1959 to 1969, reflecting both occupation-wide gains in income and advances of individual workers as they move through the working life cycle. The median income of all heads of families 25–34 years in 1959 (and 35–44 in 1969) who worked year round full time in nonfarm jobs in both years increased from $7,000 to $10,000 (1969 dollars) or by 43 percent. White-collar workers of this age had, on the whole, a significantly larger percentage increase in income than blue-collar workers, 57 percent compared with 30 percent. By occupation the increase in income from 1959 to 1969 for workers who were 25–34 years old in the base year was highest for professional men and managers (53 percent). Average gains were smaller in other white-collar occupations, but still exceeded those recorded by blue-collar workers. (See table 5.)

Workers age 35–44 in 1959 had smaller percentage gains in income than the younger group. For all heads of families age 35–44 in 1959 (and 45–54 in 1969), the median income increased by 27 percent; income of white-collar workers rose by

34 percent, blue-collar workers by 21 percent. Only among older men (age 45–54 in 1959 and 55–64 in 1969) did the incomes of blue-collar workers keep pace with those of white-collar workers, both rising by about 20 percent.

Table 5 also shows in a general way what happens to family income as workers get older. Perhaps the most crucial 10-year period, from the standpoint of family living standards, is the period when the head of the family moves from the 25–34 to the 35–44 year age bracket. During this period most workers are moving close to the peak earnings levels of their careers, their families are growing to maximum size, and overall financial obligations are rising. The figures in table 5 show that the real incomes of white-collar families rose more sharply than those of blue-collar families, moving up at an average annual rate of 5 percent and 4 percent respectively. Differences in the rates of change are less for family income than for head's income. These same patterns emerge in the next cohort (35–44 in 1959, 45–54 in 1969).

Another approach is to measure the dollar gap in family income. Among families whose head was 25 to 34 years of age in 1959, total incomes averaged $1,500 more in families headed by a fully employed professional or managerial worker than in families where the head was a less skilled white-collar worker, and $1,800 more than where he was a craftsmen or semiskilled operative. Ten years later, family incomes of professional and managerial workers exceeded those of clerical and sales workers by $2,400 (1969 dollars) and those of craftsman and operatives by $3,900.

Earnings and income by family size

The course of earnings and income as families are formed, increase in size, and eventually contract as children leave and form their own households was a major area of interest in this study. The statistics developed reflect the well-established pattern in the wage structure in the United States—a worker's paycheck is related to his job, not to the number of persons whose economic well-being is dependent on the amount of the check.

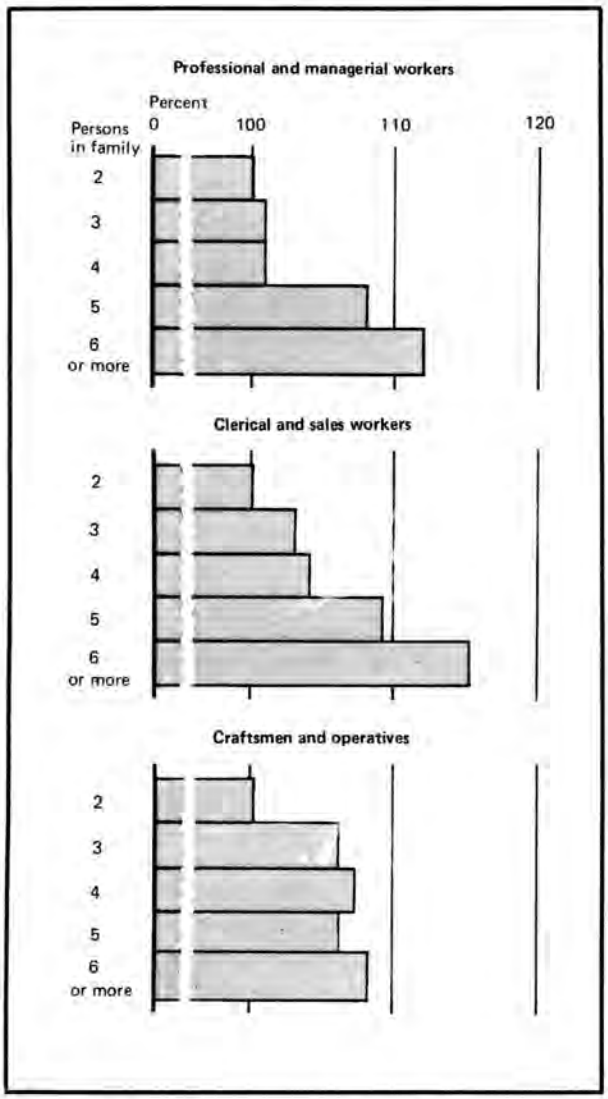
Median earnings of fully employed blue-collar workers in 1969 ranged from $7,700 for heads of two-person families to $8,500 for heads of four-person families, but showed no further increase with family size. Median earnings of white-collar workers, however, increased throughout the range of family size, rising from $9,100 in two-person families to $10,700 in four-person families and $12,000 in families of six persons or more. (See table 6.) Since many two-person families are under 25 or over 65, where earnings are at their lowest, higher earnings in families of four or more is at least in part a function of age—which in turn affects family size—rather than of family size itself.

The gap between the earnings of blue-collar and white-collar workers widens as the size of the

Table 6. Median earnings and income of husband-wife families, by family size and major occupational group in 1969

Major occupational group	Earnings of the head of family						Total family income					
	All families	Number of persons in family					All families	Number of persons in family				
		2	3	4	5	6 or more		2	3	4	5	6 or more
All nonfarm occupations	$8,947	$8,185	$8,568	$9,464	$9,577	$9,437	$11,519	$10,922	$11,334	$11,770	$11,914	$12,010
White-collar workers	10,446	9,103	9,907	10,721	11,418	12,013	13,344	12,877	13,015	13,217	13,951	14,608
Professional and managerial	11,325	10,080	10,764	11,540	12,357	12,890	14,095	13,655	13,745	13,822	14,763	15,276
Professional	11,804	10,475	11,039	11,935	12,758	13,071	14,572	14,592	13,903	13,999	15,348	15,463
Managerial	10,803	9,688	10,486	10,990	11,744	12,685	13,675	12,819	13,597	13,688	14,100	15,061
Clerical and sales	8,616	7,882	8,433	9,032	9,420	9,210	11,790	11,230	11,568	11,683	12,198	12,900
Clerical	8,252	7,832	8,123	8,500	8,877	8,295	11,293	11,185	10,938	11,029	11,940	12,194
Sales	9,547	8,011	9,256	10,175	10,290	10,556	12,437	11,304	12,696	12,536	12,542	13,667
Blue-collar workers	8,094	7,730	7,860	8,466	8,339	8,184	10,290	9,821	10,303	10,531	10,497	10,440
Craftsmen and operatives	8,261	7,883	8,016	8,600	8,478	8,387	10,486	9,974	10,556	10,686	10,611	10,722
Craftsmen	8,938	8,544	8,680	9,258	9,267	9,148	11,161	10,651	11,133	11,384	11,348	11,466
Operatives	7,629	7,220	7,436	8,068	7,758	7,644	9,708	9,243	9,832	9,968	9,661	9,866
Laborers	6,537	6,427	6,229	6,891	6,560	6,691	8,203	7,999	7,634	8,421	8,500	8,563
Service workers	6,754	5,734	6,439	7,538	7,275	7,633	9,575	8,170	9,586	10,618	9,587	10,320

Chart 3. Ratio[1] of median income of families, by size of family and major occupational group, 1969



[1] Income of 2-person family equals 100 percent.

family increases. In families of two persons, the ratio is 0.85; in medium-size families of four persons, the ratio is 0.79; for large families of six persons or more, it drops to 0.68. Moreover, large families are somewhat more prevalent among blue-collar than white-collar families. White-collar heads of families appear to be somewhat more successful than blue-collar heads in increasing their income to keep pace with the needs of a growing family.

Family income analyzed by family size follows roughly the same patterns as earnings of heads by family size, increasing throughout the range of family size for white-collar families but registering no increases for blue-collar families with more than four members.

The additional income in families of more than two or three persons was relatively small. For example, median family income in 4-person white-collar families was only 103 percent of the median for 2-person families; in 6-person families it was 113 percent. (See chart 3.) In blue-collar families the range in median incomes was even narrower. For families of four, five, and six persons or more, average incomes were about the same, about 7 percent larger than in 2-person families. For both blue-collar and white-collar families, income per capita decreases with each increase in family size. Again, however, it should be pointed out that these data are cross-sectional; worklife cycle data might show a somewhat different pattern, since workers' earnings tend to rise at the same time that their families are growing.

Table 7 shows the percent distribution of fully employed heads of 4-person husband-wife families by earnings of the head in 1969, and the distribution of total income. Data for 4-person families show much the same patterns as the figures for all families combined.

Earnings and income, by education

White-collar workers are better educated, on the average, than are blue-collar workers. Of the heads of families in this study, about three-fifths of the professional workers and one-fifth of the managerial and sales workers had completed 4 years of college or more in March 1970. The relatively low proportion for clerical workers—8 percent—still was four times as great as the proportion for blue-collar workers. The proportions completing 13–15 years of education were about one-fifth for professional, managerial, and clerical workers and about one-fourth for sales workers, compared with 7 percent for the blue-collar group.

Although workers at the higher levels of educational attainment forego a significant amount of potential earnings in their late teens and early twenties in order to pursue their education, they more than compensate for this loss as they move into their peak earning years.[12]

Earnings for workers in the white-collar and

Table 7. Percent distribution of earnings and income of 4-person husband-wife families, by major occupational group, 1969
[Numbers in thousands]

Major occupational group	Number	Percent distribution						Median income		
		All families	Under $5,000	$5,000–6,999	$7,000 9,999	$10,000 14,999	$15,000 and over	1969	Percent change (1969 dollars)	
									1959–69	Average annual rate
EARNINGS OF FAMILY HEAD										
All nonfarm occupations	7,032	100.0	6.6	14.5	34.5	30.2	14.2	$9,464	30	2.7
White-collar workers	3,542	100.0	4.2	9.3	28.8	33.0	24.9	10,721	31	2.7
Professional and managerial	2,671	100.0	3.8	7.5	24.4	35.0	29.4	11,540	29	2.6
Clerical	489	100.0	4.7	18.3	50.7	22.0	4.3	8,500	27	2.4
Sales	382	100.0	5.7	10.2	31.4	32.7	19.9	10,175	30	2.7
Blue-collar workers	3,194	100.0	8.3	19.0	41.3	27.9	3.5	8,466	25	2.2
Craftsmen	1,594	100.0	5.1	15.0	38.3	36.5	5.2	9,258	24	2.2
Operatives	1,364	100.0	10.1	21.4	45.6	20.9	2.0	8,068	26	2.4
Laborers	236	100.0	19.6	31.9	37.0	10.6	0.9	6,891	28	2.5
Service workers	296	100.0	16.9	28.4	29.4	23.0	2.4	7,538	29	2.6
TOTAL INCOME OF FAMILY										
All nonfarm occupations	7,032	100.0	3.2	8.0	23.4	36.3	29.2	11,770	40	3.5
White-collar workers	3,542	100.0	1.8	4.7	18.5	35.0	40.1	13,217	39	3.3
Professional and managerial	2,671	100.0	1.9	3.8	16.3	33.8	44.4	13,822	34	3.0
Clerical	489	100.0	0.8	9.4	29.6	39.0	21.2	11,029	45	3.8
Sales	382	100.0	2.6	4.7	19.9	38.2	34.6	12,536	42	3.5
Blue-collar workers	3,194	100.0	4.4	11.1	28.8	37.8	17.9	10,531	36	3.1
Craftsmen	1,594	100.0	2.6	8.2	24.8	41.8	22.5	11,384	36	3.2
Operatives	1,364	100.0	5.4	12.4	32.6	36.1	13.6	9,968	34	3.0
Laborers	236	100.0	11.1	23.5	33.8	20.1	11.5	8,421	31	2.8
Service workers	296	100.0	5.7	14.2	23.0	36.5	20.6	10,618	47	3.9

blue-collar groups as a whole, and in every occupation, increase with each step up the educational ladder.[13] In 1969 for example, in white-collar occupations, the earnings of heads of families who had graduated from high school were 15 percent higher than for high school dropouts and 31 percent higher than for those who never went beyond elementary school. The comparable proportions for blue-collar workers were 8 and 24 percent.

This same pattern is evident in the comparisons of the earnings of persons having higher levels of education with the earnings of high school graduates. Workers with 13–15 years of schooling have higher earnings than those with a high school education—9 percent for white-collar workers and 5 percent for blue-collar workers. White-collar workers with college degrees have earnings 38 percent greater than those with high school educations; for blue-collar workers the difference is 16 percent.

It is apparent that earnings of blue-collar workers are not as closely related to educational levels as the earnings of white-collar workers. Earnings of clerical workers were an exception to the general pattern for white-collar workers. Earnings of clerical workers were no more responsive than those of blue-collar workers to additional years of education.

The effect of the greater influence of education on earnings of white-collar workers is seen in the widening gap between white-collar and blue-collar earnings as the level of education increases. In 1969, the earnings ratio between blue-collar and white-collar workers having less than 12 years of education was 0.97, 0.91 for those having 12 years, 0.88 for those having 13–15 years of education, and 0.77 for those having 4 years of college or more.

Wives' incomes

More than half the wives in husband-wife families in 1969 had some income of their own, largely earnings. Wives who hold jobs contribute significantly to total income in families headed by workers in each of the major occupations.

In the blue-collar and white-collar groups, about the same proportion of wives are in the labor force. But wives in blue-collar families have a somewhat higher unemployment rate, are less

likely to be employed year round full time, and have generally lower earnings than wives of white-collar workers.

Labor force participation

More than two-fifths of all wives in this study were in the labor force in March 1970. Women who were married to clerical workers had the highest labor force participation rate (52 percent), women married to professional men the lowest (40 percent). Rates for the wives of blue-collar workers were about midway between these figures.

A husband's income is significant in determining whether or not his wife works, even within the same occupational group. For example, the participation rates of wives of blue-collar workers ranged from 48 percent for those whose husband's income was between $4,000 and $7,000 to 34 percent for those whose husband's income was between $15,000 and $20,000. However, in the lower income brackets, the wives of white-collar workers were more likely to be in the labor force than the wives of blue-collar workers.[14] This tendency probably reflected in part the higher educational levels of the wives of white-collar workers and the positive effect of education on labor force participation.

From 1959 to 1969, the labor force participation rates of women whose husbands were year-round full-time workers in blue-collar occupations increased from 32 to 44 percent, while the rates for wives of white-collar workers rose from 30 to 43 percent. Labor force participation of married women increased substantially irrespective of the husbands' occupation. Women married to clerical and sales workers had the largest percentage point increases. (See table 8.)

Table 8. Labor force participation rates and median income of wives,[1] by husband's occupation, 1959 and 1969

Major occupational group	Labor force participation rate			Median income (1969 dollars)		
	1959	1969	Net change	1959	1969	Net change
All nonfarm occupations	31.1	43.7	12.6	$2,049	$2,841	$792
White-collar workers	29.9	42.8	12.9	2,223	3,089	866
Professional and managerial	27.8	40.5	12.7	2,059	2,915	856
Professional	27.2	39.9	12.7	2,336	3,132	796
Managerial	28.3	40.9	12.6	1,854	2,741	887
Clerical and sales	34.3	49.1	14.8	2,540	3,422	882
Clerical	36.5	51.5	15.0	2,788	3,514	726
Sales	31.6	46.1	14.5	1,969	3,260	1,291
Blue-collar workers	31.8	44.1	12.3	1,936	2,656	720
Craftsmen and operatives	31.5	44.1	12.6	2,022	2,708	686
Craftsmen	30.6	42.8	12.2	2,137	2,764	627
Operatives	32.6	45.5	12.9	1,917	2,646	729
Laborers	33.6	44.6	11.0	1,325	2,261	936
Service workers	36.4	48.0	11.6	1,903	2,723	820

[1] Wives in husband-wife families, husbands working year round, full time.

There has been considerable discussion about the negative attitudes of blue-collar workers toward paid employment of their wives.[15] But such feelings have apparently not been strong enough to stem the strong growth in the labor force rates of married women over the past decade, irrespective of the occupation of their husbands and even though their husbands are steadily employed at full-time jobs.

Whether their husbands were white-collar or blue-collar workers, over half the wives whose husbands had year-round employment in 1969

Table 9. Contribution of wife's income to total family income, by major occupational group, 1969

[Numbers in thousands]

Major occupational group	All wives	Wives with income		Percent distribution of wives by percent of family income accounted for by wife's income							
		Number	Percent of total	Total	Less than 10.0	10.0–19.9	20.0–29.9	30.0–39.9	40.0–49.9	50.0 and more	Median
All nonfarm occupations	29,596	16,148	54.6	100.0	26.2	17.4	19.2	19.6	11.9	5.8	23
White-collar workers	14,260	7,676	53.8	100.0	28.6	16.2	18.3	18.4	12.0	6.5	23
Professional and managerial	10,392	5,347	51.5	100.0	31.3	16.7	17.8	17.3	10.8	6.0	21
Professional	4,836	2,541	52.5	100.0	31.2	15.5	18.5	17.5	12.0	5.3	22
Managerial	5,556	2,806	50.5	100.0	31.5	17.9	17.2	17.2	9.7	6.6	20
Clerical and sales	3,868	2,329	60.2	100.0	22.3	15.0	19.3	21.0	14.7	7.7	27
Clerical	2,139	1,344	62.8	100.0	20.6	14.9	18.4	22.8	16.1	7.2	28
Sales	1,729	985	57.0	100.0	24.7	15.2	20.5	18.4	12.8	8.5	25
Blue-collar workers	13,771	7,543	54.8	100.0	24.5	18.8	20.0	20.6	11.5	4.7	23
Craftsmen and operatives	12,566	6,900	54.9	100.0	24.8	18.7	19.9	20.7	11.4	4.5	23
Craftsmen	6,811	3,631	53.3	100.0	25.5	19.1	19.9	20.9	10.3	4.3	23
Operatives	5,755	3,269	56.8	100.0	24.0	18.2	19.9	20.4	12.8	4.8	24
Laborers	1,205	643	53.4	100.0	21.3	19.7	21.2	19.9	11.8	6.1	24
Service workers	1,565	929	59.4	100.0	18.9	16.3	20.3	20.6	15.0	8.9	27

also worked at some time during the year. Nearly one-fourth were themselves year-round full-time workers, about 28 percent among those married to clerical and sales workers, 22 percent among the wives of craftsmen and operatives, and 21 percent among the wives of professional and managerial workers.

The contribution of wives' earnings

In 1969, 54 percent of the wives of white-collar heads of family and 55 percent of the wives of blue-collar heads of family had some income, largely from earnings. (See table 9.) Their median income was $3,100 and $2,700, respectively.

Although median income was less for women married to blue-collar workers than for those married to white-collar workers, wives in each group contributed about the same proportion of family income in 1969 (23 percent on the average) since blue-collar husbands also earned less than white-collar husbands.

Analysis of the mean income of all wives (including those without income) provides added perspective on the overall contribution wives make to family income and the relative importance of husbands' and wives' income. The mean income of wives in 1969 contributed about 15 percent of total income in blue-collar families while the mean income of their husbands contributed about 79 percent. Other family members contributed the balance.[16] In white-collar families the mean income of all wives (including those without income) contributed about 13 percent of family income and husbands' income about 84 percent. (See table 10.)

Table 10. Proportionate contributions of family members to mean family income, 1959 and 1969

Type of family and source of income	1959	1969
White collar:		
Family income	100.0	100.0
Head's income	87.6	83.5
Wife's income	9.6	12.9
Other members' income	2.8	3.6
Blue collar:		
Family income	100.0	100.0
Head's income	83.0	79.1
Wife's income	11.7	15.1
Other members' income	5.3	5.8

From 1959 to 1969 the mean income of wives as a proportion of mean family income increased about 3 percentage points in both white-collar and blue-collar families. □

FOOTNOTES

[1] For purposes of this study, the white-collar group is composed of four major occupational groups: professional and technical workers; managers, officials, and proprietors; clerical workers; and sales workers. The blue-collar group consists of three major groups: craftmen; operatives; and nonfarm laborers. Workers are classified according to the occupation group of their longest job during the calendar year. The statistics include government employees and the self-employed as well as employees in the private sector, but exclude members of the Armed Forces.

[2] Most of the data presented in this report were obtained from the income and work experience supplements to the Current Population Survey for the years 1959 and 1969. Computer tapes were provided by the Bureau of the Census.

A detailed explanation of the income concepts and a discussion of the source and reliability of the data are contained in *Current Population Reports*, Series P-60, published by the Bureau of the Census.

[3] The husband is designated as the head of a family where the husband and wife are both present, irrespective of their earnings. A husband-wife family may consist of only two persons, that is, with no children or other related person in the household. Families headed by a man with no wife present accounted for less than 3 percent of all families headed by men. For an analysis of the income and work patterns of families headed by women, see Robert L. Stein, "Economic status of families headed by women," *Monthly Labor Review*, December 1970, pp. 3–10.

[4] Defined as workers who were employed in at least 50 different weeks of the year (paid vacations and paid sick leave are counted as periods of employment) and who in a majority of weeks worked 35 hours or more.

[5] Similarly, individual occupations within each of the seven major occupations that make up the white-collar or blue-collar group may vary substantially in hours and earnings, conditions of work, skill requirements, and worker characteristics. Postal workers are a case in point—clerical workers who resemble blue-collar workers in important aspects including degree of unionization and pay structure.

[6] Earnings are defined as money received from employment—either wages or salaries or self-employment income—before taxes and other deductions. Earnings include paid overtime, paid leave, and receipts from second or third jobs. The value of employer contributions to fringe benefits is not included in the definition.

[7] Computed by dividing the interquartile range by the median and multiplying by 100.

[8] This figure represents the compound annual rate of change in median income from 1959 to 1969 after adjustment for changes in the cost of living as measured by the Consumer Price Index. Earnings in 1959 for these family heads were not available at the time of this study. However,

average income exceeds average earnings for full-time year-round workers by only about 2 percent. For these reasons, trend analysis was based on income changes during the period.

[9] For related data on changes see *Occupation and Earnings of Family Heads in 1969, 1965, and 1959* (Bureau of the Census), Series P–60, No. 73. The figures in that report, however, relate to all workers, not only those employed year round full time.

[10] Figures for Negroes include about 200,000 members of other minority races.

[11] For a description of the flow of manpower between occupations, see Peter M. Blau and Otis Dudley Duncan, *The American Occupational Structure* (New York, John Wiley & Sons, Inc., 1967).

[12] See "Annual Mean Income, Lifetime Income, and Educational Attainment of Men in the United States, for Selected Years 1956–1968," *Current Population Reports* (Bureau of the Census), Series P–60, No. 74, October 30, 1970.

[13] Differences in earnings by education reflect more than the actual value of education. See, for example, E. F. Denison, "Measuring the Contribution of Education to Economic Growth" in E. A. G. Robinson and J. E. Vaizey, *The Economics of Education*, 1966. Denison assumes that three-fifths of the income differentials among men of similar age by years of education results from the effect of more education on the ability to contribute to production, while the remaining two-fifths reflects the tendency for individuals of greater natural ability and energy to continue their education and of other variables that are associated with, but not the result of, the amount of education.

[14] Other factors not analyzed here also significantly affect the labor force participation of wives. Among the most important are the presence and age of children and the educational level of the wife.

[15] See, for example, discussion in Harold L. Sheppard, "Discontented blue-collar workers—a case study," *Monthly Labor Review*, April 1971, pp. 29–30.

[16] According to Herman P. Miller in *Rich Man, Poor Man* (New York, Thomas Y. Crowell Co., 1971), supplementary earners are almost equally divided between wives and other family members, largely sons and daughters. The wives, however, have significantly higher incomes than the other relatives, and account for by far the majority of supplemental income.

Chapter VIII. Unions, Bargaining, and the Workplace

Changing policies in public employee labor relations

One task force report supports "meet and confer" statutes; another, advocates collective negotiations

JOSEPH P. GOLDBERG

EXPERIENCE DURING THE PAST decade has resulted in reexamination and revision of established policies in public labor-management relations and the establishment of new policies. The Federal Government, through its innovative Executive Order in 1962, further study of the issues, and a resultant revised Executive Order in 1969, has contributed much to this new spirit, as well as providing possible guides to policy. The agreement recently negotiated following the strike in the U.S. Post Office Department adds new facets to Federal policy.

The huge growth in State and local government employment has made these equally important foci for public employee policies, as Federal labor law specifically excludes these employees. The States have become important sources of experience as well, particularly in the variety of legislative policies and proposals among them. Although most recent State enactments have authorized collective negotiations (with attendant rights and machinery) and avoided explicit sanctions in the event of strikes, these are effective in only a minority of the States. (See table 1, pp. 8–10.) A few have only "meet and confer" rather than negotiation statutes. Others have legislation only for specific occupational groups. The majority of States do not have statutes encouraging employee organization or providing machinery for regularizing public labor-management relationships.

The setting

The growth of public employee organizations, and increased negotiations and strikes in the public sector, have been subject to continuing and widening exploration of public employee policies at Federal, State, and local levels. The spirit of such scrutiny has generally been one of accepting the rights of public employees, of providing them with a status consistent with that of private employees, and accommodating the special circumstances of public employment. The public sector's particular requirements, such as the need to continue public services, the absence of market factors permitting tests of strength through strikes and lockouts, and the traditional view of the sovereignty of the State, have served to restrain the full applicability of labor policies taken over from the private sector—but have not restrained the basic trend. Even the long-held view of government sovereignty vis-a-vis negotiations and agreements with government employees and their organizations is being reevalued. Strikes and strike sanctions continue to be an integral subject of debate, but generally these are viewed as symptoms of conditions requiring for their resolution avenues to regularizing the rights of public employee organizations and systematizing the arrangements for making these effective in dealing with public employees. It is the widespread view that such arrangements will work toward the elimination of the instability which has produced wide strike activity.

There has been a significant trend in the past decade in the States toward accepting employee organizations, collective negotiations, representation machinery, and provisions for meeting strike impasses but some observers view divergent and lagging developments as making for an intensification of strike activity. The different positions of the employee organizations is a recognizable factor in the diversity. However, all such organizations may be said to support the need for requiring collective negotiations and exclusive recognition, with civil service employee associations competing with labor unions for representation rights. The divergences among employee organizations are reflected in the evolution of union and some

Joseph P. Goldberg is special assistant to the Commissioner of Labor Statistics, Bureau of Labor Statistics.

employee association support for national legislation establishing national machinery and national minimum standards, albeit authorizing State and local arrangements meeting or exceeding these.

Recent studies and membership trends

Additional ingredients in this stimulating mix of policy have been provided by a number of public commissions. Continuing exploration by commissions in various States has resulted in recommendations for statutory terms for public employee labor-management relations, most recently in Colorado, Tennessee and Pennsylvania.[1] The National Governor's Conference has issued annual supplements to its initial Report of the Task Force on State and Local Government Labor Relations, which endorsed statutes requiring collective negotiations.[2] The report of the Advisory Commission on Intergovernmental Relations (ACIR) is a more recent national expression of such recommendations, along with a substantial review of State and local labor-management policies. A majority of its 27 participants—including private citizens, U.S. Senators and Congressmen, Federal Government officials, Governors, Mayors, State legislators, and elected county officials—have stated that "it tends to view the meet and confer in good faith approach as being the most appropriate in a majority of situations in the light of present and evolving conditions in State and local employment." This view evoked a substantial and forceful dissent from a varied composition of its members, who support the requirement of collective negotiations.[3] Spokesmen for AFL-CIO unions in the public employee field have criticized the recommendation as a "backward" step.[4]

A new overview of the problem has been contributed through the privately endowed Twentieth Century Fund, a long-time contributor to policy development in the private sector, through its Task Force on Labor Disputes in Public Employment. The latter consisted of experts and practitioners in both the public and private labor-management sectors. Among other recommendations, the report endorses the statutory requirement that "the public employer has the duty to meet and negotiate with the union" and "that agreements be reduced to writing." There was a split on the breadth of the recommended ban on public employee strikes.[5]

In the following summary discussion, varied practice and recommendations are summarized along with the considerations which are deemed characteristic of the public sector.

Public employee organization has grown at a rapid rate over the past decade, as total public employment increased by 45 percent (from 8.4 million in 1960 to 12.2 million in 1969) with a rise of 22 percent in Federal employment (from 2.3 million to 2.8 million) and of about 56 percent in State and local employment (from 6.1 million to 9.5 million). The membership of government employees is divided among labor unions and employee associations. Union membership of government employees doubled between 1960 and 1968, from 1.1 to 2.2 million. Approximately 50 percent of Federal employees are members, while about 8.5 percent of State and county employees are represented by the 804,000 union members at that level.

Substantial membership of State and county employees in employee associations, together with union membership, account for about 25 percent of all State and county employees. The National Education Association with its 1.1 million members supports affiliates which resort to strikes as a last resort and has acknowledged the possibility of a future closer relationship with the American Federation of Teachers.[6] The Assembly of Governmental Employees, a loosely confederated organization of mainly State associations of public employees, stresses philosophical differences with the unions over the merit system and strike prohibition, but acknowledges that it engages in substantially the same techniques as unions in competing with them for exclusive representation. It reported a membership of over 500,000 in 1969.[7] A recent BLS study reports a membership of about 265,000 members of local associations of public employees in 438 cities, competing with national unions for representation rights.[8]

Present policies

The issues involved in the growing number of public employee strikes reflect the changed state of public employee labor relations. Next to efforts to bring wages and fringe benefits into line with private sector earnings, strikes over union representation and union security issues were most prominent, reflecting both the frequent absence in the public sector compared with the private

sector of statutory machinery for representation arrangements and efforts to obtain initial agreements.[9]

Federal labor-management policies are currently governed by Executive Order 11491, Labor-Management Relations in the Federal Service, issued in October 1969, revoking Executive Order 10988, Employee-Management Cooperation in the Federal Service. The revisions in the new Order are based on a review of experience and proposals made by labor organizations, agency officials, and nongovernmental experts.[10]

Under the new order, the term "labor organization" replaces "employee organization." Employees continue to have a free and protected right to join or not join labor organizations. Organizations of supervisors and managers are excluded from the term "labor organization." Exclusive recognition is now the sole form of recognition, to be accorded to an organization receiving the majority of votes cast in a secret ballot election conducted in an appropriate unit.

Agencies and labor organizations are required to meet and confer in good faith on personnel policies and practices and working conditions, subject to applicable law and regulations, and execute written agreements or memoranda of understanding. Excluded from the requirement to meet and confer are the mission of the agency; its budget (including wages and fringe benefits), organizational setup, number of employees, and the grades and numbers of employees assigned; the technology of its work; and its internal security practices. The parties may, however, negotiate agreements on arrangements for employees adversely affected by the realignment of work forces or technological change. Management rights, in accordance with applicable laws and regulations, are specified and reserved. While no agreement may require an employee to join or remain a member of a labor organization, dues check-off is authorized on the basis of voluntary, written authorization. Grievance procedures may be negotiated which meet the requirements set by the Civil Service Commission, and may include arbitration of employee grievances and of disputes over the interpretation of existing agreements. Agreements must be approved by the agency head if they conform to applicable laws and regulations.

Consultation rights may be accorded by an agency on a national basis only to a labor organization that qualifies under criteria established by the Federal Labor Relations Council. The labor organization must be provided an opportunity to comment on proposed personnel changes, and its views will be carefully considered. Supervisors or associations of supervisors will be provided a system for intramanagement communication and consultation within an agency. However, provision is made for continued or initial recognition of units for management officials or supervisors represented by labor organizations which traditionally or historically have represented such groups in private industry and which already hold exclusive representation for such units in any Government agency.

Standards of conduct for labor organizations and management are extended, making them comparable to those for private sector unions. Recognition may only be accorded to a labor organization free of corrupt influences and of influences opposed to basic democratic principles. They must file financial and other reports, provide for bonding of officials and employees of the organization, and meet trusteeship and election standards. Certain unfair labor practices by management and labor organizations are prohibited. Strike action or picketing in a labor dispute by a labor organization is an unfair labor practice. Strikes continue to be banned by Federal statute.

Major innovations in the new Executive Order include the centralization of basic aspects of the administration of the Federal labor-management relations policy. A Federal Labor Relations Council consisting of the Chairman of the Civil Service Commission, the Secretary of Labor, and other officials of the executive branch is to decide major policy questions, develop regulations, and handle appeals from actions of the Assistant Secretary of Labor for Labor-Management Relations. The latter will decide appropriate unit questions, supervise representation elections, prescribe regulations to effectuate the provisions on the conduct of labor organizations and management, and decide complaints of violations of these. In negotiations disputes, the Federal Mediation and Conciliation Service will provide assistance. In negotiation impasses, a Federal Service Impasses Panel is established as an agency within the Federal Labor Relations Council, with discretion to consider impasses on the request of either party, following failure of voluntary arrangements. The parties may only use arbitration

Table 1. Key provisions of selected State public employee laws, including enactments as of Spring 1970

State	Employees covered	Administrative machinery	Bargaining	Representation	Dispute provisions	Strike provisions
California	State and local employees (1968 amendments do not apply to state employees).	Governmental subdivisions.	Required "to meet and confer in good faith" (1968 amendments authorized nonbinding memoranda of agreement with "determination" by governing body.)	Subdivisions may adopt procedures after consultation with employee organizations; guides suggested for recognizing employee organizations.	Authorized agreement on third party in local negotiations.	.....
	Teachers	School district, county board of education, etc.	Required to "meet and confer."	Negotiating councils with proportional representation.	None specified	.....
Connecticut	Local	State Labor Relations Board (SLRB). Board of Mediation and Arbitration (BMA).	Duty to negotiate, including written agreement.	SLRB determines representative. Exclusive representation.	BMA mediates, and factfinding.	Prohibited.
	Teachers	Local Boards of Education. State Board of Education (SBE).	Duty to negotiate, including written agreement.	Procedures set forth. Exclusive representation.	SBE mediates	Prohibited.
Delaware	State and local	State Department of Labor and Industrial Relations (SDLIR). State Mediation Service (SMS).	State and county—duty to negotiate. Municipalities—independent decision. Includes written agreement.	SDLIR determines. Exclusive representation.	SMS mediates	Prohibited.
	Teachers	Local Boards of Education. State Board of Education (SBE).	Duty to negotiate. Authorizes agreement.	Procedural guides for exclusive representation but administered by local boards. Appeal to SBE.	Authorizes local mediation and factfinding but bans arbitration.	Prohibited. Exclusive representative loss of representation rights for 2 years; loss of dues check-off for 1 year.
Maine	Local, including teachers.	Commissioner, Department of Labor and Industry (CDLI). Public Employees Labor Relations Appeals Board (PELRAB). Board of Arbitration and Conciliation (BAC).	Duty to negotiate, including written agreement.	Exclusive recognition. Subdivisions may accord representation. Elections, if required, conducted by CDLI. Appeal to PELRAB.	May call on BAC for factfinding. Permits binding arbitration, but advisory only on wages.	Prohibited and may be enjoined. Strikes are unfair labor practice.
Maryland	Teachers	Local Boards of Education. State Board of Education (SBE).	Required to meet and negotiate. Negotiation includes the duty to "confer in good faith" and "reduce to writing" agreed upon matters.	Procedures established; local board may designate majority organization as exclusive representative; SSBE establishes rules for elections and supervises.	SBE assistance; report and recommendations.	Prohibited; penalties: revocation of exclusive bargaining representation for 2 years and loss of dues check-off for 1 year.
Massachusetts	All local, including teachers.	State Labor Relations Commission (SLRC). State Board of Conciliation and Arbitration (SBCA).	Duty to negotiate including written agreement.	SLRC determines. Exclusive representation.	SBCA factfinding	Prohibited.
	State	State Director of Personnel (SDP).	Duty to negotiate, including written agreement.	Rules for determination by SDP. Exclusive representation.	.....	Prohibited. Strikes are unfair labor practice.
Michigan	All local, including teachers.	State Labor Mediation Board (SLMB) (separate administration of the labor relations and mediation function).	Duty to negotiate, including written agreement.	SLMB determines. Exclusive representation.	SLMB mediates grievance.	Prohibited; sanctions against strikes subject to appeal and court review.
Minnesota	State and local	Division of Labor Conciliation (DLC).	Required to "meet and confer."	DLC determines. Formal recognition to majority organizations; informal to others.	DLC mediates. Then adjustment panel for findings.	Prohibited. Continues earlier penalties against individuals, with right to review.
	Teachers	School boards.	Required to "meet and confer."	Recognition to single organization. Where more than one, proportional representation on teachers' council.	Adjustment panel for findings.	.....
Missouri	State and local except teachers, police, State police.	State Board of Mediation (SBM).	Required to "meet, confer and discuss," results "reduced to writing."	SBM resolves issues. Exclusive representation.	.....	Prohibited.
Nebraska	State and local	Local jurisdictions. State Court of Industrial Relations (SCIR).	Authorizes recognition, negotiation and written agreement by public employers.	Jurisdictions may grant exclusive recognition or conduct elections. SCIR certifies.	SCIR jurisdiction may be invoked to determine terms.	Prohibited. Continues earlier penalties against individual.

Table 1. Key provisions of selected State public employee laws, including enactments as of Spring 1970—Continued

State	Employees covered	Administrative machinery	Bargaining	Representation	Dispute provisions	Strike provisions
Nebraska—Con.	Teachers	School boards. State Court of Industrial Relations (SCIR).	"To meet and confer" is authorized on vote of majority of school board.	Authorizes exclusive representation.	Authorized parties to establish procedures for factfinding; decisionmaking authority of SCIR may be invoked.	Prohibited.
Nevada	Local including teachers.	Local jurisdictions; State Local Government Employee Management Relations Board (SLGB).	Duty to negotiate.	No strike pledge as condition for recognition; exclusive representation accorded by local jurisdiction; appeals available to SLGB.	SLG notified, and may appoint mediator; factfinding if impasse persists.	Prohibited; public employers may seek enjoinment; penalties for violation of enjoinment set out; by court, against employee organization (maximum fine), individual officers (maximum time on imprisonment); individual employees (dismissal or suspension); by public employers against individual or dismissal, demotion or suspension; withhold salaries, cancel contracts.
New Hampshire.	State	State Commission established.	Obligation to negotiate for purpose of reaching agreement.	State Commission conducts election and certifies results; exclusive representation.		Prohibited, every agreement to contain no strike clause; employees subject to disciplinary penalties provided by law and personnel regulations for serious misconduct.
New Jersey	State and local, including teachers.	Division of Public Employment Relations (PERI) autonomous tripartite unit in Department of Labor and Industry. Public Employment Relation Commission (PERC) in PERD for policy and rule making.	Required to bargain, including written agreement.	Majority organization is exclusive representative. Determined by employee designation or by election. Elections conducted by and rules determined by PERC.	PERC to aid in mediation; may recommend or invoke factfinding.	States that the Act of 1968 is not to be construed to "diminish in any way the right of private employees to strike."
New York	All State and local	Public Employment Relations Board (PERB) (autonomous in State Department of Civil Service).	Required to bargain, including written agreement.	Procedures for recognition by local authorities, subject to "affirmation by such organization that it does not assert the right to strike against any government..." To PERB for resolution if no local procedures, and for State employees.	a) Parties establish own procedures, b) or recourse to mediation and factfinding through PERB. c) Recommendations not accepted, legislative body or committee conducts hearing and takes action.	Prohibited; organizations may be fined and chief executive of government involved required to notify PERB. For violation, PERB to order forfeiture of representation rights and dues checkoff for such period as PERB determines. Chief executive required to deduct 2 days pay for each day employee on strike. On probation without tenure for a year. Right to review.
North Dakota	Teachers	Education Fact Finding Commission (EFFC).	Required to negotiate, and written agreement.	Local board accepts majority organization, or conducts election. If disagreement, EFFC rules govern election.	Determined by parties; or call on EFFC for factfinding.	Prohibited; individual teacher may be denied full salary during period of violation.
Oregon	State and local	Public Employee Relations Board (PERB). State Conciliation Service (SCS). (PERB may assign duties to SCS).	Required to negotiate and enter agreement.	Exclusive representation; local jurisdictions may determine or call on PERB.	Local jurisdictions may determine or call on PERB for mediation and factfinding.	Prohibited.
	Teachers	School boards	Required to "confer, consult and discuss in good faith."	Local election to determine whether an employee organization or a committee representing teachers is to be exclusive representative.	Mediation	
Rhode Island	Local	State Labor Relations Board (SLRB).	Required to bargain	SLRB determines. Exclusive representation.	Mediation by SDL with arbitration on request of either party (but decisions involving expenditures are advisory).	Prohibited.

Table 1. Key provisions of selected State public employee laws, including enactments as of Spring 1970—Continued

State	Employees covered	Administrative machinery	Bargaining	Representation	Dispute provisions	Strike provisions
Rhode Island—Continued	State	State agencies.	Required to bargain	Represents members		Prohibited.
	Teachers	School boards. State Labor Relations Board (SLRB). State Department of Education (SDE).	Required to bargain	SLRB determines. Exclusive representation.	SDE mediation; either party may request arbitration but decisions involving expenditures are advisory.	Prohibited.
South Dakota	State, local, including teachers.	Individual jurisdictions. State Labor Commission (S.C).	Required to meet and negotiate with majority representative. Settlements to be implemented by ordinance, resolution, or memorandum of understanding as may be appropriate.	Formal recognition to majority organization only for members; informal recognition to any organization.	Parties may call on SLC in case of impasse.	Prohibited. State and local governments required to apply to courts for immediate relief. Penalties against organization by courts set at maximum of $50,000 and/or imprisonment of officials for 1 year. Employees, right to appeal and court review, subject to a fine of $1,000 and 1 year imprisonment.
Vermont	Local employees, excludes "professional employees".	State Labor Relations Board (SLRB). Department of Industrial Relations (DIR).	Authorized to bargain	SLRB determines. Exclusive representation.	Mediation by DIR and governor, effort to have parties agree to arbitration, otherwise, factfinding by labor emergency board.	Prohibited; right of public employer to petition for injunction.
	State	State Employee Labor Relations Board (SELRB).	Required to bargain; written agreement.	SELRB certifies; exclusive representation.	SELRB may authorize factfinding.	Prohibited. Strikes are unfair labor practice.
	Teachers	Local boards of education.	Required to negotiate, and written agreement.	School board may waive elections for exclusive representation; or follow procedures in statute.	Parties may use mediation or factfinding.	Injunctions by court only after due hearing that action "poses clear and present danger to sound program of school education . . . is in best public interest to prevent."
Washington	Local	Department of Labor and Industries (DLI).	Required to bargain and written agreement.	Exclusive representation. Parties may decide; or invite D.I to decide and conduct election if necessary.	Mediation	Prohibited.
	Teachers	School Districts. State Superintendent of Public Instruction (SSPI).	Required to meet and negotiate.	Procedures adopted locally; exclusive representation.	Assistance of committees of educators and school directors appointed by SSPI.	
Wisconsin	Local	Wisconsin Employment Relations Board (WERB).	Required to bargain	WERB determines, exclusive representation.	WERB factfinding; unless local authorities have established comparable procedures.	Prohibited.
	State	WERB	Required to bargain	WERB determines, exclusive representation.	WERB factfinding	Prohibited.

or third party factfinding with recommendations to resolve an impasse on the authorization or direction of the Panel.

POSTAL AGREEMENT. New facets to Federal employee policies have been provided by the recent agreement negotiated with the AFL–CIO, which includes joint sponsorship of a bill establishing the United States Postal Service as an independent government establishment, proposed pay raises, and collective bargaining over wages, hours, and working conditions generally subject to private sector collective bargaining. The coverage of wages and working conditions in bargaining in the Postal Service is a major change.

In addition, jurisdiction over unit determinations, union recognition, and adjudication of unfair labor practice charges is assigned to the National Labor Relations Board under procedures comparable to those in the private sector. The strike impasse question, in recognition of the Federal ban on government worker strikes, is met by the provision of mediation, a 90-day cooling off period with factfinding, with final and binding third party arbitration, if the impasse persists.

State and local developments

The ACIR report analyzed existing State statutes relating to public employees, and found 21 had comprehensive statutes, that is, statutes conferring organizational and representation rights on broad groups of State or local employees or both. Of

these, 19 required public employers to deal with employee organizations but only 14 required mandatory collective bargaining. All required the execution of binding written agreements (one on the request of either party). "Meet and confer" provisions were effective in five States, with only one requiring written agreement. Exclusive recognition was accorded the majority representative in all of the 14 States requiring mandatory bargaining, but was required in only two of the "meet and confer" States. Detailed unfair labor practice provisions for both employer and employee organizations were set forth in the statutes of eight States providing mandatory bargaining. These States generally had provisions for mediation of unresolved negotiations, with 11 also providing factfinding procedures. Two "meet and confer" States had specific provisions for mediation only of representation and recognition disputes, and none provided for factfinding.

A number of the States dealt with above had special statutes covering such occupational groups as teachers, fire fighters, employees of publicly owned utilities, and nurses. Several of the 29 States lacking legislation covering State or local employees on a broad basis do have statutes relating to organization, representation rights, or impasse settlement for special occupational groups. Some authorized organization of employees either by statute, attorney-general opinions, or court decision. (See table 1.)

This diversity, including complete or partial statutory voids in some States, and some persistent tendencies—substantially overshadowed nowadays—to stress strike prevention and sanctions, have produced a new orientation on the part of some employee organizations. Whether this orientation toward the enactment of national legislation establishing national minimum standards for representation and bargaining rights for public employees will be actively pressed remains to be seen. It is significant, however, that this is now one of the elements in the total evolutionary pattern of the law of public employment. As one union group expressed it recently:

> At the State and local level the cause of collective bargaining has met with despair and prejudice. It is this sense of hopelessness, coupled with the urgent need of a program to give every public employee the dignity and decency which derive from the justice and equity embodied in collective bargaining which leads to the call for a Federal minimum standard bargaining law—a Federal labor law for public employees.[11]

Legal proposal

The State, County and Municipal Workers union has been in the process of developing a model Federal statute proposal. Still in a developmental stage, provisions may include guarantees for State and public employee organization, representation and collective bargaining like those for private industry employees under the Labor Management Relations Act. It would provide for a 5-member Public Employees Relation Commission. Election rules would be like those in the private sector. All State and local employees would be covered, except elected officials, with supervisors placed in separate units. Unfair labor practices would be specified, with procedures for complaints and hearings. Written agreements would be required, with the settlement going into effect automatically if the legislature takes no adverse action within 30 days. Dues check-off would be required on voluntary written authorization, limited to the exclusive representative where one has been certified. The Federal Mediation and Conciliation Service would mediate contract negotiations at the request of either party, or on its own. If factfinding is necessary, the Service would provide the parties with a slate of factfinders, who would make recommendations for settlement, with public disclosure mandatory 15 days after the recommendations are submitted. The parties could agree to use other procedures and other agencies, or to agree to final and binding arbitration. As in the private sector, strikes would not be banned. Any State or political subdivision which enacts a law which substantially meets the provisions of the National Act could apply to the Commission for exemption from the National Act.[12]

A bill drafted by the National Education Association and introduced in the current Congress is entitled the "Professional Negotiations Act for Public Education 1969." It would cover the "professional employees of boards of education," excluding superintendents of schools. Professional negotiation, or "meeting, conferring, consulting, or discussing in good faith" terms and conditions of professional service would be required with execution of a written agreement if either party so requests. A Professional Education Employee Commission would be established in the Department of Health, Education, and Welfare to administer the Act. Organization rights, recognition rights, exclusive representation to majority

representatives, and voluntary dues check-off are provided for. The National Commission would conduct hearings in contested recognition situations and order elections if necessary. Either party could call on the Commission for mediation in impasse situations, or the Commission could itself declare an impasse. If mediation were unsuccessful, either party could request submission of the issues to advisory arbitration, with the arbitrators's recommendations binding only if the parties had so agreed. Strikes would be specifically permitted, with temporary or permanent injunctions being issued only where findings of fact determine that the start or continuance of a strike would pose a clear and present danger to the public health and safety, or where the employee representative has failed to make a reasonable effort to utilize the mediation, factfinding, and voluntary arbitration machinery of the act. Unfair labor practices are set out, and the Commission is authorized to issue complaints, hold hearings, and issue orders. Here again, States which establish systems equivalent to the national system could apply for exemption.[13]

Other views

The reports of the Advisory Committee on Intergovernmental Relations (ACIR) and the Twentieth Century Task Force (TCTF) provide additional insights into the nature of policy views which are percolating in the development of law and practice in the public employee field. The ACIR may be said to reflect views by public managers and elected officials; the TCTF, the views of prominent impartial practitioners and legal experts. They do not necessarily encompass all of the views held by knowledgeable people.

The two reports diverge in one important respect. The TCTF report endorses collective negotiations, with one recommended principle stating that "the public employer has the duty to meet and negotiate with the union" in good faith, as is the statutory requirement in the private sector. To justify this stand, the report states: "In this matter, as in representative rights and in recognition, differences in the public and the private sectors are not such as to make inapplicable the rules of conduct legislated for private employment. As strike issues, these matters have been largely eliminated in industry. The extension of these rules to government labor relations can be a major contribution to stability."

The ACIR also recommended the enactment of State statutes "establishing the basic relationship between public employers and their organizations in arriving at the terms and conditions of employment; absence of such legislation tends to encourage chaotic labor-management relations, especially in local governments where the evolution of these relationships is left to chance and to the ebb and flow of political power and influence of employees and their organization and to widely varying administrative and judicial interpretations." The report stated that two routes were available for implementation, either collective negotiation or meet and confer provisions. The following are partial characterizations of these presented in this report: "While both systems involve continuing communication between the employer and employee representatives, under collective negotiations both parties meet more as equals. . . . Under a meet and confer system, the outcome of public employer-employee discussions depends more on management's determination than on bilateral decisions as 'equals.' "

"Given contemporary and evolving conditions in State and local employment," the majority ACIR view was to endorse the meet and confer in good faith approach. Stating that its recommendation was directed to those government seats which lack laws or formal policies on the subject—29 States, two-thirds of the municipalities with populations over 100,000, and half of the urban counties surveyed—the report stated: "these jurisdictions not only have failed to come to grips with a pressing intergovernmental issue, they have forfeited their basic responsibilities over to the courts, to the bureaucracy, and to the unpredictable play of political forces and the influence of employee groups." In the view of the majority, the obligation to "meet and confer *in good faith*" converts "the system into something broader and more balanced than the 'meet and confer' setup, but still something less than the glittering and often unfulfilled promises of a collective bargaining statute."

Express support for collective negotiations came from 7 of the 26 ACIR members.[14] Several of their views pointed to the prevailing trend in the State legislation enacted during the past decade toward requiring collective negotiations. All preferred collective negotiations, but some would have left "meet and confer" as at most a transi-

tional alternative leading soon to negotiations.

The question of the right of public employees to strike continues to be a major issue in the consideration of appropriate legislation. Equally prominent in the deliberations are considerations of machinery to avoid strikes. The predominant view has been that statutory provisions assuring the right to organize, bargain collectively, together with the provision of machinery to deal with grievances, representation rights, and unfair labor practice charges would have as stabilizing an effect on public employee relations as they have had in the private sector. That this has not been so in some instances has resulted in emphasis also being placed on machinery to deal with bargaining impasses to avoid strike situations.

The ACIR report and a majority of the TCTF supported continuance of the prevailing ban on public employee strikes, under all circumstances. Within the task force, however, a minority went along with a universal strike ban only for firemen and policemen; for other public employees, only if the terms and machinery established by agreement had not been exhausted or when the public health and safety were truly imperiled as established by court findings. It may also be noted that two State commissions, those of Colorado and Pennsylvania, recommended a limited right to strike for public employees, where these did not contravene contract terms and procedures, and where the public health and safety were not affected. These recommendations have not been incorporated in statutes, however. (See Vermont statute relating to teachers in table 1.)

Views on banning strikes give great emphasis to the provision of alternatives to strikes. The TCTF states that: "Threatening disputes should be subject to intense and continuing negotiations between the parties until all hope of agreement in that forum is exhausted. Then the techniques of mediation should be applied, and if that fails it should be followed by factfinding that will recommend the terms on which the disagreeing parties should end their disputes." The ACIR also stresses the need for avenues for eliminating impasses in two recommendations. States should "mandate the use of specific procedures (for example, factfinding, mediation, and advisory arbitration)" to resolve impasses under one recommendation. Under another recommendation, only mediation would be mandated, with the suggestion of State legislative authorization of additional steps.

Both the ACIR and the task force stress the need for the States to enact legislation to regularize labor-management relationships, including the establishment of independent agencies to administer the statutes. The ACIR recommendations are, of course, geared to the "meet and confer in good faith approach" and the task force to the more evident trend to collective negotiations.

Additional matters are covered in the reports, indicative of the efforts to meet significant issues which arise in employee relationships. The ACIR would require that State laws treat both State and local employees uniformly; the task force lays down general principles which are intended for uniform application. The ACIR would accord full "meet and confer" rights to the majority representative, but would not preclude informal recognition of minority group representatives. The TCTF stressed exclusive representation of the majority unions selected by employees as providing "the basis for a genuine bilateral union-management relationship." The ACIR does not deal directly with appropriate bargaining units in its recommendation, but would exclude supervisors from the grant of employee rights and privileges, while permitting them to join and be represented by organizations restricted to supervisors through which they could consult with employers on an informal basis. The TCTF stressed the practical need in public service for the largest possible unit for recognition, to avoid distortion resulting from fractionalized negotiations on cost items among agencies. The task force noted the provisions for separate units for employees and their supervisors in the Federal law for private employees and recommended that the independent labor relations agency adjudicate representation questions among its functions.

In line with its "meet and confer in good faith" recommendations, the ACIR proposed "joint effort in drafting a nonbinding memorandum of understanding setting forth all the agreed upon recommendations for submission to the jurisdiction's governing officials." The TCTF stressed that: "when an agreement between the public employer and a union has been reached, it should be reduced to writing with both affixing their signatures to it," as involving more than a symbolic gesture, in providing a documentary reference if future questions arise over the agreement. On subjects which may be covered by memorandums of understanding, the ACIR would include

"wages, hours, and other conditions of employment as fall within the statutorily defined scope of the discussions," with State statutes explicitly setting forth detailed management rights. The TCTF also recognized that some matters are covered by legislation and constitutional provisions in some States, thus limiting the authority of an administrator in an organized agency.

The TCTF further noted that labor agreements in the private sector and in State and local contracts contain management rights provisions, as well as in Federal Executive Order 11491. To cover the variety of discretionary authority possessed by public authorities, it stressed the need for "viable negotiations," which would not extend beyond the employer-agency's authority to make binding commitments. It emphasizes, however, that "no subject should be barred from consultations and discussion—in contrast to negotiations—however restricted the autonomous powers of the employer agency." Such limitations "may appear unduly restrictive to a healthy labor-management relationship," in the light of private experience. The task force goes on to state, "However, the government employee organization has a recourse not available to the union in private industry: it may take what it can get in limited negotiations, then lobby the legislature for nonnegotiable items."

HIGHLIGHTS of the mix of thinking now evident in the field of State and local employee-management relations indicate the complexities of the subject. To date, the recent trend in State legislation has been to comprehensive statutes providing for collective negotiations, with machinery comparable to that in the private sector. The absence of such action in the majority of States has produced the cross-currents already described: Employee organization proposals for national legislation establishing minimum standards; the ACIR majority recommendations for "meet and confer in good faith" State statutes as an acceptable approach for States which have otherwise failed to act; and the TCTF proposals for further extension by States of the collective negotiations legislation that has emerged as the prevailing approach in States which have acted. In the meantime, the pressures of employee unions and associations for representation rights and improved conditions are having their own impact on the developing trends. □

FOOTNOTES

[1] For analysis of earlier reports of State commissions, see J. P. Goldberg, "Labor-Management Relations Laws in Public Service," *Monthly Labor Review*, June 1968, pp. 48–55; Russell A. Smith, "State and Local Advisory Reports on Public Employment Labor Legislation," *Michigan Law Review*, March 1969, pp. 891–918.

[2] Supplement to *Report of Task Force on State and Local Government Labor Relations*, Committee on Executive Management and Fiscal Offices, National Governor's Conference (Chicago, Public Personnel Association, 1969).

[3] Advisory Commission on Intergovernmental Relations, *Labor-Management Policies for State and Local Government, 1969*, p. 99. The ACIR was established by Public Law 380, 86th Cong., 1st Session, 1959. The Commission includes 3 private citizens, 3 members of the U.S. Senate, 3 members of the U.S. House of Representatives, 3 officers of the Executive Branch, U.S. Government, 4 Governors, 4 Mayors, 3 State legislators, and 3 elected county officials.

[4] *AFL–CIO News*, April 4, 1970, p. 6.

[5] *Report and Recommendations of the Twentieth Century Fund Task Force on Labor Disputes in Public Employment, 1970.* Members participating as individuals were: Archibald Cox, Harvard University; Charles C. Killingsworth, Michigan State University; Joseph H. Loftus, U.S. Department of Labor; John W. Macy, Jr., Former Chairman, U.S. Civil Service Commission; Walter E. Oberer, Cornell University; William Simkin, Former Director, Federal Mediation and Conciliation Service; George W. Taylor, University of Pennsylvania; Saul Wallen (deceased); and Edwin E. Young, University of Wisconsin.

[6] National Education Association, press release, January 25, 1970

[7] ACIR report cited, pp. 123–124.

[8] BLS Summary Report, Municipal Public Employee Associations, January 1970.

[9] Sheila C. White, "Work Stoppages of Government Employees," *Monthly Labor Review*, December 1969, pp. 29–34.

[10] Presidential Review Committee on Employee Management Relations in the Federal Service, 1968; Study Committee on Labor Management Relations in the Public Service, Report and Recommendations,1969.

[11] AFL–CIO Maritime Trades Department, *Final Report: Collective Bargaining in the Public Sector, 1969*, pp. 35–36.

[12] *The Public Employee*, January 1970, p. 12.

[13] 91st Congress, 1st Session, S. 1951.

[14] Dissenting or excepting views were submitted by Robert P. Knowles, State Senator, Wisconsin; Edwin G. Michaelian, elected County official, Westchester County, New York; Raymond P. Shafer, Governor, Pennsylvania; Edmund S. Muskie, U.S. Senator, Maine; Robert P. Mayo, Director of the U.S. Bureau of the Budget; and Nelson A. Rockefeller, Governor, New York.

Union membership among government employees

Personnel, budget and other policies of all levels of government will be affected by union advances

HARRY P. COHANY AND LUCRETIA M. DEWEY

THE UPSURGE in the past decade in union membership at all levels of government, Federal, State and local, surprised not only public officials, but also those considered knowledgeable in labor matters. Membership growth—after dramatic gains before and during the World War II period—had reached a plateau during most of the 1950's and the outlook for further advances appeared dim. Blue-collar workers, the traditional mainstay of the labor movement, were already organized in most manufacturing and nonmanufacturing industries, while white-collar workers had repeatedly spurned offers to sign up.

White-collar workers were the fastest growing sector of the labor force and the proportion of manual workers was expected to decline because of automation, leading to widespread speculation about the "stagnation" and even the "crisis" of the labor movement.

A number of obstacles to union growth were held to exist in the public sector. It was asserted frequently that government as an employer could not legally engage in collective bargaining, since this would violate the concept of sovereignty and lead to an illegal delegation of powers. Furthermore, it was held that government operations and conditions of employment differed so markedly from those in private industry that practices and approaches developed in the latter were wholly inapplicable to the public sector. Wages and terms of employment generally were set by legislation and subsequently implemented by Civil Service Commission directives, agency regulations, and so on, thereby removing these issues from bargaining or any other form of joint decisionmaking between managers and employees. These views, it should be noted, were held not only by agency heads and large sections of the public but by government employees as well. Perhaps, because of the largely unquestioned acceptance of the "conventional wisdom" in this area, union growth in the public sector was insignificant until the start of the 1960's, although unions made up in whole or in part of government employees go back to World War I and earlier.

For reasons not fully understood even now, things changed unexpectedly and rapidly during the 1960's. A number of explanations for this development have been put forth and these will be discussed later in the article. For the sake of perspective, however, it is necessary to look first at union gains in absolute and relative terms.

Dimensions of growth

In 1956, the year the Bureau of Labor Statistics started collecting data on union membership by industry, 915,000, or 5.1 percent of a total membership of 18.1 million were in government (table 1). In 1962, the number had grown to 1.2 million, or 7 percent of total membership, and by 1968, union membership among government employees had climbed to 2.2 million, 10.7 percent of total membership. During the period 1956–68, membership in all unions increased by 2.1 million of whom more than 1.2 million were in government. At the same time, gains in manufacturing and nonmanufacturing industries were only 379,000 and 487,000, respectively. While government unions scored gains of 135.5 percent, those in private industry were held to about 5 percent. All indications point to further advances in the public sector in 1969 and 1970 so that union membership as of mid-1970 is likely to exceed 2.6 million.

Not all elements of the labor movement shared in these gains. The major beneficiaries were unions

Harry P. Cohany is chief of the Division of Industrial Relations, Bureau of Labor Statistics, and Lucretia M. Dewey is an economist in the same division.

From the *Review* of July 1970

affiliated with the AFL–CIO, which enrolled more than 1 million public servants during 1956–68, compared with 226,000 for those outside the Federation. In 1968, the last year for which data are presently available, 78 percent of the 2.2 million members in government were in AFL–CIO unions:

Membership (in thousands):	Total	AFL–CIO	Independent
1956	915	669	247
1960	1,070	824	247
1964	1,453	1,116	337
1968	2,155	1,682	473
Percent change:			
1956–60	16.9	23.2	----------
1960–64	35.8	35.4	36.4
1964–68	48.3	50.7	40.4

These changes also are reflected in the growth figures for particular unions. Prior to 1960, only three government unions had 100,000 members or more; by 1968, there were six well above this size (table 2). Between 1956–68, unions in government did better than the average growth in membership. The American Federation of Government Employees (AFL–CIO) grew by 360 percent; the American Federation of Teachers (AFL–CIO) by 230 percent; and the American Federation of State, County and Municipal Employees (AFL–CIO) by 143 percent. Since 1968, the AFGE has reported a further increase of 30,000 members, reaching a total of 325,000, the AFT now claims 190,000, a gain of 25,000, and AFSCME rolls are up by 76,000 to a total of 440,000. In addition to those unions whose jurisdiction was confined to the public sector, significant breakthroughs among government employees were also scored by unions primarily active in private industry, such as the Service Employees (AFL–CIO), Machinists (AFL–CIO), Laborers (AFL–CIO), and a number of craft unions.

Table 1. Union membership by sector, 1956–68
(Numbers in thousands)

Year	Total [1]	Manufacturing		Nonmanufacturing		Government	
		Number	Percent	Number	Percent	Number	Percent
1956	18,104	8,839	48.8	8,350	46.1	915	5.1
1958	17,968	8,359	46.5	8,574	47.7	1,035	5.8
1960	18,036	8,591	47.6	8,375	46.4	1,070	5.9
1962	17,564	8,050	45.8	8,289	47.2	1,225	7.0
1964	17,920	8,342	46.6	8,125	45.3	1,453	8.1
1966	19,126	8,769	45.8	8,640	45.2	1,717	9.0
1968	20,210	9,218	45.6	8,837	43.7	2,155	10.7
ABSOLUTE CHANGE							
1956–60	−68	−248		−25		155	
1960–68	2,174	627		462		1,085	
1956–68	2,106	379		487		1,240	
PERCENTAGE CHANGE							
1956–60	−.4	−2.8		−.4		16.9	
1960–68	12.1	7.4		5.5		101.4	
1956–68	11.6	4.3		5.8		135.5	

[1] Includes membership outside the United States.

Comparison of membership at the various levels of government for 1968 show almost 1.4 million in Federal service (63 percent of the total), and 800,000 in State and local jurisdictions. During 1966–68, the rate of expansion in both major levels was about 25 percent.

In terms of union penetration, unions in the Federal service have fared far better than those in other jurisdictions. In 1968, one-half of all Federal employees were union members (table 3)—a surprising statistic when compared with the situation in 1960. Although a large proportion of the membership was in a single department (the Post Office, which was better than 80 percent organized), major clusters were also found in a host of other agencies and installations covering professional, clerical, and blue-collar workers. Less than 10 percent of State and local employees was organized, although the number of those represented by associations or "near-unions" should be added to this figure to arrive at an overall assessment. For all of government, about one out of every five employees was a union member in 1968, a rate that has moved upward steadily throughout the last decade.

By State, government union membership varied greatly in 1968 from a low of 2,000 in Wyoming to a high of 309,000 in New York (table 4). However, union membership was concentrated in a few States. Of the total of 2.2 million, three States—California, New York, and Illinois—together accounted for about 1 out of 3 members. These three States, and Pennsylvania, Michigan, Ohio, Massachusetts, and the Maryland-D.C. area had over one-half of the total.

The States with the largest number of government union members are not always those in which unions have scored their greatest organizing successes. New York, California, and Illinois, which have the largest number of members, ranked 3rd, 34th, and 8th in terms of the proportion of government employees organized. Similarly, no strong relationship exists between the extent of organization among government employees and that among employees in nonagricultural establishments generally. West Virginia,

for example, ranked first in terms of union membership in nonagricultural establishments, but only 45th in the extent of union membership among government workers. Ranked first among government employees, Rhode Island is only 22d in rank in terms of total membership of nonfarm workers. One-fifth of the States rank in roughly the same positions in both categories. Thus, a relatively high degree of organization in private industry is not necessarily associated with similar gains in the public sector.

Of more than ordinary interest in looking at these figures are union successes in organizing white-collar workers, an area where only meager gains have been recorded in the past. The last BLS survey estimated 900,000 white-collar members in government unions, or 42 percent of total government enrollment. This figure has more than doubled since 1960 when it was estimated at 409,000. Between 1964 and 1968, white-collar membership in all unions increased by 590,000, of which 262,000 was accounted for by those in government. Massive additions to union ranks of professional and clerical employees in the public sector may well presage similar breakthroughs in private industry. At present, however, white-collar members constitute a greater proportion of all union members in government than they do in the private sector—nearly 42 percent in the former compared with 4 percent in manufacturing and 21 percent in nonmanufacturing.

	1960	*1964*	*1968*
Total white-collar membership (in thousands)	2,192	2,585	3,176
Estimated number in government unions (in thousands)	409	636	898
Percent in government unions	18.7	24.6	28.3
White-collar membership as a proportion of all members in government	38.2	43.8	41.7

It should be emphasized that all of the figures discussed refer to union *members* only. Not infrequently, the number of workers *represented* by unions far exceeds those on their books. Thus, union bargaining strength is in many jurisdictions far greater than is apparent from membership figures alone.

As noted, a complete evaluation of union gains would also have to take account of those organ-

Table 2. Total membership of selected unions with the major proportion of their membership in the public service, 1952–68 [1]

Union	1952	1954	1956	1958	1960	1962	1964	1966	1968	Percent change, 1956–68 [2]
UNIONS OF FEDERAL EMPLOYEES										
Total	452,242	526,033	533,433	545,709	535,277	667,021	793,458	933,035	1,100,087	106.2
ASCS County Office Employees, National Association of (Ind.)						12,888	14,098	14,300	14,130	8.6
Federal Employees Association (Ind.)	90,000	99,000	98,000	90,000	53,000	49,500	40,000	80,000	95,000	−3.1
Government Employees, American Federation of	48,000	62,000	64,000	60,000	70,322	106,042	138,642	199,823	294,725	360.5
Government Employees, National Association of (Ind.)							15,000			
Internal Revenue Association (Ind.)						27,125	27,000	24,130	26,360	−2.8
Letter Carriers, National Association of	95,000	103,000	108,000	110,000	138,000	150,114	167,913	189,628	210,000	94.4
Letter Carriers, National Rural Association of (Ind.)	34,570	36,355	35,900	36,723	38,321	35,852	42,300	40,340	41,192	14.7
Messengers, National Association of Special Delivery	2,000	2,000	2,000	1,987	2,000	1,500	1,500	2,073	2,605	30.3
Post Office Clerks [3]	95,000	101,576	97,052	100,000	135,000	145,000	139,000	143,146	166,000	71.0
Post Office Craftsmen [3]		40,000	40,100	38,500						
Post Office and General Services Maintenance Employees (Ind.)	10,000	7,549	7,700	7,700	7,400	8,000	8,424	9,237	13,175	71.1
Post Office Mail Handlers, Watchmen, Messengers, and Leaders; National Association of [4]	2,000	6,000	9,000	5,500	4,000	14,000	29,000	32,000	24,000	166.7
Post Office Motor Vehicle Employees, National Federation of	6,172	6,274	6,958	5,000	5,000	5,000	6,200	8,141	8,000	15.0
Postal and Federal Employees, National Alliance of (Ind.)		19,000	18,000	18,000	18,000	25,000	26,000	37,000	45,000	250.0
Postal Supervisors, National Association of (Ind.)	16,500	19,479	19,923	21,808	19,250	26,000	28,000	31,700	33,000	65.6
Postal Transport Association [5]	27,000	23,800	26,800	25,491						
Postal Union, National (Ind.)				25,000	32,000	43,000	62,000	70,000	80,000	220.0
Postmasters, National Association of (Ind.)							33,881	32,717	28,900	−14.7
Postmasters, National League of (Ind.)	26,000				12,984	14,400	14,500	18,000	18,000	38.6
UNIONS OF STATE AND LOCAL GOVERNMENT EMPLOYEES										
Total	211,000	226,468	285,000	343,772	361,158	399,856	450,197	521,277	662,120	132.3
Firefighters, International Association of	76,000	85,000	85,000	93,000	95,000	109,035	115,358	115,000	132,634	56.0
State, County, and Municipal Employees; American Federation of	85,000	96,328	150,000	200,000	210,000	220,000	234,839	281,277	364,486	143.0
Teachers, American Federation of	50,000	45,140	50,000	50,772	56,156	70,821	100,000	125,000	165,000	230.0

[1] Unions listed below have at least 50 percent of their membership in Government service.

[2] Where 1956 figures are not shown, the base period is the first subsequent year for which figures are shown.

[3] Post Office Clerks and Post Office Craftsmen merged to form United Federation of Postal Clerks (AFL–CIO) on July 1, 1961.

[4] Post Office Mail Handlers merged with Laborers' International Union of North America (AFL–CIO) on April 20, 1968.

[5] Postal Transport Association merged with United Federation of Postal Clerks (AFL–CIO) on July 1, 1961.

izations which are commonly referred to as "associations" or "near-unions." At the present time, however, no comprehensive figures for these groups exist. Various estimates place the total at between 2 and 2.5 million. The National Education Association, with more than 1 million classroom teachers, and the American Nurses Association, with 204,000 members, have been actively seeking recognition and engaging in collective bargaining, as have organizations of policemen, social workers, playground supervisors, university teaching assistants, and many other categories of State and local employees. A recent BLS survey of municipal public employee associations yielded 662 associations with about 265,000 members in 438 cities.[1] The Assembly of Government Employees, an association of State employee groups, claims that its affiliates represent more than 500,000 employees.[2] Recent contests between unions and associations leave no doubt that the latter groups are determined to stay. In a number of encounters in New York, California, and Oregon, among others, they decisively turned back union attempts to replace them.

Factors underlying growth

What lies behind this unexpected thrust for public sector bargaining? It is a matter of profound interest to bewildered administrators and to the public at large. Unlike the depression in the 1930's and the subsequent breakthrough in union membership in mass production industries, no single factor can be offered to explain the recent growth.

Clearly, unions of government employees are not of recent origin, although organizing efforts by these unions have been markedly stepped up since 1960, perhaps because of sheer persistence or a feeling that a turning point was near. Wage and fringe benefit gains by unions in private industry, widely reported in the press, found a receptive audience among government workers; at the same time, the traditional "security" of government employment looked less and less appealing in a progressively inflationary economy characterized by tight labor markets. This was particularly the case with the steadily growing number who entered government service in recent years. Long-standing local wage relationships between private and public employees were upset to the all too apparent disadvantage of the latter. The usual methods by which public servants received wage increases were too cumbersome and uncertain, pointing up that new approaches were called for. It should be added that sophisticated techniques ("human relations", and so forth) used by private employers to thwart union organization had made little headway among public managers.

Table 3. Proportion of government employees organized

[Numbers in thousands]

Year	Government		Federal Government		State and local government	
	Total employment	Percent organized	Total employment	Percent organized	Total employment	Percent organized
1956	7,277	12.6	2,209	.....	5,069	.....
1960	8,353	12.8	2,270	.....	6,083	.....
1964	9,596	15.1	2,348	38.2	7,248	7.7
1966	10,792	15.9	2,564	41.8	8,227	7.8
1968	11,846	18.2	2,737	49.4	9,109	8.8

NOTE: Dashes indicate data not available.

The rise in militancy among public employees can also be traced in some measure to the growing acquiescence in such actions by our society generally. The example of the civil rights movement, students, war protesters, and so on left its mark on teachers, hospital attendants, firemen, and others. Conduct of perhaps questionable legality had become accepted and, above all, had achieved results where more conventional means had failed. In addition to material benefits, public employees, particularly professionals, were seeking a vehicle to participate in decisionmaking, from which they had previously been excluded.

A key turning point occurred in early 1962 with the issuance of President Kennedy's Executive Order 10988, which sanctioned union organization and had wide repercussions at non-Federal levels as well. After a string of union victories in several major cities, the momentum generated proved irresistible in jurisdictions in most parts of the country. Dramatic stoppages, such as the sanitation workers' walkout in Memphis, added impetus to union efforts. Legislative reapportionment, which entailed a shift from rural to urban representatives, may also have helped matters along in some situations.

In any case, the upsurge in union activity has brought in its wake a host of problems, some relating to interunion relationships. But its greatest impact has been on the public service and consequently on public policy.

Effects on policy

As unions in the public sector have grown, they have increasingly come into competition with those in the private sector which in the past have been unopposed in their role of union spokesman in the community. Those who seek labor's endorsement must now turn to several power centers, while those in these centers are carefully delineating their roles. This new state of affairs was recognized at the AFL–CIO's 1969 convention, when the federation added two presidents of government unions to its Executive Council. [3]

The prospect of further gains has also intensified rivalries among unions and between unions and associations in organizing campaigns. This competition for new members is likely to lead to jurisdictional conflicts between unions whose membership encompasses white-collar and blue-collar workers and those made up of a particular craft. Such conflicts often underlie the question of "unit determination" since depending on the expected election outcome, one group may opt for a smaller (craft) as against a broader (installationwide) unit in one situation while taking the opposite position in another. Even within national unions, sudden membership successes have exacerbated long-smouldering conflicts, frequently resulting in changes in top officers. Such unsettled internal affairs are likely to have repercussions in dealings with departments and agencies, at times in displays of militancy and escalation of bargaining demands.

Work stoppages and the attendant issue of dispute settlement are probably the most widely discussed issues in assessing union impact on the public service.[4] Since this issue has been the subject of a number of extensive investigations, attention should now shift to how to develop a workable labor relations system to insure industrial peace.

Civil service commissions and the merit system are bound to come in for a drastic overhaul as the influence of unions expands. The functions of such commissions are likely to be confined to setting hiring standards, administering entrance and promotion examinations where stipulated, and protecting the merit system generally. Its customary role as the personnel arm of the government may be circumscribed if labor relations duties are assumed by new agencies specifically established for this purpose.

Table 4. Estimated union membership of government employees by State and as a proportion of total government employment, 1968 [1]

[Numbers in thousands]

State	Estimated membership in government [2]	Government employment		Ranking by extent of organization	
		Total [3]	Percent organized	Government unions	All unions
Total	2,155	11,846	18.2		
Alabama	29	194	14.9	23	28
Alaska	5	32	15.6	19	10
Arizona	14	109	12.8	33	33
Arkansas	11	96	11.5	40	32
California	170	1,334	12.7	34	12
Colorado	21	166	12.7	35	24
Connecticut	36	140	25.7	5	23
Delaware	8	29	27.6	4	20
Florida	56	372	15.1	22	44
Georgia	42	269	15.6	20	43
Hawaii	6	68	8.8	48	19
Idaho	4	45	8.9	47	30
Illinois	128	599	21.4	8	8
Indiana	53	285	18.9	13	6
Iowa	19	163	11.7	39	25
Kansas	18	158	11.4	41	26
Kentucky	18	160	11.3	42	18
Louisiana	27	207	13.0	30	37
Maine	9	62	14.5	25	38
Maryland-D.C. [4]	91	589	15.4	21	28
Massachusetts	90	290	31.0	2	21
Michigan	117	484	24.2	7	5
Minnesota	54	216	25.0	6	15
Mississippi	12	127	9.4	46	47
Missouri	52	270	19.3	12	7
Montana	7	54	13.0	31	14
Nebraska	13	97	13.4	27	40
Nevada	5	34	14.7	14	17
New Hampshire	6	31	19.4	11	39
New Jersey	61	343	17.8	14	16
New Mexico	6	85	7.1	50	48
New York	309	1,116	27.7	3	4
North Carolina	24	227	10.6	43	50
North Dakota	6	46	13.0	32	34
Ohio	91	531	17.1	17	9
Oklahoma	30	180	16.7	18	41
Oregon	16	136	11.8	38	13
Pennsylvania	119	586	20.3	10	3
Rhode Island	17	52	32.9	1	22
South Carolina	13	134	9.7	44	49
South Dakota	6	50	12.0	37	45
Tennessee	27	217	12.4	36	29
Texas	85	636	13.4	28	26
Utah	14	99	14.1	26	35
Vermont	4	23	17.4	16	27
Virginia	38	283	13.4	29	42
Washington	41	230	17.8	15	2
West Virginia	9	95	9.5	45	1
Wisconsin	51	243	21.0	9	11
Wyoming	2	29	7.2	49	31
Membership not classifiable	65				

[1] A total of 59 unions represent employees in government, 57 unions in the Federal government, and 18 unions in State and local government.

[2] A total of 2,155,000 members in government included 1,351,000 in Federal and 804,000 in State and local; 65,000 members were outside the United States or not classifiable by State.

[3] Source, *Employment and Earnings, States and Areas, 1939–1969* (BLS Bulletin 1370–6, 1969).

[4] Federal employment in the Maryland and Virginia sectors of the Washington Standard Metropolitan Statistical Area is included in the data for the District of Columbia.

Personnel policies and their implementation, presently decreed unilaterally by agency heads, will increasingly become the subject matter of collective bargaining. The number of provisions included in agreements will grow in the years ahead as will the degree of detail describing specific working arrangements. In this context it is well to cite the clause in the Post Office agreement which reads: ". . . To the extent provisions of the Postal Manual which are in effect on the effective or renewal date of the agreement are in conflict with this agreement the provisions of this agreement will govern."[5]

The pressure of union wage demands will require a new look at present budget-making processes. It is clear that negotiated increases will have to be included in budget submittals lest agency heads find themselves unable to pay salaries which they have agreed to previously, or which will be agreed to during the budget year. This, of course, will also necessitate changes in existing ways of moving the budget through legislative bodies.

Public administration in the United States is presently in a period of transition. Basic philosophies will have to be reexamined and new ways of conducting the public's business will have to be found. While the precise nature of the changes likely to occur cannot be predicted, it may be appropriate to keep the following statement from the 1967 National Governors' Conference report in mind: "Neither the pillars of city halls nor the foundations of the civil service crumbled when conditions of employment were negotiated instead of being fixed unilaterally." [6] □

FOOTNOTES

[1] Teachers were not included in the survey.

[2] This figure, however, may also include employees represented by city or county associations affiliated with Statewide organizations.

[3] It was reliably reported that a third president of a government union would have been added to the Council had the postal unions been able to agree on a single candidate.

[4] For the incidence of such strikes, see "Work Stoppages in Government, 1958–68" (BLS Report 348). On this subject also see Anne M. Ross, "Public Employee Unions and the Right to Strike," *Monthly Labor Review*, March 1969, pp. 14–18.

[5] U.S. Post Office agreement, February 9, 1968, p. 132, Article XXVI.

[6] See *Report of Task Force on State and Local Government Labor Relations* (Chicago, Ill., Public Personnel Association for the Executive Committee of the 1967 National Governors' Conference).

Women's participation in labor organizations

Expansion of women's participation in labor groups is not matched by an increase in leadership positions

VIRGINIA A. BERGQUIST

WHILE THE GROWTH of labor unions has slackened in the past few years, a considerable spurt has appeared in the number of women members. From 1968 through 1972, a 500,000 increase in women union members in the United States equaled the overall gain in union enrollment, an especially significant gain since women make up only one-fifth of union membership. This increasing enrollment by women in labor organizations has not been reflected in the higher elective and appointive positions held by women at national levels, according to the forthcoming *Directory of National Unions and Employee Associations, 1973*.[1]

In the last 20 years women have become increasingly important in the civilian labor force and in most labor unions. However, labor force gains by women have far outpaced their membership in unions. In 1972, only 12.6 percent of working women were active union members compared with over 15 percent in 1952. (See table 1.) This decline paralleled the general percentage decline in all unionized workers, from 24 percent in 1952 to 22 percent 20 years later.

More women have recently joined the work force in response to the diminishing stigma against women working, increasing cost of living, higher general wage levels, increasing education levels among women, and improved technology, which allows women in the home more spare time.[2] Women made up almost 40 percent of the civilian labor force in 1972, compared with 31 percent 20 years earlier. In labor unions, women's proportion of total membership rose from 18.1 percent in 1952 to 21.7 percent in 1972.

Occupation and Industry

The type of industry in which women are most frequently employed may partially explain the small proportion of women in unions. (See table 2.) Unions have organized less than 25 percent of the workers in five of the nine industries in which women constitute more than 40 percent of total employment: Textiles, finance, service, and State and local governments. In none of the industries with over 40 percent women were as many as 75 percent of the workers unionized.

According to the *Manpower Report of the President, March 1973*, "virtually all increases in female employment between 1960 and 1971 were in either the white-collar or service sectors, continuing the patterns established between 1947 and 1960."[3] Thus, the types of occupations women have entered most frequently in the last 10 years have been among the traditionally less organized. In 1972, over 60 percent of all women workers were in white-collar jobs. Only 40 percent of all men were employed in those occupations.

However, the rate at which women have been joining unions was more rapid from 1962 to 1972 than during the previous 10 years. Some 37 percent more women were members of unions in the United States in 1972 than in 1962, compared with a 6-percent growth during the preceding 10 years.

While only 13 unions had 50,000 women or more in their ranks in 1952 and 17 in 1962, this number rose to 24 in 1972 (table 3), about 14 percent of all unions. The concerted organizing campaigns carried on by AFL-CIO unions during the 1960's was partly responsible for this growth. The Retail Clerks, with 125,000 women in 1952 and 317,000 in 1972, and the Electrical Workers, 150,000 women in 1952 and 287,000 20 years later, showed particularly marked increases. Unionization drives during the late 1960's among all levels of government em-

Virginia A. Bergquist is an economist formerly in the Division of Industrial Relations, Bureau of Labor Statistics.

ployees, 43 percent of whom are women, also organized significant numbers of women. In 1952, three public employee unions (Teachers, Government Employees, and State, County and Municipal Employees) had a combined membership of 60,000 women. These same three groups accounted for over 420,000 women unionists in 1972. In addition, the New York Civil Service Association and the National Education Association together reported over 800,000 women in 1972.

The number of large unions with at least 50 percent women has remained virtually unchanged since 1952. These include the Clothing Workers, Communications Workers, Ladies' Garment Workers, Retail Clerks, and Teachers. The Office Employees, for which there was no 1952 membership estimate, also reported that in 1972 over half of its members were women. Estimates for the National Education Association and the Nurses Association, also first surveyed in 1970, showed that women constituted more than three-fifths of their membership in 1972.

Most (13 of 18) unions in which women were less than half of the membership in 1972 but which had more than 50,000 women on their rolls reported an increase in the proportion of women over the 20-year period. The Postal Workers, Railway Clerks, Retail, Wholesale and Department Store Union, State, County and Municipal Employees, and Teamsters showed especially marked increases.

Concentration and earnings

Since 1952, more than one-fifth of all unions have reported that there were no women in their ranks. (See table 4.) These included unions in predominantly "male" industries such as construction, maritime, coal mining, and air transportation (pilots). Four fewer unions reported that they had no women members in 1972 than in 1952. In percentage terms, however, the proportion of all unions that have no women actually increased from 1952 due to the shrinking number of unions resulting from mergers and dissolutions.

In the same 20-year period, the proportion of unions with some women but less than 10 percent declined from 39 to 30 percent. As in 1952, only 14 percent of all trade unions had more women than male members in 1972. These 25 unions represented 37 percent of all women trade unionists in 1972, slightly less than 10 years earlier.

A number of Bureau of Labor Statistics and Census Bureau studies have shown that union women and men employed year round on a full-time basis earn more than nonunion employees. A 1970 Bureau of Labor Statistics study found that for blue-collar workers, nonunion women averaged $4,297, $647 less than their union counterparts.[4] White-collar workers (both men and women) showed a similar differential—nonunion workers earned an average of $8,532 a year and union workers earned $8,858.

Problems of participation

Regardless of the financial benefit, women have faced numerous obstacles to participation in labor

Table 1. Civilian labor force participation and union membership of women in the United States, 1952–72

(Numbers in millions)

Year	Civilian labor force		Membership		Women as a percent of total civilian labor force	Women membership as a percent of—	
	Total	Women	Total	Women		All women in labor force	Total union membership in the United States
	Unions and associations [1]						
1970	82.7	31.5	21.1	5.0	38.1	16.0	23.9
1972	86.5	33.3	21.5	5.3	38.5	16.0	24.9
	Unions						
1952	62.1	19.3	16.0	2.9	31.0	15.1	18.1
1954	63.6	19.7	16.7	2.8	30.9	14.1	16.6
1956	66.6	21.5	17.2	3.2	32.2	14.9	18.5
1958	67.6	22.1	16.8	3.1	32.7	13.8	18.2
1960	69.6	23.2	16.9	3.1	33.4	13.3	18.3
1962	70.6	24.0	16.4	3.1	34.0	12.8	18.6
1964	73.1	25.4	16.7	3.2	34.8	12.5	19.1
1966	75.8	27.3	17.8	3.4	36.0	12.6	19.3
1968	78.7	29.2	18.8	3.7	37.1	12.5	19.5
1970	82.7	31.5	19.2	4.0	38.1	12.6	20.7
1972	86.5	33.3	19.3	4.2	38.5	12.6	21.7
Change—unions:							
1952–72							
Number	24.4	14.0	3.3	1.3			
Percent	39.3	72.7	20.4	44.1			
1952–62							
Number	8.5	4.7	.4	.2			
Percent	13.6	24.6	2.8	5.6			
1962–72							
Number	15.9	9.3	2.8	1.1			
Percent	22.6	38.6	17.1	36.5			

[1] Associations were first surveyed in 1970. That survey covered 23 associations while the 1972 study covered 35. The number of unions covered in 1952 was 215; in 1962, 181; in 1970, 185; and in 1972, 177.

unions. A study by the New York State School of Industrial and Labor Relations of Cornell University grouped barriers to women's participation in labor unions into three categories: (1) Personal-cultural —including extensive home responsibilities and a lack of personal self-confidence; (2) job related—including discrimination by employers against union employees; and (3) union related—including unfamiliarity with union procedures and a need for encouragement to participate.[5]

The 7.6 million women who were part-time employees in 1972 probably felt less incentive to participate in the union movement due to their frequent entry into and exit from the labor market, as well as the traditionally low level of unionization in the two industries in which over 64 percent of all voluntarily part-time employees work—wholesale and retail trade, and finance and service.

Women officials

Women have remained rare at the governing and high appointive levels of almost all of the 177 unions in the United States. Despite the progress women have achieved in the past 20 years in union membership, the number of women in the highest national union offices (both elective and appointive) increased only slightly. (See table 5.) As in 1952, women held the highest elected office, the national presidency, in two unions in 1972, the Stewards and Stewardesses Division of the Air Line Pilots and the Veterinarians. Women were more common in the office of secretary-treasurer, but seldom in unions with more than 50,000 members.

As shown in table 5, women were infrequently appointed to head a department at the national level. Women were most commonly research directors (10) and editors (6) in 1952; they were most frequently appointed editors or heads of social insurance departments in 1962, 1970, and 1972. Fewer women in all 4 years were named to head other major departments, most frequently education and research and education.

Statistical data concerning women in leadership roles below the national union level were not collected in the union directory survey because an estimated 71,000 locals would have had to be surveyed. However, fragmentary information from studies done by several unions, such as the Bakery Workers, the Auto Workers, and the Packinghouse Workers, indicates that women more frequently held leadership roles at local than at national levels.

Women accounted for approximately 7 percent of the members of elected governing boards of unions and employee associations.[6] These boards, generally consisting of the union president, secretary, treasurer, and vice presidents or other comparable elected officials, serve as the decisionmaking body for unions between conventions. Among their duties are the allocation of funds, interpretation of the laws of the union, and application of the constitution to its workings. Of 4,800 positions on the governing boards of both the unions and associations,

Table 2. Women as a percent of employment and estimated extent of organization by industry, 1972 [1]

Industry rank [2] of unionization	Industry or industrial group	Women as a percent of employment [3]
	75 percent and over organized [2]	
1	Transportation	11
2	Contract construction	5
3	Ordnance and accessories	23
4	Paper and paper products	20
5	Electrical machinery, equipment, and supplies	40
6	Transportation equipment	10
	50 to 75 percent organized [2]	
7	Primary metals industries	7
8	Food and kindred products (beverages)	26
9	Mining and quarrying (crude petroleum, gas)	6
10	Apparel and finished products from fabrics	46
11	Tobacco manufactures	43
12	Petroleum refining and related industries	9
13	Manufacturing	28
14	Fabricated metal products n.e.c	18
15	Telephone and telegraph	47
16	Stone, clay, glass, and concrete products	17
	25 to 50 percent organized [2]	
17	Federal Government	28
18	Rubber and miscellaneous plastic products	33
19	Printing, publishing, and allied industries	33
20	Leather and leather products	59
21	Furniture and fixtures	26
22	Electric, gas, and sanitary services (water)	15
23	Machinery, except electrical	15
24	Chemicals and allied products	21
25	Lumber and wood products, except furniture	11
	Less than 25 percent organized [2]	
26	Nonmanufacturing	40
27	Textile mill products	46
28	Government	43
29	Professional and scientific instruments	38
30	Service industries	54
31	Local government	49
32	State government	42
33	Wholesale and retail trade	33
34	Finance, insurance, and real estate	52
	Total (nonagricultural), less than 25 percent organized [2]	37

[1] Extent of unionization is based on total union membership.

[2] Extent of unionization and ranking from **Directory of National Unions and Employee Associations, 1973**, Bulletin 1813 (Bureau of Labor Statistics, 1974).

[3] Percent of women on nonagricultural payrolls from **Employment and Earnings**, March 1973.

only 350 were reported held by women,[7] although a number of the organizations failed to provide complete information on this subject.

Women were better represented at the higher appointive and elective levels of the 35 professional and State employee associations. The high proportion of women (60 percent) in the associations explains their comparative prominence in association governance. The 737,000 women in the National Education Association—63 percent of total NEA membership—accounted for the largest proportion of all association women.

Only 13 of 35 associations had no women officers or officials, compared with 149 of the 177 trade unions. The Connecticut, Illinois, Maine, Massachusetts, North Carolina, Vermont, and Washington

Table 3. Women in unions and associations with 50,000 women members or more, 1952, 1962, 1970, and 1972

(Numbers in thousands)

Union	Women membership							
	1952		1962		1970		1972	
	Number of women members	Percent of total membership	Number of women members	Percent of total membership	Number of women members	Percent of total membership	Number of women members	Percent of total membership
Total, all unions	3,000	17.9	3,272	18.6	4,282	20.7	4,524	21.7
Total, selected unions	1,862	21.0	2,582	26.1	3,475	27.7	3,674	28.9
Total, all unions and associations					5,398	23.9	5,736	24.9
Total, selected unions and associations					4,457	31.8	4,646	32.6
AFL-CIO:								
Bakery Workers [1]	60.2	35.0	(2)	(2)	60.7	40.0	51.0	35.0
Clothing Workers	261.8	68.0	282.0	75.0	289.5	75.0	273.8	75.0
Communications Workers	(2)	(2)	139.3	50.0	231.9	55.0	230.5	52.0
Electrical Workers (IUE)	(2)	(2)	98.2	33.3	105.0	35.0	116.0	40.0
Electrical Workers (IBEW)	150.0	30.0	237.9	30.0	276.5	30.0	287.0	30.0
Government Employees (AFGE)	(2)	(2)	26.5	25.0	(2)	(2)	(2)	(2)
Hotel and Restaurant Employees	(2)	(2)	200.3	45.0	(2)	(2)	(2)	(2)
Ladies' Garment Workers	292.5	75.0	330.8	75.0	353.9	80.0	342.4	80.0
Machinists	(2)	(2)	86.8	10.0	100.4	11.6	106.1	14.0
Meat Cutters [3]	59.3	18.1	64.2	14.9	61.7	12.5	92.5	17.5
Office Employees	(2)	(2)	40.0	66.7	57.8	70.0	52.8	64.0
Paperworkers [4]	35.7	13.6	(2)	(2)	(2)	(2)	(2)	(2)
Postal Workers [5]	(2)	(2)	15.8	7.8	59.0	20.0	107.4	45.0
Railway Clerks	36.0	12.0	48.0	16.0	110.0	40.0	(2)	(2)
Retail Clerks	125.0	50.0	182.0	50.0	(2)	(2)	316.6	50.0
Retail, Wholesale and Department Store Union	14.6	15.1	63.7	40.0	70.0	40.0	79.1	40.0
Rubber Workers	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Service Employees	55.5	30.0	82.4	28.0	152.3	35.0	145.2	30.0
State, County and Municipal Employees	(2)	(2)	(2)	(2)	146.7	33.0	195.7	37.0
Steelworkers	80.0	7.3	(2)	(2)	120.0	10.0	175.0	12.5
Teachers	37.5	75.0	42.5	60.0	88.3	43.0	129.2	52.0
Textile Workers Union of America	(2)	(2)	73.2	40.0	71.2	40.0	69.6	40.0
Unaffiliated:								
Auto Workers [6]	118.4	10.0	139.6	13.0	193.1	13.0	195.1	14.0
Teamsters	(2)	(2)	(2)	(2)	255.0	13.9	(2)	(2)
Employee Associations:								
Civil Service (NYS)	(2)	(2)	(2)	(2)	76.0	40.0	(2)	(2)
Education Association	(2)	(2)	(2)	(2)	726.1	66.0	736.7	63.2
Nurses Association	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

[1] Includes the Bakery and Confectionery Workers' International Union of America (Ind.) and the American Bakery and Confectionery Workers' International Union (AFL-CIO).

[2] Figure not reported to the Bureau or not available.

[3] Includes Packinghouse Workers (AFL-CIO) in 1952 and 1962.

[4] Includes Papermakers (AFL), Paperworkers (CIO)and Pulp, Sulphite Workers (AFL) in 1952; the Papermakers and Paperworkers (AFL-CIO) and Pulp, Sulphite Workers (AFL-CIO) in 1962 and 1970; and the United Paperworkers (AFL-CIO) in 1972.

[5] Includes the National Postal Union (Ind.), Postal Clerks (AFL-CIO), Special Delivery Messengers (AFL-CIO), General Services Maintenance Employees (AFL-CIO), Motor Vehicle Employees (AFL-CIO), and Postal Workers Union (AFL-CIO). On July 1, 1971, these five unions merged to form the American Postal Workers Union (AFL-CIO).

[6] Affiliated with the CIO in 1952 and with the AFL-CIO in 1962.

NOTE: Unlike table 1, figures include members in areas outside the United States, primarily in Canada.

Table 4. Proportion of women in national and international unions and associations, 1952, 1962, 1970 and 1972

Union	Number of unions								Women members (in thousands)[1]							
	1952		1962		1970		1972		1952[2]		1962		1970		1972	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All unions	213	100.0	181	100.0	185	100.0	177	100.0	.....	.....	3,272	100.0	4,282	100.0	4,524	100.0
No women members	43	20.2	48	26.5	45	24.3	39	22.0	.....	.....	.....	.....	.....	.....	.....	.....
Under 10 percent	82	38.5	58	32.0	54	29.2	53	29.9	.....	.....	168	5.1	91	2.1	98	2.2
10 and under 20 percent	25	11.7	21	11.6	26	14.1	27	15.3	.....	.....	620	18.9	820	19.2	971	21.5
20 and under 30 percent	16	7.5	12	6.6	7	3.8	6	3.4	.....	.....	303	9.3	163	3.8	98	2.2
30 and under 40 percent	10	4.7	8	4.4	15	8.1	18	10.2	.....	.....	438	13.4	1,117	26.1	1,143	25.3
40 and under 50 percent	9	4.2	12	6.6	12	6.5	9	5.1	.....	.....	423	12.9	513	12.0	529	11.7
50 and under 60 percent	13	6.1	8	4.4	12	6.5	10	5.6	.....	.....	439	13.4	679	15.8	789	17.5
60 and under 70 percent	10	4.7	7	3.9	6	3.2	6	3.4	.....	.....	193	5.9	93	2.2	141	3.1
70 and under 80 percent	3	1.4	4	2.2	4	2.2	4	2.3	.....	.....	639	19.5	404	9.4	324	7.2
80 and under 90 percent	1	.5	3	1.7	2	1.1	3	1.7	.....	.....	50	1.5	356	8.3	388	8.6
90 percent and over	1	.5	.....	.....	2	1.1	2	1.1	.....	.....	.....	.....	46	1.1	43	.9

	Number of unions and associations				Women members (in thousands)				
All unions and associations	208	100.0	212	100.0	.....	.....	5,398	100.0	5,736	100.0
No women members	45	21.6	40	18.9	.....	.....	.....	.....	.....	.....
Under 10 percent	55	26.4	55	25.9	.....	.....	97	1.8	99	1.7
10 and under 20 percent	27	13.0	28	13.2	.....	.....	820	15.2	971	16.9
20 and under 30 percent	15	7.2	8	3.8	.....	.....	183	3.4	119	2.1
30 and under 40 percent	18	8.7	20	9.4	.....	.....	1,124	20.8	1,148	20.0
40 and under 50 percent	17	8.2	25	11.8	.....	.....	651	12.1	724	12.6
50 and under 60 percent	13	6.3	17	8.0	.....	.....	681	12.6	861	15.0
60 and under 70 percent	8	3.8	8	3.8	.....	.....	826	15.3	[3] 880	15.3
70 and under 80 percent	4	1.9	4	1.9	.....	.....	404	7.5	324	5.6
80 and under 90 percent	2	1.0	3	1.4	.....	.....	356	6.6	388	6.8
90 percent and over	4	1.9	4	1.9	.....	.....	254	4.7	224	3.9

[1] Includes members outside the United States, primarily in Canada.

[2] Not available.

[3] Membership figures of the Laundry, Dry Cleaning and Dye House Workers International Union (IBT–LWIU–Ind.) are included.

NOTE: Because of rounding sums of individual items may not equal totals.

State Associations had two women officers. Two organizations understandably had a larger than usual number of women officers—5 officers of 6 in the Licensed Practical Nurses Association and 8 of 11 in the Nurses Association. Six associations were headed by women in 1972—Alaska State Employees, Classified School Employees, National Education Association, Licensed Practical Nurses, American Nurses, and Washington State Employee Association. Association presidents and secretary-treasurers made up more than half of the 44 elective and appointive positions surveyed which were held by association women in 1972.

The number of women holding appointive positions in associations increased markedly from 1970 to 1972, the only 2 years for which data are available. Compared with 1970, when a total of only 11 women occupied 3 top appointive categories (editor, public relations activities, and other), some 21 women held 7 top appointive positions in associations in 1972. This increase is partly the consequence of the 12 additional associations (to a total of 35) which fell within the scope of the 1972 survey.

Women were similarly better represented on the governing boards of associations than on those of unions. Only 4 of 35 associations reporting stated that women were not represented on their boards. Nine associations included more than five women as board members. Of the 187 selected national officers and appointed officials reported by the 24 unions with at least 50,000 women members, 6 were women. The Clothing Workers, Electrical Workers, Ladies' Garment Workers, and Railway Clerks all reported one woman official; the Textile Workers Union had two. Of the 556 members of executive boards in these unions, 18 were women.

This low level of women representation was evident throughout the entire labor movement. In the remaining 153 unions with less than 50,000 women in 1972, 27 women were reported as elected officers

or appointed officials at the national level. In none of these unions did women constitute as much as 50 percent of the total number of officers and appointed officials. Only five unions had two women officers or officials and none had more than two.

The AFL-CIO has established organizations at the State level made up of locals of affiliated national unions. Functioning as lobbyists and coordinators for AFL–CIO programs, the State labor councils are headed by an elected governing board and several officers. Of the 173 officers and officials elected by these organizations in 1972, 8 were women.

Aids to union women

In June 1963 the Equal Pay Act went into effect, erasing wage discrepancies between employees based on sex. A year later, Title VII of the Civil Rights Act invalidated all laws which were supposedly protective of women but which in practice often provided a legal foundation for discrimination between the sexes. The Equal Rights Amendment, now awaiting ratification by three-fourths of the States, would invalidate all State and Federal laws making any distinction between the sexes. Labor organizations such as the AFL–CIO (reversing its previous opposition to the ERA), Auto Workers, Teamsters, Steelworkers, Communications Workers, and Electrical Workers (IUE) have endorsed the Equal Rights Amendment.

Table 5. Selected union and association offices held by women, 1952, 1962, 1970, 1972 [1]

Position	Unions				Associations[2]	
	1952	1962	1970	1972	1970	1972
Total positions held by women	31	28	37	37	31	44
Total women	30	24	34	33	30	41
ELECTIVE OFFICES						
President	2	0	1	2	2	6
Secretary-treasurer	9	7	10	13	18	17
APPOINTIVE POSITIONS						
Director of organizing activities	(3)	1	1	0	0	2
Research director	10	3	7	3	0	3
Research and education director	1	3	0	0	0	0
Education director	2	2	2	3	0	0
Director of social insurance	(3)	5	7	6	0	1
Editor	6	6	4	3	5	5
Legal activities	(3)	1	1	1	0	1
Legislative activities	(3)	(3)	2	3	0	0
Public relations activities	(3)	(3)	2	3	1	1
Other	1	0	0	0	5	8

[1] In 1952, 215 unions were surveyed; in 1962, 181; in 1970, 185; and in 1972, 177. In 1970, 23 associations were surveyed; in 1972, 35.

[2] Associations were first surveyed in 1970.

[3] Not surveyed.

[4] Appointive positions surveyed for unions and associations varied somewhat. Appointive positions included in the category "other" for associations are: executive director, collective bargaining director, and government relations director. In 1952, the union position included in the category "other" is executive secretary.

A Bureau of Labor Statistics study of 1,300 labor agreements in effect on July 1, 1972, and covering at least 1,000 workers noted the prevalence of several contract clauses particularly significant for women.[8] Slightly less than two-thirds of the 1,300 agreements, covering more than three-fourths of these workers, prohibited discrimination due to sex. Contract clauses insuring equal pay for equal work were included in 145 of the contracts and maternity leaves in 503 agreements (39 percent).

Since March of 1970 when the Wisconsin State Federation hosted the first AFL–CIO women's conference, other State organizations, including Illinois, Arkansas, California, and Iowa, have held such meetings.[9] International unions, such as the Auto Workers, Communications Workers, Electrical Workers (IUE), Teachers (AFT), and the Newspaper Guild, have also held conferences directed at women's needs and problems.[10]

The Coalition of Labor Union Women (CLUW), convening in Chicago in March 1974 with 3,200 CLUW delegates coming from over 58 labor unions, resolved to work within the labor movement. The trade union women (nonunion women are ineligible to join) defined several goals: (1) To encourage the 30 million nonunion working women to take advantage of the tangible economic benefits of unionists by joining unions; (2) to increase women's participation within unions; (3) to seek "affirmative action" on the part of unions against employers' discriminatory practices; and (4) to press for legislative action which would further women's interests, such as child care assistance and passage of the Equal Rights Amendment. CLUW's first official convention is planned for early or mid-1975.

Potential growth in government

Employment at all levels of government exceeded 13 million in 1972. At the State and local government levels, employment more than doubled over the last two decades—from 4.2 million in 1952 to over 10.6 million in 1972. Though historically poorly organized, all levels of government are now feeling the impact of concerted organizing drives by

unions and associations, such as the State, County and Municipal Employees, Teachers, National Education Association, and Government Employees. Less than 25 percent of all government personnel are now estimated to be union members (not including associations). With women constituting 43 percent of the 13.7 million government workers in 1972, the number and proportion of organized women will probably grow along with government unions and associations. □

FOOTNOTES

[1] *Directory of National Unions and Employee Associations, 1973*, Bulletin 1813 (Bureau of Labor Statistics, 1974).

[2] *Manpower Report of the President, March 1973*, U.S. Department of Labor, pp. 64–65.

[3] *Manpower Report*, p. 65.

[4] *Selected Earnings and Demographic Characteristics of Union Members, 1970*, Report 417 (Bureau of Labor Statistics, 1972).

[5] Barbara Wertheimer and Anne Nelson, "The American Woman at Work," *Personnel Management*, March 1974, p. 22.

[6] The number of women on governing boards may reflect double counting, since officers are members of unions' executive boards.

[7] In addition, 26 women are members of the governing boards of the Stewardesses Division and the Air Line Employees Association of the Air Line Pilots. These 26 are not included in the total.

[8] *Characteristics of Agreements Covering 1,000 Workers or More, July 1, 1972*, Bulletin 1784 (Bureau of Labor Statistics, 1973).

[9] "Women workers, gaining powers, seeking more," *U.S. News and World Report*, Nov. 13, 1972, pp. 104–107.

[10] Edna E. Raphael, "Working women and their membership in labor unions," *Monthly Labor Review*, May 1974, pp. 27–33.

When workers are discharged —an overview

A special report on the handling of dismissal cases in U.S. law, contract, and custom

ROBERT W. FISHER

MOST 19th century U.S. employers would have been astonished at the suggestion that a decision to discharge a worker should be reviewed for fairness. They believed the employer-employee relationship conveyed upon them unfettered discharge power.[1] In the famous 1827 conspiracy case, *Commonwealth* v. *Moore and others,* the prosecutor made this clear:

> . . . [the employers] had an undisputed right to discharge any workman . . . when they conceived that his continuance was no longer conducive to their interest . . . they were at perfect liberty to dismiss every journeyman [tailor] . . .

To those who argued that the employer was justified in firing the tailors *because* they had demanded more money, another commonwealth attorney objected:

> . . . the discharge was a matter of perfect right, without the assignment or even existence of reason. Let him be without reason . . . let it be caprice. Still it was a right, with which no man or set of men must be permitted to interfere . . .[2]

This argument sums up the "common law" employment relationship in which the employer is perfectly free to fire any employee. The employee is perfectly free to quit. This relationship evolved out of small, person-to-person, artisan industries and an economy dominated by agriculture. As the economy grew, most workers came to know they would never become employers in the artisan tradition. They would remain skilled workers, operatives, or laborers working for someone else. The changed economic situation made the relative rights of employers and employees conscious points of dispute. The automatic assumption of employer sovereignty was questioned. Did the English common law which fit nicely an artisan/agricultural setting really suit America in the second half of the 19th century?[3]

When the 20th century opened, the typical U.S. employment relationship had tipped from the artisan/agricultural to the industrial. This accelerated movement toward a new view of the employer's power to dismiss. As one commentator put it: "Discharge on caprice and without compunction [had] taken on an antisocial flavor."[4] Nonetheless, employers continued to dismiss workers freely when they transgressed employer work rules, or pushed for higher wages, shorter hours, and a voice in the employment relationship.[5]

The situation changed abruptly during the Great Depression. The worst economic plunge in the Nation's history temporarily set back "management rights" adherents, brought new public support to proponents of "worker rights," and resulted in the passage of the National Labor Relations Act in 1935.

Supporters of management rights have urged basically that all rights in the employment relationship not won by contract or forbidden by law belonged to employers. Supporters of worker rights argued that labor possessed some "inherent" rights quite apart from contracts or laws.[6] From one point of view, the National Labor Relations Act came into being as a public curb on management rights.

The act gave workers a publicly sanctioned right to organize and bargain collectively. The U.S. Supreme Court upheld the act in 1937 and cleared the way for unions to organize millions of additional workers. (About 3.7 million were organized at the time of passage, almost 9 million by 1940.[7]) For union workers, employment tenure was no longer controlled solely by employers. For the more numerous nonunion workers, employers still generally had unilateral power until the development of fair employment practices legislation, mainly after World War II, began to place further limitations on it.

Robert W. Fisher is an economist and senior editor, *Monthly Labor Review,* Bureau of Labor Statistics.

Why workers are discharged

Today, workers are fired for reasons ranging from the bankruptcy of their employer to personal fault. There is little appeal from dismissals brought on by business failure or production cutbacks even if the worker is blameless. However, discharges for personal reasons—incompetence, insubordination, absenteeism, loafing, fighting, gambling, using intoxicants or being intoxicated on the job, stealing, destroying company property, highly individualistic grooming or dress, and similar reasons—may be challenged. However, an effective right to contest a firing is largely reserved to employees of unionized firms, most Federal and State Government employees, and many employees of local governments.

Most workers and unions would probably agree with employers that incompetence, insubordination, absenteeism, drinking, gambling, fighting, and so on are appropriate grounds for *discipline* of some sort, though not necessarily discharge. But labor and management tend to disagree, sometimes sharply, over discharges for the following: engaging in a wildcat strike, being garnisheed or arrested, belonging to a controversial organization, advocating an unpopular cause, being "disloyal" to the employer, and so on.

Dismissal of a member of a racial, ethnic, or religious minority, a woman, or an older worker also may provoke much heat and sometimes flame in the employment relationship. Whatever reason is given for the discharge, the fired worker may feel discriminated against, particularly if discharge actions appear to affect only members of his or her group. Employers are likely to be more upset than in the usual disputed discharge because of the imputation of prejudice and unfairness.

Collectively, managers and supervisors still tend to view discharge as a necessary tool in maintaining work discipline. Over time, they have accepted some "due process" restraints growing out of law and contract on their right to discharge workers. Workers—at least those in highly formalized employment situations—have lost some of their apprehension about dismissal except during periods of economic distress. Even workers in these situations, however, have made it clear they still consider dismissal too important to be left solely to employers' discretion.

The general drift has been toward placing checks on discharge in the form of deliberative reviews which prune arbitrary from justified discharges. Within the general movement, government, labor, and business continue to grope for a fair institutional formula for discharge. How much dismissal power should employers have? How much protection from discharge do workers need? What is society's role in mediating between conflicting interests?

I. The contractual shield

A worker's protection from dismissal varies greatly depending on whether he is a union member, a Federal Government employee, a State or local government employee in jurisdictions with merit systems, or other worker. Union members and Federal workers, and many State and local employees, work in what are called "fully structured" situations.[8] That is, they are usually employed under detailed, specific work rules and regulations and have clearly defined legal rights with respect to discharge and other terms and conditions of employment. Nonunion workers in large firms work in "partly structured" situations. That is, they are employed under detailed personnel practices set up by the employer. By contrast, workers employed in small nonunion firms, public employees under patronage systems, or workers employed by private individuals are in "unstructured" situations. Their only protection from discharge resides in Federal, State, or local laws that forbid or control discharge for specific reasons.

Protection from discharge in the U.S. economy is comprehensive in union contracts but is limited to organized groups of workers—about a third of the nonsupervisory work force. Protection in laws is limited to discharges for specific reasons but is comprehensive in coverage of the work force. The most important laws in this area are labor relations, antidiscrimination, and civil service laws.[9]

The discussion begins with the best protected workers: union members. It then treats laws that protect union and nonunion workers. These laws may be characterized as (1) those directed toward preventing certain practices—unfair antiunionism or discrimination based on race or color—and (2) those

that protect identifiable groups of workers—Federal, State, and local government employees. It concludes with a consideration of suggestions for improving safeguards and how discharge is handled in selected other countries.

Contractual reach

A law's sweep often stops at political, geographic, or industrial boundaries. Even national laws, such as the National Labor Relations Act (amended in 1947 by the Labor Management Relations Act), halt before certain factors—small size, intrastate activity, and so forth. One feature of union contracts is that they attempt to impose similar if not identical protections for members across political, geographic, and industrial limits.

Discharged union members generally know exactly where to look for help: the grievance procedure. A typical contract clause that enables union members to have discharges reviewed reads: "Grievances growing out of discharge, layoff, promotion, demotion, hiring, rehiring, and transfer, shall be subject to the grievance procedure. . . ." [10]

Most contracts also provide that workers may be discharged only "for just cause" or "for cause." This repudiates the common law view that an employer should be free to fire workers without cause. Just cause means the employer must have a good reason for firing an employee. Ironically, union contracts which usually seek to protect workers from discharge provide for discharge in at least one instance: when a new hire refuses to join the union within a prescribed period under a union security provision.

How the procedure works

A Bureau of Labor Statistics study found grievance procedures provided in almost all union contracts that affect 1,000 workers or more.[11] Another Bureau study found arbitration mandated in about 19 of 20 contracts.[12] The grievance procedure under the contract is the means by which a discharge is measured against just cause. In the first part of the procedure, management and labor attempt to reconcile their differences over the dismissal. In the second, which becomes operative only when the parties fail to agree, an arbitrator or arbitration panel is granted authority to make binding disposition of the dismissal case.

The Bureau study of grievance procedures also determined that contractual time limits for processing a grievance ranged from a week to a year. Most fell within a week to 2 months. Time requirements generally depend on the number and complexity of the steps in a particular procedure.

The typical grievance moves through three, four, or more steps. Dismissal cases present a special problem in that the worker is no longer on the payroll. Such cases are generally handled by the union steward and higher union officials. However, the worker does present his story directly to union officials, at the arbitration hearing, and may be invited to tell it at a labor-management conference. As in most negotiating situations, agreement at any step is final and binding. In dismissals, the first part of the grievance procedure may be truncated with the case going directly to arbitration.

Arbitration and contracts

Private arbitration under union contracts has been given a firm legal underpinning by the courts. In the Labor Management Relations Act of 1947, Congress expressed preference for private rather than public settlement of disputes. It singled out arbitration, mediation, and conciliation as means to this end. This expression of confidence in private resolution was based on the success of wartime arbitration.

Ten years later, the U.S. Supreme Court in effect approved of arbitration in some key cases. In *Lincoln Mills* (1957), the High Court held that Federal courts could enforce agreements between unions and management, including agreements to arbitrate disputes. This was another change from practice under the common law: "At common law, agreements to arbitrate future disputes were not generally enforceable." [13]

Another controversial point remained: If labor and management agreed to arbitrate, could either

Singular benefit

Protection against arbitrary discharge is probably the most important single benefit which the worker secures from trade unionism. It does more than anything else to make him a free citizen in the plant.

—Lloyd G. Reynolds,
Labor Economics and Labor Relations, p. 584.

withhold a specific issue? In a landmark series of cases involving the Steelworkers union in 1960, the Supreme Court ruled that *all* issues were arbitrable except those expressly withheld in the contract.[14] One labor relations scholar objected that the courts might make themselves "rubber stamps" for the decisions of private arbitrators.[15] Generally, the court has held its ground. However, the courts have split over whether an arbitration finding on racial discrimination is conclusive.[16]

Path of grievances

When a worker is fired, he may file a grievance with his union which, weighing strategic and tactical elements, must decide whether to take it up with management. So long as the firing is questionable, the union will probably press for reinstatement. Unless management agrees to reinstate (or the union abandons the case in the face of new evidence), the grievance will move through the grievance procedure. At the end of the line, arbitration is usually triggered by written notification by the union, although management too can ask for arbitration.

A list of arbitrators is secured from either the Federal Mediation and Conciliation Service or the American Arbitration Association, or, in some cases, such as the New York City apparel industry or the automobile industry, the discharge goes to a permanent arbitrator. Employer and union in effect approach each other from opposite ends of the list, alternately striking off names of arbitrators least acceptable to them. Ideally, they agree on the last one. (The list is always odd in number.) Sometimes, however, one or the other may look over a list and decide right away they want another. When a panel of three arbitrators or more is to be chosen, each side may pick an arbitrator with the chairman (and swing member) chosen either by a process of elimination or by the members already selected.

An arbitration hearing is a sort of court proceding with the robes removed and the sleeves rolled up. The arbitrator is judicial without being judge-like. One current complaint about the process is that arbitrators increasingly resemble judges, giving rules of procedure precedence over the needs of good industrial relations.[17]

Relations between forums

When an arbitrator's decision is in, the grievance normally ends. There are times, however, when other forums get involved. The boundaries between private grievance arbitration and public adjudication are fluid. The mandates of laws, contracts, court rulings, and custom overlap and sometimes conflict, resulting in the occasional intrusion of public forums into private procedures. Sometimes participants in private proceedings will ask for public intervention.

The reluctant union. Usually the employer is the obstacle to satisfactory resolution of a worker's dismissal grievance. Occasionally, however, the union may stand in his way. Why, in some instances, might it not press for reinstatement? Unions tend not to press grievances they believe (1) cannot be won, (2) involve rivals within the union, or (3) are without merit.[18] Since unions must pay half the cost of usually costly arbitration, their sometime selectivity is more understandable. In any event, a union must make discretionary judgments regularly. As a consequence, unions' behavior has occasionally raised the issue of "fair representation" in court cases and in proceedings before the National Labor Relations Board.

A worker can present his grievance directly to his employer under section 9 of the Labor Management Relations Act, but that would not be too promising a route in a discharge case. The employer has rendered a verdict on the value of the employee's services unlikely to be reversed by a one-on-one conference.

Recognizing the reality of half-hearted or grudging

On fair representation

The standards for what constitutes "fair representation" are not settled. They still have to be hammered out, case-by-case. At one extreme is the view that any sort of unfairness or injustice to an employee, committed by the union and acquiesced in by the employer, may be examined by the board to discover whether there has been a breach of the fiduciary duty to represent all employees fairly; . . . At the other extreme is the view that the unfair labor practice machinery is not suited to the task of deciding general questions of private wrongs, and that there is danger that the board would be inundated with charges of this character unless the line is sharply drawn.

—Lloyd G. Reynolds,
Labor Economics and Labor Relations,
pp. 502–503.

representation of workers by unions (who "own" the worker's grievance under the law and contract), Federal courts have for over a quarter of a century insisted unions must represent all workers in the bargaining unit fairly. As exclusive representative, it is their duty. The courts found this duty in the Railway Labor Act in the 1940's and 1950's in cases involving workers who refuse to join a union and black workers and members of other minorities. The courts also have found it in the language of section 9 of the Labor Management Relations Act.[19]

But while the courts have been crystal clear about the union's duty, they have been ambiguous about how to carry it out. They insist that the worker and the union exhaust the steps in the privately negotiated grievance procedure. Beyond that lies a question mark. One scholar has held that in balancing workers' rights against unions' needs for orderly control of transactions with management, the courts have given higher priority to orderly control.[20]

With the NLRB. In some decisions in the 1960's, the National Labor Relations Board called a union's failure to represent workers evenhandedly an unfair labor practice. That position would permit the Board to enumerate remedial actions for unions to take.

The Board's approach was rebuffed in a 1962 case but sustained in 1964 and 1966.[21] These results indicate the courts, following the Supreme Court's lead, will go along with linking unfair labor practices to certain flagrant instances of unfair representation. Such an instance would be a union discriminating against minority or women members or nonmembers. Where the issues are less clear cut or where the web of discrimination can be spun with greater deviousness, both the courts and the National Labor Relations Board have been more cautious.

A more settled relationship between the NLRB and contract grievances are the grounds under which the Board will review arbitration decisions. Like the courts, the Board generally keeps hands off arbitration decisions under contracts. It will intervene only if convinced the arbitration proceeding was unfair, the arbitration award conflicts with the purposes of the Labor Management Relations Act, or the parties had not agreed to accept the arbitrator's decision as final and binding.[22] The Board's position does not prevent an employee (or union or employer) from appealing issues to it—such as unfair labor practice charges—that are not or cannot be dealt with in an arbitration proceeding.

With the EEOC. Relations between contract grievances and public handling of employment discrimination cases are uneasy and unsettled, partly due to the recency of the Equal Employment Opportunity Act and the general lack of judicial precedents. In one case, a Federal circuit court ruled that workers can file a grievance under a union contract grievance procedure and file a court suit in the future so long as they do not get "duplicate" relief. This decision and others have given the worker appealing for redress for unfair treatment because of race, color, religion, sex, or national origin another forum in which to have his contractual and Title VII rights aired.[23]

With civil service laws. Under Executive Order 11616 which controls Federal union-management relations, Federal workers *cannot* appeal discharges under the grievance procedure of a union contract. They must use the civil service's statutory appeals procedure governing "adverse actions," of which discharge is one. They may, however, have union representation in the appeals process.

The situation is less clear at State and local levels because there are so many jurisdictions with separate laws and regulations. However, the concept of "binding arbitration"—a central ingredient in private labor-management contracts—has run into trouble. One researcher noted that attempts to use it in public employment disciplinary cases have been frustrated in State courts.[24] The courts' reasoning has been that appeals procedures mandated by law cannot be discarded for a negotiated process unless the law is changed.

To obey the law and at the same time receive an independent opinion on a grievance, unions and public employers at some State and local government levels use "advisory arbitration." In it an arbitrator is engaged by both parties. He renders a "decision" in the case. The decision "advises" the parties of a sensible resolution of the dispute. Even if union, employer, or both reject the advice and resolution has to emanate from the statutory procedure, the arbitrator's views, as those of a seasoned individual with no ax to grind, can form the basis for a compromise.

After reinstatement

The payoff for the fired worker—whether union or nonunion, minority or majority, woman or man—is reinstatement to the job. But what happens to

fired workers who get their jobs back? Researchers have not supplied the last word but they have uncovered important clues. All the studies are limited in scope, partly due to the existence of a multitude of cases scattered over time and throughout the country.[25]

The earliest study (covering 1950–55) explored the dismissal and reinstatement of 207 employees of 145 establishments. It was discovered that a worker's length of service and work profile before discharge were the critical elements in his success after reinstatement under arbitration. Arbitrators took particularly hard looks at cases involving senior employees (more than 5 years' service) and employees with previously good work records. These workers were more likely to be reinstated than junior employees and more likely to keep out of trouble after being restored to their respective jobs.

The later studies covered 1959, 1962–64, and 1969–70. (Two of them dealt with reinstatement under the Labor Management Relations Act rather than under private arbitration.) They tended to confirm the earlier findings. Complaints of supervisory harassment after reinstatement came largely from either junior employees or those who had poor work profiles to begin with. Junior employees had an image problem. So did workers with a string of disciplinary woes. Management possessed few clues as to what type of worker the junior employees would become and altogether too many clues as to what type of worker the often disciplined workers were. Thus both were likely to be terminated again. Workers higher in seniority and with good work records tended to make it.

II. Major legal protections

Those who are not protected from unfair discharge by a union contract are sometimes shielded by the law. Labor relations and antidiscrimination laws are the most significant of those that prohibit dismissal of workers for specific reasons. These laws reflect public policy determinations that dismissal should not be allowed for union activity, or because of one's race, color, religion, sex, or national origin. (Other laws prohibit discharge for being over 40 years old, for being garnisheed under certain circumstances, for complaining of wage-hour violations, and so forth.) By contrast, review of discharges for personal reasons—incompetence, absenteeism, and so on—have mainly been left to arrangements hammered out by private parties, typically unions and employers. However, Federal civil service law and regulations and those of some States and localities do provide comprehensive protection from discharge, calling for a review of the dismissal regardless of the reason given for it.[26] In addition, any employee covered by a labor relations or antidiscrimination statute can turn to that statute if he feels his discharge for say absenteeism is actually for a prohibited reason such as union activity or color.

Labor relations

The National Labor Relations Act (amended in 1947 and 1959) has served as the prototype for those labor relations acts enacted at State or local levels. The NLRA itself drew on the Railway Labor Act passed in 1926.[27] What follows will be largely confined to principles and procedures in the national law.

The NLRA permits workers to "form, join, or assist" labor organizations, to engage in collective bargaining through "representatives of their own choosing," and to engage in other "concerted activities" to carry on collective bargaining. Employers may not "interfere with, restrain, or coerce" workers carrying on protected activity. Of course, the strongest restraint is dismissal. The law provides procedural safeguards against such retaliatory dismissals. The act also forbids unions' pressuring employers to fire or otherwise mistreat a member in disfavor with the union, or to conduct union business in such a way (such as job assignments at hiring halls) so as to encourage nonmembers to join the union. That is, workers may carry on union activities but they may also "refrain" from doing so.[28]

The investigatory, conciliatory, and adjudicatory functions of the National Labor Relations Board are familiar to labor relations specialists, companies, and unions that have dealt with or may deal with the NLRB, but not so familiar to the general public nor, as recent events show, to some State and local governments struggling with new labor relations issues in the public service. When the NLRB receives a worker's charge that he was discharged for union (or other protected) activity, its local office investigates. If this investigation finds the *charge* meritori-

ous, an NLRB *complaint* is issued. The Board's regional office tries to resolve the situation. If it fails, the charge goes to an NLRB administrative law judge[29] who conducts a hearing at which the worker and his representative and the employer and his representative present their cases. The hearing judge issues his findings and recommends a settlement to the NLRB. In its order, the Board may adopt the administrative law judge's position, modify it, or arrive at its own conclusions. It accepts briefs from the parties' attorneys and may take oral argument before reaching a decision. If the company, employee, or the organizing union disagree with the Board, they can appeal to a Federal appellate court. The latter may uphold, modify, or refuse to enforce the Board's order. If any party is dissatisfied with the appellate decision, he can appeal to the U.S. Supreme Court. Some hotly contested cases of discriminatory discharges have shuttled between the NLRB, the appeals courts, and the Supreme Court for years.[30]

Antidiscrimination

Laws prohibiting discrimination against workers because of their race, color, religion, sex, or national origin provide another kind of protection against arbitrary dismissal. The impetus for these laws came from public policy to end discrimination against minority group and women workers, but they actually protect all workers—union and nonunion, men and women, public and private.

The strange career of such laws saw the first ones, still in operation, enacted immediately after the Civil War. A roughly 70-year hiatus followed. Then in 1940 Executive Order 8587 was issued, the first national action against job discrimination since Reconstruction. Since then, State and local jurisdictions have enacted such laws, and a number of Federal Executive Orders have been issued. The most comprehensive curb on employment discrimination—Title VII of the Civil Rights Act—was enacted in 1964.

Because laws and orders have emanated from national, State, and local jurisdictions over a considerable period, workers can contest employment discrimination, including unfair dismissal, on several grounds. Among the most important are the 14th Amendment to the U.S. Constitution, the Civil Rights Acts of 1866 and 1871, the Age Discrimination in Employment Act of 1967, Executive Order 11478 (1972), Title VII of the Civil Rights Act of 1964 (amended in 1972), and various State and local laws. The 14th Amendment and the two 19th century laws permit the worker to go directly to court. While a forceful remedy, it raises problems for the impecunious. All the others generally require that the worker exhaust the steps in an administrative procedure which loosely resembles the investigatory and conciliatory steps pursued by the NLRB. While administrative procedures also take time, they have the advantage of shifting the costs of investigation, conciliation, and court suit from the worker to the administrative agency. Of course, the worker may retain an attorney anyway and may have to go to court at his own expense if the decision reached in the administrative procedure does not suit him.

The administrative procedures of the Equal Employment Opportunity Commission, established under Title VII, will be used to illustrate the general procedures pursued by most equal or fair employment practices agencies. Workers in private, State, or local government employment who believe they have been discharged (or otherwise unfairly handled in employment) because of race, color, religion, sex, or national origin can appeal their dismissal to the EEOC. The Commission has 7 regional offices and 32 district offices. The local offices investigate, determine merit, and attempt to resolve meritorious complaints.

Before the 1972 amendments, the worker had to take his own case to Federal court if the Equal Employment Opportunity Commission failed to resolve it to his satisfaction. Under the amendments,

Unlawful practices by employer

It shall be an unlawful employment practice for an employer to fail or refuse to hire or to discharge any individual or otherwise to discriminate against any individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, sex or national origin; or (2) to limit, segregate, or classify his employees or applicants for employment in any way which would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, sex, or national origin.

—Title VII of the Civil Rights Act of 1964, as amended in 1972, section 703(a).

the Commission can now take cases to court, lifting a financial burden from the worker. The Commission also investigates cases against State and local government employers, but the U.S. Justice Department takes them to court when necessary. The 1972 law permits private organizations or individuals to bring charges on behalf of others. These changes are expected to improve the worker's chances of achieving a settlement without a court test.[31]

Discharge cases made up a significant part of the Commission's workload of charges in fiscal year 1971, the latest data of this type available:

Type of complaint	*Percent dealing with discharge*
Race or color	33.2
Religion	46.1
Sex	15.4
National origin	37.0
All other	23.0

Forty-three States, the District of Columbia, Puerto Rico, the Virgin Islands, and a number of cities also have enacted laws against discrimination. Thirty-five States' procedures meet Federal standards. The Equal Employment Opportunity Commission defers to these States, permitting them to handle cases within their area first.[32] In some of the laws, discriminatory discharge is specifically prohibited. In others, it is barred by implication because the acts forbid mistreatment of workers on discriminatory grounds.

Unlawful practices by union

It shall be an unlawful employment practice for a labor organization (1) to exclude or to expel from its membership, or otherwise to discriminate against, any individual because of his race, color, religion, sex, or national origin; (2) to limit, segregate, or classify its membership, or applicants for membership or to classify or fail or refuse to refer for employment any individual, in any way which would deprive or tend to deprive any individual of employment opportunities, . . . because of such individual's race, color, religion, sex, or national origin; or (3) to cause or attempt to cause any employer to discriminate against an individual. . .

—Title VII of the Civil Rights Act of 1964, as amended in 1972, section 703(c).

Prohibitions against discriminatory discharges (and similar unfair treatment) are clear in the law but cloudy in application. Indeed, difficulties in imputing or proving illegal motives have contributed to a recent shift in emphasis from motives to results. In the opinion of the Equal Employment Opportunity Commission (which administers Title VII), the rule emerging from recent court decisions is this: Regardless of motive, if an employer's practices or policies tend to exclude identifiable groups, such as minorities and women, then the practice or policy is illegal unless business necessity is proved.[33]

Expanding coverage. Title VII's coverage of workers has been protean in its 8 years of existence. It started out applying to firms with 100 workers or more, unions with 100 members or more (or that ran hiring halls), employment agencies that deal with covered firms, and so on. Following the 1972 amendments, the law applies to firms with 15 workers or more, unions with 15 members or more, employment agencies that deal with covered firms, and joint apprenticeship programs of covered firms and unions. The amendments also extended protection to State and local government employees and placed authority for handling discrimination charges in the Federal service in the hands of the U.S. Civil Service Commission. Like other employees, Federal workers can take their complaints to court after 180 days.

Civil servants

The Federal Civil Service Act of 1883 signaled the start of a merit system for most Federal employees. They were no longer subject to instant dismissal for reasons having nothing to do with the job, including who won the election. Between the 1880's and the first World War, many States and localities adopted similar laws.

Civil service appeals systems placed some "due process" safeguards on dismissal (and other disciplinary) actions. Public managers cannot fire subordinates and not bother about reasons, good or bad. They have to warn a worker before discharge and justify the action to managerial superiors, to a civil service commission, and, in some cases, in Federal, State, or local courts. The procedures, at least at the Federal level, have grown more complex and detailed over the years. Each step must be followed in letter and spirit or a discharge can be overturned on procedural grounds. Among the 80 million

plus workers in the U.S. ecomony, only union workers have similar detailed, legalistic protections.

Despite their legalistic trappings, however, civil service appeals systems, even those for Federal workers, remain essentially unilateral. Those deciding whether a discharge is proper are all management employees. This built-in one-sidedness, the example of grievance procedures in private industry, and other factors (such as professional lobbying for pay increases) have led growing numbers of government workers to join labor organizations. The recent upsurge has been dramatic. Between 1956 and 1968, over half the growth in union membership (about 2.1 million) was among government workers. By 1970, union membership in the public sector exceeded 2.6 million, almost tripling the 1956 level.[34]

Where contracts are won, unionized Federal Government employees can now bargain about many of the terms and conditions of employment. However, dismissals generally must still be appealed through the applicable mandated appeals process.

Today, discharge under the common law is handled much as it was in the 19th century. It still applies to all employer-employee relationships not specifically governed by statutes. And it applies to those parts of even "statutory" employment relationships where there is no legislative guidance. Under the common law, employers can still fire employees for any reason or for no reason.[35] Employees can quit with or without cause. Employers may sue an employee for damages if his quitting causes losses on materials or similar setbacks. Conversely, the employee can sue to recover damages for "wrongful discharge." The employee cannot win reinstatement under the common law, because one of its tenets is that neither employer nor employee should be made to suffer an undesired relation with the other. In the modern setting, this laissez faire relationship applies mostly to individual contracts for hire and in small, nonunion, private firms. However, this reasoning informs much of employer-employee relations in the United States and other nations.

III. With all deliberate speed

The boards, courts, commissions, and grievance procedures that place due process controls on discharge all suffer from delay—too much time, too much money. Even though, in some forums, accelerated procedures can be adopted, such as going straight to arbitration under a union contract, considerable time passes before a decision is reached. Foreign processes are also bothered by the lapse of time between claim and adjudication. The dilemma is that a swift decision may be unjust or may seem to be unjust; a just decision may take too long.

A consequence of their importance to industrial relations is that boards, courts, commissions, and grievance procedures have been showered with suggestions for improving the handling of worker grievances of which the most pressing is discharge. Most suggestions are tended to speed up things, thereby winning more worker confidence as well as trimming costs.

On labor relations

Some critics propose separation of the National Labor Relations Board's judicial from its administrative functions as one way to speed up its operations. They suggest that the Board's judicial functions either be placed in a new labor court of some sort or be taken over by regular Federal courts. (Some urge that the NLRB be abolished in favor of labor courts in the manner of some European countries.) They argue that decentralization of consideration of cases would result in greater speed. Rebutters of these proposals question whether courts could act any faster. They hold that legalism—briefs, pretrial motions, transcripts, postponements, weighing evidence, formal decisions, appeal provisions—con-

Due process

[Discipline by due process] may be and is abused. It is cumbersome, time consuming, inefficient, and annoying. Rules grow, rule interpretations multiply, precedents accumulate. . . . There are more people to consult, more precedents to consider, more vested interests opposed to change. . . .

—Orme W. Phelps, *Discharge and Discipline in the Unionized Firm*, p. 4.

sumes time regardless of the type of forum. Defenders of the proposals urge that several forums, despite legalism, could act swifter than one forum.

Other critics hold the NLRB can be streamlined and pepped up without basic alteration. They would pass more power to administrative law judges, whose decisions would be final unless at least two Board members objected. Another idea is that Board orders be self-enforcing unless a party to the order petitions for review within 30 days. Those who hold these views often suggest that the one speedup that would require no change except in policy is for the NLRB to make greater use of its injunctive powers to get discharged workers back on the job immediately.[36]

Another recent proposal dealing with a change in policy or direction rather than in function would reallocate manpower and other resources among the NLRB's various activities.[37] With regard to discriminatory dismissals, these critics propose that discharge cases (which make up the "bulk" of charges filed with the NLRB) be handled as quickly as "priority cases"—those involving secondary boycotts, proscribed picketing, and "hot cargo" contractual arrangements.

Fair employment. The Equal Employment Opportunity Commission is still relatively new. Nonetheless, proposals to speed up its handling of discriminatory discharge cases (and other law violations) are already being heard. In 1972, the Congress granted the EEOC power to go directly to Federal court with cases it could not resolve through conciliation. (Before, it had to ask the U.S. Justice Department to bring suit and then only in cases involving a "pattern or practice" of discrimination.) Supporters of added power hope the threat of court test will spur settlements in conciliation. Operationally, the agency has been adding district offices to speed handling of cases and is exploring other changes to speed things up, such as consolidation of charges against the same employer for blanket handling.

Union grievances. In a 1971 article, the former General Counsel of the Federal Mediation and Conciliation Service recommended that the backlog building up on seasoned arbitrators be reduced by use of "apprenticeship training" for new arbitrators, schedules of fees geared to encourage use of fledgling arbitrators, and, if necessary, Government publication of new arbitrators' opinions to give them exposure. He advocated jettisoning briefs, stenographic records, formal written awards, and other legalistic paraphernalia except in complicated cases. And he expressed a need for further experimentation with "conference" or "advisory" arbitration in which large numbers of "routine" cases are disposed of in a relatively short time.[38]

What should be done for workers when the union refuses to press their grievance? There have been three general proposals on this. One urges mandatory handling of all workers' grievances. A second urges mandatory handling of "critical" worker grievances —those involving discharge, seniority, and pay. The last would leave the handling of grievances entirely to the union's discretion.[39]

Supporters contend the requirement to handle all grievances would remove the possibility of invidious or irrelevant considerations affecting the union's behavior. Critics demur that it might also further clog grievance channels. Supporters of the second proposal hold that it would tend to prune borderline grievances while preserving a worker's critical job interests. Those who are skeptical argue that now discharge, pay, and seniority are generally the critical interests, but at some future time other interests may be more critical or at least as important. The problem of defining what is critical and who would define it would be a recurring headache.

The third alternative approximates the prevailing court view. It acknowledges that unions have a duty to represent all workers in the bargaining unit fairly, but argues that unions (and management) should be free to weigh each case. Moreover, supporters

The discipline case

Discipline cases account for a large portion of grievances and arbitration proceedings. . . . Each of the cases may involve one or a very few employees. But they are fought with considerable feeling and earnestness. To the employer, the case becomes symbolic of his power to maintain order and efficiency in the plant; to the union it is symbolic of the function to protect the employees generally against unjust or arbitrary action by the employer. . . . Here the situations are as personal and individual as they can be in labor relations. They cannot safely be lumped into generalizations. . . .

—Harry Shulman and Neil Chamberlain, *Cases on Labor Relations*, p. 366.

argue that few unions would fail to press critical interests. Critics doubt this, pointing out that a major reason for recent scholarly concern about individual worker's rights in grievance procedures has been occasioned by some unions' arbitrary decisions.

The stately pace of grievances has prompted some unions to look at their contractual arrangements. Notable among these, the Steelworkers and the major steel companies undertook in their 1971 contract to experiment with accelerated arbitration in what they call "routine" arbitration cases. Strict time limits are imposed on the length of the hearing and the time from hearing to decision.[40] More developments can be expected because there are frequent reports of worker dissatisfaction with the functioning of grievance procedures.

Other nations' systems

Like the United States, other countries are groping for the right formula on dismissals and other discipline. While it is generally agreed that employers cannot have an entirely free hand, a reluctance to provide means to force reinstatement is also evident. Often the law will provide money as an alternative to forced reemployment.

Great Britain. Prior to passage of the British Industrial Relations Act in 1971, workers widely resorted to the "unofficial" or wildcat strike to protest what they considered unfair dismissal. If the union steward, who wielded unusual power compared with his U.S. counterpart, could not resolve the dispute, the workers walked out. Many unofficial strikes were caused by dismissal disputes.[41]

Under the new law, which provides legal sanctions for previously informal British labor relations, workers can appeal unfair dismissal to industrial tribunals. These tribunals can recommend reinstatement but cannot compel it. However, the tribunals can compel the employer to pay the discharged worker appropriate compensation if the employer will not take the worker back.[42]

France. Labor courts in France are the oldest institutions of their kind in the world, having been established in the early 19th century. They are composed of equal numbers of representatives of labor and management viewpoints drawn from the occupational, industrial, and geographic areas covered by a court. A professional judge is introduced only in deadlocks. French workers can appeal their dismissals to the labor courts where they are "judged by their peers."[43] There are problems, however. (1) The courts have not been established for all geographic areas, industries, or occupations. Hence, some workers must take their grievances to regular courts. (2) There are no appellate labor courts so workers dissatisfied with the decision of their peers must turn to professional judges in the regular courts who may not be versed in labor issues. (3) Finally, and most important for the dismissed worker, the labor courts (and ordinary courts) cannot order his reinstatement. Thus dismissed workers with grievances bring suit for damages only.

West Germany. The German system of labor courts, which began in 1926 and survived the upheavals of National Socialism and World War II, continues to dominate the labor law system of the Federal Republic of Germany.[44] The law is everywhere in West German labor relations, ranging from the Labor Courts Act of 1926 to the Collective Bargaining Act of 1949 and the Act on Protection Against Dismissals of 1951.

Fired workers may appeal their dismissals to labor courts if they were fired with proper notice, or if fired "on the spot" directly to a panel of the Federal Labor Court. This court is the top of the three-level court system which includes regular labor courts and appellate labor courts. The courts determine if the dismissal was "socially justified," that is, if the firing was appropriate "with respect to the personality or conduct of the employee, or urgent needs of the plant. . . ." The courts may order reinstatement and backpay under this German equivalent of the "just cause" provisions which appear in private U.S. labor-management contracts. The picture in West Germany with regard to dismissals (and labor relations in general) is complicated by inevitable conflicts in a system dominated by labor courts but with significant authority residing in collective bargaining agreements and in a system of employer-employee relations which is distinct from unions and employer associations: the "works councils."

Sweden. Swedish labor law leaves the handling of discharges largely to provisions in union contracts. These cover two-thirds of Swedish workers. Contracts have sharp teeth because the work rules in collective agreements are enforceable in labor courts. Swedish law, like U.S. law, protects workers from

arbitrary dismissal because of union activity. In addition, employers cannot dismiss workers for going into military service, performing their "civic duties, getting married, or becoming pregnant." [45]

The worker tries to adjust grievances at the first management level. If unsatisfied he may ask the union to argue the case with higher levels of management. If it is not resolved at company level, the case goes to the Joint Labor Market Council for the area. In practice, few cases go beyond union and management.

Japan. The Japanese system of job protection reflects that nation's traditional paternalistic employer-employee relationship and, since World War II, the influence of American-style industrial relations.[46] Thus a worker with tenure is considered a lifetime employee, but discharge is possible for reasons specified in the labor-management contract. Typical causes for dismissal are absenteeism, insubordination, incompetence, immorality on the job, falsification of records, and similar behavior. (These are also reasons for discharge in the United States.) Procedures for appeals from or indemnification for discharge are spelled out in the labor contract. In general, the handling of discharge and other discipline is left mainly in private hands.[47]

Drawing the line

As this brief illustrative survey of other countries' practices shows, there is a general reluctance to reinstate dismissed workers. The idea is that once an employee has been fired, a fruitful reestablishment of the employment relationship is difficult at best. Like some of its industrialized counterparts, the United States does provide for reinstatement of workers discharged for specific reasons. Also, employers in large nonunion firms have set down detailed rules governing separation. The most fully protected American workers are union members. Reinstatement of workers in the manner in which it commonly occurs under U.S. union contracts is relatively unique in industrialized countries.[48]

By contrast, the situation of nonunion workers in small U.S. firms more closely resembles that of their 19th century counterparts than their 20th century union or Federal Government mates. Even in small firms, however, employers are a good deal more sensitive about the impact and importance of discharge. And Federal, State, and local laws on labor relations and discrimination do provide some protection from unfair dismissal. Nonetheless, when it all boils down, nonunion workers in small firms may generally be fired without cause. They must rely upon the costly common law remedy of damages as their only path to redress. As one researcher has put it, their grip on the job is precarious because the employer has almost total sway over it.[49] Their situation is uneasy, particularly in times of economic distress.

But the difficulty of drawing a proper line between managers' needs for authority and workers' needs to be free of arbitrary, discriminatory, and capricious discharge remains. The proposals concerning the American system of processing complaints of workers (or their representatives) against employers and of employers against workers or their representatives indicate something of the complexity of the problem. What is best for either union or employer is likely to be less than optimal for the worker. What is best for all three remains elusive.

Future developments probably will continue along the main lines of the past. As a matter of public policy, prohibitions against dismissals for other reasons will be added to those regarding union activity and discrimination as the Nation continues to shed 19th century ideology. Unions will keep on pushing to narrow the grounds for dismissal under contracts.

Other problems. Workers, mostly those outside of unions, are often unaware of their legal rights when discharged. They may automatically seek their old jobs back since workers, particularly in nonunion companies, are sometimes given another chance. This is most likely if the reasons for discharge are marginal. If rebuffed, the worker looks for another job.

Nonunion workers may have their jobs rights explained to them by unions, civil rights and civil liberties organizations, or governmental units. They may repair to the law for redress. Union members and civil servants may use their grievance and appeals procedures. However, regardless of the law, or administrative procedure, it takes a highly persistent worker to pursue his or her job rights through layers of management, commissions, boards, and courts—and often an intrepid one to return to a job after being fired. □

[1] Lawrence Stessin, *Employee Discipline* (Washington, D.C., The Bureau of National Affairs, Inc., 1960), pp. 2–3.

[2] John R. Commons and others, eds., *A Documentary History of American Industrial Society, Volume IV: Labor Conspiracy Cases* (Cleveland, Ohio, Arthur H. Clark Co., 1910); (Reprint edition, New York, Russell & Russell, 1958), pp. 172 and 238.

[3] See Orme W. Phelps, *Introduction to Labor Economics*, 4th ed. (New York, McGraw-Hill Book Co., 1967), ch. 5; Richard B. Morris, *Government and Labor in Early America* (New York, Columbia University Press, 1941). For a concise review of United States labor history, see *A Brief History of the American Labor Movement*, Bulletin 1000 (Bureau of Labor Statistics, 1970).

[4] Lawrence Stessin, *Employee Discipline*, p. 20.

[5] See, for example, Irving Bernstein, *A History of the American Worker: The Lean Years* (Boston, Houghton Mifflin Co., Publishers, 1970), pp. 1–43.

[6] See James C. Phelps, "Management's Reserved Rights: An Industry View," and Arthur J. Goldberg, "Management's Reserved Rights: A Labor View," *Management Rights and the Arbitration Process* (Washington, The Bureau of National Affairs, Inc., 1956), pp. 102–29.

[7] *A Brief History of the American Labor Movement*, p. 65.

[8] Orme W. Phelps, *Introduction to Labor Economics*, pp. 45–48.

[9] Other laws—such as the Wage and Hour Law of 1938, the Age Discrimination in Employment Act of 1967, and the Consumer Protection Act of 1969—provide some protection against arbitrary discharge in specific situations.

[11] *Major Collective Bargaining Agreements: Grievance Procedures*, Bulletin 1425–6 (Bureau of Labor Statistics, 1966), p. 20, quote from the contract between the West Virginia Pulp and Paper Co. and the Interstate Papermakers.

[11] *Major Collective Bargaining Agreements: Grievance Procedures*, Bulletin 1425–1 (Bureau of Labor Statistics, 1964), p. 1.

[12] *Major Collective Bargaining Agreements: Arbitration Procedures*, p. 5.

[13] R. W. Fleming, *The Labor Arbitration Process* (Urbana, University of Illinois Press, 1965), p. 22.

[14] *United Steelworkers* v. *Warrior and Gulf Navigation Co.*, 363 U.S. 574 (1960); *United Steelworkers* v. *Enterprise Wheel and Car Corporation*, 363 U.S. 593 (1960); and *United Steelworkers* v. *American Manufacturing Co.*, 363 U.S. 564 (1960).

[15] Harry Wellington, *Labor and the Legal Process* (New Haven, Yale University Press, 1968), pp. 122–23.

[16] See, for example, *Newman* v. *Avco Corp.*, 451 F. 2d 743 (1971) and *Alexander* v. *Gardner-DeVow Co.* (1972).

[17] See William J. Kilberg, "The FMCS and arbitration: problems and prospects," *Monthly Labor Review*, April 1971, p. 41; and James F. Power, "Improving arbitration: roles of parties and agencies," *Monthly Labor Review*, November 1972, p. 21. See also "New directions in grievance handling and arbitration," a group of 5 articles in *Monthly Labor Review*, November 1972, pp. 3–30.

[18] *Major Collective Bargaining Agreements: Grievance Procedures*, p. 17.

[19] Legal scholars consider these cases important: *Steele* v. *Louisville & Nashville R.R.*, 323 U.S. 192 (1944); *NLRB* v. *Wallace*, 323 U.S. 248 (1944); *Elgin, Joliet & Eastern Ry. Co.* v. *Burley*, 325 U.S. 711 (1945); *Syres* v. *Oil Workers*, 350 U.S. 892 (1955); *Ford Motor Co.* v. *Huffman*, 345 U.S. 330 (1953); and *Manuel Vaca* v. *Niles Sipes*, 368 U.S. 171 (1967).

[20] See Benjamin Aaron, "The Individual's Legal Rights as an Employee," *Monthly Labor Review*, June 1963, pp. 666–73.

[21] See *Miranda Fuel Co.* and *Michael Lopuch* (140 NLRB No. 7, 1962), first decided in 1959 (125 NLRB No. 53) and reconsidered; 362 F. 2d 172, 180 (C.A. 2, 1963); see *Monthly Labor Review*, March 1963, pp. 305–306; *Hughes Tool Co.* (147 NLRB 1573, 1964); *United Rubber Workers, Local 12* v. *NLRB* (368 F. 2d 12, C.A. 5, 1966), see *Monthly Labor Review*, February 1967, p. 61. See also *Local 1367, International Longshoremen's Association* (C.A. 5, 1966).

[22] See Jay W. Waks, "Arbitrator, Labor Board, or Both," *Monthly Labor Review*, December 1968, pp. 1–5. For a recent statement of the NLRB position, see *Collyer Insulated Wire* and *Local 1098, Brotherhood of Electrical Workers* (192 NLRB No. 150), *Monthly Labor Review*, November 1971, pp. 64–66.

[23] *Bowe* v. *Colgate Palmolive Co.* (416 F.2d 711, C.A. 7, 1969).

[24] Charles P. Fischbach, "Grievance Arbitration in Public Employment Disciplinary Cases," *Labor Law Journal*, December 1971, pp. 780–87.

[25] Arthur M. Ross, "The Arbitration of Discharge Cases: What Happens After Reinstatement," *Critical Issues in Labor Arbitration* (Washington, The Bureau of National Affairs, Inc., 1957); see *Monthly Labor Review*, June 1957, pp. 677–88; Dallas Jones, *Arbitration and Industrial Discipline* (Ann Arbor, University of Michigan, 1961); and Les Aspin, "Legal Remedies Under the NLRA: Remedies Under 8(a)(3)," *IRRA Series: Proceedings* of the Twenty-Third Annual Winter Meeting (Madison, Wis., 1971), pp. 264–272; see *Monthly Labor Review*, March 1971, pp. 57–59. See also Thomas J. McDermott and Thomas H. Newhams, "Discharge-Reinstatement: What Happens Thereafter," *Industrial and Labor Relations Review*, July 1971, pp. 526–40.

[26] Some jurisdictions do not provide the strict rules governing discharge that are contained in Federal Civil Service procedures.

[27] In labor relations, the Railway Labor Act covers railroad and airline workers. The law provides that they settle disputes privately "in conference," but also provides for the National Railroad Adjustment Board which arbitrates disputes over rights under an agreement. The adjustment board is divided into four divisions which handle grievances for (1) operating employees, (2) shop employees, (3) all nonoperating employees except shop, waterborne, and supervisory employees, and (4) all other railroad employees. The 1936 amendment which placed airlines under the act permits airlines and their employee unions to use either private arbitration or set up public adjustment boards.

[28] Sections 7 and 8 of the National Labor Relations Act.

[29] Officials who performed a similar function prior to 1971 were called trial examiners.

[30] See *Monthly Labor Review*, January 1964, pp. 65–66, and May 1968, pp. iii–iv.

[31] A worker is free to file a court suit if the Commission does not resolve his complaint or file a court suit on his behalf within 180 days. The Commission is required to notify him when the 180-day period ends. The worker then has 90 days in which to file suit. Courts can appoint attorneys for complainants who cannot get one.

[32] Section 706 of Title VII, Civil Rights Act of 1964, as amended in 1972.

[33] The U.S. Supreme Court's decision in *Willie Griggs* v. *Duke Power Co.* (1971) is the most important.

[34] Harry P. Cohany and Lucretia M. Dewey, "Union membership among government employees," *Monthly Labor Review*, July 1970, pp. 15–20.

[35] See "Discharge in the Law of Arbitration," *Vanderbilt Law Review*, December 1966, p. 81.

[36] For a summary and analysis of alternatives, see Fritz L. Lyne, "The National Labor Relations Board and Suggested Alternatives," *Labor Law Journal*, July 1971, pp. 408–23.

[37] William Gomberg and Bernard Samoff, "Improving Administrative Effectiveness of the NLRB," *Labor Law Journal*, April 1973, pp. 201–220.

[38] William J. Kilberg, pp. 43–45.

[39] Alfred W. Blumrosen, "Legal Protection for Critical Job Interests: Union-Management Activity Versus Employee Autonomy," *Rutgers Law Review*, Summer 1959, pp. 631–65.

[40] Ben Fischer, "Arbitration: the steel industry experiment," *Monthly Labor Review*, November 1972, pp. 7–10.

[41] Frederic Meyers, *Ownership of Jobs: A Comparative Study* (Los Angeles, Institute of Industrial Relations, University of California, 1964), pp. 27–28.

[42] Norman Robertson and K. Ian Sams, "The new legal framework for Britain's industrial relations," *Monthly Labor Review*, March 1972, pp. 48–52.

[43] Xavier Blanc-Jouvan, "The Settlement of Labor Disputes in France," in Benjamin Aaron, ed., *Labor Courts and Grievance Settlement in Western Europe* (Berkeley, Calif., University of California Press, 1971), pp. 1–80.

[44] See Thilo Ramm, "Labor Courts and Grievance Settlement in West Germany," in Benjamin Aaron, ed., *Labor Courts and Grievance Settlement in Western Europe*, pp. 81–157.

[45] *Labor Law and Practice in Sweden*, Report 285 (Bureau of Labor Statistics, 1964), pp. 27–30. See also Folke Schmidt, "The Settlement of Employment Grievances in Sweden," in Benjamin Aaron, ed., *Labor Courts and Grievance Settlement in Western Europe*, pp. 159–246.

[46] See Robert Evans, Jr., "Japan's labor economy—prospect for the future," *Monthly Labor Review*, October 1972, pp. 3–8.

[47] *Labor Law and Practice in Japan*, Report 376 (Bureau of Labor Statistics, 1970), pp. 18–20, 29–32.

[48] Benjamin Aaron, ed., "Introduction," *Labor Courts and Grievance Settlement in Western Europe*, pp. xix–xx.

[49] Frederic Meyers, *Ownership of Jobs: A Comparative Study*, pp. 7, 100.

Productivity Bargaining in Britain

H. M. DOUTY*

IN 1960, A SERIES of collective bargaining agreements was concluded at the large Esso Refinery at Fawley near Southhampton in England. These agreements received unusual attention, partly because they were unusual in the British tradition of collective bargaining, and partly because the underlying circumstances, the negotiating process, and the results were subsequently analyzed in penetrating detail in a book by Allan Flanders. Flanders termed them a "productivity package deal," and stated that they were "without precedent or even approximate parallel in the history of collective bargaining in Great Britain." [1]

The Fawley agreements provided a substantial wage increase in return for (1) a number of changes in working practices, including some relaxation of craft jurisdiction over jobs, the elimination of craftsmen's mates (helpers) and their use in other work, provision for additional late-shift work, and greater freedom for management in the use of supervision; and (2) a drastic reduction in overtime work which had, in effect, become institutionalized and part of the wage structure of the firm.

A review-essay in 1964 termed the productivity agreement of the Fawley type "a still embryonic development in collective bargaining," but noted the introduction of productivity considerations in two other situations.[2] One involved the road services of the London Transport Board,[3] and the other the nationalized electricity supply (that is, electric utility) industry.[4]

A Fabian Society study in 1966 listed 51 "major agreements and related developments since 1960" in the field of productivity bargaining.[5] Not all of these were collective agreements (various public reports dealing with productivity considerations in bargaining situations were included). Also in 1966, the Secretariat to the Royal Commission on Trade Unions and Employers' Associations prepared a valuable research paper on productivity bargaining.[6] This study was based largely on information supplied to the Commission by over 20 undertakings. It does not take into account the effect on such bargaining of the sharp change in incomes policy announced on July 20, 1966, and described in the next section.

Productivity and Incomes Policy

Interest in the "productivity agreement" was stimulated by the course of the incomes policy introduced by the Labor Government following the negotiation in late 1964 of a "Joint Statement of Intent on Productivity, Prices, and Incomes" with the Trades Union Congress and leading employers' associations.[7] Nonstatutory review and investigatory machinery was provided for in early 1965 in the form of a National Board for Prices and Incomes.[8] A statement of policy on wage and price increases was issued in April providing for a wage adjustment norm defined as "the average rate of

*Senior Research Consultant, Bureau of Labor Statistics.

[1] Allan Flanders, *The Fawley Productivity Agreements: A Case Study of Management and Collective Bargaining* (London, Faber and Faber, Ltd., 1964), p. 13.

[2] Laurence C. Hunter, "Productivity Agreements," *Scottish Journal of Political Economy*, November 1964, pp. 260–286.

[3] *Report of the Committee of Inquiry to Review the Pay and Conditions of Employment of the Drivers and Conductors of the London Transport Board's Road Services* (London, H.M. Stationery Office, 1964).

[4] *Report of a Court of Inquiry Into the Causes and Circumstances of a Dispute Between the Parties Represented on the National Joint Industrial Council for the Electricity Supply Industry* (London, H.M. Stationery Office, May 1964, Cmd. 2361).

[5] Ken Jones and John Golding, *Productivity Bargaining* (London, Fabian Society, 1966), pp. 30–33.

[6] Royal Commission on Trade Unions and Employers' Associations, Research Papers 4: 1 *Productivity Bargaining;* 2 *Restrictive Labor Practices* (London, H.M. Stationery Office, 1967).

[7] The "Joint Statement" was signed on December 16, 1964. An account in depth of British incomes policy from 1964 to about the end of 1966 will be found in Lloyd Ulman, "Under Severe Restraint: British Incomes Policy," *Industrial Relations*, May 1967, pp. 213–266. For a highly perceptive analysis of the development of British incomes policy during the postwar period, see E. H. Phelps Brown, "Guidelines for Growth and for Incomes in the United Kingdom: Some Possible Lessons for the United States" in George P. Shultz and Robert Z. Aliber, eds., *Guidelines: Informal Controls and the Market Place* (Chicago, University of Chicago Press, 1966), pp. 143–163.

[8] *Machinery for Prices and Incomes Policy* (London, H.M. Stationery Office, February 1965, Cmd. 2577).

From the *Review* of May 1968

increase of money incomes per head which is consistent with stability in the general level of prices." [9] This "norm," unlike the guideposts figure in the United States, was based on the anticipated rather than the past trend in national productivity.[10] It was stated to be—in the event, optimistically—3 to 3½ percent. Like the guideposts in the United States, certain exceptions to the norm were noted. One involved situations in which "the employees concerned, for example, by accepting more exacting work, or a major change in working practice, make a direct contribution towards increasing productivity in the particular firm or industry." In the United States, the roughly parallel exception was stated to mean "where changes in work rules create large gains in productivity and substantial human costs requiring special adjustment of compensation." [11]

In its initial phase, extending for about 15 months, incomes policy failed to check a relatively rapid rise in wages.[12] During this period, a nonstatutory "early warning system" of proposed wage or price actions proved ineffective.[13] On July 20, 1966, with the economic situation deteriorating, the Prime Minister called for "a 6-month standstill on wages, salaries, and other types of income, followed by a further 6 months of severe restraint and for a similar standstill on prices." The 6-month "freeze" even extended to the implementation of existing commitments to increase pay or reduce standard hours of work.

The drastic action of July 20 was the subject of a White Paper.[14] It was also marked by the passage of the Prices and Incomes Act of 1966, which received Royal Assent on August 12. The act placed the National Board for Prices and Incomes on a statutory basis, and gave it broad authority to obtain information and conduct investigations. For a limited period, the Government was given the power to require that particular prices or the pay of particular workers should not be increased or should revert to the level prevailing on July 20, 1966.[15] The act gave the government reserve power to require advance notification of proposed increases in wages or prices.

For the 6-month period of "severe restraint" following the freeze, little scope was allowed for the routine exercise of collective bargaining over wage adjustments. The norm for the annual rate of increase in incomes per head during the first half of 1967 was stated to be zero.[16] There were effectively two exceptions, one relating to the "lowest paid workers" and the other to agreements calculated to increase productivity and efficiency.

For the 12-month period following June 30, 1967, these two criteria appear to continue to constitute the principal bases for wage adjustments, although two additional criteria were incorporated in a new White Paper.[17] One relates to pay increases required to secure "in the national interest" a change in the distribution of manpower; the other involves severe wage inequities which "in the national interest" should be corrected. The qualifying phrase should serve severely to limit the application of these criteria. A new norm for general wage increases was specifically rejected. The Prices and Incomes Act, 1967, gives the Government limited reserve powers over prices and incomes for a period of 12 months after expiration (on August 11, 1967) of part IV of the 1966 act.[18]

The devaluation of the pound on November 20, 1967, lends new urgency to incomes policy. In a speech to the House of Commons on November 20, the Chancellor of the Exchequer warned that the advantages of devaluation could be lost if, among other things, "large wage claims were made and conceded, which would have the effect of increasing the cost of our goods." He added that "where there are large and genuine increases

---

[9] *Prices and Incomes Policy* (London, H.M. Stationery Office, April 1965, Cmd. 2639).

[10] D. J. Robertson, "Guideposts and Norms: Contrasts in U.S. and U.K. Wage Policy," *The Three Banks Review*, December 1966.

[11] Council of Economic Advisers, *Annual Report*, 1966, p. 91.

[12] Between April 1965 and July 1966, the index of hourly wage rates for manual workers increased 9.3 percent, the index of retail prices 4.1 percent, and estimated average output per head by less than 2 percent.

[13] *Prices and Incomes Policy: An "Early Warning System"* (London, H.M. Stationery Office, November 1965, Cmd. 2808).

[14] *Prices and Incomes Standstill* (London, H.M. Stationery Office, July 1966, Cmd. 3073).

[15] This portion of the act, part IV, was brought into operation on October 6, 1966, and expired on August 11, 1967. Only limited use was made of these powers, but they were essential to assure observance of the standstill on wage and price increases.

[16] *Prices and Incomes Standstill: Period of Severe Restraint* (London, H.M. Stationery Office, November 1966, Cmd. 3150).

[17] *Prices and Incomes Policy After 30th June, 1967* (London, H.M. Stationery Office, March 1967, Cmd. 3235).

[18] See "Prices and Incomes Bill," *Ministry of Labor Gazette*, June 1967, pp. 475–476.

in productivity, this can be reflected in wage bargaining. The Government has already begun consultations with the TUC [Trades Union Congress] and the CBI [Confederation of British Industry] on the existing prices and incomes policy, to ensure that it measures up to the needs of the new situation." [19]

The Productivity Agreement

In August 1966, shortly after the beginning of the wage standstill, the National Board for Prices and Incomes was requested by the Government to examine and report on productivity agreements negotiated at company or industry level. Two reports were issued: the first provides interim criteria for the appraisal of such agreements; and the second, based on a number of case studies, contains an analysis of the nature of productivity agreements, the circumstances surrounding their development, and their implications for the future.[20]

The productivity agreement, in essence, represents a trade-off of inefficient working practices for higher pay. The term excludes general promises of greater effort or efficiency, as well as productivity gains flowing solely from technological change. The contribution of the workers must be specific and direct and involve more exacting work or a major change in working practices.

The Board established seven guidelines for the appraisal of productivity agreements. These guidelines (from the June 1967 report) are:

> i. It should be shown that the workers are making a direct contribution towards increasing productivity by accepting more exacting work or a major change in working practices.
>
> ii. Forecasts of increased productivity should be derived by the application of proper work-standards.
>
> iii. An accurate calculation of the gains and the costs should normally show that the total cost per unit of output, taking into account the effect on capital, will be reduced.
>
> iv. The scheme should contain effective controls to ensure that the projected increase in productivity is achieved, and that payment is made only as productivity increases or as changes in working practice take place.
>
> v. The undertaking should be ready to show clear benefits to the consumer through a contribution to stable prices.
>
> vi. An agreement covering part of an undertaking should bear the cost of consequential increases elsewhere in the same undertaking, if any have to be granted.
>
> vii. In all cases negotiators should beware of setting extravagant levels of pay which would provoke resentment outside.

It is clear from these guidelines that the productivity agreement should represent the outcome of carefully prepared and probably prolonged negotiations, that costs and benefits should be quantified as accurately as possible, and that control procedures should be established to monitor the results. The productivity agreement, in short, should not be used as a subterfuge for cost increases. At the same time, the Board fully recognized that the legitimate interests of the workers in pay and job security would have to be protected in the negotiation of such agreements.

Among the seven productivity agreements studied in detail by the Board, overtime hours were at issue in five. This reflects the widespread use of overtime in British industry as a device to raise earnings to what are regarded as acceptable levels, rather than as a device to meet production emergencies. The result has been that workers tend "to spin out their work into the hours qualifying for overtime pay," with the consequence that "managers lose control over the pace at which work is performed, so that effective planning becomes difficult." [21] With one exception, for which there are attenuating circumstances, agreements on this issue have realized sharp reductions in the proportion of overtime to standard hours, accompanied by strengthened managerial control over the work process.[22]

Another subject of major importance in the bargaining situations analyzed was greater flexibility in the use of the work force. The issue in essence involved relaxation of areas of work jurisdiction associated with craft skill or tradition. The problems, as one might expect, were most severe in the

[19] *New York Times*, November 21, 1967.

[20] National Board for Prices and Incomes, *Productivity and Pay During the Period of Severe Restraint*, Report 23 and *Productivity Agreements*, Report 36 (London, H.M. Stationery Office, December 1966, Cmd. 3167; June 1967, Cmd. 3311).

[21] Ibid., Report 23, p. 9.

[22] Ibid., Report 36, pp. 3–4 and 26–27.

skilled trades where the workers are organized on a craft basis, but difficulties were also encountered among groups of operatives. Efforts to change long established work practices also frequently involved formidable technical problems of work definition. Nevertheless, the agreements appear to have made progress in breaking down craft rigidities and other barriers to more effective manpower utilization.

Only one situation involved formal restriction of output—in this case, limitation on the overall average speed of trucks engaged in petroleum distribution, which determined the time for which vehicles must remain outside the plants. After much difficulty, a large measure of agreement was reached on this issue, which resulted in a sharp reduction in overtime hours.

Questions of overmanning were at issue in several of the major situations studied, and were of central importance in many of the small-scale and partial productivity agreements examined by the Board. In general, negotiations over manpower reductions appear to have proceeded smoothly, usually with a "no-redundancy" provision. In two of the major agreements, provisions relating to shift work constituted important issues.

This brief summary should be sufficient to provide an indication of the substance of productivity bargaining. The issues revolve about rules and practices significantly affecting manpower utilization. Bargainable issues will vary, depending on the company or industry concerned. In many situations, of course, manpower may be used effectively, and there may be little scope for bargaining over this issue.

Wages, Costs, and Prices

The Board places great emphasis upon the importance of estimating as precisely as possible the gains to be expected from proposed changes in working rules or practices. This is obviously necessary, although often in practice most difficult, if consequent increases in pay are not to exceed the economies effected. In view of the great variety of changes that can be negotiated, the Board holds that "the increase in pay which can be allowed in a productivity agreement is indeterminate and open to bargaining," [23] but with an upper limit set by the maintenance of unit costs at a level no higher than they otherwise would have reached.

The outcome of productivity bargains, it is hoped, will provide margins for price reduction. This has not yet happened to any significant extent in the situations analyzed by the Board. "In most instances," the Board reports, "productivity agreements have so far done no more than place companies in a better position to absorb other cost increases so as to hold prices stable, or in a better position to sustain price cuts forced upon them by competition." [24]

Role of Productivity Bargaining

In a lecture at Oxford University prior to the wage and price standstill, Mr. Aubrey Jones, chairman of the National Board for Prices and Incomes, observed:

> I think it is a fact that we suffer more from restrictive working practices in this country than any other industrialized country. I am not sure why this should be. It may be because we were the first country to undergo an industrial revolution; it may be because of the survival in this country of craft attitudes and habits; it may conceivably be because the wage structure itself makes for a feeling of insecurity and thus perpetuates protective practices. The reason for the fact I do not pretend to know—there is a vast field for research here. It is right that we should try to change the fact. And the attempt has been started in a dozen or so productivity agreements, as a result of which workers agree to more flexible working arrangements —the free interchange, for example, of craft and process workers—in exchange for generous increases in remuneration. . . . These agreements are, I think, likely to spread and it is right that we should look at them carefully.[25]

This emphasis on working rules and practices that adversely affect productivity was clearly evident in the work of the Board prior to the freeze. In a variety of cases referred to it for review, the Board ventured to make concrete suggestions for increased productivity.[26] In the meantime, as pre-

---

[23] Ibid., p. 39.

[24] Ibid., p. 22.

[25] The lecture, under the title "Prices and Incomes Policy: Reflections After the First Six Months," was reproduced in the *Whitley Bulletin*, April 1966, pp. 56–60.

[26] National Board for Prices and Incomes, *General Report, April 1965–July 1966* (London, H.M. Stationery Office, August 1966, Cmd. 3087), ch. 4.

viously noted, a number of formal productivity agreements had been negotiated and had attracted wide attention, and productivity considerations had been introduced into reports of public boards of inquiry in several important industrial relations situations. After July 1966, the productivity bargain offered an avenue of escape from the severe restrictions imposed on wage increases. Interest in such arrangements understandably grew.

At this juncture in British industrial development, productivity bargaining may prove a valuable tool for eliminating or modifying outmoded work rules and practices over a wide range of British industry. Evidently a climate has been created among many management and union groups reasonably favorable to its use. Certainly a willingness by both sides of industry to consider problems of efficiency in the organization of work is essential. In this connection, considerable significance should be attached to a joint statement by the Confederation of British Industry and the Trades Union Congress in July 1967 on the importance of joint efforts to improve efficiency in the use of labor and on concrete procedures for the achievement of this end.[27] Included is provision for a joint CBI–TUC Steering Committee to exercise "general supervision over the initiative, checking progress, and recommending ways in which it can be improved."

Ordinarily, of course, the impetus for change must come from management, for efficiency in the use of labor and other resources is primarily a managerial responsibility. However, to the extent that uneconomic work practices reflect technological or other conditions (for example, safety) that no longer exist, or that represent defensive reactions to problems of job security that more than two decades of substantially full employment have greatly eased, unions clearly have a stake in corrective action. Such action typically results in immediate gains in pay or other conditions of employment, and should provide long-term benefits flowing from improvement in the competitive position of the firm or industry.

Genuine productivity bargains are not easy to negotiate, and sometimes—consider the case of firemen on diesel locomotives in this country—they cannot be voluntarily concluded at all. They normally require extensive advance preparation by management, negotiating flexibility on both sides, and frequently the removal of deep-seated fears and inertia—not all on the part of the workers concerned and their representatives. The criterial established by the National Board for Prices and Incomes to judge productivity bargains reflect these factors. These or similar criteria are clearly essential within the framework of an incomes policy with either a zero or a positive norm for general wage increases. Productivity bargains are exceptional occurrences. Over a period of time, however, they may have an important cumulative effect on efficiency in the economy. The case of the west coast longshore industry in the United States shows how significant the gains may be.[28]

As compared with the United States, the structure of union organization in Great Britain, and the system of collective bargaining and industrial relations that has evolved, may tend generally to retard productivity growth and may make the conclusion of productivity negotiations more difficult.[29] But the growth of such bargaining since 1960, and the emphasis especially since 1965 on productivity considerations within the framework of incomes policy, suggest that progress can be made. Moreover, productivity bargaining, to the extent that it has an influence, may itself be a factor in modifying present institutional arrangements.[30]

In its review of productivity agreements, the National Board for Prices and Incomes concluded that "there is a strong case for encouraging the spread of productivity agreements which conform with the requirements of a prices and incomes policy." [31] In the nature of the case, agreements of this type cannot be central to such policy. If

---

[27] *Productivity: Joint Initiative by the Confederation of British Industry and the Trades Union Congress* (published jointly by the CBI and TUC, London, July 1967).

[28] See Max D. Kossoris, "1966 West Coast Longshore Negotiations," *Monthly Labor Review*, October 1966, pp. 1067–1075, and Joseph P. Goldberg, "Containerization as a Force for Change on the Waterfront," *Monthly Labor Review*, January 1968, pp. 8–13.

[29] M. S. Ryder, "Collective Bargaining for Greater Productivity: Some Factors in the American Labor Relations System Possibly Generating Greater Productivity," *British Journal of Industrial Relations*, July 1967, pp. 190–197.

[30] Some light is thrown on this question by Ellen McCullough, "Productivity Agreements and the Structure of Collective Bargaining," *British Journal of Industrial Relations*, March 1967, pp. 28–39.

[31] National Board for Prices and Incomes, Report 36, p. 47.

the aim of policy is a stable rather than a falling price level, incomes policy in an expanding economy must provide for general increases in money wages and other incomes, and thus in real wages. A zero norm for wage increases can only be a temporary expedient. The basic problem under normal circumstances is to contain such increases, on the average, to a level dictated by changes in national productivity.

British incomes policy since July 1966 has reflected emergency conditions. The 6-month standstill on wage increases was remarkably successful. The wage rate index between July and December 1966 remained absolutely stable. During the period of severe restraint (first half of 1967) the index advanced by about 2 percent (using December 1966 as the base), but the increase included the effect of agreements made but not implemented prior to the standstill. Incomes policy since June 1967, as we have seen, continues to be highly restrictive.

A new element has been added by the currency devaluation that occurred on November 20, which should improve Britain's export position. But devaluation, by raising the prices of imported goods, will tend to raise the level of internal prices. The rise from this source is estimated at about 3 percent at retail. This will add to the pressure behind the dam represented by incomes policy. If the advantages of devaluation are not to be lost, however, some decline in the level of real incomes seems essential until, with the trade balance restored, growth in money and real incomes can be resumed. This places great responsibility upon the trade unions, whose central federation now plays a role in the implementation of incomes policy. In an official statement on devaluation on November 22, 1967, the Trades Union Congress stated that its General Council "will not regard increases in prices arising from the reduced external purchasing power of the pound sterling as constituting in themselves justification for increases in wages." Productivity bargaining may serve as one safety valve in the present situation, and may possess, as previously suggested, longrun significance for efficiency in British industry.

A productivity agreement is not one in which increases in pay are accompanied by vague promises to increase output. It is one which introduces new standards of work measurement and new methods of control to ensure that the standards are subsequently adhered to. A productivity agreement in this strict sense presupposes careful advance preparation and more often than not the reoganization of management . . . All the productivity agreements which we have examined have offered rewards for workers to cooperate in the more effective use of resources; it is this that creates the special character of these productivity agreements. Some of them, moreover, offer a prospect of lifting industrial relations to a new plane. In much of British industry, ineffective managerial control is at present the counterpart of "custom and practice" imposed by workers in an attempt to win security which is at best only partial. By contract an effective productivity agreement could begin a process of continuous and developing adaptation of practices to changing technology setting a pattern for future relationships.

—From *Productivity and Pay During the Period of Severe Restraint* (National Board for Prices and Incomes, 1966).

New approach to occupational safety and health statistics

New mandatory recordkeeping program covers almost 60 million workers and will provide Nation with a more accurate toll of job-related injuries and illnesses

LYLE R. SCHAUER AND THOMAS S. RYDER

THE BUREAU OF LABOR STATISTICS currently is conducting the Nation's most intensive survey of work injuries and illnesses. The new program is authorized by the Occupational Safety and Health Act of 1970 which is designed to strengthen and enforce work-related safety and health standards. Booklets, instructions, and report forms have been mailed to 50,000 establishments, the first group to participate in the Bureau's only mandatory recordkeeping program.

Current estimates indicate that 14,500 Americans are killed and more than 2 million injured on the job every year. But these figures understate the true extent of occupational injury and illness.

Under the act, the Bureau's role is to revamp the Government's approach to collecting work injury statistics. Virtually all employers throughout the country are required to participate. And the records they are maintaining will be more complete than ever before. By including nearly all employers, the Bureau is greatly expanding its statistical universe, to almost 60 million Americans at about 5 million workplaces. Employees protected by other Federal occupational safety and health laws, such as the Coal Mine Health and Safety Act, are excluded from coverage, as are State and local government employees, but participating States will provide comparable coverage for their employees in the near future.

The scope of recordable injury and illness has been widened to present a more realistic picture of the losses incurred. Every work-related injury or illness which involves loss of consciousness, requires medical treatment, or prevents an employee from carrying out all of his regularly assigned duties must be recorded. No longer can the incidence of injury be masked by transferring the worker to a new job or by retiring or firing him. Only simple first-aid cases may be excluded.[1]

The act calls for a rigorous, accurate set of statistics to bolster standard setting and compliance activities and directs the Secretary of Labor, in consultation with the Secretary of Health, Education, and Welfare, to "develop and maintain an effective program of collection, compilation, and analysis of occupational safety and health statistics." The Secretary of Labor has assigned to the Bureau of Labor Statistics the responsibility for this program.

Work injury statistics represent the oldest program in the Bureau of Labor Statistics. The first domestic study in this field—investigating the iron and steel industry accident experience—was carried out by the Bureau in 1910. By 1925–26, the Bureau was beginning to establish frequency and severity accident rates by industry, using State records.

In 1937, the Bureau began compiling data through use of the Z16.1 standard, developed by the forerunners of the American National Standards Institute. The standard was revised in 1945, 1954, and 1967. However, under the Z16.1 classifications, the system was based on voluntary State and company reporting, and it became evident that industrial accident statistics were frequently incomplete.

In 1969, Secretary of Labor J. D. Hodgson (then the Under Secretary) noted in a letter to the Institute that a proposed occupational safety and health act called for a national mandatory system for the collection of safety and health statistics. He asked the Institute to evaluate the effectiveness and applicability of the Z16.1 standard as the standard for such a national system. In response, the Institute formed a study group to "review available reporting methods and standards of reporting injuries on a nationwide basis and if necessary develop a simple method of reporting injuries."[2] The study group found that for a mandatory national reporting system the Z16.1

Lyle R. Schauer is a labor economist and Thomas S. Ryder is a social science research analyst in the Office of Occupational Safety and Health Statistics, Bureau of Labor Statistics.

standard with its detailed severity charges for different kinds of injuries and for special exceptions was too complex. The standard was also criticized as too insensitive to measure trends in injury experience.

Exceptions and provisions for transfer to other jobs resulted in extremely low injury frequency rates for knowledgeable firms. In some cases, the Z16.1 standard was used only to make comparisons with experiences of other companies; different definitions of work injuries were used for internal purposes. Finally, the study group found that the standard was not adequate for recording information about occupational illnesses. (In fact, no information on occupational illnesses was recorded.) The group recommended a new comprehensive system.

The proposals were circulated for comments among various associations, the Labor and Business Research Advisory Committees of the Bureau, other Federal agencies, and other interested parties. A Federal interagency committee, established to review these comments, concerned itself with needs of compliance as well as statistics.

The recordkeeping regulations published by the Labor Department in the *Federal Register* on July 2, 1971, incorporated many of the suggestions and recommendations received, including most of the study group's proposals. In the ensuing months, as the recordkeeping system became operable, further revisions were found necessary to avoid undue burden on employers.

The recordkeeping system

The recordkeeping system stipulated under the Occupational Safety and Health Act is designed to obtain reliable, current, and uniform information about occupational injuries and illnesses at the workplace. It is the basic source of data for the statistical program. In addition, the system will provide OSHA and State safety inspectors with on-the-spot records of each occupational accident. The maintenance of records will also serve to heighten employers' awareness of safety and health problems.

The recordkeeping system involves the use of three forms on which to record work-related injuries and illnesses: a log of occupational injuries and illnesses, a supplementary record of occupational injuries and illnesses, and a summary of occupational injuries and illnesses.[3] None is a *report* form—all are to remain at the workplace and be available at reasonable times for examination by representatives of the Department of Labor or the Department of Health, Education, and Welfare, or States accorded jurisdiction under the act. The records are to be retained at the workplace for 5 years.

An occupational injury or illness must be entered on the Log of Occupational Injuries and Illnesses (OSHA Form 100) within 6 working days after notification of the case. This form contains columns for entering the date of injury (or of initial diagnosis of illness), occupation of injured or ill employee, department to which employee was assigned, nature of injury or illness, and part of body affected. Each case is also to be classified either as an injury or as one of seven classes of illnesses. In the case of a fatality, the date of death is also entered.

When cases involve one or more lost workdays (but not death), the number of lost workdays is entered; nonfatal cases without lost workdays (for example, temporary loss of consciousness) are also indicated. It is hoped this breakdown will eliminate the problem of losing track of accidents which resulted in transfer or termination of employment before lost workdays occurred.

The log provides substantial information about each recordable case and should be of considerable assistance to Federal and State compliance officers. A quick examination of the log will tell, for example, what occupations or departments are incurring injuries and illnesses and will indicate areas to be checked during safety inspections.

The log also acts as a worksheet to organize information needed for the Summary of Occupational Injuries and Illnesses (OSHA Form 102). This form contains a summarization of all log entries for a calendar year and must be prepared and posted by February 1 in each establishment at a location where the employer customarily posts notices to his employees.

In addition to the items entered on the log, additional information must be recorded within 6 days on the Supplementary Record of Occupational Injuries and Illnesses (OSHA Form 101). Such information is chiefly concerned with the accident or exposure which resulted in injury or illness. While use of OSHA Form 101 is not mandatory, all information called for on the supplementary record must be available in some form in the establishment. Nearly all of these items are usually found on workmen's compensation or insurance forms, which may be used as long as they contain all the information required on the supplementary record. Missing items can be appended to one of these alternate forms to make them acceptable.

Location of records

Another important provision of the new law concerns the location of records. Records must be kept at the lowest possible organizational level. This has a twofold purpose: To provide records for the use of compliance officers near the point of operations, and to assure that the statistics accurately reflect the size and activity of the reporting unit. In particular, the system is designed to avoid the pooling of information from large numbers of small establishments into companywide reports; for example, that one report present the combined records of such diverse activities as central office, warehousing, production, and maintenance. Such reports, in which low accident sectors (administrative) dilute high ones (production), may mask important trends. In addition, the pooling of records of several sawmills could hide the fact that one is particularly unsafe.

The basic recordkeeping unit is the *establishment,* defined as a single physical location where business is conducted or where services or industrial operations are performed. Distinctly separate activities, such as contract construction activities at a lumberyard, are to be treated as separate establishments. Firms which are physically dispersed, such as those in construction or communications, may maintain records at the place where employees report each day. In addition, these records must be kept in such a way that they can be available without delay and at reasonable times for examination by compliance officers. The widespread computerization of company records forced some modifications of this procedure; however, even where some central recordkeeping is permitted, copies of all pertinent forms must be present in the establishment within specified periods.

Petitions for variance

An employer may wish to define "establishment" in a different manner, keep records in a place other than the establishment, or keep records different from those required in the regulations. If so, he may petition the appropriate Regional Director of the Bureau of Labor Statistics. He must identify the establishment(s) for which an exception is sought, describe the proposed alternate procedure, explain the reason for the exception, and file a statement that the employees concerned have been notified. To meet the last requirement, an employer has several options. He can give a copy of the petition for exception to his employees or their authorized representative, or he may post a statement summarizing the petition and specifying where a copy of it may be examined. The employees and their representatives must also be notified that they have 10 working days following receipt of notice to submit a written objection to the Regional Director.

When an employer seeks relief for establishments located in more than one region, the petition must be referred to the Assistant Commissioner for Occupational Safety and Health Statistics in Washington, D.C.

The Regional Director or the Assistant Commissioner, as the case may be, may grant the petition for exception if he finds that the proposed procedure will provide equivalent information and will not interfere with the purposes of the act. Notice of the grant of a petition must be published in the *Federal Register.*

Most employers have now been formally notified that they are responsible for keeping records of work-related injuries and illnesses. The Bureau prepared a recordkeeping booklet which contained the necessary forms, instructions for completing them, a copy of the poster which must be displayed in each workplace to inform employees of their rights and responsibilities, and a summary of the act. Over 5 million copies of this booklet were mailed to employers registered on the Social Security Administration's extensive mailing lists.

Conceptual changes in recordkeeping

All covered employers must maintain records as set forth in the regulations and must comply with reporting requirements if specifically requested. Congress intended the broadest possible coverage for the act and defined a covered employer as "a person engaged in a business affecting commerce who has employees, but does not include the United States or any State or political subdivision of a State." Accordingly, this has been interpreted to include virtually all nonpublic employment.

The law's definitions of recordable occupational injuries and illnesses represent the most dramatic change from the Z16.1 standard. The definitions of recordable cases start with specific instructions from Congress; that is, the act says employers shall record and report and the Department of Labor shall compile statistics on work-related deaths, injuries, and illnesses, other than minor injuries requiring only

The safety law in brief

The law which is designed to protect the American worker at the workplace is the Williams-Steiger Occupational Safety and Health Act of 1970. Key aspects of the law—standard setting and enforcement, intergovernmental cooperation, research, and statistics—represent a radical change in the approach to occupational safety and health. The main thrust is that every employer must ensure a place of employment free of recognized hazards.

Developing and enforcing safety standards at the workplace is the responsibility of the Secretary of Labor. (Safety and health standards are sets of rules for avoiding hazards which have been proved by experience or research to be harmful to the safety or health of workers.) Within the 2-year limit set by the act, the Secretary may accept existing Federal standards, such as those affecting contractors under the Walsh-Healey Act. Or he may promulgate as occupational safety and health standards any national consensus standards, such as those developed by the American National Standards Institute or the National Fire Protection Association. (Some standards apply to all employees. An example would be those dealing with fire protection. Many standards, however, apply only to workers engaged in certain types of work, such as handling compressed gases.) If there is conflict among standards, the Secretary of Labor is to select the one which offers the greatest protection to employees.

To provide for instances of grave danger to employees, the act also allows for the creation of emergency temporary standards effective immediately upon publication in the *Federal Register;* they must be replaced by permanent standards within 6 months.

The Secretary may also promulgate, modify, or revoke any occupational safety or health standard when presented with justifying evidence. He is empowered to set up an advisory committee of not more than 15 members (at least 1 of whom is to be selected by the Secretary of Health, Education, and Welfare) to study the available information and submit to him its recommendations regarding the standard within 90 days, or, in special cases, within 270 days.

The proposals will be published in the *Federal Register,* and within 60 days after a period for public comments the Secretary must decide on the standard.

Finally, the new law provides machinery for employers to petition the Secretary for a temporary variance from a standard while they seek to comply with it.

The Secretary of Labor is responsible for enforcement of the act. Authorized representatives from the Departments of Labor and Health, Education, and Welfare may enter an establishment at any reasonable time. Two persons, representing the employer and the employees, may accompany the inspector on his visit. Significantly, warning of an impending visit by an inspector is prohibited except by approval of the Secretary.

Noncompliance with standards or failure to maintain adequate records or to satisfy posting requirements may result in written citations describing the violation and fixing a time limit for correction. The law requires that employers post citations prominently at or near the site of the alleged violation. Civil and criminal penalties up to $10,000 and/or 6 months' imprisonment may be imposed for violations of standards, rules, or orders.

Employers may contest citations, penalties, or abatement periods if they notify the Secretary within 15 days of receiving notification of an alleged violation. Appeals are to be handled by the three-member quasijudicial Occupational Safety and Health Review Commission, whose rulings may be appealed to the U.S. Court of Appeals.

The act encourages the States to assume responsibility for developing and administering occupational safety and health laws and for carrying out their own statistical programs. Any State may adopt a plan for developing and enforcing standards if it meets Federal criteria.

Federal interagency cooperation is involved in areas specifically excluded from the act and regulated by other government occupational health and safety standards. For example, the Department of Health, Education, and Welfare, working through a new National Institute for Occupational Safety and Health, is carrying out research and related activities, including work on occupational illness, an area heretofore largely ignored.

first-aid treatment. In addition, the act specifically includes medical treatment cases; cases in which there is a loss of consciousness; cases in which there is a restriction of work or motion; and cases in which there is a transfer to another job. All of these cases, as defined in the act, are "recordable" occupational injuries and illnesses.

These recordable cases are divided into three classes—fatalities, lost workday cases, and nonfatal cases without lost workdays. Under the new system lost *workdays*, not calendar days, are counted; likewise, those cases where a worker is put on a temporary job and those where an injured employee can work at his own permanent job but either cannot perform all of the functions or cannot perform all day.

The former concept that no time was lost (hence, that no injury was to be recorded) as long as the employee could carry out another established and available job has been eliminated; any change in occupation caused by an occupational accident or illness is now considered as recordable. This change alone should result in a substantial increase in recorded occupational accidents and illnesses.

Another significant change in the recording procedure is the elimination of the old time-charge system. The Z16.1 standard assigned fixed-time charges for fatalities and permanent disabilities and measured time lost for other injuries in terms of calendar days; under the new system, the exact number of lost workdays is to be recorded. Recording procedures concerning fatalities are also changed. Unlike the old system, which arbitrarily assigned a charge of 6,000 workdays per death (the estimated equivalent of 20 years of lost workdays), the new system requires no time-charge for fatalities. In cases where an employee dies after returning to work as the result of a lingering illness or injury, employers are required to correct their records.

The reporting system

The new reporting system is also conceptually different from the old system. First of all, the base for reporting injury frequency rates will be 100 full-time employees as opposed to the million employee hours previously used.[4] Second, as a result of the changes in recordable injury and illness classifications, all Z16.1 measures such as severity rates, average days charged per permanent-partial disabling injury, and so on, will no longer be available. In their place will be a series of OSHA-based measures, such as injury and illness incidence rates, lost workday cases, and number of lost workdays.

Regulations concerned with reporting requirements and the report form were published in the *Federal Register* in late 1971. The report form OSHA 103, which is mailed to establishments selected to participate in the surveys, collects the information found on the yearly summary form (OSHA 102). In addition, it collects information concerning the establishment's principal product or service, employment size and hours worked, and medical provisions in case of accidents. Employers are required to return the completed OSHA 103 to Washington or the participating State within 3 weeks.

Data collection

The Bureau is using a mail survey to collect data for the second half of 1971. The survey covers 50,000 establishments and data collection began in February 1972. The first annual survey will cover more than 200,000 establishments, with data collection beginning in January 1973.

Panels in each annual survey period will be divided into two groups: The national direct sample, in which establishments in States not participating report directly to the Bureau of Labor Statistics, and the cooperating State sample. In both cases, the source for sample selection will be the State unemployment insurance files or similar records. In each survey, all employers with 100 employees or more will be required to submit a report. Those with fewer than 100 employees will be sampled by size each year on a rotational basis.

The survey will produce injury and illness incidence rates and other measures for manufacturing at the 4-digit Standard Industrial Classification level and for nonmanufacturing at the 3-digit SIC level. (SIC levels are numerical assignments to levels of industry; thus, the more digits in an SIC code, the more specialized the industry it describes.) Mining and Federal Government employees will be excluded from the surveys, and agriculture, forestry, fisheries, and State and local government personnel will be excluded from the first survey. Occupational injury and illness data for many of these industry sectors will be available, however, from other surveys or sources.

Federal grants are available to States that wish to participate in the program. The initial phase, plan-

ning grants, is designed to assist States in preparing their statistical programs for participation in the annual national survey. The Federal share in the planning grants is generous, covering up to 90 percent of the planning budget. As of January 1972, 48 States, three territories, and the District of Columbia had submitted project statements and been authorized planning grants.

Operational grants will be assigned to States as they join in the annual collection of work injury and illness statistics. These grants will be assigned on a yearly basis and will follow a 50–50 Federal-State formula. Federal assistance is also available to States on a 90–10 basis for experimentation and demonstration projects relating to the statistical program.

The Bureau's regional offices are playing an important role in the statistical program. A chief function is to assure the adequacy and quality of cooperative State data by providing training and assistance and monitoring State agency operations in the survey.

Research and special studies

Research under the Occupational Safety and Health Act plays an important role in the Bureau's program. This research will fall primarily into three categories.

First, there will be the traditional cause and rate studies. These will examine characteristics of the injured worker (focusing on age, sex, occupation, and exposure time) and the accident itself. "Situational studies" will provide in-depth information about accidents involving a particular machine or tool, exposure to certain substances like toxic chemicals or flying pieces of metal, and potential environmental hazards.

Measuring and evaluating the impact of the occupational safety and health act will be the second area of research. Findings will be reviewed by the Secretary of Labor in making his annual progress report, required by the act.

The final broad area of concern will be the socioeconomic cost of occupational accidents and disease. While consideration will be paid to the costs of these accidents to industry groups and the economy as a whole, much attention will focus on the company and the individual involved—lost production, retraining, curbed earning power and ruined careers, and family adjustment to a disabled breadwinner. □

FOOTNOTES

[1] First-aid treatment is defined as "one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care." (From *Definitions* on back of OSHA No. 100.)

[2] *Proposed National System for Uniform Recording and Reporting of Occupational Injuries and Illnesses* (New York, American National Standards Institute, 1970), p. 10.

[3] Copies of these forms are available free of charge from the Bureau of Labor Statistics, Washington, D.C. 20212, or from any of the regional offices.

[4] The incidence rate is calculated as:

$$\frac{N}{MH} \times 200{,}000$$

where

N = number of injuries and/or illnesses

MH = total hours worked by all employees during reference year

200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year)

Chapter IX. Work Scheduling and Worklife

The future of work: Three possible alternatives

The role of work in our society will change; fertility patterns will affect the direction of change and the climate in which choices will be made

DENIS F. JOHNSTON

CURRENT INTERPRETATIONS of the meaning of work in American society range from a reassertion of its traditional significance to the view that its fundamental *raison d'etre* is about to be removed by advances in automation—advances which have been heralded as the "cybernetic revolution."[1] A corresponding range of views is evident with respect to the meaning of work in the life of the individual—from the assertion that work will continue to provide a central focus for personal satisfaction and status achievement to the argument that our traditional work ethic is undergoing rapid erosion, to be displaced by new criteria of personal worth and achievement unrelated to work performance.[2]

The three "scenarios" which follow depict possible alternative directions of change which may emerge in our society with regard to the role and significance of work. The first is labeled the "green" scenario, in deference to the controversial work by Charles A. Reich.[3] The second is labeled the "blue" scenario; it is basically antithetical to the first, and implies a strong commitment to full employment and the preservation of the traditional role of work in our society. The third scenario, representing a synthesis, is labeled the "turquoise" scenario. These scenarios are deliberately simplified "ideal type" constructs; they are intended to be exploratory and should not be construed as forecasts of expected outcomes.

In the long run, the size and age distribution of the population are significant factors influencing both the felt needs of the society and the supply of workers to meet those needs. For this reason, the description of the three scenarios is followed by a summary of two alternative sets of population and labor force projections, designed to illustrate the cumulative effects of different fertility levels over a span of 70 years. Different fertility levels influence the likelihood that our society will evolve toward one or another of the scenarios, and are in turn influenced by the changing values and life styles expressed in the different scenarios. These relationships are considered briefly in the concluding section.

Denis F. Johnston is senior demographic statistician in the Office of Manpower Structure and Trends, Bureau of Labor Statstics. An expanded discussion of this subject, entitled "Illustrative Projections of the Labor Force of the United States to 2040," will be included among the Research Reports of the Commission on Population Growth and the American Future, to be published in the fall of 1972.

The green scenario

In this scenario, the displacement of workers by increasingly sophisticated, self-regulating machinery is assumed to extend rapidly from basic activities of production and distribution into white-collar and service occupations as well.[4] An increasing proportion of the population of working age is unable to find a need for their services. Concern for economic security or for material goods is no longer a significant motivation for the expenditure of work effort, since the supply of these goods is ensured by increasingly automated processes, and their distribution among the members of society is ensured by a variety of social mechanisms. With the provision of material needs and related services assured, the desire for growing material affluence is gradually displaced by concern for psychic and social enrichment in nonwork settings.

An underlying assumption here is, of course, a nearly complete separation of work and rewards. Members of such a society would share in the consumption of goods and services in much the same way they presently share in the use of such "free" goods as air and water. Under these conditions, conventional definitions of labor force, work, and em-

ployment would lose much of their relevance. The society would evolve into a two-caste system, comprising a small elite of highly trained cybernetic engineers and a growing majority of persons whose primary relationship to the economy would be limited to consumption. The life styles of this majority would be oriented toward highly diversified forms of expressive behavior—a veritable greening of America.[5]

The notion that the importance of work in our society will continue to diminish can be supported by statistical indicators reflecting the decline in the length of the average working day, the increase in the length of paid vacations, and the reduced proportion of life spent in the labor force. The following tabulation,[6] showing the change in expectations of the average 20-year-old working man, reflects the declining proportion of life spent in the labor force:

	1900	*1950*	*1968*
Life expectancy	42.2	48.9	49.2
Work life expectancy	39.4	43.1	41.5
Retirement expectancy	2.8	5.8	7.7
Percent of life in retirement	6.6	11.9	15.6

Although comparable estimates and projections for women are not available, it is apparent that the increasing labor force participation of women compensates, at least in part, for the reduction in work effort among men. Nevertheless, both sexes are entering the labor force later and retiring earlier, so that a continued reduction in the total proportion of time spent at work is likely.

If work absorbs less of an individual's time, it does not necessarily follow that it has less meaning or importance for him. However, a few studies and a larger number of impressionistic accounts have pointed to the emergence of life styles in which work is no longer regarded as intrinsically or personally valuable, but is accepted primarily for the monetary rewards it brings.[7] In one such study, only about one-third of the jobs surveyed were found to be "ego-involving," with the bulk of these concentrated in the upper white-collar groups. The remainder, including the overwhelming majority of entry-level positions, were classified as "society-maintaining."[8] As the new entrants to the labor force acquire both the habits of industry and the requisite skills in their chosen fields, they may be expected to search for an adult "identity" in terms of their work role. To the extent that this search is frustrated by the paucity of challenging or "ego-involving" jobs, a further erosion of the traditional work ethic may be ahead.[9]

The intuitive appeal of our first scenario is undeniable. It envisions a society which enjoys the ultimate liberation—from both the fear of want and from the need to submit to the disciplines of work. But its implications are profoundly disturbing, and its underlying assumptions can be challenged. Most disturbing is the likelihood that reliance upon an automated system, controlled and understood by a select minority, implies an elitist control of the majority.

But the conceptual leap from a vision of what is technologically feasible in theory to the conclusion that such a vision is about to be realized involves a non sequitur of classic proportions. Our experience with the impact of automation does not thus far indicate the disappearance of work to be done—especially when we consider the mounting social and ecological problems associated with increased production and consumption.[10] Undoubtedly, rapid technological advances will continue to produce major changes in the nature and content of work, but it does not necessarily follow that the need for, and importance of, work will be diminished.

Moreover, our green scenario may also be flawed by its misconception of the value orientations of the youthful dissidents and apostles of "deviant" life styles. Those who refuse to participate in a "corrupt" society, or who reject the notion of engaging in "meaningless" work or ritualistic and "irrelevant" education are not necessarily denying the values which underlie these pursuits; they may instead be advocating reforms designed to reassert them in purer form.[11] The emergence of an increasingly cybernated technology, accompanied by increasing levels of education and aspiration among persons of working age, may indeed produce dramatic changes in the relative emphasis given to the economic, social, and psychological components of job content and performance, but work is likely to retain its traditional position as a major factor in orienting the individual within the society.[12]

The blue scenario

The essential characteristic of this scenario is the realization and maintenance of a full employment economy, together with the progressive removal of remaining barriers to the employment of those

groups whose desire for employment has been frustrated by a variety of handicaps or by discrimination. Two basic assumptions differentiate this scenario from the one preceding. First, the pace and direction of technological change is modified and channeled by the introduction of measures which ensure a sustained high level of demand for workers. Second, this demand is matched by a supply of appropriately trained persons willing to work.

On a number of counts, this is a plausible outlook. First, our experience with the impact of automation thus far suggests a continued expansion in the number and variety of professional, technical, and service occupations geared to the operation of automated machinery. Second, our attempts to reduce the social costs of the externalities associated with our current patterns of production and consumption may require substantial inputs of labor-intensive work effort rather than increased automation. For example, a drastic reduction in the use of chemical pesticides and fertilizers might well entail a considerable expansion in the labor inputs required to maintain production of agricultural products in the future. Third, it is conceivable that the United States, in concert with other highly industrialized countries, might attempt to boost production and income in the less developed countries. The resulting expansion of effective demand for U.S. goods and services would generate increased demand for U.S. labor. Fourth, the demand for work and the income it brings is far more pervasive in our society than the demand for income unrelated to work. Evidence of the strength of this value is the Employment Act of 1946, which expressed the need to create and maintain conditions under which useful employment opportunities would be afforded to those who are "able, willing, and seeking to work." This act provides the necessary legislative underpinning for a "full employment" policy. Should attempts to achieve full employment conflict with efforts to attain other national objectives, there is ample leeway, under the carefully qualified wording of this act, for the development of policies and programs designed to ensure "reasonably full" employment. If such policies were to include measures which reduced other sources of income to those deemed able to work while at the same time effectively removing existing barriers to the employment of those who are willing to work, our blue scenario would be quite realistic.

Finally, efforts to achieve our national goals in a number of areas are likely to generate a high level of demand for labor, thus facilitating the achievement of full employment. Assuming national commitment to 16 major goals, Leonard A. Lecht of the National Planning Association first estimated the dollar cost of attaining each of these goals, and then translated these costs into estimates of associated manpower requirements. Lecht's major findings strongly contradict the view that millions of workers are about to become redundant because of the spread of automation; he found, instead, that full achievement of these goals by the mid-1970's would require the employment of about 10 percent more workers than are expected to be in the labor force by that time.[13]

Other experts foresee neither the displacement of workers nor the abandonment of work as a means of livelihood, but rather the emergence of government (particularly at the State and local levels) as a dominant employer of *first* resort.[14] This argument is based on the conviction that solutions to our mounting social and environmental problems can be developed only through governmental initiative and coordination. They envision new forms of public-private collaboration in dealing with these problems, recognizing the key role of government in developing and monitoring the large-scale programs which may be called for. The significance of their findings lies in their agreement that continued increases in productivity do not necessarily imply a reduction in demand for labor, particularly if the society devotes more attention and resources to the difficult public problems emerging.

The turquoise scenario

This setting assumes continued improvement and application of automated machinery and related technological advances in meeting the growing needs of the society. It differs from the first scenario, however, in regard to the life styles which are seen to accompany this advance. In the turquoise setting, the economic security and material wealth generated and maintained by an increasingly cybernated technology are accompanied by sustained demand for work in four major areas: (1) a core of highly trained technicians and engineers needed to maintain and improve the machinery of production and distribution, supplemented by a growing corps of ombudsmen to

provide the feedback information needed to direct this machinery in accordance with public wishes and agreed-upon social values; (2) a growing number of workers in the fields of public and personal services; (3) a growing number of craftsmen and artisans whose handiwork continues to be valued because of its individualistic, nonmachine characteristics and stylistic qualities; and (4) a major expansion of employment in what Toffler has aptly termed the experience industries—a blending of recreational and educational opportunities packaged to appeal to the interests of an increasingly affluent and educated population enjoying greater amounts of leisure time.[15]

In this scenario, work retains much of its conventional significance, both in economic terms and in sociopsychological terms. However, unlike our blue scenario, it envisions a major transformation in the relative importance of economic and noneconomic work needs. As a shrinking proportion of workers is engaged in the basic tasks of production and distribution, more and more workers are involved in occupations whose productivity grows slowly, or in modes of work for which conventional measures of productivity are inappropriate. This shift links the economic sector more closely to noneconomic forces, such as changes in life styles, so that nonmaterial cultural values tend to become the primary determinants of what we produce and consume.[16]

The salient feature of this scenario is the gradual reunification of work and leisure into a holistic pattern as was characteristic of most preindustrial societies. Such a reunification may already be observed in the guise of coffee breaks, informal on-the-job socializing, and increasing concern for the amenities of the work setting. But these are only the surface manifestations of more profound changes. The proliferation of on-the-job training courses, for example, reflects an increasing concern with the need to elicit from workers a greater sense of commitment by increasing their opportunities for growth and fulfillment within the work setting. What is significant in these developments is not the claim or belief that such innovations are conducive to increased productivity, but rather the fact that they represent an attempt to humanize the work setting.

The basic pressure for continued modifications in these directions stems from the increasing educational attainment of workers, together with the progressive removal of barriers to the employment of individuals whose participation in the labor market was formerly restricted. The more highly educated individuals now entering the labor force in rapidly increasing numbers have acquired high aspiration levels and expectations concerning their work roles and careers. Their enormous potential cannot be tapped without opening up new channels of communication for mutual education and sharing of experience and outlooks.[17]

A corresponding set of accommodations may be expected if the goal of equal opportunity for meaningful work is to be achieved by the "disadvantaged." The possible measures to be adopted or expanded in this area range from a variety of training courses—remedial education, skill upgrading, and the like—to the provision of facilities such as day-care centers designed to permit the fuller participation of those persons in some way handicapped in seeking and holding jobs. A continuation of these trends under conditions of technologically induced productivity increases suggests that a considerable share of these increases might be absorbed in the form of measures which promote a more socially and psychologically satisfying work experience.[18]

An important consequence of this type of change would be a continued expansion of the labor force as conventionally defined. This expansion would be accompanied by a gradual reduction in average hours worked per year, together with a more subtle blending of work and leisure activities.

Population and labor force projections

Through their effects on size and age distribution of the labor force, fertility patterns are likely to affect the future role of work in our society—and the range of alternatives available.

The population projections summarized in table 1 illustrate the cumulative effect of two alternative fertility levels. Series B represents the adoption of a three-child family norm; Series E represents the adoption of a two-child norm.[19] The accompanying labor force projections illustrate the effects of these alternative fertility levels at 20-year intervals upon the size and age distribution of the labor force.

By 1980, the lower (two-child) series yields a labor force 1.7 million larger than the higher (three-child) series, because under the postulated

patterns of child-spacing, the two-child series implies a smaller proportion of women with young children, which in turn implies a higher percentage of women in the labor force, other things being equal. By the year 2000, the effect of the higher labor force participation of women in the two-child series is overshadowed by the smaller number of young workers who have been born under this series. As a result, the labor force of 127 million is 9.8 million smaller than that which would occur under the three-child series. Beyond the year 2000, the cumulative effect of the difference between Series B and Series E fertility levels is dramatic. By 2020, the Series B labor force would be 45 million larger than the Series E projec-

Table 1. Illustrative projections of total population and total labor force, by age and sex, 1960 to 2040

	1960	1970	Series B (3-child norm)				Series E (2-child norm)			
	Actual	Actual	1980	2000	2020	2040	1980	2000	2020	2040
POPULATION [1]										
Numbers in thousands:										
Total, all ages	180,525	205,397	236,797	320,780	440,253	598,179	225,510	266,281	299,177	317,382
Male	89,281	100,752	115,941	158,051	218,103	297,002	110,178	130,253	146,284	154,716
Female	91,244	104,645	120,856	162,729	222,150	301,177	115,332	136,028	152,893	162,666
Percent distribution:										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 16 years	32.9	30.7	29.4	31.4	32.1	32.1	25.9	24.2	22.5	22.0
16 to 24 years	12.2	15.7	16.0	15.6	14.6	14.7	16.8	13.6	12.2	12.2
25 to 54 years	37.6	34.9	35.7	36.9	35.7	36.4	37.5	42.9	39.4	39.3
55 years and over	17.4	18.7	18.9	16.1	17.6	16.8	19.8	19.4	25.9	26.6
TOTAL LABOR FORCE [2]										
Number in thousands:										
Total, 16 and over	72,104	85,903	101,096	136,422	185,814	255,312	102,818	126,660	141,138	147,724
Male	48,933	54,343	63,574	84,249	114,183	156,367	63,574	77,388	85,576	89,182
Female	23,171	31,560	37,522	52,173	71,631	98,945	39,244	49,272	55,562	58,542
Percent distribution:										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
16 to 24 years	17.6	23.2	22.8	22.2	20.9	20.9	22.9	17.7	16.0	16.2
25 to 54 years	64.6	59.9	61.0	65.0	64.1	64.8	61.2	68.5	64.2	65.1
55 years and over	17.7	16.9	16.2	12.8	15.1	14.4	15.9	13.8	19.8	18.7
NOT IN LABOR FORCE										
Numbers in thousands:										
Total, all ages	108,421	119,494	135,701	184,358	254,439	342,867	122,692	139,621	158,039	169,658
Male	40,348	46,409	52,367	73,802	103,920	140,635	46,604	52,865	60,708	65,534
Female	68,073	73,085	83,334	110,556	150,519	202,232	76,088	86,756	97,331	104,124
Percent distribution:										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 5 years	18.5	14.8	19.2	18.3	18.6	19.0	15.6	14.1	13.3	12.9
5 to 15 years	36.3	37.9	32.1	36.4	37.0	37.0	32.0	32.0	29.3	28.1
16 to 64 years	33.9	33.4	33.8	31.5	30.5	30.6	36.0	35.6	34.9	33.4
65 years and over	11.4	13.9	14.9	13.9	13.9	13.4	16.4	18.3	22.5	25.5
Dependency ratio [3]	1.50	1.39	1.34	1.35	1.37	1.34	1.19	1.10	1.12	1.15

[1] Data relate to total population, including Armed Forces abroad, as of July 1 of the specified year. Estimates for 1960 and 1970 are current estimates as of those dates. Projected data were prepared by the Bureau of the Census for the Commission on Population Growth and the American Future, and are consistent with the projections published in Current Population Reports, Series P-25, No. 448.

[2] Data include Armed Forces, and are annual averages for the specified years. Data for 1960 and 1970 are estimates based on then current population estimates. Projected data were prepared by the author for the Commission on Population Growth and the American Future, and are not official Bureau of Labor Statistics projections.

[3] The "dependency ratio" is the number of persons of all ages who are not in the labor force divided by the total labor force.

NOTE: The Series B projections of population represent the growth patterns that would result if the future fertility of American women were to follow a trend such that women now entering the child-bearing ages and all subsequent cohorts of women would have 3,100 children ever born per 1,000 women. The Series E projections represent the growth patterns that would result if these succeeding cohorts of women were to have 2,110 children ever born per 1,000 women, which is just enough to barely replace each generation, given current mortality levels. Both series assume the same trend in mortality, and both assume the same annual net migration to the United States of 400,000 persons per year.

The corresponding series of labor force projections were developed to illustrate the effects of different levels of fertility on the size and age-sex distribution of the labor force. These fertility differentials were assumed to affect only the economic activity rates of women of child-bearing ages. The projected rates of labor force participation for both sexes are extrapolations of actual trends observed during the postwar period; they assume no sudden or drastic change in the propensity of different age-sex groups to enter or leave the labor force.

The labels "B" to "E" used here are two of the five arbitrary designations the Bureau of the Census has employed to identify different series of population projections they have prepared in recent years. The five series "A" to "E" may be defined in terms of the number of children born per 1,000 women throughout their childbearing period: Series A=3,350; Series B=3,100; Series C=2,775; Series D=2,450; and Series E=2,110. Series A, which represents a reasonable upper limit for the birth cohorts of women who entered childbearing ages at the start of the post-World War II "baby boom," has been dropped as being above the range of reasonable current expectations for future fertility of American women. Therefore, Series B now represents the highest series considered to be attainable in the future. Series E, at the lower extreme, represents the fertility needed to barely replace the current generation. Because Series B approximates an average fertility of three children per woman, it has been referred to as the "3-child norm." Similarly, Series E, approximating a fertility rate of two children per woman, is termed the "2-child norm."

tion; by 2040, 107 million larger.

The contrast between the two series is even more striking when the amount of the average annual net increase in the labor force is considered. In the higher series, the labor force rises from an annual average of 1.5 million during the 1960–80 period to 3.5 million a year during the 2020–40 period. The corresponding increase in the lower series is from 1.5 million a year in the 1960–80 period to only 300,000 a year in the 2020–40 period. In other words, both the population and the labor force of the lower series approach a constant level by around the middle of the next century, but the higher series implies exponential growth.

The age distribution of these alternative projections reveals a number of significant differences, particularly after the year 2000. During the 1960–80 period, the projected labor force increase in both series is roughly the same: 35 percent of the increase will be young adults (age 16 to 24 years), while about 12 percent will be older workers (55 years old and over). During the next 20-year period, 20 percent of the projected increase in the high series consists of young workers, while older workers contribute about 5 percent of the increase. In the lower series, the number of younger workers actually declines, so that nearly all of the increase is accounted for by workers in the central working ages, 25 to 54.

The contrast between the two series is even more striking during the following period (2000 to 2020). In the higher series, older workers account for only a slightly larger proportion of the labor force increase than younger workers, 17 and 21 percent respectively. But in the lower series, less than 2 percent of the projected rise occurs among younger workers, while 72 percent occurs among workers 55 and over. By 2040, about 21 percent of the labor force under the high series would be under age 25, and 14 percent would be 55 and over; the corresponding percentages for the lower series are 16 and 19 percent, respectively.

In summary, the salient feature of the higher series of the labor force projections is the continued rise in the number of workers, sustained by the ever-increasing supply of new young entrants to the labor force. The outstanding characteristic of the lower series of projections, on the other hand, is the sharp fluctuation in the age distribution of the workers, tending, in the long run, toward an older, more slowly growing labor force. Thus, each of these projected series would give rise to a different pattern of stresses in accommodating the potential supply of workers to the demands of the economy.

Projections and scenarios

The relationships among our three scenarios and the two series of population and labor force projections can only be described in general terms; the tentative and conjectural nature of these generalizations must be stressed.

At first glance, a return to the higher growth pattern of Series B would appear to be consistent with our traditional self-image as an expanding society—a society which continues to equate growth with progress in all spheres of life. However, the longrun implications of such continuing growth portend the emergence of serious and historically unprecedented stresses which would tend to reduce the range of options open to the society and would adversely affect the climate in which choices must be made in the future. By the year 2000, a Series B population of about 320 million people, enjoying a national per capita productivity which has continued to rise at the conservative rate of, say, 2.2 percent per year (in real terms) would be producing—and consuming—nearly three times the volume of goods and services it presently utilizes. By the year 2040, such a population, then numbering close to 600 million, would, on the same assumption, produce and consume over 13 times our current output.[20] Not only would such a growth pattern generate unprecedented pressures on the supply of natural resources and trigger vast environmental side effects, but it would also produce a host of social strains and psychological frustrations, as the growing affluence of each individual inevitably impinges upon that of his fellows. In the long run, any society which is geared to an exponential pattern of demographic and economic growth is bound to encounter a series of progressively severe "shocks" as its demands surpass the available supply of all those elements—such as breatheable air, potable water, and usable space—which are not growing exponentially, and may in fact be rapidly diminishing.[21]

One possible outcome of our attempts to overcome the challenges posed by such enormous growth would be a forced adoption of certain features of our

"green" scenario. For example, the social and environmental costs associated with the increased production needed to sustain our growing population might induce such rapid adoption of new technologies that the normal growth in the labor force could no longer be fully absorbed. The resulting imbalance between the supply of potential workers and the demand for their services could then create a need for increased reliance upon mechanisms of support unrelated to work.

Alternatively, any failure to meet the demand of increased production and distribution by technological means, or an inability to solve the associated problems of pollution, waste disposal, and the like by such means might force increased reliance upon labor intensive efforts. Under these circumstances, our evolution towards the blue scenario would be associated with declining productivity and corresponding declines in the level of living of the population as a whole. In short, a return to the growthmanship of the higher series implies movement into an environment of heightened stress whose challenges are likely to impose drastic changes in our way of life, whether or not these challenges are successfully met by means of technological innovation.

The consequences of a continuation of our current trend toward reduced fertility are generally more hopeful, if only because the sheer volume of the population increases much less rapidly. If we again assume, for purposes of illustration, that real per capita productivity grows at 2.2 percent per year, we find, by the year 2000, a Series E (two-child norm) population of about 270 million producing and consuming about 2.4 times our current volume of goods and services. By the year 2040, this population, then approaching a constant number of about 320 million, would produce about seven times our current output.

Many of the same types of problems associated with the higher series would still emerge under the lower series, but the growth pattern of the lower series would afford the society considerably greater leeway in managing these problems before they assume crisis proportions. Moreover, the gradual aging of the population resulting from the Series E growth pattern is less likely to produce sudden crises; instead, the society is likely to experience a gradual shift from concern with the problems of youth toward concern with those services and facilities designed to meet the needs of the older population. Under these circumstances, the realization of our turquoise scenario would be greatly facilitated. The older age distribution of the Series E population and labor force would seem to imply a greater interest in the introduction of changes which preserve the traditional meaning of work while improving the conditions under which it is performed. The relatively greater concern of such a population with the adjustments of aging and retirement would encourage further experimentation with various combinations of work and leisure, while the smaller number of new young entrants to the labor force could more readily be absorbed into meaningful and satisfying career patterns.[22]

The major conclusion which emerges from these brief speculations is that a return to the Series B growth patterns may be expected to generate an atmosphere of much greater social and economic stress than would occur if the Series E pattern was realized. Both series of future growth give rise to serious problems, but the lower growth pattern would afford the society a greater degree of freedom from the pressing demands of undiminished population growth and would thereby facilitate both the emergence of a wider range of alternatives for our future societal development, and a more rational choice among these alternatives. □

FOOTNOTES

[1] See Seymour L. Wolfbein, *Work in American Society* (Glenview, Ill., Scott Foresman, Inc., 1971); Sebastian de Grazia, *Of Time, Work, and Leisure* (New York, Doubleday & Co., Inc., 1964); Walter S. Neff, *Work and Human Behavior* (New York, Atherton Press, 1968); Alan Fox, *A Sociology of Work in Industry* (London, Collier-Macmillan Ltd., 1971), chapter 1; and C. Gilbert Wrenn, "Human Values and Work in American Life," in Henry Borow, editor, *Man in a World at Work* (Boston, Houghton Mifflin Co., 1964), pp. 24–44.

[2] Compare, for example, Garth L. Mangum, "Guaranteeing Employment Opportunities," in Robert Theobald, editor, *Social Policies for America in the Seventies: Nine Divergent Views* (New York, Doubleday & Co., Inc., 1968), pp. 25–55, and the statement of the Ad Hoc Committee on the Triple Revolution, W. H. Ferry, Chairman, reprinted in John A. Delehanty, editor, *Manpower Problems and Policies: Full Employment and Opportunity for All* (Scranton, International Textbook Co., 1969), pp. 140–149.

[3] Charles A. Reich, *The Greening of America* (New York, Random House, 1970); Philip Nobile, editor, *The Con III Controversy* (New York, Pocket Books, Inc., 1971); and Henry Fairlie, "The Practice of Puffers," *Encounter*, August 1971, pp. 3–13.

[4] Ad Hoc Committee on the Triple Revolution, *op. cit.*, March 1964. The three "separate and mutually reinforcing revolutions" are the cybernation revolution, the weaponry revolution, and the human rights revolution. The document stresses the implications of the first of these.

[5] The "elitist" implications of this scenario are but dimly perceived by Reich, but they are clearly delineated by Donald N. Michaels, "Cybernation: The Silent Conquest," in *Automation: Implications for the Future*, Morris Philipson, editor (New York, Random House, 1962), pp. 78–128. See also the classic work of Jacques Ellul, *The Technological Society* (New York, Random House, 1964), translated from the French edition of 1954 by John Wilkinson.

[6] The estimates of life expectancy discussed above are from conventional life tables. Those relating to the average expected duration of working life reflect the proportions of the surviving population of males who were in the labor force at successive ages at the specified time. For a detailed explanation of the derivation of conventional tables of working life, see U.S. Department of Labor, Manpower Administration, *The Length of Working Life for Males, 1900–60*, Manpower Report Number 8, July 1963, and Howard N. Fullerton, "A table of working life for men, 1968," *Monthly Labor Review*, June 1971, pp. 49–55. If trends in average hours of work per week observed during the first six decades of the twentieth century are extrapolated, the average amount of time spent at work during the year would be about two-thirds its present level by the end of the century. On this subject see Stanley Lebergott, "Labor Force and Employment Trends," in Eleanor Bernert Sheldon and Wilbert E. Moore, editors, *Indicators of Social Change* (New York, Russell Sage Foundation, 1968), pp. 97–143, especially table 2, and Mary A. Holman, "A National Time-Budget for the Year 2000," *Sociology and Social Research*, October 1966, reprinted (in part) in Marion Clawson, "How Much Leisure Now and in the Future?" in *Leisure in America: Blessing or Curse?*, James C. Charlesworth, editor, Monograph 4 (Philadelphia, American Academy of Political and Social Science, April 1964), pp. 1–20. For recent analyses of trends in the direction of increased leisure and its utilization, see Geoffrey H. Moore and Janice N. Hedges, "Trends in labor and leisure," *Monthly Labor Review*, February 1971, pp. 3–11, and Janice N. Hedges, "A look at the 4-day workweek," *Monthly Labor Review*, October 1971, pp. 33–37.

[7] Ben B. Seligman, *Most Notorious Victory: Man in an Age of Automation* (New York, The Free Press, 1966), p. 368, as quoted in Walter S. Neff, op cit, p. 241. Also see Ben Seligman, "Automation and Labor," in Ellis L. Scott and Roger W. Bolz, *Automation Management: The Social Perspective* (Athens, Ga., The Center for the Study of Automation and Society, 1970), pp. 138–152, and Bruce Mazlish, "Obsolescence and 'Obsolescibles' in Planning for the Future," in Stanford Anderson, Editor, *Planning for Diversity and Choice* (Cambridge, Mass., M.I.T. Press, 1968), pp. 155–169.

[8] Robert J. Havighurst, "Youth in Exploration and Man Emergent," in *Man in a World at Work*, op. cit., pp. 215–236.

[9] *Ibid.* Compare Walter S. Neff, op. cit., chapter 15, pp. 236–251, and Harvey Swados, "Work as a Public Issue," *Saturday Review*, Dec. 12, 1959, pp. 13–55 and 45. Also see Paul Goodman, "Youth in the Organized Society," *Commentary*, 1960, pp. 95–107.

[10] Victor C. Ferkiss, *Technological Man: The Myth and the Reality* (New York, The New American Library, 1970). Ferkiss argues that the emergence of "technological man" would ensure the employment of technology in the service of social and humanitarian goals. Ellul, op. cit., is not so optimistic. On this issue, see Hasan Ozbekhan, "The Triumph of Technology: 'can' implies 'ought,'" in *Planning for Diversity and Choice*, op. cit., pp. 204–233. Ozbekhan argues that technology should not be more than a means to ends prescribed by social values; "can" does *not* imply "ought."

[11] Nicholas Rescher, "Value-Considerations in Public Policy Issues of the Year 2000" (paper presented at the Technological Forecasting Conference, 1969, sponsored by the Industrial Management Center, Inc.). For a fuller exposition of methods assessing trends in values, see Kurt Baier and Nicholas Rescher, editors, *Values and the Future* (New York, The Free Press, 1969).

[12] Harold L. Wilensky, "Varieties of Work Experience," in *Man in a World at Work*, op. cit., pp. 125–154.

[13] Leonard A. Lecht, *Manpower Needs for National Goals in the 1970's* (New York, Frederick A. Praeger, 1969). Fifteen of these goals were initially described in the Report of the President's Commission on National Goals, *Goals for Americans* (The American Assembly, 1960). A 16th goal, relating to space exploration, was later added. The outcome of such an exercise is, of course, heavily dependent upon its assumptions. Imprecise specification of goals and of attainment of a given goal were critical problems here. Lecht provides details on his procedure in appendix C.

[14] Irving H. Siegel and A. Harvey Belitsky, "The Changing Form and Status of Labor," *Journal of Economic Issues*, March 1970, pp. 78–94.

[15] Alvin Toffler, *Future Shock* (New York, Random House, Bantam edition, 1970), chapter 10.

[16] Ibid., p. 453.

[17] Bertram M. Gross, editor, *A Great Society?* (New York, Basic Books, Inc., 1966), p. 338. Compare Margaret Mead, "The Changing Cultural Patterns of Work and Leisure," U.S. Department of Labor, Manpower Administration, Seminar on Manpower Policy and Programs, January 1967.

[18] For a balanced treatment of the alternatives of a "segmentalist" versus a "holistic" approach to work and leisure, see Stanley Parker, *The Future of Work and Leisure* (Lon-

don, MacGibbon & Kee, Ltd., 1971, and New York; Praeger, 1971), chapter 10. For a persuasive argument in favor of a holistic approach, see Joffre Dumazedier, *Toward a Society of Leisure* (New York, The Free Press, 1967, translated from the French by Stewart E. McClure), chapter 4.

[19]An average annual per capita increase in total output per worker of 2.2 percent (in real terms) is consistent with an assumed rise in productivity per man-hour of 2.5 percent per year, and a decline in hours worked per worker of 0.3 percent per year. Both of these rates of change are approximately consistent with long-term trends in the United States. These simple calculations are, of course, purely illustrative, and do not take account of a host of factors which might affect both productivity and its measurements over the 70-year span of our projections.

[20] Such enormous growth is roughly comparable with the growth we have experienced during the past 70 years. Compare Herman Kahn and Anthony J. Wiener, *The Year 2000* (New York, Macmillan, 1967), chapter 3, pp. 167–184, and E. J. Mishan, *The Costs of Economic Growth* (New York, Praeger, 1967). Also see Professor Mishan's article, "On Making the Future Safe for Mankind," *The Public Interest*, Summer 1971, pp. 33–61.

[21] See Barry Commoner, "Economic growth and ecology—a biologist's view," and Walter W. Heller, "Economic growth and ecology—an economist's view," *Monthly Labor Review*, November 1971, pp. 3–13 and 14–31, respectively.

[22] See David Riesman, "Leisure and Work in Post-Industrial Society," in Jack Douglas, editor, *The Technological Threat* (Englewood Cliffs, N.J., Prentice-Hall, Inc., 1971), pp. 71–91.

Trends in labor and leisure

GEOFFREY H. MOORE AND JANICE NEIPERT HEDGES

LEISURE is intrinsically bound up in the quality of life. Its distribution—among the population and over lifetimes—and the uses to which it is put are indicative of the well-being of a society. Yet the increase in the United States in time free of work and available for leisure activities has been far less widely noted than the upward march of the output of goods and services.

The relative neglect of leisure as a measure of the Nation's advance in living standards is related to its elusive quality. Worktime, and its reduction over a period of years, can be measured statistically. It is more difficult to tell whether leisure has actually grown. Even to define leisure is difficult. "Free, unoccupied time" expresses one common definition. Students of leisure, however, are likely to think of it as a state of being, rather than as time. De Grazia expressed this concept: "Leisure is a state of being in which activity is performed . . . for its own sake."[1]

Significantly, most current definitions of leisure use work as the reference point. That is, leisure time or leisure activities are contrasted, implicitly or directly, with worktime or productive activities. In some other societies, leisure has been the reference point. In Greece, in the 5th century B.C., for example, "business" was the negative form of the word we translate as leisure, "schole." And the Latin word for business, "negotium," is the antonym of "otium," which is leisure. In Athens or Rome, the Bureau of Labor Statistics would have been the Bureau of Leisure Statistics. But times have changed.

Leisure in ancient Greece and leisure in "advanced" societies such as ours differ in another important aspect. The Greek concept of leisure was time to develop human capacities through contemplation and music. Webster's New World Dictionary defines leisure for our age as "time in which to indulge in rest and recreation." One writer has labeled the Greek concept "full time" and the modern concept "empty time."[2]

Nor are the perimeters of modern leisure clearly established. To some they encompass nonworking time, to others, only time that is free of all commitments. "Discretionary time" expresses for still others the boundary between work and leisure. In recent years some economists, notably Becker and Linder, have thought of the allocation of time not as a dichotomy but as a continuum, and have treated it as a scarce resource whose allocation among different activities is governed by economic principles.[3] The activities that occupy one's time are not always easy to classify as work or leisure—commuting, for example, or sleeping, shopping, eating, caring for one's children, or seeking a job. But all such activities have a cost in terms of opportunities foregone, and they confer benefits of one kind or another. This kind of cost-benefit analysis applied to time promises to illuminate many of the choices people make, and the economics of leisure will in due course be profoundly affected by it.

Composition and growth of leisure

In this paper, leisure is discussed largely as time free of the necessity to earn a living. With the aid of data compiled by the Bureau of Labor Statistics, we shall try to present a picture of the size and shape of American leisure, and answer such questions as: Who gets it? How has it grown in the past? How might it grow in the future?

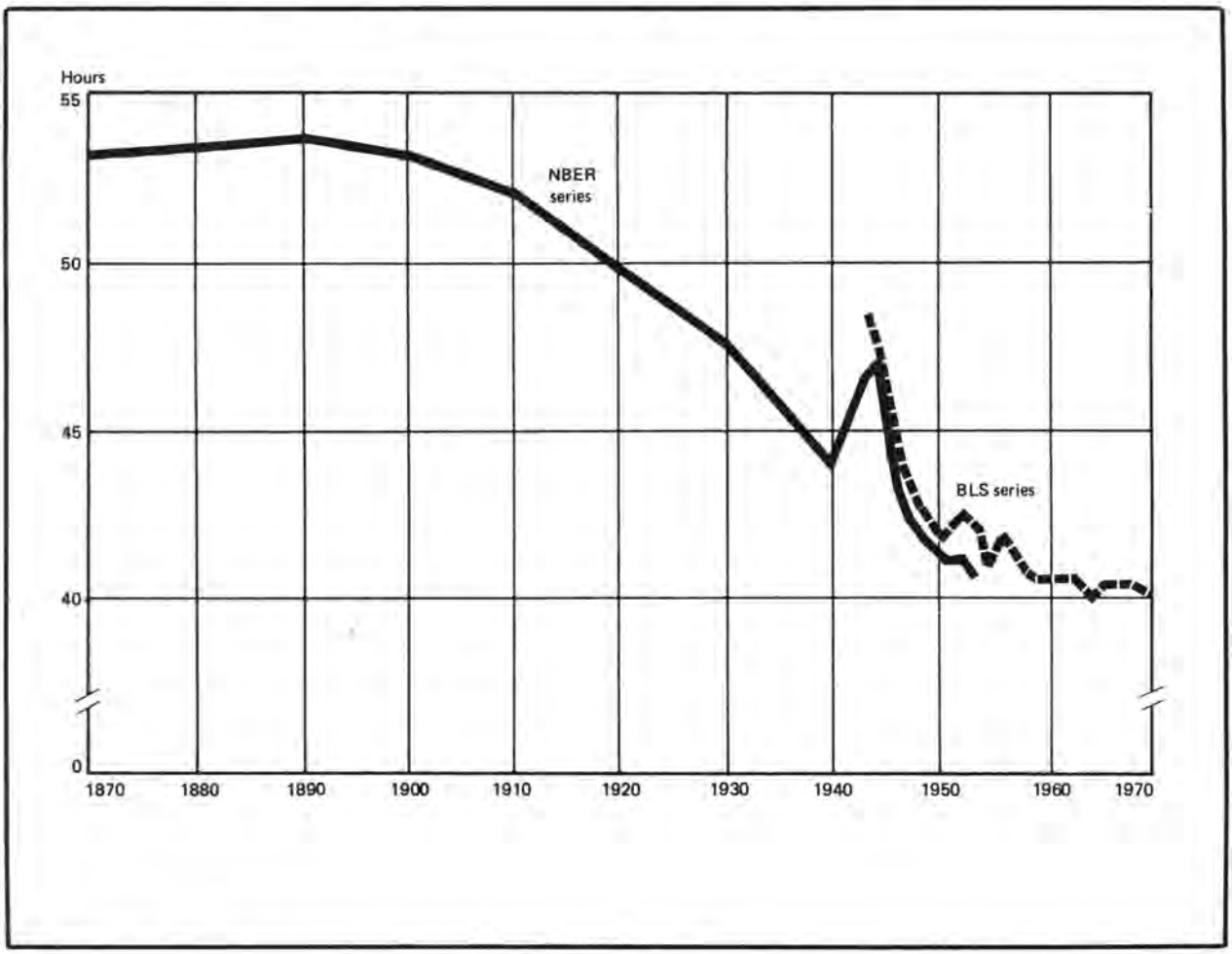
The best indicator of the long-term swing toward more leisure hours in the past century is the

---

Geoffrey H. Moore is Commissioner of Labor Statistics. Janice Hedges is an economist in the Division of Economic Studies, Bureau of Labor Statistics. Susie Scandrett assisted in developing the statistical data. Mr. Moore presented an earlier version of this paper to a seminar on "The Economics of Leisure," sponsored by the National Association of Business Economists and the University of Denver, Denver, Colo., October 26–27, 1970.

From the *Review* of February 1971

Chart 1. Average weekly hours per worker, civilian economy, selected years, 1869–1970



shortening workweek. Paid vacations and other forms of free time have assumed major importance only in recent years.

SHORTER WORKWEEK. In the 1870's the average workweek was about 53 hours. Today the average is close to 40 hours—about 13 hours less than a century ago. (See chart 1 and table 1.) The decline during the 1960's was about 40 minutes for all workers, and about 30 minutes for full-time workers.[4] (See table 2.)

Factors other than the desire for leisure have been important in achieving this reduction in the workweek. The concept of shorter hours as a work-sharing device, for example, has played a large role in reducing hours of work, as illustrated by the National Industrial Recovery Act and the Fair Labor Standards Act, under which the substantial hours reductions of the 1930's and 1940's were accomplished. Other important factors include changes in the industrial and occupational structure, such as an increase in service industries, which employ significant proportions of part-time workers, and a decrease in agricultural workers, who characteristically work long hours. Some reductions in scheduled hours have been for the purpose of increasing overtime earnings, rather than increasing time free of work. It is significant that between 1956 and 1968, while the straight-time workweek in manufacturing fell from 37.6 to 37.1 hours, overtime hours rose from 2.8 to 3.6 hours, more than canceling out the reduction.

PAID VACATIONS AND HOLIDAYS. Although the movement toward shorter hours was dominated for many years by reductions in the workweek and the workday, vacations and holidays have become increasingly important. Paid vacations and holidays were extended first to managers, officials, and professional workers. Most wage earners, at

least until the 1940's, were paid for the number of hours they worked or the number of pieces they produced; their earnings ceased if they stopped working to take a vacation because of a holiday or any other reason.

Since 1960, paid vacations have spread rapidly. In 1968, two-thirds of all workers in the private nonfarm economy received a paid vacation. (See table 3.) Of the remainder, some were newly hired employees, and the rest worked in firms that made no provision for paid vacations.

The recent growth in the number of vacation weeks has been spectacular. In 9 years, from 1960 to 1969, the total number of weeks that workers spent on vacation increased almost 50 percent, or from 87 to 129 million weeks. (See table 4.) The average length of a worker's vacation increased from 1.3 to 1.7 weeks, while vacations for full-time workers increased from about 1.8 to 2.2 weeks.

The practice of paying workers for holidays and for time lost for personal reasons also has been increasing in recent years. Between 1960 and 1968, paid holidays for office workers increased by three-tenths of a day on the average; for plant workers, by seven-tenths of a day. In 1968, office workers received an average of 8 paid holidays; plant workers, about 7.5.

The terms of choice between work and leisure are, of course, altered drastically when the cost of an hour's or a day's or a week's less work is shifted from the employee to the employer. The trends mentioned above show the effect of the shift in those terms.

Table 1. Average weekly hours per worker, civilian economy, selected years, 1869–1970

Year	National Bureau of Economic Research	Bureau of Labor Statistics
1869–78	[1] 53.2	
1879–88	[1] 53.4	
1890	53.7	
1900	53.2	
1910	52.1	
1920	49.8	
1930	47.7	
1940	43.9	
1943	46.6	48.5
1944	47.0	47.8
1945	45.7	46.1
1946	43.5	44.3
1947	42.5	43.5
1948	42.0	42.8
1949	41.6	42.1
1950	41.2	41.7
1951	41.0	42.2
1952	41.0	42.4
1953	40.6	41.9
1954		40.9
1955		41.6
1956		41.5
1957		41.0
1958		40.6
1959		40.5
1960		40.5
1961		40.5
1962		40.5
1963		40.4
1964		40.0
1965		40.5
1966		40.4
1967		40.4
1968		40.1
1969		39.9
1970		[2] 39.6

[1] Decade average.
[2] May 1970.

Table 2. Hours worked by full-time workers, May 1955, 1960, and 1965–70 [1]

[Numbers in thousands]

Year	Number of workers	Hours at work					
		Average	Percent distribution				
			Total	35–39	40	41–48	49 and over
1955	51,008	46.0	100	7	49	21	23
1960	52,723	45.8	100	7	52	17	23
1965	56,483	46.2	100	8	49	18	25
1966	57,195	45.7	100	8	51	17	24
1967	56,527	45.3	100	8	51	17	24
1968	57,839	45.2	100	9	51	17	23
1969	58,679	45.3	100	9	52	16	24
1970	58,360	45.1	100	9	53	15	22

[1] Persons 14 years and over for 1955–66, 16 years and over for 1967 forward.
NOTE: Columns may not add due to rounding.

LIFE EXPECTANCY AND WORKLIFE. Reductions in the workweek and increases in vacations, holidays, and time off for personal reasons tell only part of the story, for the growth in leisure has not been limited to the worklife. The widening gap between the worklife and total life expectancy is responsible for a significant share of the growth in time free of paid work.

Life expectancy for men at birth increased by 18 years (to almost 67 years) between 1900 and 1960. (See table 5.) Their worklife expectancy in the same period increased by 9 years (from 32 to 41 years). The net effect of changes in life and worklife expectancy was an increase of 9 years of work and 9 years of time out of the labor force.

Women gained more than men, both in life expectancy and in worklife expectancy, but about the same as men in time out of the labor force. Between 1900 and 1960, women's life expectancy rose by 22 years (from 51 to 73 years), their worklife expectancy by 14 years (from 6 to 20 years), and their time out of the labor force by more than 8 years, compared with 9 years for men. The rise in the earning power of women is one of the inducements, no doubt, that caused them to split their

Table 3. Percent distribution of workers by weeks of paid vacations, private nonfarm economy, 1968

Industry	Total	Without paid vacation	Weeks of paid vacations			
			Under 1	1 and under 2	2 and under 3	3 and over
All workers:						
All industries	100	34	2	16	28	20
Manufacturing	100	18	3	18	30	32
Nonmanufacturing	100	43	2	16	26	14
Office workers:						
All industries	100	20	2	13	39	25
Manufacturing	100	10	2	9	40	38
Nonmanufacturing	100	24	2	14	39	21
Nonoffice workers:						
All industries	100	40	3	18	22	16
Manufacturing	100	20	4	21	27	28
Nonmanufacturing	100	52	2	17	20	9

22-year increase in life expectancy 14 to 8 in favor of paid employment, while men split their 18-year increase 9 to 9.

GAINS OVER THE CENTURY. What does the additional time free of work in the past 100 years add up to in terms of the lifetime of the full-time worker? And what gains were made in the 1960's?

During the past century, reduction of the average workweek by about 13 hours amounts to a gain of about 675 hours of free time annually. BLS data indicate that workers average about 1.7 weeks vacation. With an average workweek of about 40 hours, vacations account for about 70 more hours of free time a year, compared with the worker a century earlier. Similarly, BLS data indicate that all workers receive an average of about 5.5 holidays a year, which can be translated into approximately 45 hours of additional free time annually. Vacation and holiday time for workers thus add to about 115 hours per year, or a total gain in time free of work of nearly 800 hours annually—roughly 1 month out of 12. The additional years of nonworking time in youth and old age represent a further gain of about 18,000 hours during a man's lifetime. Altogether, the lifetime gain for all workers in the past 100 years comes to about 50,000 hours free of work.

TRENDS OF THE 1960's. Since 1960, all workers have gained about 50 hours a year in time free of work—about 30 hours from a reduction in the workweek, 15 hours in additional vacation time, and 4 hours in additional holiday time. Full-time workers have gained about the same total, although changes in vacation and holiday time have been relatively more important in reducing the total worktime.

The reduction in hours worked since 1960 accounts for only a small fraction of the gain in productivity that the economy has achieved since 1960. BLS estimates of output per man-hour indicate that to produce the 1969 output with the 1960 productivity would have required an additional 650 hours of working time for each person employed in 1969. Thus, the reduction of about 50 hours in worktime amounted to only about 8 percent of the hours that have been made available by the Nation's increased productivity in the past decade.

Limits on leisure

The gains that workers have made in time free of work have been substantial. Why then do so many people feel they have so little leisure?

DISTRIBUTION OF WORK HOURS. Contributing to a feeling of a lack of leisure is the distribution of total hours worked among employed persons.[5] Although the 40-hour week is regarded as the "standard" workweek, the standard is by no means universal. Many full-time workers today work much longer than 40 hours, either because their job normally exceeds the standard, or because of overtime, or because they hold more than one job. Total hours worked by full-time workers in May 1970 averaged 45 hours a week, according to the household survey conducted by the Bureau of the Census for the Bureau of Labor Statistics.[6] Little more than half of all full-time workers actually worked a 40-hour week. (See table 6.)

Table 4. Vacation weeks, 1960 and 1969

Item	1960	1969
Number of weeks (in millions)	86.7	129.0
Average weeks per worker	1.3	1.7
Average weeks per full-time worker	1.8	2.2
Percent distribution	100.0	100.0
January	1.8	1.7
February	2.1	2.3
March	1.8	2.3
April	4.9	5.5
May	3.6	3.6
June	12.1	11.6
July	29.2	28.4
August	27.3	26.0
September	7.2	7.4
October	4.5	5.2
November	3.0	3.2
December	2.3	2.8

NOTE: This table understates vacation weeks since the survey week, which includes the 12th of the month, generally avoids all major holidays whereas vacations tend to occur more frequently during holiday weeks.

Table 5. Life and worklife expectancy at birth, by sex, 1900, 1940, and 1960

[Number of years]

Life and worklife expectancy	1900	1940	1960	Increase	
				1900–60	1940–60
MEN					
Life expectancy	48.2	61.2	66.6	18.4	5.4
Worklife expectancy	32.1	38.3	41.4	9.3	3.1
Difference	16.1	22.9	25.2	9.1	2.3
WOMEN					
Life expectancy	50.7	65.9	73.1	22.4	7.2
Worklife expectancy	6.3	12.1	20.1	13.8	8.0
Difference	44.4	53.8	53.0	8.6	−0.8

Nine percent worked less, the balance worked more—some, much more. Over one-fifth were at work 49 hours or more and over 1 in 10 worked 60 hours or more. Who are these workers who put in long workweeks? Hours data by worker characteristic and occupation give some answers.

Among male full-time workers in May 1970, 14 percent worked 49–59 hours and another 14 percent worked 60 hours or more. (See table 7.) In the 20–24 year age group, about one-fifth worked 49 hours or more. In every older age group, including workers 65 years of age and over, about 3 out of 10 men employed full time worked 49 hours or more a week.

Among all full-time women workers in May 1970, 6 percent worked 49–59 hours and 4 percent worked 60 hours or more. The proportion working long hours increased in each successive age group.

Marital status also affects hours at work. In the survey week in May 1970, about 30 percent of all married males compared with 19 percent of all single males worked 49 hours or more. (See table 8.)

Occupation is another factor associated with working hours. Among managers, officials, and proprietors, more than two-fifths worked 49 hours or more a week last May. A smaller but still substantial proportion of professional workers—about one-fourth—were at work 49 hours or more. (See table 6.)

About 3 out of 10 salesworkers and private household workers reported working 49 hours or more. Most farm workers reported long hours. Over three-fifths of the farmers and farm managers and more than one-third of the farm laborers worked 60 hours or more in the May survey week.

MOONLIGHTING. Among those who work long hours are the "moonlighters," those who hold two or more jobs.[7] In May 1969, about 4 million persons, more than 5 percent of all workers, held two jobs or more at the same time. About half of them worked 55 hours or more during the survey week.

Most moonlighters work at two jobs or more because they value additional income over leisure. In 1969, 2 out of 5 moonlighters cited the need for additional income for regular household expenses. Another 1 out of 5 said they worked at two jobs or more either to pay debts or to save for the future. The importance of economic reasons for multiple job holding is supported by data on marital and family status. The moonlighting rate was less than 4 percent for single men. Among married men, rates were about 6 percent for those with no children under 18 and rose as the number of children in the family increased. The rate for men with five children or more under 18 was 11 percent.

OVERTIME. The number of workers who put in overtime on their regular job is much larger than the number of moonlighters. In May 1970, 14.5 million workers were on extended workweeks. The prevalence of overtime work has been increasing as scheduled overtime for day-to-day operations has become an integral part of the wage-hour structure. Management decisions to schedule overtime are affected by factors that include economic conditions, alternative costs of hiring and training new workers, requirements of manufacturing

Table 6. Percent distribution of hours worked by full-time workers, by major occupation, May 1970

[Numbers in thousands]

Occupation	Number of workers	Hours at work					
		Total	35–39	40	41–48	49–59	60 or more
Total	58,360	100	9	53	15	12	11
White-collar workers	29,371	100	11	51	14	13	11
Professional and technical	8,990	100	9	51	16	15	11
Managers, officials, and proprietors	7,428	100	5	35	17	19	24
Clerical workers	9,951	100	18	66	10	4	2
Sales workers	3,000	100	11	45	15	18	11
Blue-collar workers	21,408	100	6	60	18	10	6
Craftsmen and foremen	8,395	100	5	57	19	12	6
Operatives	10,675	100	7	62	16	9	7
Nonfarm laborers	2,340	100	5	64	18	8	5
Service workers	5,259	100	10	57	15	9	9
Private household	435	100	14	45	16	12	14
Other service workers	4,823	100	9	58	15	9	9
Farm workers	2,321	100	7	12	12	16	53
Farmers and farm managers	1,437	100	4	9	9	15	63
Farm laborers and foremen	883	100	10	17	17	18	37

NOTE: Columns may not add due to rounding.

Table 7. Percent distribution of hours worked, by sex and age, May 1970

[Numbers in thousands]

Sex and age	Part time						Full time						
	Number	Hours at work					Number	Hours at work					
		Total	1–4	5–14	15–29	30–34		Total	35–39	40	41–48	49–59	60 or more
MEN													
16 years and over	7,150	100	4	22	46	27	39,904	100	5	50	17	14	14
16–19 years	2,126	100	6	34	50	10	1,078	100	12	51	20	8	9
20–24 years	1,015	100	2	23	50	25	3,926	100	7	54	18	12	10
25–34 years	974	100	2	11	42	45	9,634	100	4	48	18	16	13
35–44 years	700	100	2	9	40	49	9,252	100	4	48	17	15	16
45–54 years	695	100	1	10	41	48	9,030	100	4	51	16	14	15
55–59 years	375	100	3	13	44	41	3,499	100	5	53	15	13	14
60–64 years	324	100	5	17	48	30	2,360	100	5	51	16	14	14
65 years and over	941	100	8	31	48	13	1,122	100	12	43	15	14	17
16–21 years	2,617	100	5	32	50	12	2,149	100	10	54	18	8	10
Major activity:													
School	1,790	100	7	38	49	6	136	100	36	38	11	7	9
Other	829	100	3	20	52	25	2,014	100	8	55	18	8	10
WOMEN													
16 years and over	9,707	100	5	24	47	24	18,456	100	18	61	11	6	4
16–19 years	1,651	100	9	41	41	9	843	100	20	67	9	3	1
20–24 years	1,149	100	4	23	45	28	3,052	100	18	65	11	4	2
25–34 years	1,719	100	5	21	46	27	3,455	100	17	64	12	5	2
35–44 years	1,849	100	4	19	50	27	3,696	100	19	61	11	6	4
45–54 years	1,687	100	3	17	52	28	4,305	100	17	61	12	6	5
55–59 years	645	100	3	18	50	29	1,698	100	18	57	11	7	6
60–64 years	503	100	3	21	50	26	965	100	18	53	13	9	6
65 years and over	505	100	9	31	49	11	443	100	22	47	12	8	12
16–21 years	2,164	100	8	38	42	12	2,025	100	20	67	10	3	1
Major activity:													
School	1,327	100	11	48	38	3	46	100	46	30	13	11	.....
Other	838	100	4	22	47	27	1,979	100	19	68	10	3	1

NOTE: Columns may not add due to rounding.

processes, and union-management agreements. For workers, a reduction in scheduled hours with no reduction in time worked may be a device for securing higher wages through premium pay.

MORE PEOPLE IN THE LABOR FORCE. The high proportion of men and women in the labor force also contributes to a lack of leisure. Among the population 16 years and over in 1969, 81 percent of the men and 43 percent of the women were working or looking for work. Although labor force participation rates for men have declined, the decline has been concentrated among younger and older men. To illustrate, the proportion of young men age 18 and 19 who were in the labor force fell from about 81 percent in 1947 to 70 percent in 1969, reflecting longer periods of formal education. During the same years, the proportion of men age 65 and over who were in the labor force fell from 48 to 27 percent, reflecting reduction in retirement ages. In contrast, labor force participation of men in the prime working age (45–54 years) remained substantially the same, at about 95 percent.

Moreover, labor force participation rates for women have risen substantially—despite Veblen's observation at the turn of the century that "propriety requires respectable women . . . to make more of a show of leisure than men of the same social classes."

Insufficient data on worktime and free time for women performing unpaid housework and child-care at home make it impossible to calculate the loss in leisure for married women and their families when they take paid employment. Advances in technology and small family size are widely assumed to have reduced the working hours of housewives, facilitating their entry into paid employment. However, a recent survey indicates that the worktime of full-time homemakers is not less than it was 40 years ago—about 8 hours a day. For employed homemakers, it is about 5 hours a day.[8]

DO-IT-YOURSELF PROJECTS. The high proportion of the population in the labor force and the unequal distribution of hours worked are major factors in the scarcity of leisure. Other factors include the popularity of "do-it-yourself," which to some extent represents a substitution of unpaid labor for the earning of income, rather than leisure-time activities. Instead of taking a second paid job, the

worker performs a variety of skilled trades in his own home, such as television and radio repair, painting, wallpapering, and carpentry. "Do-it-yourself" extends beyond the home; in stores, it goes under the name of "self-service."

MAINTENANCE AND SERVICING OF DURABLE GOODS. In addition, economic growth and higher living standards cause an increasing variety of demands upon time. Roy Harrod first drew attention to a growing scarcity of time due to the servicing and maintenance required by consumption goods.[9] In 1965, the general theory of time allocation developed by Gary Becker, referred to earlier, included time spent in using consumer goods. Linder, in *The Harried Leisure Class*,[10] follows the same basic approach. He observes that the material riches of advanced societies are apparently incompatible with the superfluity of time that is characteristic of materially poor cultures. An example is the economic commitment to maintain and service durable goods, such as automobiles and washing machines, that goes with their ownership.

What is the future of leisure

In past periods, the strength of the movement toward shorter hours has been influenced by factors that include increases in productivity; the value workers and their unions place on shorter hours versus larger earnings; the needs of employers or the technical constraints imposed by industrial equipment; and changes in the occupational and industrial structure. These same influences will continue to determine trends in leisure hours.

Productivity gains over the past two decades averaged 3.1 percent annually. BLS has projected a similar growth rate for the next decade. Thus, the potential for increased leisure and/or increased income should continue to be about the same during the 1970's as in the 1950's and 1960's.

If the entire gain in output per man-hour expected during this decade were taken in leisure time, then hours for workers would be reduced by an average of 3 percent a year, and the workweek in 1980 would be 29 hours. However, this is most unlikely. Gains in productivity in the 1970's probably will be divided, as in the past, between shorter worktime and higher real incomes.

The economic answer to the distribution of gains in productivity lies in the combination of leisure and goods (or purchasing power) that will maximize the satisfaction of individuals. Workers of course have individual preferences between extra leisure and additional income, although these preferences cannot always be realized. Younger workers, older workers, and married women seem to prefer shorter hours to additional income. Most of the part-time workers who do not wish full-time work are in these groups. In contrast, males in the prime working years, especially those who are married, are more likely to choose income rather than leisure, as evidenced by the extensive moonlighting of this group referred to earlier.

Social sciences other than economics provide perspective on the choice of work or leisure. Sociologists, social anthropologists, and psychologists point to the satisfaction and status that men

Table 8. Percent distribution of hours worked by male workers, full time, by age and marital status, May 1970

[Numbers in thousands]

Age	Single							Married, wife present						
	Number	Hours at work						Number	Hours at work					
		Total	35–39	40	41–48	49–59	60 or more		Total	35–39	40	41–48	49–59	60 or more
16 years and over	4,801	100	9	57	15	9	10	33,064	100	4	49	17	15	15
16–19 years	890	100	14	51	17	8	10	176	100	6	48	36	6	5
20–24 years	1,598	100	9	63	14	8	7	2,205	100	6	48	20	14	12
25–34 years	1,071	100	5	57	16	11	11	8,162	100	4	47	18	17	14
35–44 years	486	100	7	55	16	9	12	8,332	100	4	47	17	16	17
45–54 years	442	100	8	55	15	11	12	8,083	100	4	50	17	14	16
55–59 years	147	100	14	45	9	6	26	3,117	100	4	53	16	13	14
60–64 years	105	100	13	48	16	7	16	2,065	100	5	52	15	14	14
65 years and over	61	100	10	49	7	13	21	924	100	12	42	16	14	16
16–21 years	1,493	100	11	56	16	8	9	629	100	8	48	23	9	13
Major activity:														
School	132	100	34	39	11	7	9	4	100					
Other	1,363	100	9	57	16	8	9	626	100	7	48	23	9	13

NOTE: Columns may not add due to rounding.

find in work or in the work situation. Although the work ethic has been a strong influence on choices for work or leisure, some weakening in it has become evident. Margaret Mead, expressing the change, remarked that "As once it was wrong to play so hard that it might affect one's work, now it is wrong to work so hard that it may affect family life." [11] Nevertheless, the attitude that work gives purpose to life is much more widely held today than is Aristotle's view that "the goal . . . of business is leisure."

Collective bargaining and legislation also will play a role in determining the amount of time free of work in the 1970's. On the whole, legislation has been most effective in reducing hours in industries that lag far behind the norms. Labor-management agreements have been pace setters in the movement for shorter hours. The collective bargaining policies adopted by resolution at the AFL–CIO convention in October 1969 indicate that unions will continue seeking to reduce working hours through reduction in scheduled hours, longer vacations, and additional paid holidays.

Changes in the industrial and occupational structure of the economy also will automatically influence the leisure time of workers. The reduction in farm employment and the rise in employment in the service industries will in the future, as in the past, tend to reduce the average workweek.

A further reduction in working hours over the long term seems to be assured. Although the increasing proportion of part-time employees, due to the growth of employment in trade and services, will be a contributing factor, small reduction in the workweek of full-time workers also is expected during the 1970's. Increased holidays, vacations, and shorter worklife will add to a decrease in worktime.

Forms leisure will take

Although productivity increases, choices between income and leisure, and the mix of employment by industry and occupation will determine to a large extent the *amount* of additional leisure, the *form* leisure will take involves other considerations. "Lumps of leisure," [12] in contrast to small bits of leisure added to each day, have been gaining in favor.

Retirement years represent one such "lump of leisure" that is growing. By 1980, the labor force participation rate for men 65 and over is expected to decline to 22 percent, down 4 percentage points from 1968. Improvements in social security benefits and private pension plans are enabling increasing numbers of older workers to choose retirement over work. For long-service employees, total retirement income (including private pension and social security payments) is approaching preretirement income after taxes.

Longer vacations and longer weekends also represent lumps of leisure that are gaining favor. A 5-day (or even more, a 4-day) week offers economies of scale, such as a saving in commuting time, over a 5½- or a 6-day week. In addition, it provides a wider selection of leisure-time activities, increasing the utility of free time. Longer vacations offer similar benefits. Although the 4-day week may be distant for most workers, slow advances in that direction continue. About 7,000 workers in a small number of firms distributed throughout the United States were on a 4-day week in 1970.[13] Many companies that have gone to the 4-day week require their workers to put in 9 or even 10 hours a day. Growing interest in a 4-day week is reflected in a Federal law that, effective in 1971, shifts five mid-week holidays to Mondays.

Another development is the use of working time for education, training, or retraining. This is not strictly leisure time, representing rather the reunification of work and education. One observer, who would maintain the standard 40-hour week at work, but schedule part of it for education, draws on the example of the Boimondau watchcase factory in France.[14] In this factory, owned and managed by the workers, the work force studies engineering, literature, music, and other subjects on company time. The same workers have an interesting approach to the use of free time. They and their families spend three 10-day periods each year working on a farm owned in common.

The sabbatical is another form of leisure that may become more extensive in the future. The utility to a worker of a year's leisure may be greater at age 50 or 55 than at the end of his life. Or it may be greater than a reduction of 1 hour in the workweek over an entire worklife, which is roughly equivalent to a year's leisure. The sabbatical, first established for college teachers in the 1880's, was adopted in the steel industry in 1963. Negotiations in that year provided 3 months of

paid vacation every 5 years for workers in the top half of the seniority roster. Those with lesser service became eligible under the 1968 negotiations for 3 weeks of paid vacation every 5 years in addition to their regular paid vacation time. (It is interesting to note that office workers in the steel industry—who, unlike the plant workers, had the option of a sabbatical or added income—generally preferred the income.)

IN SUMMARY, tremendous shifts in the worklife of the average man have occurred during the past century, and time free of the necessity of earning a living has increased spectacularly. Reductions in the average workweek, longer vacations, more holidays, greater opportunities for part-time work, the shift away from farming, changes in educational and retirement opportunities all have played a role. The choice between work and leisure has been profoundly altered as these changes have occurred.

In the past decade, many of these changes have continued. The reduction in the average workweek has been at a slower rate, however, than in previous periods. A significant share of the reduction has been due to an increasing proportion of part-time workers and a decreasing proportion of farm-workers. Scheduled hours for full-time workers showed little change.

Paid vacations and holidays also continued to increase during the 1960's and contributed to a 50-percent increase in the number of vacation weeks enjoyed by employees.

Workers took about 8 percent of the increased productivity during the 1960's in leisure, somewhat less than during preceding decades.

Although leisure time has increased overall, some groups have increased their labor force participation, hold more than one job, and work long hours. Groups that work long hours include executives and proprietors, professional workers, farmworkers, and married men. And if household work is added to the workweek of married women in the labor force, we have another group that puts in a long workweek.

For the 1970's, the potential for increased leisure and/or income is expected to continue at about the level of the 1960's. The actual change in time free of work will depend largely on preferences for leisure versus goods, and changes in the industrial and occupational structure. However, further reductions in working time are likely to be small during the 1970's, with attention centering on the reshuffling of time free of work in order to provide larger blocks of leisure. □

FOOTNOTES

[1] Sebastian de Grazia, *Of Time, Work and Leisure* (New York, Twentieth Century Fund, 1962).

[2] A. R. C. Duncan, *The Concept of Leisure* (Ontario, Canada, Queen's University, Industrial Relations Centre, 1963).

[3] Gary Becker, "A Theory of the Allocation of Time," *The Economic Journal*, September 1965, pp. 494–517, and Staffan Burenstam Linder, *The Harried Leisure Class* (New York, Columbia University Press, 1970).

[4] In analyzing changes in the workweek, trends for full-time workers and for all workers need to be distinguished. The trend for all workers is affected by the growing relative importance of part-time workers, especially of women, students, and partially retired workers who do not appear in the full-time count.

[5] Peter Henle, "Leisure and the Long Workweek," *Monthly Labor Review*, July 1966, pp. 721–727. Reprint No. 2500.

[6] The customary reference month for trend data on hours obtained through the household survey is May. This practice is followed for two reasons: (1) May is considered a normal month for hours data since the survey week does not include a holiday, while annual average data may be distorted because of the varying incidence of holidays in other months of the year; and (2) for some of the earlier years, data on hours are available only for the month of May, when special surveys were made.

[7] Vera C. Perrella, "Moonlighters: Their Motivations and Characteristics," *Monthly Labor Review*, August 1970, pp. 57–64.

[8] Kathryn E. Walker, "Homemaking Still Takes Time," *Journal of Home Economics*, October 1969, pp. 621–624.

[9] Roy F. Harrod, untitled paper in *Problems of United States Economic Development*, Vol. 1 (New York, Committee for Economic Development, January 1958), pp. 207–213. Mimeographed.

[10] Linder, op. cit.

[11] See "The Pattern of Leisure in Contemporary American Culture," *Annals of the American Academy of Political and Social Science*, Vol. 313, 1957, p. 14.

[12] Juanita Kreps, "Lifetime Tradeoffs Between Work and Play," *Proceedings of the Twenty-first Annual Winter Meeting, Industrial Relations Research Association*, 1968, pp. 307–316.

[13] Riva Poor, ed., *Four Days, Forty Hours* (Cambridge, Mass., Bursk and Poor, 1970).

[14] Sidney Lens, "A Shorter Work Week," Fogel and Kleingartner, eds., *Contemporary Labor Issues* (Belmont, Calif., Wadsworth Publishing Co., Inc., 1966), pp. 169–176.

What's wrong with work in America? —a review essay

Reviewer questions thesis of rising job discontent; emphasizes high employment strategy as primary condition for improving or eliminating undesirable jobs

HAROLD WOOL

THE RASH of rank-and-file union contract rejections and wildcat strikes during the late 1960's and early 1970's, particularly the well-publicized strike by workers at the General Motors facility in Lordstown, Ohio, highlight what some are interpreting as a sort of gut revolt against work as it is organized in the American economy.

Reports of apathy, absenteeism, and even industrial sabotage among blue-collar workers, of poor morale among some white-collar workers (particularly those in repetitive dead-end jobs), of college youths' disdain of bureaucratic jobs in government or industry, and even of executives forsaking promising careers to head out to fields unknown—all these have caused some observers, notably commentators from the print and broadcast media, to question the future of work in American society. Is our commitment to the work ethic fading?

Since all of these symptoms appeared to imply some weakening of this commitment, it is not surprising that the search for a culprit has turned its spotlight on the institution of work itself—the way it is organized, its adequacy in meeting human needs, and the effects of work upon other dimensions of human welfare. A special focus of concern has been the "blue-collar worker" with the automobile assembly-line worker as the inevitable archetype. The "blue-collar blues" has become part of the media lexicon, together with knowing references to more esoteric psychological terms such as "work satisfiers and dissatisfiers," "alienation," and "anomie."

The media, moreover, have simply reflected a growing concern on the part of key officials in industry, labor, and the Government—a concern that "all is not well" among important segments of our nation's work force. An initial official effort to place these concerns in broader perspective was contained in a paper on the "Problems of the Blue-Collar Worker," prepared in early 1970 by U.S. Department of Labor staff for an ad hoc White House Task Group.[1] The paper pointed to symptoms of growing disaffection among lower-middle-income workers

Harold Wool is a senior economist at the Research Center of the National Planning Association.

Work In America

Work in America: Report of a Special Task Force to the Secretary of Health, Education, and Welfare, Prepared under the Auspices of the W. E. Upjohn Institute for Employment Research. Cambridge, Mass., The MIT Press, 1973, 262 pp. $2.95, paper.

In addition to chairman James O'Toole, the task force included:

Elizabeth Hansot, Program Office, National Endowment for the Humanities;

William R. Herman, Special Assistant for Policy Analysis, Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health, Education, and Welfare;

Neal Herrick, Director, Office of Program Development, Employment Standards Administration, U.S. Department of Labor;

Elliot Liebow, Chief, Center for Studies of Metropolitan Problems, Division of Special Mental Programs, National Institute for Mental Health;

Bruce Lusignan, Associate Professor, School of Engineering, Stanford University;

Harold Richman, Professor of Social Welfare Policy, University of Chicago;

Harold Sheppard, Washington staff, W. E. Upjohn Institute for Employment Research;

Ben Stephansky, Director, Washington office of the W. E. Upjohn Institute for Employment Research; and

James Wright, Community Organizer, National Center for Urban Ethnic Affairs.

(those in the $5,000–10,000 family income range), and suggested that this was due to a combination of pressures: an "economic squeeze," resulting from inflationary pressures and limited advancement opportunities; a "social squeeze," reflected especially in deterioration of their communities and in racial ethnic conflicts; and a "workplace squeeze" associated with a variety of depressing working conditions, ranging from grinding monotony to unpleasant or unsafe work environments.

Further evidence that job satisfaction had become a matter of top-policy interest was provided by this reference in President Nixon's 1971 Labor Day Message: "In our quest for a better environment, we must always remember that the most important part of the quality of life is the quality of work, and the new need for job satisfaction is the key to the quality of work."

Against this backdrop, Elliot Richardson, then Secretary of Health, Education, and Welfare, approved initiation in December 1971 of a broad-gaged study of the "institution of work" and of its implications for health, education, and welfare.

The study was conducted by a 10-member Task Force, chaired by James O'Toole, a social anthropologist serving as a staff assistant in Secretary Richardson's office. Patterned after an earlier HEW study group on higher education policies, the members of the task force were apparently given full rein to develop their own thinking on the issues, independent of the usual bureaucratic constraints. The resulting report, *Work in America,* was released in December 1972, together with a cautious foreword by Secretary Richardson, which praised the report for "the breadth of its perspective and its freshness of outlook," but clearly disassociated himself and the Administration from many of its recommendations.

The task force view

The study takes as its point of departure the premise that "work"—broadly defined as socially useful activity—is central to the lives of most adults. In addition to the obvious economic functions of work, work performs an essential psychological and social role in providing individuals with a status, a sense of identity, and an opportunity for social interaction. Referring to recent surveys as evidence, it concludes that individuals on welfare and the poor generally have the same needs and compulsions for work as do those in the economic mainstream.[2]

But, though the work ethic is still "alive" in America, the report finds that it is not "well"—and it ascribes this condition to the institution of work itself. Citing a variety of psychological studies and survey findings, the task force concludes that large numbers of American workers at all occupational levels are pervasively dissatisfied with the quality of their working lives. Significant numbers of employed workers are locked in to "dull, repetitive seemingly meaningless tasks, offering little challenge or autonomy." And many others, including large numbers of older workers, "suffer the ultimate in job dissatisfaction" in being completely deprived of an opportunity to work at "meaningful" jobs.

The principal sources of worker discontent as seen by the authors are to be found in the confines of the individual workplace itself. The central villains of the piece are (1) the process of work breakdown and specialization associated with the pernicious influence of Frederick W. Taylor and his industrial engineer disciples, and (2) the diminished opportunities for work autonomy, resulting from the shift in locus of jobs from self-employment or small scale enterprises to large impersonal corporate and government bureaucracies. Although these trends are recognized as having been underway for many decades, what is new in the current climate, the study contends, is a revolutionary change in attitudes and values among many members of the work force—youth, minority members, and women. With higher expectations generated by increased educational achievement, these groups in particular are placing greater emphasis on the intrinsic aspects of work, its inherent challenge and interest, and less on strictly material rewards. In the case of minority workers, the study recognizes that large numbers are still concerned with the elemental needs for a job—any job—that pays a living wage, but it notes relatively high rates of discontent among black workers in many better paying jobs as well. The relegation of women to poor paying, low status jobs, and the plight of older workers, both in and out of the labor force, are also discussed.

This complex of discontents is, in turn, identified as the root cause of various ills besetting the American economy—"reduced productivity," "the doubling of man-days per year lost through strikes," and increases in absenteeism, sabotage, and turnover rates. In addition, a variety of other ills are attributed to work-related problems, including problems of physical and mental health, family instability, and drug and alcohol addiction.

Since the central diagnosis for this wide array of economic and social problems is found in the faulty

organization of work, the principal remedy presented by the task force is the reorganization of work. Although "work redesign" is never explicitly defined by the authors, a number of recent experiments are cited —both here and abroad—which have had in common an extensive restructuring of jobs designed to broaden and vary the scope of workers' duties and to provide increased worker autonomy and participation in work-related decisions, often accompanied by some form of profit sharing. Collaborative efforts by labor, management and government in Norway and Sweden, resulting in a number of pilot job redesign projects, are cited as a model for emulation.[3]

Although work redesign is identified as the "keystone" of the report, the authors concede that this is not a sufficient solution to the problems of work—and of workers—in America. The final two chapters therefore address themselves, more generally, to a range of other work-related problems and possible solutions. Since some jobs can "never be made satisfying," an alternative approach is to facilitate movement of workers out of these jobs, through a massive midcareer retraining option or "self-renewal program" for workers.

In a concluding chapter, the report addresses itself broadly to a variety of other manpower and welfare policy issues. It endorses a "total employment" strategy, designed to produce "reasonable satisfying" jobs not only for the 5 million workers currently reported as unemployed but for an estimated 10 to 30 million additional persons who are underemployed, on welfare, or out of the labor market but who—the authors contend—would take meaningful jobs, if available. This is to be accomplished through a combination of large-scale manpower training and public employment programs and through appropriate fiscal and monetary policies. With respect to welfare reform, it is strongly critical of mandatory work provisions, as applied to welfare mothers, as reflecting a lack of appreciation of the social value of the mother's role in housekeeping and childrearing activities. The report suggests that policy emphasis be shifted to obtaining suitable employment for the fathers, while upgrading the status of housework—in part, by including housewives in the statistical count of the labor force.

Evaluating the report

From this summary, the coolness of official response to this study will not be difficult to understand.

For somewhat different reasons, this reviewer also has mixed feelings about the value of this study as a basis for broad social policy. Its strength—and its weaknesses—lie in its advocacy of a humanistic approach to assessment of work as a social institution. Its perspective is primarily that of the behavioral scientist, who appraises the "value" of work in terms of its total impact upon the individual—in contradistinction to the market-oriented perspective of many economists, who view work primarily as another factor contributing to the GNP and measure its "value" solely in terms of financial rewards. The task force offers insightful—if still fragmentary—documentation concerning the ways in which many jobs (both blue collar and white collar) are proving "dissatisfying" particularly to some members of the new generation. And scattered through its chapters are a number of provocative recommendations which deserve further study and followthrough. However, in its zeal to advance the cause of "humanization of work" the report suffers from overgeneralization concerning the extent and nature of work dissatisfaction and from overstatement of the potentials of work redesign as a primary solution to work-related ills.

A central theme of this study is that "a general increase in their educational and economic status has placed many American workers in a position where having an interesting job is now as important as having a job that pays well" and that the organization of work "has not changed fast enough to keep up with rapid and widescale changes in worker attitudes, aspirations and values."[4] From this premise it is reasonable to infer that the level of worker discontent has significantly increased in recent years.

A look at available data

Yet a review of available research and statistical evidence offers very limited support for this hypothesis. For this purpose we have explored two types of data: (1) job satisfaction survey findings, and (2) those statistical indicators which have frequently been cited as manifestations of worker discontent, such as quit rates, strikes, absenteeism, and productivity.

Job satisfaction surveys. In a recent review of the extensive literature on job satisfaction, Robert Kahn reports that some 2,000 surveys of "job satisfaction" were conducted in the United States over a period of several decades. These surveys have varied greatly in scope and design, from intensive studies of workers in a particular plant, occupation, or industry to much more general polls covering a national cross-section of the work force. In spite of these differences, Kahn —as well as earlier observers—has noted a certain

consistency in the response patterns. "Few people call themselves extremely satisfied with their jobs, but still fewer report extreme dissatisfaction. The modal response is on the positive side of neutrality—'pretty satisfied.' The proportion dissatisfied ranges from 10 to 21 percent . . . Commercial polls, especially those of the Roper organization, asked direct questions about job satisfaction in hundreds of samples and seldom found the proportion of dissatisfied response exceeding 20 percent." [5] Neither Kahn nor other scholars could detect a consistent trend in job satisfaction from the available data.

Statistical indicators. It is not unreasonable to infer, as does the task force report, that job dissatisfaction will be reflected in a variey of cost-increasing worker behaviors, such as low productivity, high voluntary turnover, high absenteeism, and increased strike activity. Research evidence based mainly on specific plant or industry studies is available to support at least some of these direct relationships, notably in the case of turnover and absenteeism. If worker discontent has been significantly increasing, some indication of this might be reflected in the overall trends of the relevant statistical indicators. Yet the evidence in this respect is inconclusive:

1. *Labor turnover.* A detailed multivariate analysis of quit rates of manufacturing workers recently completed by the Bureau of Labor Statistics indicates that year-to-year fluctuations in these rates over a 20-year period are largely explained by cyclical variations in job opportunities, as measured by the rate of new hires, and that there has been *no* discernible trend in the quit rate over this period.[6]

2. *Absenteeism.* In the absence of any direct program for statistical reporting of absenteeism trends, the Bureau of Labor Statistics has analyzed data from the Current Population Survey on trends in the proportion of workers who have been absent from their jobs for all or part of a week due to illness or other personal reasons. This initial analysis does point to a small increase in worker absence rates since 1966. The average daily rate of unscheduled absences rose from 3.3 percent in 1967 to 3.6 percent in 1972, an increase of about 10 percent. The data are, however, far from conclusive, and do not provide a basis for generalization longer-term trends or their causes.[7]

3. *Strikes.* A sharp increase in the level of strike activity was recorded in the second half of the 1960's and in the early 1970's. Man-days of idleness due to strikes rose from 0.13 percent of estimated working time in 1961–65 to 0.26 percent in 1966–71. However, the incidence of strikes normally tends to increase during inflationary periods. Strike idleness, as a percentage of working time, was actually considerably higher during the years immediately following the end of World War II (1946–50) and following the outbreak of the Korean War (1952–53) than during the more recent period of rapid price increases. Moreover, "bread and butter" issues, such as pay, benefits, job security, and union organization or security issues, have continued to account for all but a modest percentage of all strikes. In 1971, only 5.5 percent of strike idleness was attributed to plant administration or other working condition issues.[8]

4. *Productivity.* Productivity growth, as measured by output per man-hour in the private economy, which had experienced a longer-term growth trend of about 3–3½ percent a year, slackened appreciably following the mid-1960's and dropped to less than 1 percent a year in 1969 and 1970. Declines in productivity growth have occurred in the past during or immediately after periods of high economic activity. The productivity growth rate rebounded sharply, moreover, in 1971–72, thus suggesting that cyclical factors, rather than any deep-seated worker unrest, were mainly responsible for the previous decline.[9]

5. *Labor force participation.* Abstention from work or work-seeking activity is the ultimate form of rejection of work as an institution. Yet there has been no evidence of a downtrend in the overall proportion of the population, 16 years and over, reported as in the labor force. In fact, this percentage has increased over the past two decades, from 59.9 percent in 1950 to 61.3 percent in 1970.[10]

There have been some important divergent trends among different components of the working-age population. Thus, the labor force participation rate of men has declined from 86.8 percent in 1950 to 80.6 percent in 1970, mainly due to steady reductions in worker rates among school and college-age youth and among men 55 years and over. It is difficult, however, to interpret the decline in labor force rates for men as reflecting a rejection of work as an institution, in the face of the fact that their sisters and wives have flocked into the labor force in unprecedented numbers over this same time span, increasing their labor force participation rate from 33.9 percent in 1950 to 43.4 percent in 1970 with most of the increase occurring among married women. The desire to supplement family income was apparently a decisive factor inducing their entry into the labor force, even though these women have been disproportionately concentrated in low paying and often routine types of work.

From this necessarily brief review, it will be evident that there is little objective evidence to support an inference of a rising wave of discontent among workers, associated directly with the nature of their jobs. Fluctuations in some of the indicators, which appeared at first blush to support this hypothesis (such as labor turnover rates, strike activity and productivity growth rates) can, on closer inspection, be attributed to quite different causes, notably to the tight labor market and inflationary trends prevailing in the late 1960's and to associated labor market

forces. The overall labor force participation trends—such as the sharp and sustained inflow of married women into gainful employment—simply cannot be reconciled with any hypothesis of an extensive rejection of "low quality" work. The available absenteeism data, which suggest some increase since the mid-1960's, are still too incomplete to support any broad generalizations—although they do tend to reinforce more specific reports concerning the special frustrations of the automobile industry assembly-line workers. Even the mass of survey data designed to elicit direct measures of job dissatisfaction have failed to show any consistent trend.

Why are supposed trends not visible?

If this trend has not in fact developed in visible and measurable dimensions, we may well ask 'Why not?" Is it because the statistical barometers for measuring emerging social trends are too incomplete, too gross, and too insensitive for this purpose? Or is it because the theoretical constructs which lead to certain expectations as to worker behaviors and attitudes simply do not conform to reality?

Most of the available statistical indicators are clearly much too aggregative to serve as reliable indexes of worker discontent. Statistical series such as productivity and labor turnover were designed for quite different purposes. Much more disaggregation of the data, and supplementary research, is needed before we can reliably isolate the influence of specific causal factors. And we are still in the early stages of development of meaningful indexes of job satisfaction and of absenteeism. It is quite possible, therefore, that the available measures—separately and in combination—are too crude and insensitive to detect any new emerging social force.

In part, however, the explanation lies in the model of worker aspirations and behavior postulated by the social psychologists. Their point of departure is a hierarchical ordering of human needs, which, as outlined by Abraham Maslow, begins with satisfaction of basic material wants, such as food and shelter, and ascends to higher order needs, such as "self esteem" and "self actualization." An alternative formulation by Herzberg is couched in terms of "extrinsic" and 'intrinsic" job factors. Extrinsic factors, such as poor pay, inadequate benefits, or poor physical working conditions may lead to job dissatisfaction, while true satisfaction depends upon the intrinsic nature of the job, its work content, and its inherent challenge and interest. But both models lead to the inference that, as the general wage level increases and physical working conditions improve, the emphasis shifts from strictly economic issues to demands for improvement in the nature of work itself.

It is difficult to challenge this scale of aspirations in the abstract. In fact, numerous surveys indicate that when workers are asked what aspects of work are most important to them, "interesting work" often heads the list, particularly among the more educated or more affluent segments of the population. Given this apparent scale of values and the rising "affluence" of American workers, why—then—have most workers not overtly attempted to change the contents of their work? For example, has the continued concentration of organized labor on "bread and butter" issues, rather than "quality of work," simply reflected a lack of sensitivity on the part of union leaders to the real needs of their members—or has it in fact reflected the priorities of their rank-and-file members?

As a broad generalization, we believe that the latter assumption corresponds much closer to reality. One fallacy in the Maslow-Herzberg model of worker aspirations, as a guide to behavior, lies in its inherently static premises. Even though individual earnings and family incomes have increased steadily over the decades, the great majority of American workers certainly do not consider themselves as "affluent," when they relate their spendable income to their spending needs, for what they now consider an acceptable standard of living. As Christopher Jencks has recently pointed out, this escalation of living standards "is not just a matter of 'rising expectations' or of people's needing to 'keep up with the Joneses' " but is due in part to the fact that with changes in our mode of life, such goods as an automobile, a telephone, or packaged foods have become an integral part of our cost of living—of participating in our social system.[11] Thus, when hard choices have to be made between a monotonous job in a regimented environment, which pays relatively well and which offers job security, and a poorer paying, less secure but more "satisfying" job, most workers—particularly those with family commitments—are still not in a position to make the trade-off in favor of meeting their "intrinsic" needs.

Moreover, most workers and most union leaders tend to be highly skeptical of the real potential of "job enrichment" as a practicable means of improving their work environment. This skepticism results from earlier experiences when worker participation, profit sharing, and similar approaches were instituted

by some firms as an alternative to pay increases or as a means of staving off unionization. This point of view has recently been colorfully expressed by William W. Winpisinger, general vice-president of the International Association of Machinists:

> If you want to enrich the job, enrich the pay check. The better the wage, the greater the job satisfaction. There is no better cure for the blue-collar blues.[12]

The quest for autonomy

One of the more questionable premises made by the authors concerning the nature and sources of worker discontent is the assumption that large numbers of workers have an urge for "autonomy" at the work place and are chafing at the disciplines and controls imposed by large bureaucratic organizations —whether big business or big government. Is this in fact a major preoccupation of most workers in our society today—or is it an image created by popular emphasis on extremes: the extreme of the real frustrations of the automobile assembly-line worker, on the one hand, and of the revolt of some (probably small) fraction of upper-middle-class youth, on the other?

Certainly, one of the most "bureaucratic" organizations in modern society today is the military; no other large organization imposes equal constraints upon both the working lives and the personal lives of its labor force. Yet in 1972, while the Vietnam war was still underway, over 330,000 young men, about one-fourth of the militarily eligible manpower pool, elected to voluntarily enlist in military service. This total excludes about 85,000 additional draft-motivated enlistees, as well as many thousands of others who offered to enlist, but failed to meet physical or mental test standards. Between 1970 and 1972, voluntary (not draft-motivated) enlistments into the Army had risen by fully 80 percent, largely in response to major increases in compensation and other special inducements offered as part of the effort to move to an all-volunteer military force.[13] Numerous surveys have shown that few young men have any great illusions about the "intrinsic" aspects of most enlisted jobs: by large majorities, young high school graduates (who account for a large majority of enlistees) have recognized that civilian jobs are far preferable to military service in terms of such criteria as "freedom," "interesting work," and "highly respected job."[14] Yet, when faced with the limited range of choices open to them, large numbers of young men have been willing to accept the constraints and risks of military service in exchange for some of its visible benefits—its training and educational opportunities, its opportunity for travel and new experiences, and its material rewards.

In similar vein, prestige rankings of various civilian occupations, based on a number of surveys, have failed to reveal any consistent preference for autonomous, self-directed employment, in comparison with more regimented, but better paying and more secure occupations. Office machine operators and bookkeepers rate higher than small independent farmers in these rankings. Assembly-line workers outrank taxi drivers, in popular esteem.[15] And as we have previously noted, many millions of married women have moved from household work, which—though unpaid—has the virtue of being self-directed, into the more regimented world of gainful employment.

THE FOREGOING COMMENTS are clearly not designed to imply that "all is well" with the quality of work in America or that, as a nation, we can afford to be complacent about some of the danger signals which have been brought to our attention. The fact that over 10 percent of employed workers express general dissatisfaction with their jobs, that many more are dissatisfied with specific aspects of their work situation, and that these proportions are much higher for youth, for women, and for minorities, is a challenge to management, unions, and the government to pursue corrective actions.

However, if our interpretation of the recent labor market behavior and attitudes of American workers is valid, it does imply a different set of criteria for measuring quality of jobs and a different set of priorities for improvement of the quality of work. Our premise is that workers have no difficulty in distinguishing between the "good" and the "bad" jobs in our economy. The least desirable jobs, typically, are inferior *both* in terms of pay and related benefits and in terms of the intrinsic nature of the work itself. Included in this category are most domestic service and hired farm labor jobs and a large proportion of the 20 million jobs occupied by workers in the private nonfarm economy which, according to a recent BLS survey, paid less than $2.50 per hour in April 1970.[16] Numerous unskilled or semiskilled jobs paying somewhat higher wages can also be included in this category because of the oppressive nature of the work and lack of advancement opportunities.

It has been possible for employers to recruit an adequate supply of workers for most of these low-level jobs because of the continued existence of a large pool of workers who have had no effective

labor market choices. Included in this pool are a disproportionate number of minority members, teenaged youth, women, and recent immigrants—who share common handicaps of limited skill, limited work experience, restricted mobility, and various forms of institutionalized discrimination. These categories of workers constitute a relatively large share of the 5 million "visibly" unemployed workers and probably represent an even larger proportion of the "invisible" unemployed not included in our statistics of active job-seekers. So long as this reservoir of low-wage labor is available, employers have little incentive to increase the pay or to enhance the quality of these jobs.

The most potent strategy for improving the quality of these jobs and/or reducing their relative numbers is by reducing the size of this reserve pool of workers. It is no coincidence that the most significant progress in improving the relative status of low-wage workers in this country has been made during periods of acute wartime labor shortage, such as during World War II. It is no coincidence, either, that employer initiatives for experimentation with work redesign abroad have been most evident in countries such as Sweden and West Germany, which have managed their economies with much lower ratios of peacetime unemployment than in the United States—and have been initiated in precisely those industries, such as the automobile industry, which have most acutely felt a labor shortage situation.

The most important single set of measures which can contribute to improvements of *quality* of work in America are, thus, those designed to increase the *quantity* of work in America. This requires a much more positive national commitment to a maximum employment policy—even, if need be, at the cost of a somewhat higher level of acceptable inflation. In turn, a climate of sustained high employment can make possible more effective implementation of specific manpower and labor market policies designed to upgrade the status of workers in low level jobs and to promote equality of employment opportunity. It may, in fact, bring us closer to the era of the "post-subsistence" economy when those jobs which do not meet minimum economic *and* psychological standards will be effectively ruled out from the labor market competition.

There should be no illusion that these goals are easily attainable—either through the recommendations scattered through *Work in America* or through those proposed in the numerous other recent studies concerned with national manpower and economic policies. We can only share Secretary Richardson's expressed sentiments that this report represents "a beginning and not a conclusion" and hope that its goal will be actively pursued by the Administration of which he is so prominent a member. □

———*FOOTNOTES*———

[1] Report initially summarized in *The New York Times*, June 30, 1970, p. 1. See also Jerome M. Rosow, "The Problems of Lower-Middle-Income Workers," in Sar A. Levitan, ed., *Blue Collar Workers: A Symposium of Middle America*, (New York, McGraw-Hill, 1971), pp. 76–95.

[2] For a report of one such survey, see Leonard Goodwin, "Welfare mothers and the work ethic," *Monthly Labor Review*, August 1972, pp. 35–7.

[3] Some of these efforts are described by Joseph Mire in "European workers' participation in management," *Monthly Labor Review*, February 1973, pp. 9–15.

[4] *Work in America*, pp. x, xi.

[5] Robert L. Kahn, "The Meaning of Work: Interpretation and Proposals for Measurement," in Angus Campbell and Phillip E. Converse, *The Human Meaning of Social Change* (New York, Russell Sage Foundation, 1972), pp. 173–4.

[6] Paul A. Armknecht and John L. Early, "Quits in Manufacturing: A Study of Their Causes," *Monthly Labor Review*, November 1972, pp. 31–7.

[7] Based on a forthcoming BLS study on absences from work.

[8] *Work Stoppages in 1971*, Summary Report, U.S. Department of Labor, June 1972, table r. 4. In 1972, strike idleness declined to 1.4 working days per thousand from 2.6 in 1971. *Work Stoppages 1972*, U.S. Department of Labor, Press Release 73–865, January 9, 1973.

[9] *Economic Report of the President*, January 1973, pp. 34, 231.

[10] *Manpower Report of the President, 1972*, pp. 157, 192.

[11] Christopher Jencks, *Inequality: A Reassessment of the Effect of and Schooling in America* (New York, Basic Books, Inc., 1972), p. 5.

[12] Paper presented before the annual meeting of the Industrial Relations Research Association, December 1972, at Toronto, Canada.

[13] Based on unpublished data, Office of Assistant Secretary of Defense, (M&RA).

[14] Harold Wool, *The Military Specialist: Skilled Manpower for the Armed Forces* (Baltimore, Md., The Johns Hopkins University Press, 1969), p. 114.

[15] Paul M. Siegal, *Prestige in the American Occupational Structure*, unpublished doctoral dissertation, University of Chicago, 1971, table 5.

[16] Steven Sternlieb and Alvin Bauman, "Employment characteristics of low-wage workers," *Monthly Labor Review*, July 1972, p. 11.

A look at the 4-day workweek

Do recent switches from the standard 5-day week presage a nationwide trend?

JANICE NEIPERT HEDGES

THE 4-DAY WORKWEEK has caught the imagination of the public. It has intrigued management and is winning guarded support from labor organizations. But the big question is unanswered: Is a breakthrough from a 5-day to a 4-day week imminent? The current standard is not immutable. But neither is a shift to some new standard inevitable.

Today, the standard workweek is 5 days and 40 hours.[1] These figures are the historical result of (1) a long term trend in practice and in law toward an 8-hour day, and (2) the Fair Labor Standards Act of 1938, which fixed the 40-hour weekly standard[2] for workers in firms engaged in interstate commerce.

This article examines the 4-day week at present and arrives at some tentative conclusions about its future.

Prevalence of the 4-day week

In mid-1971, about 600 firms offered some form of the 4-day week for at least part of their work force and for at least some weeks of the year.[3] The variations ranged from 10-hour days to 9 hours or less, and included 4½-day weeks. The firms were largely on the Eastern seaboard and in the Central States. They were predominantly engaged in manufacturing, but also included a variety of service and other firms. Generally they were nonunion; a few had contracts with small unions or locals of large national unions. The number of workers on a 4-day week was estimated roughly at 75,000, or about one in every 1,000 workers in the United States.

On the basis of numbers alone, the workers and firms involved in the 4-day week are thus too few to assert that a major change is in the making. Nor are the firms sufficiently representative to indicate whether a short week is feasible on a national scale. Few are capital-intensive, few compete in world markets, few employ more than 500 workers. Moreover, in numerous instances, the 4-day week is on trial with both workers and management, and in more than a dozen firms it has been tried and discontinued.

At this time, prospects for the 4-day week may be better judged by its consistency with prevailing trends in work time than by its relatively small and tentative beginnings.

Trends in work time

Where the 4-day week is coupled with a 10-hour day, it reverses the almost unbroken trend of a century toward shorter workdays. The 8-hour day was won after a long struggle, with which the union movement is so closely identified that it has been said that the unions owe as much to the 8-hour fight, for their form and direction, as the 8-hour fight owed to the unions for its success.[4] But the 4-day week is not necessarily a 40-hour week. Limited data available to the Bureau of Labor Statistics on firms employing 50 workers or more indicate that in these firms the "shorter workweek" is 4½ days as often as 4 days and ranges from over 40 hours a week to less than 30.[5]

The movement toward a 4-day week is in accord with two other trends that have dominated recent changes in work time. The first is the preference for "blocks of leisure," extended vacations, for example, rather than small reductions in daily and weekly hours. The second is the increasing diversity in work schedules.

A growing preference for blocks of leisure is manifested in the rapid extension of paid vacations. During the 1960's the average number of vacation weeks per employed person increased from 1.3 to over 1.7 weeks, while for many long-service employees the length of vacation grew to 4 weeks or more. Paid vacations and holidays together consti-

Janice Neipert Hedges is an economist in the Office of Economic and Social Research, Bureau of Labor Statistics.

tuted a record two-fifths of the estimated 50-hour total reduction in annual worktime in the decade of the 1960's.[6]

The legal rearrangement of national holidays in order to increase the number of 3-day weekends, beginning in 1971, is another manifestation of the interest in blocks of leisure.

The apparent willingness of many workers to maintain the same weekly hours (and extend the workday) in order to achieve longer weekends[7] suggests that the preference for larger blocks of leisure instead of reductions in the workweek may be at least as strong now as in the 1960's.[8]

The 4-day week, as it is developing, also seems consistent with the trend toward a multiplicity of work schedules. This trend traces back more than half a century to the beginning of the growth of part-time schedules. Its future may lie in the "gliding workday," in which workers set their own arrival and departure time within a 12-hour working day, restricted only by the total weekly hours required.[9]

For the present, the 4-day week has given the trend toward variety a big push forward. In addition to substantial variations in the weekly hours of 4-day schedules, the selection of workdays is not uniform, either from firm to firm or within a firm (some of which operate 7 days a week with two or more work forces), or even necessarily for the same workers week after week. "Weekends" may be Friday through Sunday, Saturday through Monday, or even in midweek.

Arguments for and against

In further evaluating the prospects for the 4-day week, let us turn now to the arguments put forward by its supporters and its detractors.

Pro. The 4-day week was introduced by management. This represented a departure from the past, for initiatives in proposing new work schedules have come more often from labor.

Greater productivity and lower unit cost are the most telling arguments put forward by management. Higher output per man-hour is ascribed largely to improved moral that results in reduced absenteeism, tardiness, and turnover. Higher weekly output also is attributed to the reduction in startup and close-down time relative to operating time, and the keying of work schedules to processing time for a specific operation rather than to a standard workweek. In addition, in some firms that have shifted to 4-day weeks of less than 40 hours, coffee breaks have been discontinued (although workers may have coffee at their machines or desks).

Productivity gain is a persuasive argument on two counts. First, increases in productivity yield benefits that include potential increases in the standard of living and reductions in worktime.[10] Second, growth in productivity has lagged in recent years, with the annual rate of increase in output per man-hour averaging only 2.1 percent from 1966 to 1970, in comparison with 3.0 for the preceding 20 years.[11]

An increase in "usable leisure" sums up the major appeal of the 4-day week to workers. Even when a reduction in workdays is not accompanied by a reduction in weekly hours, the compression of worktime into 4 days extends the weekend by 50 percent.

A reduction in commuting time adds further appeal. Travel time between home and workplace—viewed as "lost time" by most commuters—has been increasing for city dwellers as well as for those who live in the suburbs.[12] For 4-day-a-week workers, commuter trips are reduced by 20 percent. Traffic congestion might be reduced as well, as the smaller trip total would be spread out over more than 4 days.

Working costs such as commuting fares, restaurant lunches, and child care are reduced in many cases.

These arguments sound compelling. But as the Secretary of Labor observed recently, ". . . the verdict is far from in. Against those employers who report . . . benefits are those who foresee almost insuperable obstacles related to three-shift operation needs and other production requirements. Many union leaders regard the 10-hour day as retrogressive. . . . Nor, in spite of flowing testimonials, is it clear how the average worker feels about it."

Con. Arguments against the 4-day week center on the possible adverse effect on the health and welfare of workers and, in the long run, on productivity and on costs. (If the 4-day week evolves into fewer hours in the workweek, the first concern would be removed.)

The health and safety of workers was a major rationale for the shortening of the workday from 10 hours to 8 hours or less. Improvements in technology have decreased the physical strain of work, but in many work situations mental and emotional strain has increased. On the other hand, a 3-day weekend may provide sufficient rest and relaxation to sustain the worker through a 4-day week of 10-hour days. More experience with 4-day weeks should indicate

whether working conditions, attitudes, and values now prevalent lead to new conclusions about the most desirable combination of workdays and hours.

Meanwhile, Federal and State statutes and many union contracts embody the concern that long days have a deleterious effect on a worker's health and well-being (and on his employment opportunities). Most of these reflect this concern by providing for overtime pay at premium rates after 8 hours of work. Collective bargaining agreements can, of course, be renegotiated and laws can be amended.[13] But unless they are, workers covered by such provisions are unlikely to be put on 4-day 40-hour schedules, or on any 4-day schedule that increases their employer's liability for overtime payments.

The largest group of workers covered by statutes providing for overtime pay in excess of an 8-hour day are those directly employed by the Federal Government.[14] An additional 3.7 million workers employed by Government contractors have similar coverage under the Contract Work Hours and Safety Standards Act or the Walsh-Healey Act.[15]

A number of State wage and hour laws impede the adoption of the 4-day week in one way or another. For example, State restrictions on maximum daily hours for women mean that a 4-day week would necessitate a reduction in weekly hours. Restrictions on night work for women encumber the flexible scheduling that is vital to adapt the 4-day week to round-the-clock operations. State restrictions pertaining to women workers are easing, however, in the wake of the Civil Rights Act of 1964 and subsequent court decisions.

The second argument raised against the 4-day week—that productivity cannot be sustained in the long run, let alone increased—cannot be answered definitively on the basis of available experience.

It is apparent, however, that short-term productivity gains experienced by the limited number of firms now on 4-day weeks are not necessarily indicative of long term results on a large scale. For example, the increased productivity currently reported by 4-day firms is attributed in substantial part to their ability to hold experienced workers and recruit superior workers. Their advantage in these respects would of course be lost if the 4-day week were adopted by other firms that compete for the same labor. Some of the improvement may be a short-lived "Hawthorne effect." It is possible also that the low productivity now associated with the last day of the workweek would move in time to the 4th day of a 4-day workweek or to the 9th or 10th hour of the day.

The path ahead

What then seem to be the prospects for the 4-day week, in view of basic trends in worktime and the major arguments pro and con? Some observations may be useful.

1. The 4-day week can be expected to spread, but it is unlikely ever to dominate work schedules to the same extent that the 5-day week has for almost a generation.

The 5-day, 40-hour week represented a national standard based on worker health and efficiency and on the sharing of jobs. The impetus now is for work schedules designed to fit the technological and other requirements of an individual firm and the needs and preferences of its workforce. Rationalization rather than standardization is the guideline.

In some firms, technological requirements such as continuous operations, heavy capital investments, or other special situations may indeed create insurmountable obstacles for the 4-day week. Nor is a short workweek likely to prove popular with all workers, especially if it is combined with longer days or fewer breaks in the day. Some with family responsibilities may find it too difficult to adjust child care and home maintenance to a long workday. And some, who are highly work-oriented, may miss the challenge of a full week of work (some of these, of course, may try to fill out the week with a second job).

2. Support for the 4-day week may shift. Although management gave the 4-day week its first push, this came primarily from small, independent firms.[16] Large corporations are expressing serious reservations.[17] On the other hand, the initial negative reaction of union organizations—caused largely by the short workweek's association with 10-hour days—could be modified if the 4-day week proves a likely vehicle for reducing weekly hours.

Labor organizations are not likely to accede to 10-hour days without overtime pay. The AFL–CIO Executive Council in early August 1971, for example, while going on record in favor of collective bargaining efforts to reduce working hours and to reschedule workweek arrangements to the mutual satisfaction of unions and management, urged the rejection of proposals to drop the requirement of time-and-one-half pay for over 8 hours of work a day on government contracts.[18]

Management generally has envisaged increased utilization of plant and equipment through 4 days of 10 hours, with a portion of the work force on hand each day, covering 5 to 7 days a week. Labor's attention is directed toward the 3-day weekend and the possibility of shorter weekly hours. These differences may be difficult to reconcile.[19]

3. Although the 4-day workweek has been associated with "compressed" rather than fewer weekly hours, in the long run it probably will be shorter in hours as well.

How much the reduction in weekly hours will be, and how fast, cannot be forecast. In the long term, it will be limited by the growth of productivity, by the distribution of productivity gains between reductions in worktime and increases in goods, and by the allocation of reductions in worktime to other areas, including paid vacations.

An average gain of approximately 3 percent a year in output per man-hour is expected during the 1970's.[20] If all these were channeled into reducing weekly hours, a 4-day 32-hour week could be achieved by 1980. This is highly improbable; still, the reduction in weekly hours in the 1970's could be larger than in previous years. Other possible applications of productivity gains—such as increases in years of schooling and paid vacation weeks for the average worker—have shown substantial gain since 1940 and may have reduced somewhat the pressure for further advances along these lines, thus increasing the prospects for reducing the workweek. Moreover, for many workers, basic needs for goods and basic needs for time for rest and relaxation both have been met. In the 1970's, more than ever before, the choice between more goods and more leisure will be a matter of opting for a particular life style.

Impact of short workweek

As the 4-day week spreads, its wider effects will become evident. Among these are its possible impact on the total supply of and demand for labor, on the part-time labor market, and on workers with family responsibilities, especially women.

Some increase in employment can be anticipated as a result of larger markets for leisure goods and services—as Henry Ford recognized in 1922, when he pioneered the 5-day week with a view to increasing the demand for automobiles. Recreation, transportation, and construction are among the industries where employment may increase.

On the supply side, the effects of the 4-day week are less certain. A 4-day week accompanied by a reduction in weekly hours probably would attract more married women to the labor force and might also encourage some older workers to postpone retirement. A 10-hour day, however, might present an additional hurdle to full-time employment of women with family responsibilities, since child care—and to a lesser extent the preparation of meals—cannot be relegated to the weekend, however long. On the other hand, some might prefer long workdays that permitted them to be home one more day a week. The effect of the 4-day week on the entry of mothers into the labor force and its implications for additional demands for child care facilities is particularly important, since current needs for day care already far outstrip the resources available.[21]

Demand for part-time workers also might be expected to increase. For example, in service, manufacturing, or other industries that require round-the-clock operation, one part-time shift could be used to supplement two 10-hour shifts. Capital-intensive firms, in particular, would be likely to make heavy use of part-time shifts, in moving to a 4-day week of 10-hour days. In addition, some firms probably would use some workers for only 1 to 3 days a week, in order to extend their operations beyond 4 days.

On the other hand, the regular part-time workforce (traditionally made up of women, students, and older workers) might experience strong competition as some full-time workers on 4-day schedules search for additional hours of work. The proportion of workers who hold more than one job—the moonlighters—has ranged between 4.5 percent and 5.7 percent over the past 15 years.[22] This proportion could increase, although limited experience of firms that have shifted to the 4-day week in the past year suggests that their workers are more interested in a longer weekend than in a second job.[23]

The 4-day week raises other questions, both social and economic, to which no definitive answers are available. And not all the questions have been raised yet. It is still true, as one observer wrote in 1957: "What is most needed today is greater experience with the 4-day week. . . . Nothing could be more welcome than the development in a number of major areas and industries of a 4-day week so that the country can profit by this experience."[24] □

FOOTNOTES

[1] In 1969–70, about four-fifths of the 14 million plant workers surveyed by the Bureau of Labor Statistics were on a 40-hour schedule, and nine-tenths of the total were on a 5-day schedule.

[2] Effective in 1940.

[3] *Poor's Workweek Letter*, September 1, 1971.

[4] George Brooks, "Historical Background," *The Shorter Work Week* (Washington, D.C., Public Affairs Press, 1957).

[5] Data for a new Bureau of Labor Statistics series—scheduled weekly hours by scheduled days in the workweek for workers covered in the area wage surveys—are being collected and will be published for single metropolitan areas as they are completed. The first report will be published this winter. Over a 2-year period, these data will be available for all 90 metropolitan areas covered by the area wage surveys, as well as for the regional and national estimated totals of all metropolitan areas.

[6] Geoffrey H. Moore and Janice N. Hedges, "Trends in labor and leisure," *Monthly Labor Review*, February 1971, pp. 3–11.

[7] Gallup Poll, March 1971.

[8] Something roughly analagous to economies of scale may explain the appeal of larger blocks of leisure to workers and the appeal of longer workdays to their firms.

[9] See the *New York Times*, July 12, 1971, p. 1.

[10] Moore and Hedges, op. cit.

[11] *Productivity and the Economy* (BLS Bulletin 1710, 1971).

[12] *Factors and Trends in Trip Lengths* (Washington, D.C., National Academy of Science, Highway Research Board, 1968). National Cooperative Highway Research Program, Report 48.

[13] The U.S. Department of Labor held public hearings in Washington, D.C., in September 1971 to determine possible courses of action the Department may wish to recommend with respect to the adoption of a 4-day 40-hour workweek without the requirement of paying time-and-one-half for work in excess of 8 hours a day by contractors subject to the overtime provisions of the Walsh-Healey Public Contracts Act and the Contract Work Hours and Safety Standards Act. See p. 2, this issue.

[14] U.S. Code, Sec. 5542 and 5544 (1970 edition).

[15] The Fair Labor Standards Act, covering 45 million workers engaged in interstate commerce, does not affect daily schedules. Its overtime pay provisions refer only to a maximum 40-hour week.

[16] Kenneth E. Wheeler, "Small Business Eyes the Four-Day Workweek," *Harvard Business Review*, May–June 1970, pp. 142–147.

[17] Neil A. Martin, "Can the Four-Day Week Work? Dun's Presidents Panel," *Dun's*, July 1971, pp. 39–40, 45.

[18] Statement by the AFL–CIO Executive Council on The National Economy, San Francisco, Calif., August 9, 1971.

[19] Herbert R. Northrup, "Reflections on the Ten-Hour Day, Four-Day Week," remarks delivered at a conference July 23, 1971, sponsored by Industrial Relations Counselors, Inc., Princeton, N.J., published in The Bureau of National Affairs *Daily Labor Report*, July 27, 1971, pp. D–1/4.

[20] See "The U.S. Economy in 1980: a preview of BLS Projections," *Monthly Labor Review*, April 1970, p. 7.

[21] In 1970, licensed day care centers and family day care homes had an estimated capacity of about 750,000 children; working mothers had 6 million children under 6 years of age.

[22] See Howard V. Hayghe and Kopp Michelotti, "Multiple jobholding in 1970 and 1971," p. 38, this issue.

[23] Riva Poor, *4 Days, 40 Hours* (Cambridge, Mass., Bursk and Poor Publishing Co., 1970).

[24] Peter Henle, "Which Way to Greater Leisure?" *The Shorter Work Week*, op. cit.

A new type of working life table for men

'Generation' table provides a more realistic means of estimating labor force activity than 'period' tables

HOWARD N. FULLERTON, JR.

DEMOGRAPHERS have been concerned with the limited usefulness of conventional or "period" life tables in tracing the expected life spans of actual population groups, particularly when death rates are known to be changing. The problem arises because conventional life tables measure life expectancy at each age and ordinarily are based upon mortality rates applicable to each age observed at one point in time.

An attempt to overcome this limitation may be made by using what are called "generation" life tables in which the life spans of groups are followed through time. The major difficulties in developing such tables are that they require a far more extensive set of mortality rates covering the life span of an actual population, and more extensive computations.[1] Despite these difficulties, generation tables are worth constructing because they present a more realistic picture of life expectancy.

By the same token, period working life tables, like standard life tables, assume that the mortality and labor force participation rates observed at one point in time will remain unchanged. A more realistic table would follow an age group (birth cohort) from its entry into the labor force until the last worker in the group had withdrawn or died. Thus, a generation working life table uses successive observations of mortality and participation rates at 5- or 10-year intervals. For example, using 5-year intervals, the worklife expectancies of men who were 15–20 years old in 1940 would be compared with expectancies in 1945 (20–25 years), 1950 (25–30 years), and so on.

Complete data on a cohort of workers would not be available until all workers had retired (or died). Consequently, to be able to construct a generation table for a group still in the labor force, their mortality and labor force rates would have to be projected through the oldest age in the table. To the extent that the table is based on actual mortality and work experience, it presents a history of the group's worklife, and the various measures (such as labor force accession rates and worklife remaining) summarize the dynamics of actual events rather than providing a snapshot as does the period table.

This article describes 1940, 1950, and 1960 generation tables of working life for men, developed to illustrate the advantages and limitations of such measures. The generation working life tables were constructed using generation life tables and the estimated and projected labor force participation rates for each generation or cohort through time. In contrast to the results obtained from period tables, generation tables point out that expected working life will be longer for each successive cohort. Accession rates for each cohort reflect the different economic and social conditions prevailing at their time of entry into the labor force, with the 1940 and 1960 cohorts having high rates of entry for the first 4 years of working age. The 1940 cohort, affected by World War II and subsequent veterans benefits, continued to have high entry rates beyond age 25.

Expected length of work life

The generation table of working life indicates that for successive groups of men entering the labor force in 1940, 1950, and 1960, the expected working life at age 16 increased from 44.5 years in 1940 to 44.8 years in 1950 and 45.2 years in 1960. Table 1 provides information on the expected working life for the cohorts entering the labor force in 1940, 1950, and 1960, respectively. (Sources of data and the technical construction of the generation working life table are discussed in the appendix.) The

Howard N. Fullerton, Jr. is a labor economist in the Division of Labor Force Studies, Bureau of Labor Statistics. This article is based upon a paper presented at the annual meeting of the Population Association of America in Toronto, Canada, in April 1972.

expectations of life, work-life, and "retirement" are summarized in table 2. In the context of this paper, "retirement" refers to a worker's final withdrawal from the labor force, not to participation in any formal program providing annuity benefits. Thus, retirement at ages before 55 reflects forced withdrawal due to illness or injury more than voluntary action. The mortality projections assume a slowly rising expectation of life for each successive cohort —amounting to less than a year's improvement among the cohorts entering the labor force between 1940 and 1960.

Table 1. Generation table of working life for groups of men entering the labor force in 1940, 1950, and 1960

Age interval (x to x+n)	Number living of 100,000 born alive			Accessions to the labor force (per 1,000 in population)	Separations from the labor force (per 1,000 in labor force)			Average number of remaining years	
	In population	In labor force			Due to all causes	Due to death	Due to retirement	Life	Labor force participation
	(L_x)	Percent of population (w_x)	Number (Lw_x)	($1{,}000\ A_x$)	($1{,}000\ S_x$)	($1{,}000\ S^d{}_x$)	($1{,}000\ S^r{}_x$)	($e^\circ{}_x$)	($e^{\circ w}{}_x$)
	In years of age							At beginning of year of age	
	1940 cohort								
16–20	366,143	46.56	170,486	631.4	2.1	2.1	54.0	54.0	44.5
20–25	453,046	88.58	401,308	60.1	2.3	2.3	—	50.4	40.8
25–30	448,226	95.40	427,608	12.2	2.0	2.0	—	46.0	36.3
30–35	443,733	97.41	432,240	—	2.8	2.0	.8	41.4	31.6
35–40	438,798	96.55	423,666	—	4.5	2.9	1.6	36.8	27.0
40–45	430,814	96.11	414,040	—	5.9	4.7	1.2	32.3	22.6
45–50	418,135	94.61	395,598	—	14.6	7.5	7.1	28.0	18.2
50–55	398,862	89.92	358,657	—	19.1	11.6	7.5	23.9	14.4
55–60	371,648	86.58	321,773	—	35.7	17.1	18.6	20.2	10.6
60–65	334,773	69.62	233,069	—	97.1	25.9	71.2	16.8	7.1
65–70	287,224	37.17	106,770	—	231.5	39.3	192.2	13.7	5.0
70 and over	568,772	11.59	65,932	—	—	—	—	10.9	6.6
	1950 cohort								
16–20	379,889	59.66	226,630	505.6	1.6	1.6	—	54.4	44.8
20–25	471,051	88.81	418,340	55.7	2.0	2.0	—	50.8	41.1
25–30	466,747	95.08	443,783	4.2	1.7	1.7	—	46.2	36.4
30–35	462,416	96.23	444,964	(1)	2.1	2.1	—	41.6	31.7
35–40	456,360	96.36	439,749	—	4.8	3.2	1.6	37.0	27.1
40–45	447,974	94.88	425,047	—	7.8	4.4	3.4	32.6	22.6
45–50	435,825	93.27	406,503	—	11.4	6.9	4.5	28.3	18.4
50–55	416,848	90.55	377,460	—	17.5	11.1	6.4	24.2	14.4
55–60	389,542	85.79	334,188	—	38.0	16.4	21.6	20.4	10.4
60–65	352,500	68.70	242,153	—	97.8	24.8	73.0	16.9	7.1
65–70	304,418	36.10	109,895	—	232.4	37.8	194.6	13.7	5.0
70 and over	602,678	11.21	67,565	—	117.6	52.5	65.1	10.9	6.6
	1960 cohort								
16–20	380,951	55.56	211,647	545.3	1.4	1.4	—	54.8	45.2
20–25	475,308	88.17	419,079	60.7	1.9	1.9	—	51.1	41.3
25–30	470,600	95.02	447,164	1.6	2.1	2.1	—	46.5	36.6
30–35	466,018	95.92	446,995	—	2.4	1.9	.5	42.0	31.9
35–40	461,180	95.53	440,546	—	4.2	2.6	1.6	37.4	27.3
40–45	453,177	94.39	427,776	—	7.2	4.3	2.9	32.8	22.8
45–50	441,194	92.84	409,587	—	10.8	6.6	4.2	28.5	18.5
50–55	423,263	90.17	381,669	—	17.7	10.2	7.5	24.3	14.4
55–60	393,208	85.48	336,134	—	38.2	15.7	22.5	20.5	10.5
60–65	360,602	68.28	246,215	—	93.8	24.1	69.7	17.0	7.2
65–70	311,863	36.28	113,159	—	232.8	37.7	195.1	13.8	5.0
70 and over	621,581	11.18	69,480	—	117.4	52.5	64.9	11.0	6.6

[1] Less than 0.04 per thousand.

Table 2. Expectations of years of life, worklife, and retirement[1] for men entering the labor force, selected ages

Age	Expectation of life			Expectation of worklife			Expectation of retirement		
	1940	1950	1960	1940	1950	1960	1940	1950	1960
16	54.0	54.4	54.8	44.5	44.8	45.2	9.5	9.6	9.6
25	46.0	46.2	46.5	36.3	36.5	36.6	9.7	9.7	9.9
35	36.8	37.0	37.4	27.0	27.1	27.3	9.8	9.9	10.1
45	28.0	28.3	28.5	18.2	18.4	18.5	9.8	9.9	10.0
55	20.2	20.4	20.5	10.6	10.4	10.5	9.6	10.0	10.0
65	13.7	13.7	13.8	5.0	5.0	5.0	8.7	8.7	8.8

[1] Retirement refers to final withdrawal from the labor force at any age.

This slow rise in life expectancy, combined with the gradually rising expectation of length of working life, yields a nearly constant period of retirement among the three cohorts shown in the table. For all cohorts, and all ages except 65, a man can expect to be retired or not in the labor force for more than 9 years. By age 55, he can expect to spend almost half of his remaining life in retirement.

It is also useful to see how data from generation tables compare with that from period tables. Table 3 compares a summary of years of expected worklife remaining for period and generation tables. The most noticeable feature of the period tables is that they all have higher expectations of worklife than the generation tables. If the conditions of 1950 had continued unchanged as is assumed in period tables, a worker entering the labor force at age 16 could have expected to work 46.9 years. By contrast, the generation tables show he would work 44.8 years. Although this difference is most marked for this cohort, it is also true for the 1940 and 1960 age groups.

The generation tables show that each successive cohort has an expectation of longer worklife (except at age 55), while the period tables indicate that workers in 1950 had the longest expected work life. According to the period tables, a worker at age 16 years old in 1950 could expect to work a half year longer than a 16-year-old in 1960, or one age 35 could expect to work 0.7 years longer, and one age 65 would have worked 1.1 years longer than men of the same age in 1960. This difference may be attributable to the increase in retirement plans in the 1950's. The impact of these plans on worker withdrawals is such that a worker age 65 years old in 1950 could expect to work another 7.4 years, while one entering the labor force in 1950 and remaining there until reaching age 65 in the year 2001 would work only 5 years after 65, according to the generation table. The impact of the increase in pension plans between 1950 and 1960 which results in marked differences between the 1950 and 1960 period working life tables is diffused throughout the generation tables.

Those who entered the labor force in 1940 may be followed in the period tables as well as in the generation table. At age 16, the 1940 table gives an expectation of 44.8 years of work life, 0.3 years higher than the generation table. But, when this cohort was 25, the 1950 period table suggested that they could expect to work 2.0 years longer than the generation table, and in 1960, 1.3 years longer than the generation table.

We may also compare a generation table with a period table from around the end of the worklife for these particular age groups. We have two period working life tables for the year 2000, one prepared for this study, and one calculated as background to an article by Stuart Garfinkle.[2] These estimates are denoted in table 3 by A and B, respectively. A 15-year-old entering the labor force in 1950 would be 65 in 2000, and one entering in 1960 would be 55. For the 1950 group of 15-year-olds the more recently constructed period table developed for this article is comparable to the generation table, because the period table covers a time close to the end of the individual's work-life. The earlier Garfinkle table indicates 9.3 years of working life remaining. This table differs from the later table in two ways: (1) the mortality projections reflect the experience through 1951, rather than 1961, and (2) the labor force projections assumed that labor force rates for workers under age 65 would remain constant, and those for workers 65 and over would decline only 10 percentage points from the levels of March 1954. As a consequence, the expected

Table 3. Expected years of worklife remaining: generation and period tables

Age	Generation tables			Period tables				
	1940	1950	1960	1940	1950	1960	2000	
							A[1]	B[1]
16	44.5	44.8	45.2	44.8	46.9	46.4	45.4	47.3
25	36.3	36.5	36.6	36.6	38.5	38.0	36.9	37.7
35	27.0	27.1	27.3	27.8	29.3	28.6	27.4	28.2
45	18.2	18.4	18.5	19.7	20.6	19.8	18.6	19.4
55	10.6	10.4	10.5	12.4	13.0	11.9	10.5	11.1
65	5.0	5.0	5.0	6.8	7.4	6.3	5.0	9.3

[1] A, refers to recent estimates by the author; B, to earlier estimates by Stuart Garfinkle. (See text footnote 2.)

number of workyears remaining is higher than in the more recent estimates. The differences between these two period tables reflect the conjectural nature of any working life table relating to a period 30 years in the future.

Retirement rates

The retirement rates in the generation table are based on projections which assume that past trends will continue into the future (table 4). For ages 55–60, the successive age groups will have gradually increasing retirement rates (from 18.6 to 22.5 per thousand). The rates for the 60–65 and 65–70 age groups do not show any clear pattern. The rates for ages 65–70 appear to be stabilizing around 195 per thousand, while it is difficult to draw any conclusion about the 60–65 age group.

These rates may be compared with those from period tables. For the 55–60 age group, there is a steady but slow increase in the rates from 1940 to 1960, and another slow increase from 1980 to 2000, but in between, 1960 to 1980, there is a large increase. (The 1970 rate for this group is 17.2, closer to the 1980 rates.) One can conclude that between 1960 and 1980, retirement of men in the 55–60 age group will be accelerated, and indeed, there was considerable response in the 1960's to retirement plans with provisions for early retirement. Around 1980, the effects of this upsurge in early retirement are expected to level out, though the tables indicate the ultimate rate should be above 21.

For the 60–65 and 65–70 age groups, the 1950 period table showed the lowest rates. An examination of the 1945 and 1955 tables indicate they are typical rates. It is the 1940 rates which are high, due to the economic conditions prevailing that year which discouraged workers from remaining in the labor force. From 1950 on, retirement rates have increased for both groups and these may continue to increase until after the turn of the century.

When the generation and period rates are compared, the retirement rates for ages 55–60 and 60–65 from the generation table are about twice those in the 1940 and 1950 period tables. The rates for ages 65–70 for both 1940 and 1950 in the generation table are more than twice those for the same ages in the 1940 and 1950 period tables. Thus, the use of period tables to estimate retirement trends in the latter part of this century would lead to an underestimate of retired workers.

When comparing the period tables with the generation table, the latter point to a longer retirement. This increase is due mainly to the decrease in expected working life. That is, the expected years of life remaining at age 55 increased by 1.2 years from the 1940 period table to the 2000 period table, while the expected years of retirement increased 4.1 years. Thus, about two-thirds of the change in retirement between these two period tables is caused by the drop in working life expectancy.

The expectation of retirement for the three groups (55–60, 60–65, 65–70) may be found at various ages in the period tables and compared with those from the generation table at least once for each. The 1940 cohort will be 55 in 1980; the expected length of retirement in the generation table is 0.4 of a year higher than in the period tables. Since the period tables are taken at years close to the end of the worklife of the cohorts, the expected length of retirement should not vary much from the period to the generation table. The 1950 cohort will be 65 in 2000, and the period table for that year and the generation table expectations of retirement differ by only a tenth of a year. The 1960 group will be 55 in 2000, and the expectations of retirement from both tables are the same.

Table 4. Retirement[1] rates and expected years of retirement: generation and period tables

Age group	Generation tables			Period tables				
	1940	1950	1960	1940	1950	1960	1980	2000
	Retirement rates (per thousand)							
55–60	18.1	21.6	22.5	11.2	11.7	12.7	19.6	21.4
60–65	71.2	73.0	69.7	36.4	31.0	49.8	68.0	73.3
65–70	192.2	194.6	195.1	78.0	64.5	119.3	179.2	193.3
	Expectation of retirement (years)							
55	9.6	10.0	10.0	5.9	6.0	7.4	9.2	10.0
60	9.7	9.8	9.8	6.0	5.9	7.4	9.1	9.9
65	8.7	8.7	8.8	5.4	5.3	6.7	8.2	8.8
70	4.3	4.3	4.4	4.0	4.1	3.9	4.1	4.4

[1] Retirement refers to final withdrawal from the labor force, at any age.

Labor force accession rates

The generation life tables show different patterns of entry into the labor force for each of the three cohorts (table 5). For the 1940 cohort, the high rates (631.4 per thousand) reflect the lower rates of school enrollment, especially beyond high school, which prevailed at the time. By 1950 many in this cohort were completing education under veterans

Table 5. Labor force entry rates per thousand for men at selected ages: generation and period tables

Age group	Generation tables			Period tables				
	1940	1950	1960	1940	1950	1960	1980	2000
16–20	631.4	505.6	545.3	611.8	501.4	543.3	497.9	506.8
20–25	60.1	55.7	60.7	58.0	57.4	60.1	92.2	96.3
25–30	12.2	4.2	1.6	[1]	8.2	14.7	11.8	13.6

[1] Less than 0.04 per thousand.

benefits, so that its accession rate was still high (12.2) when the cohort was 25–30. The accession rates for the cohort entering the labor force in 1950 are lowest of all (505.6) despite generally higher labor force participation. This can be explained partly by delayed entry due to more schooling. Judged by the period tables for the latter half of the century, this may be a "typical" entry rate for 16 to 20-year-olds. The experience of the cohort which entered the labor force in 1960 appears to reflect the changed labor market situation associated with the early 1960's. With lower labor force participation initially, the 16 to 20-year-old group experienced a higher entry rate eventually than did the similar group in 1950. During the 1960's, many young workers were both students and part-time workers. By the end of the decade, the cohort that began entering the labor force in 1960 had virtually completed their entry; the age group 25–30 had a rate of 1.6 per thousand.

Comparison of the generation table with the period ones demonstrates the usefulness of the former. For example, the 1940 period table indicated that all workers would have entered the labor force by 25 years of age. Actually, due to the impact of events in the 1940's the group that was 15 to 20 years old in 1940 was still entering the work force in 1950 at the relatively high rate of 12.2 per thousand when they were 25–30. On the other hand, the 1960 period table indicated a high rate of entry for all groups under 30, which did *not* continue, according to the 1960 generation table. Of interest in the 1980 and 2000 period table is the high rate of entry for 20- to 25-year-olds, demonstrating the expected impact of deferred entry caused by a growing proportion of potential workers attending school beyond high school.

Relationship to labor force projections

One important use of working life tables is to supplement projections of the labor force with projections of the annual number of entrants to and withdrawals from the labor force. Rates of accession, applied to the projected population 16 to 29, yield estimates of the number of new entrants to the labor force for specified future years. Similarly, rates of separation applied to the older population in the labor force yield estimates of withdrawal from the labor force. Adjusted for the effects of reentrants, these estimates can in turn be used to evaluate labor force projections by comparing the net increases obtained as the difference between gross entrants and gross withdrawals with the net increases implied in the basic labor force projections.

A second method of evaluating a projection is to put the labor force rates into a working life table and see what the results imply. For example, the projections made by Sophia (Cooper) Travis and Denis Johnston in 1965[3] show a maximum rate of labor force participation in the male age group 35 to 44, while the tables of working life yield a maximum rate currently at age 33 or 34. Closer examination of the rates developed by specific ages confirms the fact that the average rate for the 35 to 44 group is in fact higher than that of the 25 to 34 group, even though the peak rate occurs in the younger group. Maximum labor force participation for men has been occurring at a later age since the 1940 table:

Year	*Age*	*Rate*
1940	31	95.7
1950	32	97.1
1960	34	97.3
1968	33	96.7
1975	34	96.0
1980	34	96.1
1985	34	95.7
2000	34	95.4

Similarly, the labor force accession and withdrawal rates may be examined for realism and conformance to trends already observed. These procedures use period working life tables rather than generation tables. The latter may be constructed and compared with others made from previous or alternate labor force projections. In this case the mortality assumptions have to be the same. It is also possible to use one set of labor force rates, and examine the effects of alternate projections of mortality on the pattern of working life.

GENERATION TABLES of working life for men were constructed by applying labor force participation

rates for each of three cohorts to generation life tables. The expectation of life remaining increased slowly from cohort to cohort while the labor force participation rate decreased slightly so that although the length of worklife remaining for each cohort increased, from 44.5 for 16-year-olds in 1940 to 45.2 years in 1960, the average length of the retirement period for these three groups of men remained constant at about 10 years. Comparison with period retirement rates indicate that the men in these age groups will retire at twice the levels experienced in the 1940's and 1950's. In conclusion, the construction of generation tables of working life appears to offer a more realistic means of estimating both the volume of entry into and withdrawal from the labor force for specified future years than do the period tables on which we have relied in the past.

———*FOOTNOTES*———

[1] Henry S. Shryock, Jacob S. Siegel, and associates, *The Methods and Materials of Demography* (U.S. Bureau of the Census, 1971), Volume II, pp. 446ff.

[2] Stuart Garfinkle, "Changes in Working Life of Men, 1900–2000," *Monthly Labor Review*, March 1955, pp. 297–300.

[3] Sophia Cooper and Denis F. Johnston, "Labor Force Projections for 1970–80," *Monthly Labor Review*, February 1965, pp. 121–140 (reprinted as Special Labor Force Report No. 49.).

Appendix: Data sources and tabular construction

THE GENERATION working life table, like the period one, requires two building blocks: mortality data (in the form of a life table) and labor force participation rates. These data are then used to develop three sets of probabilities—of dying, of entering the labor force, and of leaving the labor force alive—for each age group at regular intervals (in this case, 5 years) for a period of 60 years or more. The accuracy of the resulting table depends upon the quality of the mortality and labor force rates. Of the various tables of working life for men constructed by the Bureau of Labor Statistics, those for 1940, 1950, 1955, and 1960 were used directly in developing the generation table.[1] The 1960 working life table was published using the abridged 1960 life table, but this article uses the 1959–61 unabridged life table.

The year 1945 presented a problem in that neither an appropriate life table nor completely satisfactory labor force participation rates were available. In this case, the life table values and the participation rates were obtained by interpolation by mathematically splining through 1940, 1950, and 1960 data. The 1965 and 1970 tables were prepared using labor force data from the Current Population Survey (reported in *Employment and Earnings*) and the final 1965 and provisional 1970 abridged life tables.

For years after 1970, the high mortality life tables associated with the Social Security Administration's Actuarial Study No. 62 were used.[2] Since values for years after 1970 would be the midpoint of successive 5-year intervals, they were interpolated to get life table values for the first year of each 5-year interval; for example, the rates for the 1975 life table were interpolated from those in the 1972–73 and 1977–78 tables.

The labor force participation rates were prepared as a preliminary step in the next periodic revision of the Bureau of Labor Statistics projections of the labor force. The projected rates all have the characteristic that by the year 2020, the average 5-year change observed over the postwar years is reduced to zero.[3]

Like a conventional life table, the table of working life begins with an initial population group of 100,000 persons born alive that decreases at each successive age according to a pattern determined by their mortality rates. In the working-life table, this hypothetical population is affected by two additional factors: rates of labor force entry and exit. Unlike death rates, these rates are not available for directly determining increments to, or decrements from, the labor force.

However, because the value from a standard life table (L_x) may be interpreted as the age distribution of the hypothetical population subject to the mortality rates prevailing among the actual population at a given time, multiplication of these values by age-specific labor force participation rates provides a hypothetical labor force (Lw_x).

Although calculating this hypothetical labor force solves the problem of not having any directly observed entry and separation rates, that of obtaining the survivorship values (lw_x) remains. The procedure has been to make a linear interpolation of the

single-year-of-age values from the distribution of the hypothetical labor force (Lw_x). The latter was separated into single-year-of-age groups by using Beers multipliers and then the survivor values (lw_x) were interpolated linearly. With these values in hand, the table could be completed. The generation working life table was constructed in a similar manner; the labor force participation rates for each cohort were multiplied by the hypothetical population (L_x) values from a generation life table.

Construction of the table

The following sections are a review of the specific values presented in the generation working life table.

Year of age. All variables in the table are expressed in terms of exact age (x) or the interval between age x and age $x + n$. The interval n, as shown in column 1 of table 1, is 5 years, unless otherwise specified. With the exception of the expectations of life and work life (columns 9 and 10), all the variables in the table relate to the age interval specified.

The hypothetical population (L_x) and labor force participation rates (w_x) are the basic inputs to the table (columns 2 and 3) and have already been discussed earlier in the article.

Number in the labor force. The figures in column 4 ($_nLw_x$) represent the hypothetical labor force, given the life table and the labor force participation rates for each age as indicated by the equation:

$$_nLw_x = {}_nw_x \cdot {}_nL_x$$

Accessions to the labor force. The fifth column of the table (1,000 $_nA_x$) contains a measure of net entries into the work force expressed as a rate per thousand. It is calculated from successive labor force values, discounted for mortality. (This value is not computed for ages greater than the one at which the labor force participation rate reaches a maximum.) The measure is computed as follows:

$$_nA_x = \frac{{}_nLw_{x+1} + {}_nLw_x\,({}_nm_x - 1)}{{}_nL_x}$$

(where $_nm_x$ is the mortality rates applicable to a specific age group of the hypothetical population and

$$_nLw_x \leq {}_nLw_{x+1},$$

Two other terms important to the working life table but not displayed are $(_nL\dot{w}_x)_n$ and lw_x. The former term represents an alternative concept of the hypothetical labor force. If u is the maximum labor force participation rate, attained at age k then:

$$\begin{aligned} {}_nL\dot{w}_x &= u \cdot {}_nL_x, x \leq k, \\ &= {}_nw_x \cdot {}_nL_x, x \geq k \end{aligned}$$

Thus $_nL\dot{w}_x = {}_nLw_x$ at and after the age of maximum labor force participation (k), but for younger ages, the alternative labor force ($_nL\dot{w}_x$) is based on *maximum* labor force rates. The other term (lw_x), represents the survivors already mentioned, and is the number in the work force who have attained a specific age x. It is necessary to interpolate from $_nL\dot{w}_x$ to lw_x in the manner already described.

Rate of separation, all causes. The rate of separation from the work force ($_nS_x$) due to all causes (column 6) is computed in a manner similar to the mortality rate for a specific age group in the stationary population:

$$_nS_x = \frac{lw_x - lw_{x+n}}{{}_nL\dot{w}_x} = \frac{{}_nS_x}{{}_nL\dot{w}_x}$$

While the work force is still growing, it is assumed that all withdrawals result from death, thus

$$_nm_x = {}_ns_x.$$

Rate of separations. After the age of peak labor force participation, a table of working life has two types of separations: deaths ($_ndw_x$) and withdrawals ($_nr_x$). They are related to separations as follows: The values in column 7 ($_nS_x^d$) measures separations due to death in the hypothetical work force:

$$_nS_x^d = \sum_{j=x}^{n} dw_j / {}_nL\dot{w}_x$$

where dw_j is the deaths for a single-year-of-age group within the interval x to $x+n$. (During years of peak retirement, the relation between death and retirement changes so rapidly that the calculation on a 5-year basis overstates the death rate[4].) The values in column 8 ($_nS_x^r$) are treated as statistical residuals:

$$_nS_x^r = {}_nS_x - {}_nS_x^d$$

Average number of remaining years. The function of column 9 is identical to that of a conventional life table. The remaining years of life (e_x), is expressed as:

$$e_x^{\circ} = \frac{\sum_{j=x}^{\infty} {}_nL_j}{l_x}$$

Average remaining working years. In column 10, to compute the average number of remaining years of work life (ew_x), or the expectation of worklife, the concept of ${}_nL\hat{w}_x$ as the number of person-years in the work force is used. Total cumulative person-years remaining in the labor force (Tw_x) is computed by adding up all succeeding ${}_nL\hat{w}_x$ values from the last age shown in the table back to the first age x:

$$Tw_x = \sum_{j=x}^{\infty} {}_nLw_j' = {}_nLw_x' + Tw_{x+n}$$

and $e^{\circ}w_x = \frac{Tw_x}{lw_x}$ is the expectation of working for age x. □

——APPENDIX FOOTNOTES——

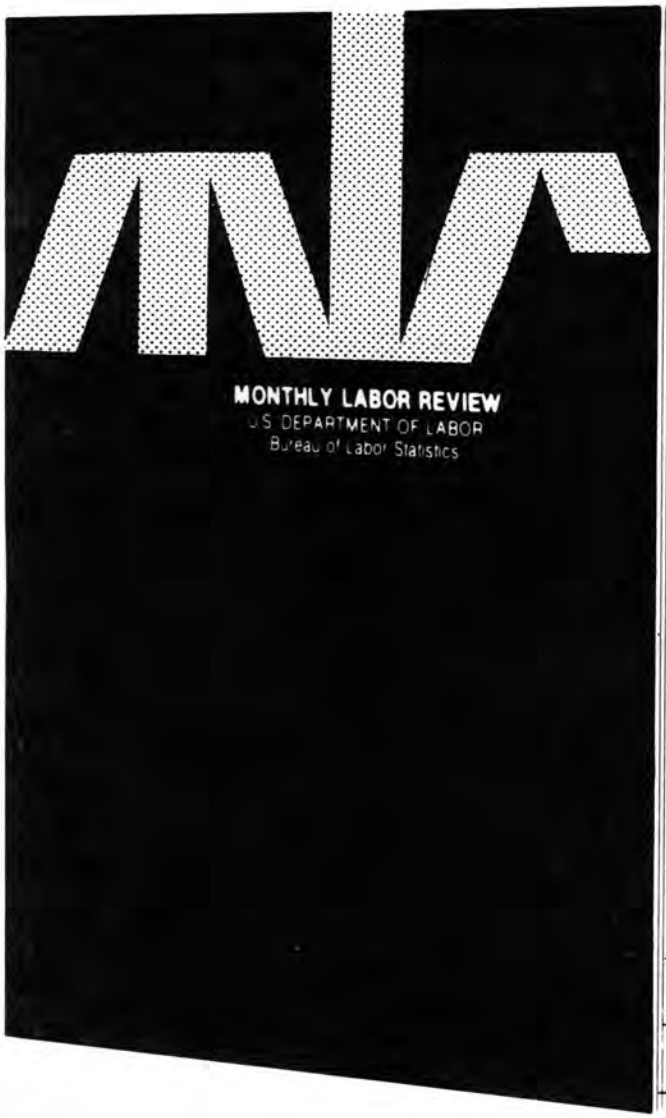
[1] The 1940, 1950, and 1960 working life tables are available in "The Length of Working Life for Males, 1900–60," Manpower Report No. 8, July 1963. The 1955 table appears in "The Length of Working Life," a paper presented by Seymour L. Wolfbein to the Fourth International Gerontological Congress, Merano, Italy, July 1957 (mimeographed).

[2] Francisco Bayo, *United States Population Projections for OASDHI Cost Estimates* (Social Security Administration, Actuarial Study No. 62, December 1966).

[3] For a discussion of the Bureau of Labor Statistics methods of projecting the labor force, see Sophia Cooper and Denis F. Johnston, "Labor Force Projections for 1970–80," *Monthly Labor Review*, February 1965, pp. 121–140 (reprinted as Special Labor Force Report No. 49).

The illustrative projections of total labor force participation rates used in developing the generation table of working life were obtained as follows: (1) For each age-sex group, the average 5-year change in labor force participation rates, as observed over the postwar period, was calculated. (2) Each 5-year change was then gradually reduced by formula so that all changes would be approximately zero after 10 periods—about 50 years. (3) These projected 5-year changes were then added algebraically to the observed rate used as a benchmark (1969–71 average) to yield rates for 1975, 1980, . . . 2000.

[4] *Tables of Working Life: Length of Working Life for Men* (BLS Bulletin 1001, 1950), pp. 73–74.



Current labor statistics

Book reviews and notes

Developments in industrial relations

Major agreements expiring next month

Significant decisions in labor cases

Special articles on pensions, arbitration, women at work

Special labor force reports

Current employment analysis

Analysis of price changes

Family budgets

Trends in wages and compensation

Union convention reports

Industry productivity studies

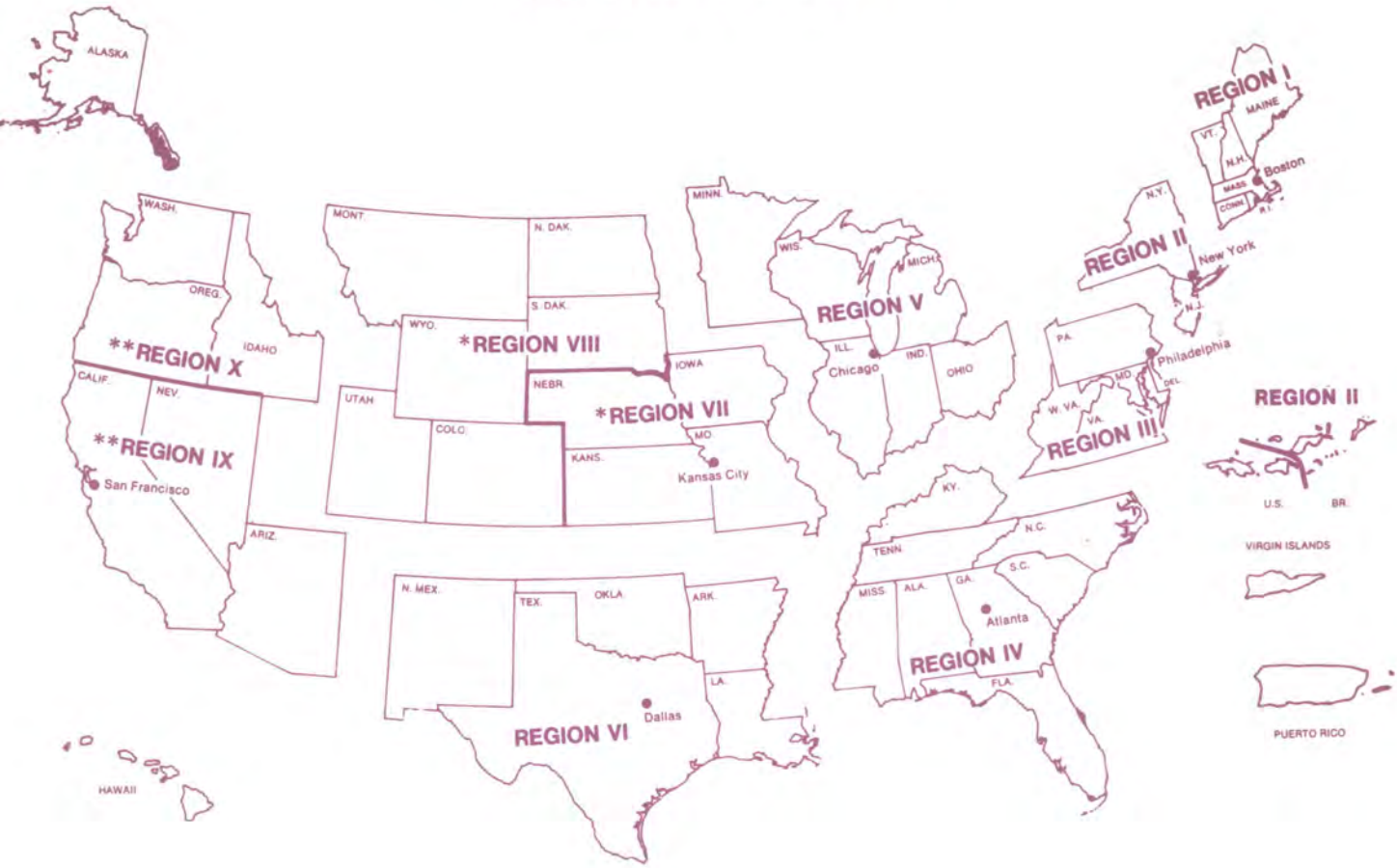
Foreign labor developments

Labor force projections

Occupational safety and health statistics

☆ U.S. GOVERNMENT PRINTING OFFICE : 1975 O—583-675(160)

BUREAU OF LABOR STATISTICS
REGIONAL OFFICES



Region I
1603 JFK Federal Building
Government Center
Boston, Mass. 02203
Phone: (617) 223-6761

Region II
Suite 3400
1515 Broadway
New York, N.Y. 10036
Phone: (212) 971-5405

Region III
P.O. Box 13309
Philadelphia, Pa. 19101
Phone: (215) 597-1154

Region IV
1371 Peachtree Street, N.E.
Atlanta, Ga. 30309
Phone: (404) 526-5418

Region V
9th Floor
Federal Office Building
230 S. Dearborn Street
Chicago, Ill. 60604
Phone: (312) 353-1880

Region VI
Second Floor
555 Griffin Square Building
Dallas, Tex. 75202
Phone: (214) 749-3516

Regions VII and VIII*
911 Walnut Street
Kansas City, Mo. 64106
Phone: (816) 374-2481

Regions IX and X**
450 Golden Gate Avenue
Box 36017
San Francisco, Calif. 94102
Phone: (415) 556-4678

* Regions VII and VIII are serviced by Kansas City
** Regions IX and X are serviced by San Francisco

U.S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS
WASHINGTON, D. C. 20212

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD CLASS MAIL

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF LABOR

U.S.MAIL

LAB - 441