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A Summary of BLS Projections

Bulletin 1809
U.S. DEPARTMENT OF LABOR
Bureau of Labor Statistics
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U.S. DEPARTMENT OF LABOR
Peter J. Brennan, Secretary

Bureau of Labor Statistics
Julius Shiskin, Commissioner

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Preface

This bulletin summarizes the latest BLS projections of the U.S. economy to 1985. It consists of reprints of four articles from the *Monthly Labor Review,* December 1973, and added appendixes containing explanatory notes and detailed tables. A few minor corrections have been made to some of the figures and text. This bulletin replaces *The U.S. Economy in 1980: A Summary of BLS Projections,* Bulletin 1763.

These projections are part of the ongoing program of the Bureau of Labor Statistics for study of the likely patterns of future economic growth and the resulting manpower implications. More comprehensive bulletins containing greater detail and further explanation of methods are scheduled for publication at a later date.

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Introduction: An Overview of BLS Projections

JACK ALTERMAN

TWO SIGNIFICANT DEPARTURES from past trends are suggested by the Bureau of Labor Statistics projections of the U.S. economy to 1985 which are presented in the following chapters of this bulletin: (1) a sharp slowdown in overall economic growth and (2) a potential oversupply of college graduates, both to begin in the late 1970's.

The new projections—like earlier ones published by the Bureau of Labor Statistics—are designed to provide a framework for assessing future manpower requirements and to provide information for career guidance of young people. The projections also are used by government, business, and other groups for a variety of planning and policy development purposes.

The projections provide information on long-term changes in the size, composition, and education of the labor force; productivity; hours of work; gross national product and its distribution among the various categories of demand for goods and services; industry output; and employment and occupational requirements. The latest set of projections revises the previously published set of projections to 1980 and extends the estimates to 1985.

This chapter discusses some findings of the new projections, and summarizes major assumptions and techniques underlying the projections. In addition, a summary comparison of the revised projections to 1980 with earlier estimates for that year is also included. Three other chapters in this bulletin present projections to 1985 of population and the labor force (pp. 8–17), occupational changes (pp. 18–26), and gross national product, final demand, industry output, and employment (pp. 27–42).

More detailed bulletins covering additional statistical detail for individual industries and occupations and an expanded discussion of findings and methodologies will be published at a later date.

Jack Alterman is assistant commissioner, Office of Economic Trends and Labor Conditions, Bureau of Labor Statistics.

Some findings

By 1985, the U.S. labor force will reach 108 million; the number of persons employed, 103 million (both totals include military); and gross national product, about $1.9 trillion (1972 dollars). These results reflect a number of assumptions underlying the projections and in particular a key assumption that basic economic factors will not veer from long-term paths. Despite these assumptions of continuation of underlying economic forces, demographic changes already in the works presage changes in growth and trained manpower.

Perhaps the most important departure from the long-term trend lies in the rather sharp slowdown in economic growth projected to start about 1978 and continue into the 1980's. (Because the projections are for the specific years 1980 and 1985, the slowdown is dated as covering 1980–85).

The expected dampening in the rate of economic growth is almost entirely demographic; that is, caused by changes in the growth of the population 16 and over from which the work force is drawn. For some time, the birth rate has fallen from the peak periods of the late 1950's and early 1960's. The slowdown in births will begin to show up in the smaller number of new entrants into the labor force towards the end of the 1970's.

To put this slowdown into perspective, during the 1955–68 period, the labor force grew at an annual rate of 1.5 percent; during the 1968–80 period, it is projected to grow somewhat faster—1.8 percent a year. During 1980–85, however, it will drop sharply to 1.1 percent and is projected to decline during the late 1980's and possibly beyond.

The slowdown in the rate of increase in the labor

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force, given continuation of long-run rates of increase in labor productivity and declines in hours of work, results directly in a slowdown in the projected increase of real gross national product from about 4 percent a year in 1968–80 to only 3.2 percent in the period after 1980. The 3.2-percent rate is substantially lower than the economic growth rate of the post-World War II period.

It should be emphasized that the dampening in the rate of growth is not due to any assumption regarding failure to achieve high levels of employment. On the contrary, the projections assume 96 percent of the civilian labor force employed in both 1980 and 1985.

The reduction in the rate of economic growth is not inevitable. The slowdown in the growth of the labor force can be offset by either (1) increasing productivity, (2) reversing the long-term decline in hours of work and increasing weekly hours, (3) sharply increasing labor force participation among younger people and women and delaying retirement of older workers, or (4) a combination of all three approaches. It would, however, take a major national effort to modify historical rates of change in productivity, hours of work, and labor force participation rates, given the strength of the basic underlying economic and institutional factors.

The projected reduction in the growth rate obviously has many implications for the entire economy and its parts. It will present major problems in achieving a balanced transition from a higher to a lower sustainable growth rate. Business will have to be much more critical in developing long-range marketing, investment, and staffing plans, avoiding dependence on past trends. Government will have to deal with a slackening in the growth of revenues, resulting in increased pressures on budgets. It is true that demand for governmental functions will also be dampened somewhat as a result of slower growth in the labor force and economic activity, but the situation may still require a more critical evaluation of priorities at all levels of government.

The projected slowdown may have some beneficial aspects, however. Chief among these are a reduction in pollution and waste disposal problems. Similarly, the long-term problems associated with increasing demand for energy and natural resources may be alleviated somewhat. Lastly, a reduced growth rate may make possible an improved balance of payments situation resulting from a decline in imports relative to exports.

The other major departure from historical experience will be the shift in the supply and demand for college graduates. The projections indicate that the nation will be moving from a period (in the 1950's and 1960's) when demand for college graduates outstripped supply to one in the 1970's when supply and demand will be roughly in balance. However, the balance for individual occupations and levels of education may present serious problems. In the 1980's, however, we anticipate the supply of graduates (based on the Office of Education's projections) increasing faster than the demand for them. The surplus may amount to about 140,000 a year during the 1980–85 period, or more than 10 percent of the projected supply.

The surplus does not mean large-scale unemployment among college graduates. Rather, it is quite likely that an increasing proportion of college graduates will take positions other than their first choice. It also may mean a rise in job "requirements" as college graduates become more generally available. If steps are not taken to facilitate the transition from undersupply to oversupply, we may be faced with a large number of disappointed college graduates and another group of workers with less than a college education, concerned about competition from college graduates for promotion to or employment in better paying jobs.

It is possible that the imbalance in the supply-demand situation for college-educated workers may not be as large as projected, because college enrollment will slow down as students become aware of the less favorable job market. This may be offset, however, by continued strength in the belief that the contribution of a college education to personal development and broadened outlook is at least as important as the professional training acquired.

General assumptions

The projections to 1980 and 1985 are based on a number of assumptions; some explicit but others, even more numerous, implicit.

Fiscal, monetary, and *manpower training and educational programs* will achieve a satisfactory balance between relatively low unemployment and relative price stability, permitting achievement of the long-term economic growth rate. The projections assume a 4-percent unemployment rate (of the civilian labor force) and a 3-percent annual increase in the implicit price deflator for gross national product.

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The institutional framework of the American economy will not change radically.

Economic, social, technological, and scientific trends will continue, including values placed on work, education, income, and leisure.

Efforts to solve major domestic problems such as those of air and water pollution, solid waste disposal, urban congestion, inadequate industrial safety, and energy shortages may consume more productive resources but will not have more than a marginal effect on long-term economic growth.

Assumptions directly affecting growth

Population growth is projected to conform to Census Series E projections, which provide that fertility rates remain at the replacement level. The projected labor force is derived from the assumed population by extrapolating future participation rates for each age-sex group from the 1955–72 trend, tapered so that in 50 years all changes are reduced to approximately zero.

Average annual hours are assumed to decline by 0.5 percent a year in the agricultural sector, by 0.3 percent a year in the private nonagricultural sector.

Productivity in the private nonfarm economy is assumed to grow at its long-term rate—2.7 percent a year. This assumption, combined with a similar assumption regarding continuation of the long-term average annual productivity rate of 5.5 percent for the farm sector, yields an annual rate of increase for the total private economy of 2.9 percent during 1968–80 but 2.8 percent in 1980–85, due to the declining relative weight of the farm sector.

Governmental assumptions

All levels of government will expand efforts to meet a variety of domestic needs, but State and local government activity will continue to grow relative to Federal activity. It has been further assumed that Federal, State, and local budgets will be close to balance by 1980 and 1985 as a result of:

No change in Federal tax legislation other than that contained in the Tax Reform Act of 1969.

The tax rate for Social Security remains as currently legislated, but the wage base is allowed to grow with the deflator for consumer expenditures, thus maintaining a constant real wage base.

Federal transfer payments were assumed in line with the provisions of Federal legislation through 1975. After that, transfer payments are assumed to increase in accord with (a) the rate of increase of the population over 62; (b) the rate of price increase; and (c) an expansion of 3 percent a year to cover increased coverage or real benefits.

Increased Federal revenue resulting from growth in the economy will be used largely to expand Federal grants to State and local governments relative to other categories of expenditures, although at a diminishing rate. The substantial increase in Federal grants will permit State and local governments to slow the rate of increase in their taxes.

Defense expenditures are assumed to continue to decline as a proportion of the Federal budget and of GNP. The size of the Armed Forces will be reduced to about 2 million and kept at that level.

Federal nondefense purchases of goods and services are assumed to increase at rates below that of real GNP, but will account for an increasing share of total Federal purchases of goods and services.

Assumptions about major sectors

In residential construction, estimates assume a meeting of housing goals by 1978. Thereafter, residential construction is a constant proportion of real GNP.

Projected U.S. energy requirements will be roughly in line with those projected by the U.S. Department of the Interior in *U.S. Energy Through the Year 2000,* December 1972. This means major reliance on oil imports to close the energy supply-demand gap. (During the last quarter of 1973, curtailment of oil supplies from the Mideast raised questions regarding use of imports to close the supply-demand energy gap over the next few years. It remains to be seen whether this restriction on oil imports will continue over the long run and what implications this may have for the long-term growth rate and structural changes in the economy resulting from the effort to develop domestic alternatives to oil imports.)

In international trade, it is assumed that by 1980 and 1985 the United States will have achieved a slight surplus in our net export balance, in spite of increased imports of oil.

Projection methodology

Labor force projections. Development of the 1980 and 1985 projections begins with the labor force.

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Based on the Bureau of the Census projections of population (Series E), labor force estimates are developed through separate projections of the labor force participation rates for various groups in the population, 16 years and above, by age and sex. The participation rates are then applied to the projected levels of each population group.

Gross national product. GNP is projected as the product of three major variables: (a) employment which is based on the projected labor force and an assumption of a 4-percent civilian unemployment rate; (b) annual hours per job; and (c) output per man-hour. The projections are developed separately for Federal Government, State and local government (excluding government enterprises), the agricultural sector, and the private nonagricultural sector and then aggregated to derive target year GNP.

Distribution of potential GNP. GNP is distributed into major categories of demand through the use of a macroeconometric model which starts with potential GNP and develops estimates of government revenue, personal income, and business income. The estimates are then used, along with selected exogenous estimates, to develop projections of government purchases of goods and services, personal consumption, and investment expenditures.

Conversion of demand into industry employment. (a) Major final demand components are distributed into detailed "bills of goods" item by item. (b) The potential demand for all final goods and services is converted into industry output requirements (135-industry detail) through the use of interindustry (input-output) relationships projected to the target years. (c) Projected industry output is converted into employment requirements based on estimates of annual hours per job and output per man-hour, also projected to the target years.

The projection system contains a number of checkpoints to see that projections made at different stages are mutually consistent. Important among these is the check of employment derived as the aggregate of the industry employment projections with total employment used initially. The results of the input-output employment projections are also checked and reconciled with an independent set of industry employment projections derived by regression techniques.

Conversion of industry employment into occupational needs. This process is based on the use of projected industry occupational patterns and modification of the initial industry employment projections to match the detail of the industry-occupational table (116 industries, 162 occupations). The industry occupational patterns are then applied to the employment projections to derive estimates of occupational needs.

Estimates of job openings. These are developed by combining the growth implied by the occupational projections with estimates of replacement needs. These are developed from tables of working life based on actuarial experience for deaths and general patterns of labor force participation of each age. Withdrawals from the labor force can be projected for men and women separately in each occupation for which age and sex are known. The net effects of interoccupational transfers, however, are not known in systematic fashion; therefore, such data are not included in estimates of total job openings.

Identification of manpower imbalances. Such imbalances are based on analyses of projected occupational requirements and trends in the number of individuals entering educational or training programs designed to prepare them for specific occupations and on trends in the proportion of those who complete their education or training and enter the related occupational field.

Qualifications

Making a set of projections as comprehensive as those described in the chapters which follow involves many assumptions, some of which have a great deal of uncertainty attached to them. It would be possible to make alternative assumptions for each of these variables and discern the ramifications. However, the combinations and permutations would quickly make the results incomprehensible. For that reason, the projections discussed in these chapters are limited to a basic set of estimates and assumptions. However, some implications of alternative assumptions for growth, output, and employment will be reported in bulletins to be published later.

Even beyond those projections or assumptions for which alternatives could be used, uncertainties concerning these projections exist. While they have

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been made with care and the models used, tested, and evaluated, many questions remain. Any model or technique is only a shortcut to capture intricate relationships in the economy. These shortcuts may obscure important structural changes. Also, it is usual in making projections, to tend, when all else fails, to move toward the center of reasonable alternatives, while the economy is never quite that cooperative. Further, in developing projections to years as distant as 1980 and 1985, it is inevitable that in certain areas events will take place which could materially affect the projections.[2] As one example, it is conceivable that defense expenditures could be drastically increased or reduced as a result of international developments or decisions regarding national priorities. This would affect not only Federal expenditures, but the level and structure of investments and consumer expenditures, input-output relationships, and the relative rates of output and employment growth for selected industries. Consequently, while BLS has taken considerable time and care in developing these projections, before they are used by others they should be evaluated carefully, particularly the assumptions underlying them.

In general, the projections should be considered as estimates amid uncertainty. Nevertheless, they are believed to be useful in providing indicators of relative future growth of demand, output, employment, and occupations.

Comparison with 1980 projections

The revised 1980 projections are not substantially different from the earlier set of 1980 projections, published in 1970. When both sets are made comparable by use of the 4-percent unemployment rate assumptions and the 1972 price level for the constant dollar estimates of gross nationa[1] product, the revised 1968–80 GNP annual growth rate is 4.0 percent, only slightly lower than the earlier projection of 4.1 percent. The slight decline results from changes in two of the factors which affect the overall growth rate being largely offsetting—higher labor force increases and lower annual hours of work. The other major factor—productivity—is only slightly lower in the revised projections than in the earlier estimates.

The comparison of the distribution of GNP among major components of demand shows a decline in the relative share of final goods and services preempted by Federal Government purchases, stated in constant prices. This is due in large part to a reduction in the size of the Armed Forces, based on the assumption of an all-volunteer army. The revised projections show a somewhat higher proportion of GNP for each of the other major components of final demand; personal consumption expenditures, private domestic investment, and State and local government purchases of goods and services. The surplus in net exports is smaller.

The new employment projection is about 3 million higher than the earlier estimate, with most of the increase, in terms of number of jobs, in three major sectors—trade; finance, insurance, and real estate; and other services. Revised employment projections for agriculture and construction are lower than earlier estimates.

The current occupational projections show substantially higher estimates for white-collar workers, primarily in clerical occupations, and blue-collar workers, largely among nonfarm laborers. The latter estimate still shows a decline in the relative proportion of nonfarm laborers, but not as much of a decline as projected earlier. The revised estimates for service and farm workers are substantially lower than earlier projections.[3] □

———*FOOTNOTES*———

[1] The earlier projections to 1980 were published in the *Monthly Labor Review*, April 1970, and in a series of BLS Bulletins, as follows:

Patterns of U.S. Economic Growth, Bulletin 1672 (1970)
The U.S. Economy in 1980: A Summary of BLS Projections, Bulletin 1673 (1970)
College Educated Workers, 1968–80, Bulletin 1676 (1970)
Occupational Manpower and Training Needs, Bulletin 1701 (1971)
Tomorrow's Manpower Needs: Volume IV, *The National Industry-Occupational Matrix and Other Manpower Data*, Bulletin 1737 (1972). Revised 1971.

In addition to the 1980 projections, the Bureau has also developed projections to 1970 and 1975. See *Projections 1970: Interindustry Relationships, Potential Demand, Employment*, Bulletin 1536 (1966), and *Projections of the Post-Vietnam Economy, 1975*, Bulletin 1733 (1972).

[2] This is one of the reasons the Bureau seeks to update, review, and extend its projections about once every 2½ to 3 years.

[3] A more detailed comparison of the revised and earlier 1980 projections is provided in appendix B of this bulletin.

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Chapter 1. Population and Labor Force Projections

DENIS F. JOHNSTON

THE POSTWAR "BABY BOOM" which pressed heavily on school capacity and subsequently swelled the ranks of younger workers during the late 1960's will have a similar impact on the ranks of workers between 25 and 40 years of age between 1972 and 1985, according to Bureau of Labor Statistics projections of the labor force to 1985. By contrast, the proportion of workers under 25 will fall relative to older groups of workers in the latter part of the 1972 – 85 period. As a result, some of the problems associated with very large numbers of young workers beginning their careers will diminish as these workers move into the older age groups, which generally have fewer employment problems.

Projections of population

These labor force expectations are based on expected changes in population. Between 1972 and 1980, the U.S. population is projected to increase by about 15 million to 224 million. However, if the current rate of child birth continues, the size of the population under 16 years old will decline by over 4 million while the working-age population (16 years and over) will rise by 19 million. Among those of labor force age, the 16- to 19-year-old population remains nearly constant. The prospective increase in the population of young adults (20 to 34 years old) is most important—a rise to 12.5 million, reaching 58 million in 1980. By contrast, the group aged 35 to 54 years will increase by only 1.4 million and the population 55 and over grows by about 5 million. The net effect of these changes is to increase the proportion of the population that is of working age (16 and over) from 71 percent in 1972 to 75 percent in 1980, and to raise the median age of the population from 28.1 years in 1972 to 29.6 years in 1980, reversing the declining trend observed since the mid-1950's.

Between 1980 and 1985, the population under 16 years old is projected to increase by 3.2 million—reflecting the continuing rise in the number of women of child-bearing age. The 16- to 19-year-old group, in contrast, declines by over 2 million, in line with the decline in the number of births during the late 1960's.[1] While the 20- to 34-year-old group continues to increase by about 3 million during this period, its growth is overshadowed by that of the group 35 to 54 years old, which is expected to increase by 5.4 million. The older population also continues its steady increase during this 5-year period, with the net effect that the total population increases by 11.6 million during the period and the median age reaches 30.6 years by 1985.[2]

Key population changes between 1972 and 1985 by age group are as follows:

Group	*Percent change*
Total population	13
Under 16 years	−2
16 years and over	19
16 to 19 years	−12
20 to 34 years	34
35 years and over	16

These major changes in population are expected to strongly influence the growth and age-sex composition of the labor force.

Fertility fluctuations

The most important demographic development in the United States since World War II has been the enormous fluctuation in the fertility rate (births per 1,000 women 15 to 44 years old). It rose from 85.9 in 1945 to a peak of 122.9 in 1957 (up 43 percent) and then declined to 73.4 in 1972 (down 40

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percent).[3] The initial effects of the "baby boom" of the 1950's have already been registered in the rising school enrollments of the late 1950's and early 1960's and in the heavy inflow of teenage jobseekers from the mid-1960's onward. The movement of this baby boom generation through the population constitutes the most dynamic feature of the population projections to 1985 and beyond. The 60 million persons born in the 15 years between 1947 and 1961 stand in marked contrast to the 40 million born during the preceding 15 years (1932 to 1946). Ignoring the counteracting effects of mortality and immigration, these 60 million persons were 11 to 25 years old in 1972; they will be 19 to 33 years old by 1980, and 24 to 38 years old by 1985. Furthermore, their number is considerably larger than the approximately 54 million births expected (according to the assumed Series E fertility levels of the U.S. Bureau of the Census) during the following 15-year period, 1962 to 1976. The reverse effects of this "baby bust" are only beginning to be felt in the recent declines in elementary school enrollments. Expressed in terms of average births per woman, the fertility decline of the past 15 years implies a dramatic shift from a "three child" to a "two child" family norm—a shift which has been associated with profound changes in the roles of adult women, particularly with respect to their interest in, and availability for, paid employment.

The Series E projection of population, which has been adopted in developing the latest projection of labor supply, is summarized in table 1. This projection reflects the assumption that the "two child" norm shall continue to prevail over the projection period. Since current fertility levels are already consistent with (or even slightly below) the level needed to sustain that norm, the adoption of Series E implies the assumption that fertility rates will not continue to decline significantly in the next 12 years. The population series which is adopted has no effect upon the population of working age (16 years and over) until the late 1980's. Prior to that time, all persons in that population have already been born.[4]

Table 1. Total population, by age and sex, July 1, 1960, 1972, and projected to 1980 and 1985

Sex and age	Number (in thousands)				Percent distribution			
	1960	1972	1980	1985	1960	1972	1980	1985
BOTH SEXES								
Total, all ages	180,681	208,839	224,134	235,699	100.0	100.0	100.0	100.0
Under 16 years	58,857	60,926	56,794	59,979	32.6	29.2	25.3	25.4
16 years and over	121,824	147,913	167,340	175,720	67.4	70.8	74.7	74.6
16 to 19 years	10,710	15,923	16,397	14,049	5.9	7.6	7.3	6.0
20 to 34 years	34,027	45,573	58,030	61,195	18.8	21.8	25.9	26.0
35 to 54 years	44,802	46,365	47,777	53,187	24.8	22.2	21.3	22.6
55 years and over	32,285	40,052	45,136	47,289	17.9	19.2	20.1	20.1
Median age in years	29.4	28.1	29.6	30.6				
MEN								
Total, all ages	89,331	102,053	109,240	114,915	49.4	48.9	48.7	48.8
Under 16 years	29,917	31,055	28,979	30,632	16.6	14.9	12.9	13.0
16 years and over	59,414	70,998	80,261	84,283	32.9	34.0	35.8	35.8
16 to 19 years	5,417	8,100	8,339	7,139	3.0	3.9	3.7	3.0
20 to 34 years	16,884	22,740	29,187	30,845	9.3	10.9	13.0	13.1
35 to 54 years	22,015	22,497	23,249	26,039	12.2	10.8	10.4	11.0
55 years and over	15,098	17,661	19,486	20,260	8.4	8.4	8.7	8.6
WOMEN								
Total, all ages	91,350	106,786	114,894	120,784	50.6	51.1	51.3	51.2
Under 16 years	28,940	29,871	27,815	29,347	16.0	14.3	12.4	12.4
16 years and over	62,410	76,915	87,079	91,437	34.5	36.8	38.8	38.8
16 to 19 years	5,293	7,823	8,058	6,910	2.9	3.7	3.6	2.9
20 to 34 years	17,143	22,833	28,843	30,350	9.5	10.9	12.9	12.9
35 to 54 years	22,787	23,868	24,528	27,148	12.6	11.4	10.9	11.5
55 years and over	17,187	22,391	25,650	27,029	9.5	10.7	11.4	11.5

SOURCE: For 1960, see **Estimates of the Population of the United States, by Age, Color, and Sex: July 1, 1960 to 1965, Current Population Reports, Population Estimates,** Series P-25, No. 321 (Bureau of the Census, 1965), table I. For 1972, 1980, and 1985, see Series P-25, No. 493, table 2 and unpublished single-year age detail.

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Projections of labor force

As shown in table 2, the total labor force of the United States is projected to increase by nearly 13 million between 1972 and 1980, from 89 to about 102 million, and by almost 6 million between 1980 and 1985, reaching just under 108 million in 1985.[5] This projection indicates that the proportion of women workers in the labor force is expected to continue to rise, but at a much more moderate pace than that during the 1960–72 period (32.3 percent to 37.4 percent). By 1980 it is expected to rise to 38.5 percent, with little change by 1985 (38.7 percent). The projection also reveals a major shift in the distribution of the labor force by age, reflecting in large part the impact of past changes in fertility, particularly the movement into the young adult group of the large postwar baby boom cohorts. This shift can be illustrated by means of the ratio of workers 20 to 34 years old to those aged 35 to 54. In 1960, that ratio was .72; by 1972, it had risen to .96; by 1980, it is expected to rise to 1.20; and by 1985, it declines moderately to 1.13.

Another important feature of the projection is the initially rapid increase in the size of the labor force in the 1970's, and the slowdown which begins late in the decade. The projection yields an average annual rate of increase over the entire projection period (1972–85) of 1.5 percent—1.7 percent between 1972 and 1980, and 1.1 percent, 1980 to 1985.[6]

Over three-fourths of the projected 1972–80 increase in the labor force is expected to occur among the group 20 to 34 years old. This group will grow from 36 percent of the labor force in 1972 to 42 percent by 1980. In absolute numbers, the group rises from 32½ to over 42 million. The groups aged 35 to 54 years old and 55 years old and over will also grow, though more moderately, the former increasing 4.4 percent to about 35 million and the latter 11.1 percent to just over 16 million. By contrast the number of teenage workers (16 to 19) entering the labor force—whose massive growth between 1960 and 1972 helped to create problems of jobs for youth and to bring about a marked decline in the labor force's median age (from 39.8 to 37.2 years)—will peak around 1979, declining slowly thereafter.

Because 20- to 34-year-olds will lead labor force growth between 1972 and 1980, the emphasis in manpower policy may be expected to shift toward concern to provide more permanent career jobs from the past emphasis on entry-level jobs. Expected increases in the number of workers 35 to 54 years (about 150,000 a year during 1972–80) and workers 55 years and over (about 200,000 a

Table 2. Total labor force, by age and sex, annual average 1960, 1972, and projected to 1980 and 1985

Sex and age	Number (in thousands)				Percent distribution			
	1960	1972	1980	1985	1960	1972	1980	1985
BOTH SEXES								
Total, 16 years and over	72,142	88,991	101,809	107,716	100.0	100.0	100.0	100.0
16 to 19 years	5,246	8,367	8,337	7,165	7.3	9.4	8.2	6.7
20 to 34 years	22,749	32,463	42,223	44,758	31.5	36.5	41.5	41.6
35 to 54 years	31,562	33,689	35,165	39,463	43.7	37.9	34.5	36.6
55 years and over	12,585	14,472	16,084	16,330	17.4	16.3	15.8	15.2
Median age in years	39.8	37.2	35.2	35.8				
MEN								
Total, 16 years and over	48,870	55,671	62,590	66,017	67.7	62.6	61.5	61.3
16 to 19 years	3,184	4,791	4,668	3,962	4.4	5.4	4.6	3.7
20 to 34 years	16,019	20,601	26,375	27,896	22.2	23.1	25.9	25.9
35 to 54 years	20,974	21,116	21,759	24,361	29.1	23.7	21.4	22.6
55 years and over	8,692	9,163	9,788	9,798	12.0	10.3	9.6	9.1
WOMEN								
Total, 16 years and over	23,272	33,320	39,219	41,699	32.3	37.4	38.5	38.7
16 to 19 years	2,062	3,576	3,669	3,203	2.8	4.0	3.6	3.0
20 to 34 years	6,730	11,862	15,848	16,862	9.3	13.3	15.6	15.7
35 to 54 years	10,588	12,573	13,406	15,102	14.7	14.1	13.2	14.0
55 years and over	3,893	5,309	6,296	6,532	5.4	6.0	6.2	6.1

SOURCE: For 1960 and 1972, U.S. Department of Labor, **1973 Manpower Report of the President**, table A-2; for 1980 and 1985, Denis F. Johnston, "The U.S. labor force: projections to 1990," **Monthly Labor Review**, July 1973, pp. 3-13.

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year) are not markedly different from 1960–72 trends. But the substantial increase in the ratio of young adult workers (20 to 34 years) to those 35 to 54 years may limit promotional opportunities for the younger workers.

Relative labor force growth between men and women is expected to alter sharply and is perhaps the most controversial feature of the new labor force projections. During 1960–72, women made up 60 percent of the net increase in the labor force; between 1972 and 1980, they are projected to account for only 46 percent of net growth. This anticipated slowdown is attributable to (1) the increase in the women's population to 1980 being concentrated in the 25- to 34-year-old group, which has a lower labor force participation rate than the groups (under 25 and 35 to 54) which grew most rapidly in the 1960's, and (2) the assumed halt in the decline in women's fertility rates, which implies that increased labor force participation attributable to declining fertility will not be as evident over the coming years.

Labor force outlook, 1980–85

The baby boom group which causes the 20- to 34-year-olds to lead labor force growth in the 1972–80 period begins to shift into the 35–54 age group during 1980–85. Nearly three-fourths of the projected growth in the labor force during this period is expected to occur in this group, some 4.3 million of the net gain of 5.9 million workers. By contrast, the size of the teenage labor force is projected to fall steadily by about 240,000 a year, reaching 7.2 million in 1985. The young adult labor force (20 to 34 years old) is projected to increase by only 500,000 a year in contrast to 1.2 million a year during the 1972–80 period. Finally, the number of older workers is projected to rise very slowly at this time—with the steady increase in the size of the older population being counterbalanced by the assumed continuation of the declines in their rates of labor force participation.

Projected changes in the rates of labor force participation of the different age-sex groups are instructive (table 3). The gradual rise in the percentage of the population of working age in the labor force (from 59.2 percent in 1960 to 61.3 percent in 1985) reflects both the growing participation rates among women and the growing proportion of the population in the prime working ages for men. Table 3 also reveals the "conservative" nature of the projection—with the sole exception of teenage men, the projected changes in rates of labor force participation (whether positive or negative) are much more modest over the projected period (1972–85) than the actual changes during the 1960–72 period. The discussion which follows suggests reasons for this conservatism, but the root cause is the fact that the labor force projection is "surprise-free," and therefore tends to discount, albeit crudely, the imputed effects of such major "surprises" as the

Table 3. Total labor force participation rates,[1] by age and sex, actual 1960 and 1972 and projected to 1980 and 1985

Sex and age	Total labor force participation rates (in percent)				Percentage point changes in participation rates			
	1960	1972	1980	1985	1960–72	1972–85	1972–80	1980–85
BOTH SEXES								
Total, 16 years and over	59.2	60.2	60.8	61.3	1.0	1.1	0.6	0.5
MEN								
Total, 16 years and over	82.2	78.4	78.0	78.3	−3.8	−.1	−.4	.3
16 to 19 years	58.8	59.1	56.0	55.5	.3	−3.6	−3.1	−.5
20 to 34 years	94.9	90.6	90.4	90.4	−4.3	−.2	−.2	----
35 to 54 years	95.3	93.9	93.6	93.6	−1.4	−.3	−.3	----
55 years and over	57.6	51.9	50.2	48.4	−5.7	−3.5	−1.7	−1.8
WOMEN								
Total, 16 years and over	37.3	43.3	45.0	45.6	6.0	2.3	1.7	.6
16 to 19 years	39.0	45.7	45.5	46.4	6.7	.7	−.2	.9
20 to 34 years	39.2	52.0	54.9	55.6	12.8	3.6	2.9	.7
35 to 54 years	46.5	52.7	54.6	55.6	6.2	2.9	1.9	1.0
55 years and over	22.6	23.7	24.5	24.2	1.1	.5	.8	−.3

[1] Percent of total population in total labor force.

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Vietnam buildup and the decline in fertility observed during the recent past. Also omitted from consideration are a number of conceivable socioeconomic or legislative changes which could significantly alter the participation rates of particular groups in the population. For example, any major expansion in the availability of day-care or "child-development" centers would enable more mothers of young children to choose between the labor force and work at home, and would, in addition, create a substantial demand for adults qualified to staff these centers.

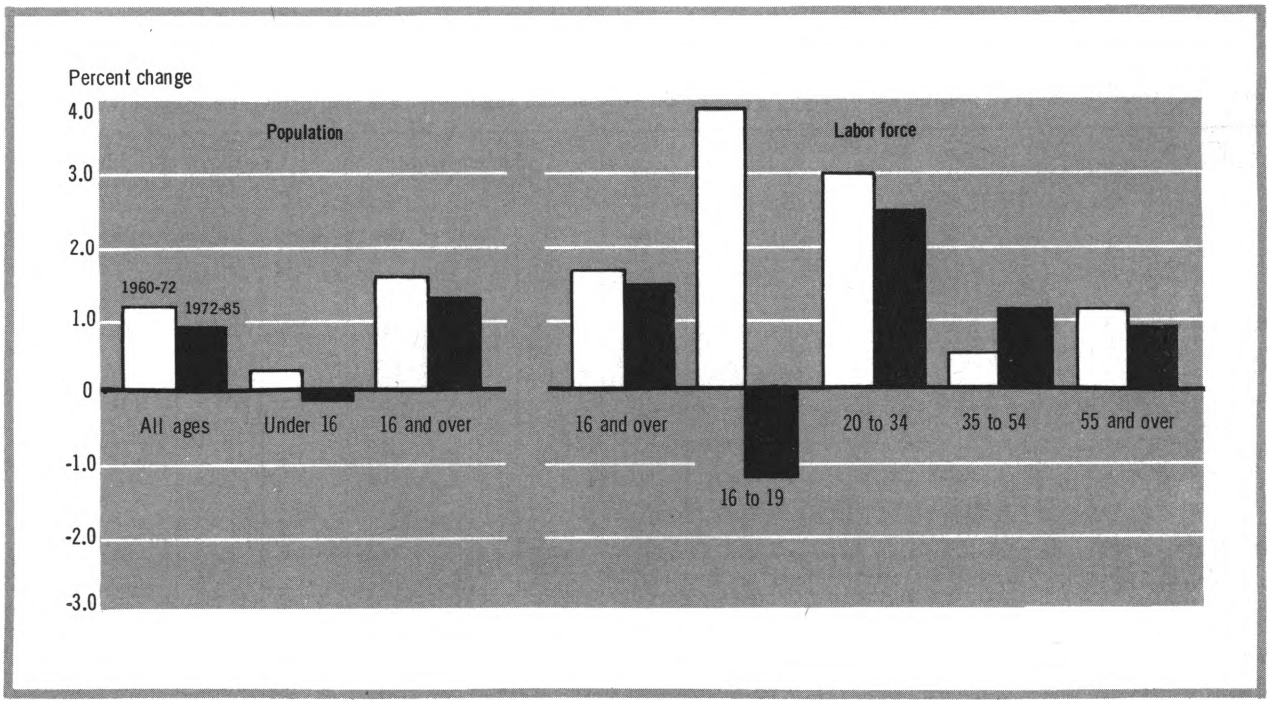
The observed and projected annual average rates of change in the population and total labor force are summarized in chart 1. A significant feature which emerges from these computations is that the labor force has grown more rapidly than the population during the 1960–72 period—an average increase of 1.7 percent a year compared with 1.2 percent a year. More recently (1968–72), this relative increase has been greater—2.0 percent for the labor force and 0.9 percent for the population. A similar disparity in growth is in prospect for the remainder of the current decade, with projected average annual growth rates of 1.7 percent in the labor force and 0.9 percent in the population. However, this disparity disappears early in the 1980's. Between 1980 and 1985, the average annual growth rate in the labor force is 1.1 percent compared with 1.0 percent for the population. This reduction in labor force growth relative to that of the population implies that the potential gains in per capita output which stem from a more rapid growth in labor force than in population will not be notable after 1980.[7]

Differences in the projected rates of change in the size of the several age groups in the labor force also suggest that programs and policies designed to meet emerging manpower problems should be developed in anticipation of the changing relative size of the several age-sex groups in the labor force, on the grounds that any group whose rate of growth is significantly higher than the overall average is likely to encounter (and to generate) certain strains at every stage in the working-life cycle.[8]

Projected education of workers

In March 1972, two-thirds of the people 16 years old and over in the civilian labor force had completed at least 4 years of high school, and nearly 1 worker in 7 had completed at least 4 years of college (chart 2). According to the latest projection, over 3 out of 4 persons in the civilian labor force will be high school graduates by 1985 (73 percent

Chart 1. Average annual rates of change in population and labor force, 1960–72 and 1972–85



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by 1980 and 77 percent by 1985). At that time nearly 1 worker in 5 will have completed 4 years of college or more.[9]

When fewer women were in the labor force, the educational attainment of women workers was, on average, considerably higher than that of the men. As more women enter the labor force, however, the educational distribution of women workers has become more similar to that of working men, as more women with only average amounts of schooling have been drawn into the labor force. For example, in March 1962, almost three-fifths of women workers had completed 4 years of high school or more compared with roughly half of working men. By March 1972, almost seven-tenths of women workers had that much schooling compared with well over three-fifths of male workers. This convergence is expected to continue; between March 1972 and 1985, the proportion of high school graduates among working men is projected to increase until it almost matches the proportion of women graduates —76.5 percent compared with 77.8 percent.

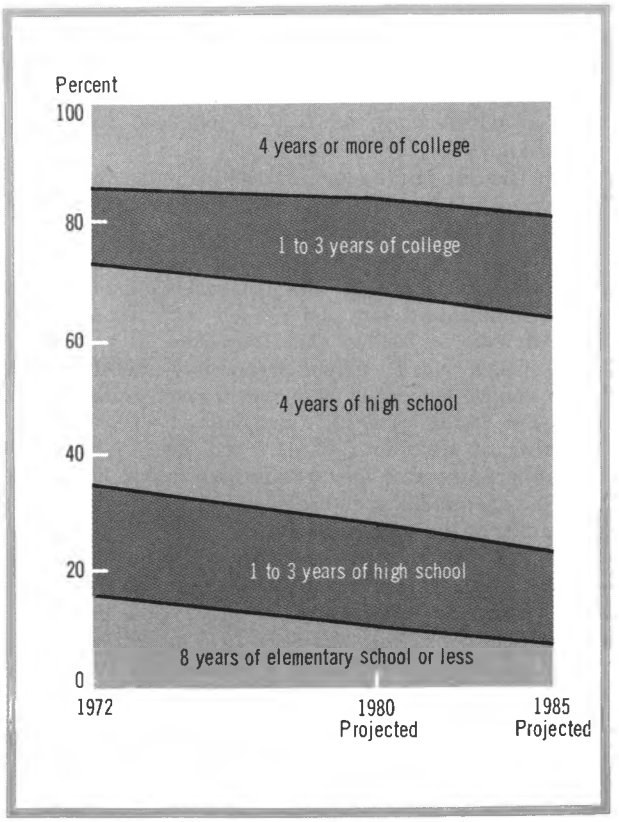
The outlook for the supply of workers at opposite extremes of the educational ladder is particularly significant. In accordance with long-term trends, both the number and the proportion of workers with 8 years or less of formal schooling is projected to decline rapidly, from about 1 worker in 7 in March 1972 to about 1 in 10 in 1980 and down to 1 in 13 by 1985. Numerically, they will drop from 12.8 million in 1972 to 10.0 million in 1980 and down to 7.9 million in 1985. In contrast, the number of workers with 4 years of college or more is projected to increase from 11.6 million in 1972 to 16.4 million in 1980 and 20.3 million in 1985, when they will account for nearly 1 in 5 workers in the labor force.

Workers with 1 to 3 years of high school (a group which has typically experienced particularly severe unemployment problems) are also projected to decline in number, but not until after 1980. In March 1972, 16.4 million workers fell in this category. By 1980, their number is projected at 17.3 million, and by 1985, at 16.4 million.

Workers with 4 years of high school completed constitute the largest group in the labor force—nearly 2 in 5 workers in 1972 and just over that in 1980 and 1985. However, the dramatic increase in the educational attainment of the labor force since World War II stems in large part from the enormous rise in the number of persons continuing their schooling beyond high school. In accordance with this long-term trend, the number of workers with 1 to 3 years of college is projected to increase from 11.6 million in 1972 to 15.8 million in 1980 and 18.1 million in 1985. Thus among those with at least 4 years of high school, the proportion of workers with 1 year of college or more increases from 41 percent in 1972 to 44 percent in 1980 and 47 percent in 1985.

The projected average annual rates of change in the number of workers with different amounts of education display even greater range than those of the several age groups in the labor force. Between March 1972 and 1985, the number of workers with 8 years or less of education is projected to decline by 3.6 percent a year, on average, while the number of college graduates rises an average of 4.2 percent a year over the same period. Thus, the supply of college graduates in the Nation's labor force is projected to increase at over 2½ times the rate of increase of the labor force as a whole. This rapid buildup, it should be noted, is not a new phenomenon; a similar disparity between the growing supply

Chart 2. Educational attainment of the civilian labor force, March 1972 and projected 1980 and 1985



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of the college educated and the growth of the labor force as a whole has been characteristic of the entire postwar period. Nevertheless, the expected continuation of this disparity suggests either the need for continued rapid expansion in the kinds of careers for which highly educated workers are qualified or the entry of many college-educated workers into occupations which did not formerly attract many college graduates.

In particular, the supply of women college graduates in the labor force, which is projected to grow by 4.7 percent a year, on average, to 1985, must be considered in the light of the anticipated stabilization of job opportunities in education and related fields. The full utilization of college-educated women may therefore require considerable movement into occupations formerly dominated by college-educated men. For such mobility to occur, it would be necessary for these types of occupations to expand at a pace considerably faster than the 4.0-percent annual rate needed merely to absorb the anticipated supply of male college graduates between now and 1985. If such a growth rate cannot be maintained, it is likely that employers will continue to upgrade the educational requirements of jobs which need to be filled so as to match the growing supply of highly educated workers. This upgrading would further limit the employment opportunities of noncollege jobseekers, and might, in addition, generate problems of underemployment and job dissatisfaction among workers whose formal education exceeds the actual requirements of their jobs.[10] □

———*FOOTNOTES*———

[1] The annual number of births rose steadily from 3.3 million in 1946 to a peak of nearly 4.3 million in 1961. Thereafter, it declined to less than 3.3 million in 1972. According to the fertility levels assumed in these projections (Series E), the annual number of births should again rise slowly, reaching about 4.3 to 4.4 million a year during the early 1980's.

[2] Even under Series E (with fertility remaining at the bare replacement level), the population continues to increase for about 70 years, though at a diminishing rate. See *Illustrative Population Projections for the United States: The Demographic Effects of Alternate Paths to Zero Growth, Current Population Reports, Population Estimates and Projections,* Series P-25, No. 480 (Bureau of the Census, 1972).

[3] The general fertility rate is defined as the number of birth occurring in a given calendar year per 1,000 women 15 to 44 years old at the midpoint of that year.

[4] Since all the projected population series assume the same trends in mortality and the same amount of net annual immigration, they differ solely with respect to the assumed level of fertility. The four series currently projected (C,D,E, and F) may therefore be identified in terms of the average number of births per woman: Series C=2.8, Series D=2.5, Series E=2.1, and Series F=1.8. Two earlier series of projections (A=3.4 and B=3.1) have now been dropped because they assume implausibly high levels of fertility for the near future. Since Series B is fairly representative of the average fertility of the "baby boom" period, the shift from that level to the current one is conveniently termed a shift from the "three child" to the "two child" norm. See *Projections of the Population of the United States, by Age and Sex: 1970 to 2020, Current Population Reports, Population Estimates and Projections,* Series P-25, No. 493 (Bureau of the Census, 1972).

[5] Denis F. Johnston, "The U.S. labor force: projections to 1990," *Monthly Labor Review,* July 1973, pp. 3–13, reprinted as Special Labor Force Report 156. These projections supersede those which were presented by Sophia C. Travis, "The U.S. labor force: projections to 1985," *Monthly Labor Review,* May 1970, pp. 3–12, and reprinted as Special Labor Force Report 119. Information by color or race, which was provided in the earlier report, is not yet available.

[6] The annual net growth in the labor force is expected to reach a peak in the late 1970's, when the peak birth cohort born in 1961 reaches the age of initial entry into the labor force.

[7] For further discussion of the implications of these prospective changes, see the chapter by Ronald E. Kutscher in this bulletin, pp. 27–42. For a brief discussion of alternative projections of labor force, see appendix 1 to this chapter.

[8] For further discussion, see the *Manpower Report of the President,* March 1973, chapter 3, "Population Changes: A Challenge to Manpower Policy," pp. 59–82. It is also argued, changes in the age-sex distribution of the labor force may exert some effect on the aggregate unemployment rate, apart from the recognized influence of demand conditions on total employment. Rough estimates of this effect can be obtained if we adopt some set of age-sex specific unemployment rates as a "standard" and if we grant the further simplifying assumption that the unemployment rate for each age-sex group is unaffected by changes in its relative size.

The results of such an exercise indicate that the changing age-sex distribution of the labor force may account for an increase of about 0.5 percentage points in the hypothetical total unemployment rate over the 1955–72 period. This effect is, of course, largely attributable to the heavy inflow of teenage and women jobseekers—groups having typically higher unemployment rates—during this period. If this exercise is extended over the projection period, the results indicate no significant change in the hypothetical total unemployment rate between 1972 and 1980, followed by a reduction of perhaps 0.2 percentage points between 1980 and 1985. These results were obtained by using as a "standard" the arithmetic average of the age-sex specific

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unemployment rates for the years 1956, 1965, and 1968, when the total unemployment rate was 4.1, 4.5, and 3.6 percent, respectively. These "standard" rates were then applied to the actual or projected age-sex distribution of the civilian labor force as of 1955, 1972, 1980, and 1985.

[9] Denis F. Johnston, "Education of workers: projections to 1990," *Monthly Labor Review,* November 1973, pp. 22–31, to be reprinted as a Special Labor Force Report. This article includes a description of the methods and assumptions employed in developing these projections.

[10] This matter is considered more fully in the chapter by Neal Rosenthal in this bulletin, pp. 18–26.

Appendix 1. Alternative Labor Force Projections

The number of alternative projections of the labor force, even if constrained by generally agreed upon notions of plausibility, is very large. However, the number of possible alternatives is reduced by the fact that the projected population of working age is not affected by postulated differences in fertility until the late 1980's. The number is further reduced if it is assumed that prevailing definitions of economic activity, employment, and unemployment remain unchanged. Nevertheless, the adoption of different methods or periods for extrapolating observed trends in labor force participation rates of the several age-sex groups in the population, or the construction of projection formulas or equation systems reflecting alternative theories as to the underlying causes of these observed trends could yield a virtually unlimited number of alternative projections.

Two sets of alternative projections are presented in this section. The first is designed to illustrate the estimated effect of postulated changes in fertility on the size of the female labor force in 1980 and 1985 (appendix table 1). The second is designed to demonstrate the effect of two alternative projections of the rates of labor force participation of each age-sex group over the same period (appendix table 2). In each set, the "basic" projection is included for purposes of comparison.

As shown in appendix table 1, the higher fertility of women implied by the Series D projection of population implies a higher proportion of women in each age group 16 to 49 years old who would have children under 5 years of age. This in turn implies, ceteris paribus, a higher proportion of women having the lower labor force participation rates associated with child-care responsibilities, so that the aggregate number of working women is lower than it would be if fertility levels were lower. The reverse effect is evident in the assumption of the lower fertility levels of the Series F projection of population. This series implies a lower proportion of women with young children, hence it yields a larger proportion having the higher labor force participation rates of women without young children to care for, so that the total number of working women is larger.

In 1980, a shift from the basic projection (Series E) to the higher fertility of Series D results in a total labor force of 101.1 million, nearly 700,000 below that of the basic projection. Alternatively, a shift to the lower fertility of Series F yields a total labor force of 102.2 million, about 360,000 larger than that of the basic projection. By 1985, the corresponding range is from 106.9 million (higher fertility) to 108.2 million (lower fertility). It is assumed here that the labor force rates of men and of women 50 and over are not affected by the postulated changes in fertility.

The range in the projected size of the total labor force (from higher to lower fertility—Series D to Series F), expressed as a percentage of the basic projection, is 1.0 percent in 1980 and 1.2 percent in 1985. Among women

Appendix table 1. Effect on alternative fertility assumptions on projected total labor force, 1980 and 1985 [1]

Sex and age	1980			1985		
	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
MEN						
Total, 16 years and over	62,590	62,590	62,590	66,017	66,017	66,017
WOMEN						
Total, 16 years and over	38,548	39,219	39,576	40,915	41,699	42,230
16 to 24 years	10,025	10,261	10,412	9,495	9,726	9,897
25 to 34 years	8,874	9,256	9,444	9,856	10,339	10,663
35 to 49 years	10,021	10,074	10,092	11,876	11,946	11,982
50 years and over	9,628	9,628	9,628	9,688	9,688	9,688

[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 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 article assume Series E.

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Appendix table 2. Alternative projections of total labor force 16 years old and over, by sex and age, 1980 and 1985

[Numbers in thousands]

Sex and age	1980			1985			Differences 1980		Differences 1985		Differences as a percent of basic projection 1980		1985	
	Basic projection (1)	Model A: Constant 1969–71 rates (2)	Model B: projected 1955–72 rates (3)	Basic projection (4)	Model A: Constant 1969–71 rates (5)	Model B: projected 1955–72 rates (6)	Columns (1)–(2) (7)	Columns (1)–(3) (8)	Columns (4)–(5) (9)	Columns (4)–(6) (10)	Columns (7) ÷ (1) ×100 (11)	Columns (8) ÷ (1) ×100 (12)	Columns (9) ÷ (4) ×100 (13)	Columns (10) ÷ (4) ×100 (14)
BOTH SEXES														
Total, 16 years and over	101,809	100,408	101,892	107,716	105,811	108,224	1,401	−83	1,905	−508	1.38	−0.08	1.77	−0.47
MEN														
Total, 16 years and over	62,590	63,858	61,898	66,017	67,679	64,644	−1,268	692	−1,662	1,373	−2.02	1.10	−2.52	2.08
16 to 19 years	4,668	4,824	4,686	3,962	4,131	3,954	−156	−18	−169	8	−3.34	−.38	−4.26	.20
20 to 24 years	8,852	9,055	8,766	8,496	8,748	8,330	−203	86	−252	166	−2.29	.97	−2.97	1.95
25 to 34 years	17,523	17,616	17,432	19,400	19,540	19,235	−93	91	−140	165	−.53	.52	−.72	.85
35 to 44 years	11,851	11,921	11,817	14,617	14,734	14,543	−70	34	−117	74	−.59	.29	−.80	.51
45 to 54 years	9,908	10,016	9,826	9,744	9,883	9,605	−108	82	−139	139	−1.09	.83	−1.43	1.43
55 to 64 years	7,730	7,947	7,613	7,716	8,000	7,487	−217	117	−284	229	−2.81	1.51	−3.68	2.97
65 years and over	2,058	2,479	1,758	2,082	2,643	1,490	−421	300	−561	592	−20.46	14.58	−26.94	28.43
WOMEN														
Total, 16 years and over	39,219	36,550	39,994	41,699	38,132	43,580	2,669	−775	3,567	−1,881	6.80	−1.98	8.55	−4.51
16 to 19 years	3,669	3,528	3,620	3,203	3,027	3,146	141	49	176	57	3.84	1.34	5.49	1.78
20 to 24 years	6,592	5,953	6,524	6,523	5,751	6,578	639	68	772	−55	9.69	1.03	11.84	−.84
25 to 34 years	9,256	8,222	9,260	10,339	9,048	10,764	1,034	−4	1,291	−425	11.17	−.04	12.49	−4.11
35 to 44 years	6,869	6,499	7,128	8,560	7,921	9,074	370	−259	639	−514	5.39	−3.77	7.46	−6.00
45 to 54 years	6,537	6,243	6,933	6,542	6,130	7,137	294	−396	412	−595	4.50	−6.06	6.30	−9.10
55 to 64 years	5,057	4,795	5,307	5,213	4,840	5,610	262	−250	373	−397	5.18	−4.94	7.16	−7.62
65 years and over	1,239	1,310	1,222	1,319	1,415	1,271	−71	17	−96	48	−5.73	1.37	−7.28	3.64

workers, the corresponding range amounts to 2.6 percent in 1980 and 3.2 percent in 1985.

The second set of alternative projections, shown in appendix table 2, demonstrates the implications of two different assumptions with respect to future rates of labor force participation. Model A assumes that the labor force participation rate of each age-sex group remains constant at the average of the actual 1969–71 levels. This model is primarily useful in illustrating the effect of the changing size and age-sex distribution of the projected population on the projected labor force. Model B employs projected rates of labor force participation obtained by linear least-squares extrapolation of the observed participation rates of each age-sex group over the 1955–72 period.

Viewed in the aggregate, the basic projection is less than 0.1 percent below that which would result from linear extrapolation to 1980, and only 0.5 percent below the linear model in 1985. In contrast, the basic projection is 1.4 percent above the constant rate model in 1980, and 1.8 percent above it in 1985. However, these net effects mask the considerably larger deviations among men and women in the labor force—deviations which tend to be mutually counteracting. For example, by 1985, the basic projection of the male labor force is nearly 1.7 million below that of the constant rates model (Model A) and nearly 1.4 million higher than that of the linear extrapolation (Model B). Conversely, the basic 1985 projection of the female labor force is nearly 3.6 million larger than Model A, and 1.9 million smaller than Model B.

Additional research is planned on this subject in the future, with the aim of developing a number of more detailed and realistic alternatives than the illustrative examples shown here. □

Appendix 2. Assumptions and Methods

The Series E population projection reflects the assumption that the cohort of women now beginning their childbearing experience, and all future cohorts, will have, on average, 2.1 children per woman. It assumes, further, that older cohorts of women who have already begun childbearing will record levels of fertility such that their own average completed family size will gradually approach the 2.1 norm. It also assumes a gradual but steady reduction in mortality rates and a net annual immigration of 400,000 persons. As noted previously, only the latter two factors can have any effect on the size of the population of working age before the late 1980's. Nevertheless, variation in any of these fundamental demographic processes can have a considerable effect on population size over time. For

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example, under the Series E assumption, the total growth of the U.S. population between 1972 and the year 2000 amounts to about 56 million, of which about one-fourth is attributable to the flow of immigrants and the birth of their offspring. Thus, a reduction of, say, 40 percent in the volume of immigration would reduce total population growth by about 10 percent.

As noted previously, variations in the birth rate cannot affect the size of the population of working age prior to the late 1980's, but they can have a significant impact on the size of the labor force, via changes in the proportion of women of childbearing age who have pre-school age children to care for.[1]

The labor force projections reflect anticipated changes in the demographic composition of the population of working age, together 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 changes in the size and age-sex distribution of the population; projected changes in participation rates play a relatively minor role. The projections assume no drastic changes in the propensity of various 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 leave the labor force or which would alter the prevailing definitions of "labor force," "employment," or "unemployment." Unless otherwise specified, the projections relate to the total labor force 16 years old and over, comprising the civilian labor force plus the Armed Forces. The assumed size of the Armed Forces in 1980 and 1985 is 2 million—1,960,000 men and 40,000 women. Thus, as will be indicated in the other articles in this issue, the 1980 projected total labor force of 101,809,000 implies a civilian labor force of 99,809,000. The further assumption of an unemployment rate of 4 percent yields a total employment figure (on the persons concept) of 95,817,000.[2] □

———*APPENDIX FOOTNOTES*———

[1] For further details, see Johnston, "The U.S. labor force: projections to 1990."

[2] Additional information on these underlying assumptions is provided in the chapter by Jack Alterman in this bulletin, pp. 3–7.

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Chapter 2. Projected Changes in Occupations

NEAL H. ROSENTHAL

MOST LONG-TERM trends in the employment of white-collar, blue-collar, service, and farm workers are expected to continue over the next dozen years, but some important changes will occur in the mix of occupations within these broad categories, according to Bureau of Labor Statistics projections of the U.S. economy to 1985. Technological changes will cause employment to increase in some occupations and to decrease in others. The spread of the computer will continue to be a notable example of this. Also, differences in industrial growth will boost some occupations (for example, those in the health field); while others grow more slowly than in the recent past (the educational field) and still others continue to decline relatively (mining jobs). Another phenomenon is a potential supply that is greater than potential requirements for college graduates beginning in the late 1970's in jobs traditionally held by these workers.

Total employment is expected to increase about a quarter between 1972 and 1985, going from almost 82 million to over 101 million (based on a count of employed persons).[1] (See tables 1 and 2.) Expected changes for major occupational classifications are shown in table 3.

Many factors will cause changes in employment levels of major occupational groups and specific occupations. One of the greatest will be variation in growth rates among industries. Each has a different occupational structure. For example, the health services industry employs mostly physicians, nurses, hospital attendants, and other health workers. A rapid growth in this industry would logically result in rapid growth of health occupations.

Another factor that affects occupational employment is changes in the occupational structure within an industry. These may be caused by technological innovations in machines or procedures. As a result, individual occupations may expand or contract and new occupations often emerge. For example, the computer resulted in the emergence of programmers, systems analysts, and computer operators but contributed to the decline in relative importance of payroll and inventory clerks and a variety of other clerical occupations. Changes in business operations, such as a shift to self-service in stores and supply-demand conditions in an occupation, can also alter the occupational structure of industries. For example, technicians have been substituted for engineers during periods of engineering shortages.

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Growth among white-collar groups

Professional and technical. Employment growth in this major group will continue to be faster than all others, from 11½ million in 1972 to about 17 million by 1985. This is about one and one-half times the annual rate of employment increase projected for all occupations combined. (See table 4.) Despite this, the projected 1972–85 growth is slower than it was between 1960 and 1972. A major reason for this is the expected slowdown in the growth of jobs for elementary and secondary school teachers and engineers (which accounted for over one-fourth of all professional workers in 1972). Opportunities for teachers will slow because growth in the number of pupils will moderate. The rate of increase in engineers' jobs, rapid in the 1960's largely as a result of expanded space exploration and increased research and development, will be reduced because these activities are not expected to have a comparable effect through the mid-1980's. As is the case with all major occupational groups in these projections, the annual rate of growth is expected to be slower between 1980 and 1985 (2.5 percent) than from 1972 to 1980 (3.5 percent) as the slowdown in the rate of growth of the economy also has its effect.[2]

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Growth in demand for goods and services, resulting from population growth and rising business and personal incomes, will continue to be a major reason underlying job growth among these highly trained workers. As the population continues to concentrate in metropolitan areas, requirements are expected to increase for professional and technical workers in environmental protection, urban renewal, and mass transportation. Requirements for professional workers also should increase because of continuing growth of research in the natural and social sciences, although the rate of growth in these activities as a whole is likely to slow from the very rapid pace of the 1960's. Demand for professional workers to develop and use computer resources also is expected to grow rapidly in the 1972–85 period.

Managers and administrators. Employment in this occupational group is projected to reach 10½ million in 1985, up from 8 million in 1972, representing a much higher average annual rate of growth than occurred during the 1960–72 period. However, a large part of the future growth reflects a catchup because little change in managerial and administrative employment occurred between 1968 and 1972 although total employment increased. The slowdown in growth from 1980 to 1985 largely reflects the deceleration in the rate of growth of trade, a major employer of managers with about two-fifths of the total in 1972.

Table 1. Employment by major occupational group, 1960 and 1972, and projected 1980 and 1985

[in thousands]

Occupational group	1960[1]	1972	1980	1985
Total	65,778	81,703	95,800	101,500
White-collar workers	28,351	39,092	49,300	53,700
Professional and technical workers	7,236	11,459	15,000	17,000
Managers and administrators	7,367	8,032	10,000	10,500
Sales workers	4,210	5,354	6,300	6,500
Clerical workers	9,538	14,247	17,900	19,700
Blue-collar workers	23,877	28,576	31,800	32,800
Craft and kindred workers	8,748	10,810	12,300	13,000
Operatives[2]	11,380	13,549	15,000	15,300
Nonfarm laborers	3,749	4,217	4,500	4,500
Service workers	8,354	10,966	12,700	13,400
Private household workers	1,965	1,437	1,300	1,100
Other service workers	6,387	9,529	11,400	12,300
Farm workers	5,196	3,069	2,000	1,600

[1] Data for 1960 were adjusted to reflect the occupational classification in the 1970 census to make it comparable to the 1972 and projected 1980 and 1985 data.

[2] Includes the 1970 census classification, operatives, except transport and transport equipment operatives.

NOTE: Details may not add to totals because of rounding.

Table 2. Percent distribution of employment, by major occupational group, 1960 and 1972, and projected 1980 and 1985

Occupational group	1960[1]	1972	1980	1985
Total	100.0	100.0	100.0	100.0
White-collar workers	43.1	47.8	51.5	52.9
Professional and technical workers	11.0	14.0	15.7	16.8
Managers and administrators	11.2	9.8	10.5	10.3
Sales workers	6.4	6.6	6.6	6.4
Clerical workers	14.5	17.4	18.7	19.4
Blue-collar workers	36.3	35.0	33.1	32.3
Craft and kindred workers	13.3	13.2	12.8	12.8
Operatives[2]	17.3	16.6	15.6	15.1
Nonfarm laborers	5.7	5.2	4.7	4.4
Service workers	12.7	13.4	13.3	13.2
Private household workers	3.0	1.8	1.3	1.1
Other service workers	9.7	11.6	12.0	12.1
Farm workers	7.9	3.8	2.1	1.6

[1] Data for 1960 were adjusted to reflect the occupational classification in the 1970 census to make it comparable to the 1972 and projected 1980 and 1985 data.

[2] Includes the 1970 census classification, operatives, except transport and transport equipment operatives.

Changes in business size and organization have caused the number of salaried managers to go up while numbers of self-employed managers have declined. Requirements for the salaried are expected to continue to grow rapidly as industry and government increasingly depend on them. Technology will also contribute to their employment growth. For example, an increasing number of technically trained managers will be needed to administer research and development programs and to make decisions on the installation and use of automated machinery and automatic data processing systems.

By contrast, the number of self-employed managers (proprietors) are projected to continue to decline as the trend toward larger firms continues. The expansion of quick-service grocery stores, self-service laundries and drycleaners, and hamburger and frozen custard drive-ins, however, is expected to slow the rate of decline.

Clerical workers. Employment in clerical jobs is expected to grow faster than total employment, rising to almost 20 million in 1985 from over 14 million in 1972. Among the major occupational groups, only professional workers' jobs are expected to grow faster. Nevertheless, the clerical rate of growth is slower than that during 1960–72. The slower annual rate of growth from 1980 to 1985 will be largely because of a projected slowdown in the rate of growth of trade and manufacturing, which combined employed about one-third of all clerical

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workers in 1972. However, the projected decline in the 1980–85 growth rate is expected to be less for clerical workers than most major groups.

Clerical workers, the largest major occupational group in 1972, will be greatly affected by developments in computers, office equipment, and communication devices—all of which are expected to retard the growth of employment for some clerical occupations and increase it for others. For example, the use of computers and bookkeeping machines to handle routine, repetitive work is expected to reduce the utilization of clerks in filing, payroll computation, inventory control, and customer billing. On the other hand, the number of clerical workers needed to prepare material for the computer is projected to increase greatly.

Other types of clerical workers, however, are unlikely to be affected significantly by technology. For example, secretaries, typists, and receptionists and others whose tasks involve contact with the public should not be greatly affected. Increased use of secretaries, typists, and receptionists in industries that employ large numbers of them, such as miscellaneous business services and legal services, is projected to account for a growth of 2.5 million during 1972–85 or about half the total growth in the group over this period.

Sales workers. The anticipated expansion of trade is expected to increase the need for sales workers, while changing techniques in merchandising are expected to hold down some of the increase. Employment is projected to rise about 1 million from 1972 to 1985, but the rate of increase is slower than that expected in total employment. As a result, their share of total employment is projected to decrease slightly (0.2 percent). The projected 1972–85 rate of growth, slower than that experienced by this group over the 1960–72 period, is caused by the projected slower growth of trade which employs over two-thirds of all sales workers. The annual rate of growth of sales workers is expected to be slower between 1980–85 than between 1972–80, also following the trend in employment in trade. As stores remain open longer and expand into suburban areas, an increase in demand is expected for retail salesworkers who account for about half of all workers in the group. However, changes in merchandising techniques, such as increased use of self-service, checkout counters, and vending machines will retard the increase.

Table 3. Expected changes in major occupational classifications, 1972–85

Classification	1972		1985		Percent change, 1972–85
	Number of jobs (in millions)	Percent	Number of jobs (in millions)	Percent	
Total employment	81.7	100.0	101.5	100.0	24
White-collar workers	39.1	47.8	53.7	52.9	37
Blue-collar workers	28.6	35.0	32.8	32.3	15
Service workers	11.0	13.5	13.4	13.2	22
Farm workers	3.1	3.8	1.6	1.6	—47

Growth among blue-collar groups

Craft and kindred workers. Employment in these highly skilled blue-collar occupations is expected to rise from just under 11 million in 1972 to 13.0 million in 1985, a slower rate of growth than over the 1960–72 period. Because of the unusual growth in the number of construction craftworkers and mechanics from 1971 to 1972, the rate of increase from 1972 is somewhat slower than the long-term trend.

The rising demand for these workers is expected to stem from the growth in the two major industry groups that employ large numbers of craftworkers—manufacturing and construction. Construction activity has a major effect on the number of craftworkers because 1 out of every 2 workers in this industry is in this group. Expected requirements for construction craftworkers are projected to account for about one-third of the total growth. Because of its much larger size, manufacturing, in which about 1 in 5 is a craftworker, employs about the same number of craftworkers as construction.

Operatives. More blue-collar workers are in this group than in any other. Employment of operatives is projected to rise from 13½ million in 1972 to over 15 million in 1985, a much slower rate of increase than that for total employment. Consequently, the proportion of operatives relative to total employment is expected to slide downward about a percentage point by 1980 and another half point by 1985. Between 1980 and 1985, employment of operatives is expected to grow very slowly, about one-third the rate expected during 1972–80. This reflects the expected slowing down of the growth rate in manufacturing. Three of every five semi-

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Table 4. Average annual rate of employment change by major occupational group, 1960–1972 (actual) and 1972–85 (projected)

Occupational group	1960–72	1972–80	1980–85	1972–85
Total	1.8	2.0	1.2	1.7
White-collar workers	2.7	3.0	1.7	2.5
Professional and technical workers	3.9	3.5	2.5	3.1
Managers and administrators	.7	2.8	.8	2.0
Sales workers	2.0	2.1	.5	1.5
Clerical workers	3.4	2.9	1.9	2.5
Blue-collar workers	1.5	1.3	.7	1.1
Craft and kindred workers	1.8	1.6	1.2	1.4
Operatives	1.5	1.6	.5	1.0
Nonfarm laborers	1.0	.7	0	.4
Service workers	2.3	1.9	1.0	1.6
Private household workers	−2.6	−1.7	−3.4	−2.4
Other service workers	3.4	2.4	1.4	2.0
Farm workers	−4.5	−5.4	−4.4	−5.0

NOTE: All data reflect the occupational classification into major groups used in the 1970 Census. However, operatives, except transport and transport equipment operatives, were combined into one group in this article.

skilled workers in 1972 were employed as operatives in manufacturing. Large numbers were assemblers or inspectors, and many worked as operators of material-moving equipment such as powered forklift trucks. Among the operatives employed outside factories, drivers of trucks, buses, and taxicabs made up the largest group. Through the projected period, sophisticated technological advances are expected to greatly slow employment growth for operatives.

Nonfarm laborers. Employment requirements for laborers are expected to increase slowly between 1972 and 1985, despite the employment rise anticipated in manufacturing and construction, the two industries which employ two-fifths of laborers. This reflects a change from the 1960–72 period when employment of laborers increased nearly 1 percent a year.

Increases in demand for laborers are expected to be offset roughly by rising output per worker resulting from the continuing substitution of machinery for manual labor. For example, power-driven equipment such as forklift trucks, derricks, cranes, hoists, and conveyor belts will take over more of the handling of materials in factories, at freight terminals, and in warehouses. Other power-driven machines will do excavating, ditch digging, and similar work. In addition, integrated systems for processing and handling materials and equipment will be installed in an increasing number of plants.

Service workers

A growing population, expanding business activity, increasing leisure time, and rising levels of disposable personal income are the major factors underlying increased needs for service workers. These occupations encompass a wide variety of jobs and skills. They include such diverse jobs as FBI agent, police officer, beauty operator, and janitor.

Employment of service workers is projected to rise from 11 million in 1972 to over 13 million in 1985, a somewhat slower rate of growth than that projected for total employment. Employment of private household workers, however, which make up a large part of this major group, is projected to decline from 1.4 million to 1.1 million. If private household workers are excluded from the calculations, service workers show a faster rate of growth (29.1 percent) than total employment.

The projected 1972–85 rate of growth of service workers (including private household workers) is slower than that experienced over the 1960–72 period. However, growth between 1960 and 1972 was greatly affected by the very rapid expansion during the 1969–72 period. The projected 1972–80 growth rate is near that experienced over the 1960–69 period. Between 1980 and 1985, the growth rate is expected to be slower than in the 1972–80 period because of the projected slowdown in the rate of growth in the service industries, which employ about two-thirds of these workers.

Farm workers

These workers, who make up nearly 90 percent of all workers in agriculture,[3] are expected to decline nearly one-half (3.1 million in 1972 to 1.6 million in 1985). This represents a somewhat faster rate of decline than in the 1960–72 period. Consequently, their share of total employment also is expected to fall between 1972–85 from 3.8 percent to 1.6 percent. The annual rate of decline is expected to be slower between 1980 and 1985 (–4.4 percent) than from 1972 to 1980 (–5.4 percent).

Declining needs for farm workers continue to be related to rising productivity on farms. Improved machinery, fertilizers, seeds, and feed will permit farmers to increase output with fewer employees. For example, improved mechanical harvesters for vegetables and fruits will decrease the need for seasonal or other hired labor. Developments in pack-

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ing, inspection, and sorting systems for fruits, vegetables, and other farm products also will reduce employment requirements.

Net occupational openings

Projections of growth of occupations provide only partial insight into the story of future manpower requirements. Of equal (if not greater) importance is the demand for new workers created by the necessity of replacing workers who retire or die. Over the 1972–85 period about twice as many openings will result from replacements as from growth. Over 61 million openings will occur due to occupational growth and replacement needs during 1972–85, an average of about 4.7 million jobs annually. Of these, replacement needs will account for 2 of every 3 job openings. (See table 5.)

Replacement needs will be the most significant source of job openings in each of the major occupational areas—white collar, blue collar, service, and farm. However, in individual occupations expected to increase rapidly, growth requirements are likely to exceed those for replacement. On the other hand, replacement needs are likely to exceed the average in those occupations that (a) employ many women, who frequently leave the labor force to assume family responsibilities, and (b) have a large proportion of older workers who have relatively few years of working life remaining.

Implications for trained manpower

In the past two decades, the rise in the educational level of the labor force was paralleled by rising educational requirements of jobs. This was reflected in a more rapid growth of the major occupational groups with the highest educational attainment. The major apparent gaps were a shortfall of college graduates trained to work in engineering, scientific, teaching, and medical professions during the late 1950's to the mid-1960's. In looking to the future, the question arises as to whether the increasing educational attainment of the population will continue to be matched by an increase in the educational requirements for satisfactory employment. Despite this concern, there is little doubt that employers are seeking people with higher levels of education because many jobs are more complex and require greater skill. Examples of this increasing complexity are the introduction into health occupations of complicated equipment for chemical analysis, and use of more highly sophisticated equipment in occupations in offices, banks, insurance companies, and government.

A great many of the implications of the new projections stem from the projected supply-demand picture for college graduates. United States colleges and universities—principal suppliers of the country's most trained manpower—are expected to continue turning out record numbers of graduates through the mid-1980's. (See chart 1.) The U.S. Office of Education has projected that a total of 20.1 million degrees will be awarded over the 1972–85 period,[4] including first professional.[5]

Degree	*Number awarded from 1972–85 (millions)*	*Percent increase, 1972–85*
Total	20.1	46
Bachelor's	14.6	44
Master's	4.0	41
Doctorate	.6	66
First professional	.9	85

Not all degree recipients, however, can be considered part of the effective new supply of college-educated workers. Most master's and doctorate degree recipients are employed before receiving their advanced degrees and are already considered part of

Table 5. Job openings[1] by major occupational group, 1972–85

[In thousands]

Occupational group	Total	Growth	Replacement
Total	61,200	19,800	41,400
White-collar workers	38,800	14,600	24,200
Professional and technical	12,000	5,600	6,400
Managers, officials, and proprietors	5,900	2,400	3,500
Sales workers	3,800	1,100	2,700
Clerical and kindred	17,000	5,400	11,600
Blue-collar workers	13,800	4,200	9,600
Craft and kindred workers	5,300	2,200	3,100
Operatives[2]	7,200	1,800	5,500
Nonfarm laborers	1,300	200	1,000
Service workers	8,500	2,400	6,100
Private household workers	700	−400	1,100
Other service workers	7,800	2,800	5,000
Farm workers	100	−1,400	1,500

[1] Resulting from occupational growth and replacement of workers who leave the labor force.

[2] Includes the 1970 census classification, operatives, except transport and transport equipment operatives.

NOTE: Details may not add to totals because of rounding.

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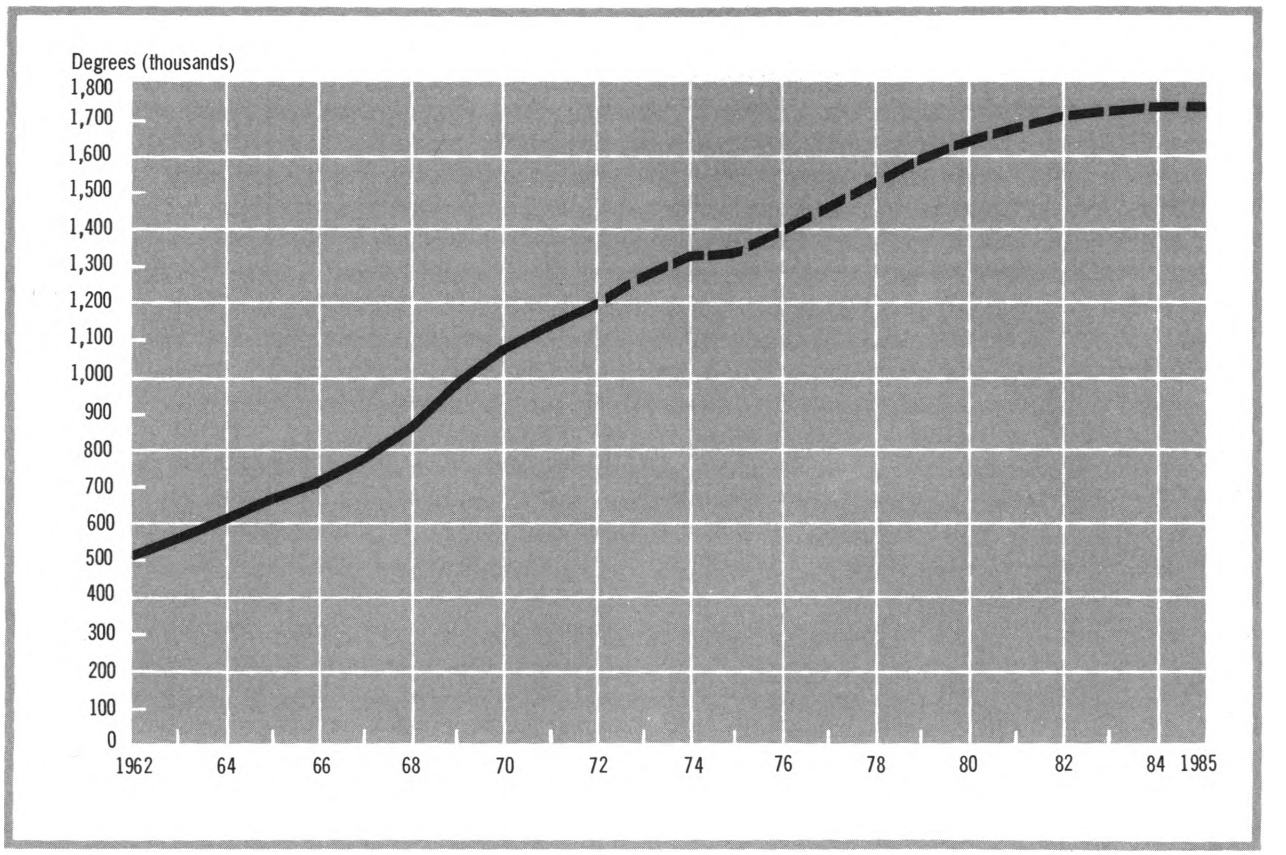
Chart 1. Total degrees awarded, 1962–72, and projected degrees, 1972–85



Source: U.S. Office of Education.

the existing supply of college-educated workers. Other degree recipients, especially at the bachelor's level, delay entry to the labor force to continue their education, enter the Armed Forces, or become full-time housewives.

Relying on past patterns of entry into the labor force, we can estimate 13.2 million persons will enter the civilian labor force between 1972 and 1985 upon receiving their degrees; 11.2 million at the bachelor's level, 1.2 million at the master's, approximately 20,000 at the doctorate level, and 750,000 recipients of first professional degrees. (See table 6.)

In addition, the supply of new graduates will be augmented by more than 2.0 million persons with college-level training who will come into the labor force between 1972 and 1985. These expected additions will consist of over 900,000 immigrants and delayed entrants and reentrants to the labor force —primarily women who delayed seeking a job or who were working in earlier years but withdrew from the labor force—and nearly 1.2 million persons entering the civilian labor force after separation from the military. The new supply of college-educated manpower expected to enter the labor force from 1972–85 will total about 15.3 million.

Job opportunities for college-educated workers will stem generally from three sources: growth in employment of occupations currently requiring a college degree for entry, the need to replace workers in such occupations who die, retire, or leave the

Table 6. Projected supply of college graduates, 1972–85

[In thousands]

Source of entrants	1972–85	1972–80	1980–85
Total	15,250	8,850	6,400
New college graduates	13,170	7,540	5,630
Bachelor's	11,200	6,405	4,795
Master's	1,220	700	520
Doctor's	20	10	10
First professional	750	425	325
Military separations	1,150	750	400
Others	910	560	350

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labor force for other reasons, and the trend toward hiring college graduates for jobs once performed by workers with less educational attainment.

An analysis of growth, replacement, and rising entry requirements indicates that 14.5 million new college graduates will be needed between 1972 and 1985: 7.7 million to take care of occupational growth and rising entry requirements, and 6.8 million for replacements. The following tabulation (in millions) shows proportions for selected periods:

	1972–85	*1972–80*	*1980–85*
Total	14.5	8.8	5.7
Growth	7.7	5.0	2.7
Replacements	6.8	3.8	3.0

Thus, the available supply, 15.3 million, will be about 800,000 above projected job requirements. This prospective situation will affect workers across the entire occupational spectrum.

The situation in which potential supply is greater than prospective requirements is projected to be more acute in 1980–85 than in 1972–80. The prospective "gap" is roughly 100,000 for the 1972-80 period and 700,000 for the 1980–85 period, or 140,000 a year. The widening of the gap arises from the expected slowdown in the rate of growth of the economy in the later period and not from an accelerated increase in degree recipients. In fact, the rise in the number of degree recipients will slow over 1980–85. The average number of degrees granted annually over 1972–80 is expected to be almost 70 percent or 585,000 higher than the previous 10 years' average. But over 1980–85, degrees granted will average only 19 percent or 277,000 higher than in 1972–80. (See table 7.) However, job openings in 1980–85 are expected to rise at an even slower rate—by 4 percent annually, or barely 50,000 a year more than the average in 1972–80.

The data have implications for what has been described statistically as "rising entry requirements."

Table 7. Average annual number of earned degrees, actual 1962–72, and projected for selected periods, 1972–85

Period	Total	Bachelor's	Master's	Doctor's	First professional
1962–72	855,900	633,000	166,500	22,800	33,600
1972–80	1,441,100	1,043,500	292,100	44,700	67,200
1980–85	1,718,200	1,248,600	333,800	55,000	80,900
1972–85	1,547,700	1,122,400	304,200	48,600	74,700

There are job-related reasons why employers will require increasing proportions of workers in many occupations to have a college degree. However, employers have traditionally preferred to hire persons with the highest educational qualifications available, especially for white-collar jobs, even when the educational attainment of the individual hired is above that really needed to perform the job. Thus, college graduates are expected to continue to have a competitive advantage over those with less education in competing for employment. Despite the apparent surplus of college graduates for the 1980–85 period, which is generated by statistics based on past patterns, it is unlikely that the unemployment rate of college graduates will be affected significantly. Rather, it is likely that college graduates will obtain jobs previously held by individuals with less than 4 years of college. In general, graduates have reacted to changes in the job situation in the past by taking the best available job, and there is no reason to assume that this will change. Problems for college graduates will more likely be underemployment and job dissatisfaction, resulting in increasing occupational mobility rather than unemployment.

The apparent abundance of college graduates as a whole does not imply that all supply-demand imbalances in the professions will be eliminated. Much depends on the number of students who prepare for each professional field. This will depend not only on the choices students make, but also on the capacity of schools of medicine, engineering, and other fields where the number of students that can be accommodated is relatively inflexible over the short run.

It is difficult to predict the number of job opportunities in a given field in relation to the number of individuals who will choose careers in the field, but it is useful to trace what would happen if recent trends in the number of students who elect to study and enter each field continued through the mid-1980's. Extrapolation of past experience indicates potential sharp differences in supply-demand situations among occupations. For example, if past trends continue, personnel shortages can be anticipated in some professions, notably medicine, chemistry, and engineering, along with pronounced oversupply in others, particularly teaching and the biological sciences. Imbalances of this kind may be intensified unnecessarily, if shortrun job situations are allowed to outweigh the long-range employment outlook in making educational and career decisions. In engineering, for example, freshman enrollments

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dropped 11 percent between 1970 and 1971, according to data of the Engineers Joint Council. Yet manpower requirements are expected to rise substantially in engineering over the 1970–80 decade as a whole, implying a replay of the 1960's scarcity of personnel in the profession unless the downtrend in enrollments is quickly ended.

By contrast, indications are that the softened demand for Ph. D.'s which characterized the employment situation in the last few years may not improve as the decade progresses. Projections of the National Science Foundation suggest that the oversupply of Ph. D.'s in the sciences and engineering could range between 15,000 and 60,000 by 1980.[6] Other studies [7] have indicated that the country may produce more Ph. D.'s in all fields than will be required. As with college graduates in general, a greater number of Ph. D.'s than available jobs traditionally requiring the degree implies underemployment, if employed in the occupational area for which the Ph. D.'s trained, or the necessity for Ph. D.'s to shift to another occupation with a better supply-demand situation. The result in either case is likely to be job dissatisfaction, however, rather than unemployment. However, this does not mean employment problems will not exist. There is some evidence that employers in private industry may not want to employ scientists and engineers with Ph. D.'s in jobs not requiring that level of education.[8] They may not want to hire workers who will be dissatisfied and leave their jobs or who require too high a salary compared to lesser trained workers who can perform the same job.

The availability of more college-trained workers is expected to have an adverse effect on many of the less educated. It is likely to mean that, in the future, workers with less than a college education will have less chance of advancing to professional positions, as many could do in the past, particularly in professions such as engineering and accounting. They will also have less opportunity for promotion to higher level positions in sales, managerial, and some clerical and service occupations. This is essentially a problem of credentials. If the required educational qualifications for a job rise more rapidly than the actual education required to perform the job, the availability of more college-educated workers will limit advancement of workers with fewer years of schooling. Such situations are very likely in sales.

College graduates, however, will not be in a more favorable position in all occupations. In the crafts, workers in greatest demand will be those who have vocational training rather than a college education; as in the past, persons with college degrees will make little inroad in the crafts. Similarly, employers seeking operatives and laborers will be reluctant to hire college graduates except for some part-time or temporary jobs because of the obvious potential for job dissatisfaction. Moreover, in another broad occupational area closely related to professional work—paraprofessional and technical work—college graduates are likely to face stiffer competition. Community and junior colleges and other postsecondary schools have proven they can train workers for many occupations in this category through 2-year programs or less, and the number of students completing these career educational programs is expected to increase even more rapidly than college graduates.

Based on a continuation of trends, it is projected that only about one-fourth (23.7 percent) of all openings over the 1972–85 period would require 4 years of college or more. However, trends indicate that a somewhat greater proportion of entrants to the labor force will have such training. Thus, the continuing emphasis on higher education could pose a threat to the flow of energetic, intelligent manpower to manual occupations. If continued, this emphasis could result in job dissatisfaction for those who out of necessity enter manual jobs and make it difficult for employers to fill many of the less desirable jobs. This could result in a greater proportion of college graduates seeking self-employment in their field, perhaps as a consultant or in a private research agency, rather than accepting a job in another occupation.

Another condition which may arise is that young people in high school will become aware of the plight of new college graduates who are not able to enter the field of their choice and, thereby, change their aspiration for a college education. Because current society esteems a college degree and recognizes the benefit of a college education to aspects of life other than work, such changed aspirations are not anticipated in great numbers. The complexity of the problem suggests the need for growing emphasis on vocational guidance to provide young people with the background needed to make a satisfactory choice for education and career. □

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FOOTNOTES

[1] Statistics on employment in this chapter are based on the concept used in the Current Population Survey in which each individual is counted once in his major occupation. The data for total employment here, therefore, differ from the data in the chapter in this bulletin by Ronald E. Kutscher, pp. 27–42, which presents a count of jobs. Since a worker may hold more than one job, the job count data is greater than that presented here. Additional differences between the totals occur because the job count is based primarily on data from a survey of establishments collected by State agencies in a cooperative program with the Bureau of Labor Statistics and the count of individuals is based on a survey of households conducted by the Bureau of the Census for the Bureau of Labor Statistics. The reasons that cause the employment count to differ between these two surveys are indicated in Gloria P. Green, "Comparing Employment Estimates from Household and Payroll Series," *Monthly Labor Review,* December 1969, pp. 9–20.

[2] See the chapter by Ronald E. Kutscher in this bulletin for a discussion of the difference in the rate of growth in total employment between 1972 and 1980 and 1980 and 1985.

[3] This estimate is based on total and occupational employment in agriculture as reported in the Current Population Survey, in which each individual is counted once in his major occupation.

[4] These projections are based on a continuation in the patterns of enrollments in college by the college-age population. See *Projections of Educational Statistics to 1980–81,* OE 72–99, for additional details on the basic assumptions used by the Office of Education in developing projections of earned degrees.

[5] First professional degrees include degrees in law, medicine, dentistry, etc.

[6] *1969 and 1980 Science and Engineering Doctorate Supply and Utilization* (Washington, National Science Foundation, 1971), NSF 71–20.

[7] See, for example, Deal Wolfle and Charles V. Kidd, "The Future Market for Ph. D.'s," *Science,* Aug. 27, 1971, pp. 784–93, and Allan M. Cartter, "Scientific Manpower for 1970–85," *Science,* Apr. 9, 1971, pp. 132–40.

[8] *Ph. D. Scientists and Engineers in Private Industry, 1968–80,* Bulletin 1648 (Bureau of Labor Statistics, 1970).

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Chapter 3. Projections of GNP, Income, Output, and Employment

RONALD E. KUTSCHER

GROSS NATIONAL PRODUCT is projected to increase slightly faster during 1968–80 than it did during the previous 15 years, but then to slow down considerably during 1980–85, according to projections of the U.S. economy to 1985 by the Bureau of Labor Statistics.[1] This increase and the later sharp slowdown in the rate of economic growth reflect changes in the pace of labor force growth. By contrast, productivity or output per man-hour in the total private economy is expected to drift down very slowly during the 1968–80 period.

The slight increase in economic growth in the 1970's followed by a sharp slowdown in the early 1980's is an important factor influencing many elements of the economy. The following shows the 1980–85 projected slowdown (as measured by the average annual rate of increase) compared with the rates for 1955–68 and 1968–80 for selected growth components:

	1955–68	*1968–80*	*1980–85*
Gross national product (1972 dollars)	3.7	4.0	3.2
Personal income (current dollars)	6.3	8.0	6.5
Private gross national product per man-hour (1972 dollars)	3.0	2.9	2.8
Employment (count of jobs)	1.6	1.9	1.2

Projected economic growth

Real gross national product in 1972 dollars is projected to grow at 4.0 percent per year[2] compared with 3.7 percent in 1955–68. On the other hand, the 1980–85 growth is appreciably slower at 3.2 percent a year.[3] The projected 1968–80 increase in the growth rate over that of 1955–68 is consistent with previous BLS projections and derives from the projected accelerated growth in the labor force in the 1970's.

From 1972 to 1980, a rate of growth of 4.6 percent is projected, as shown in table 1. This rate, which is substantially higher than the 1968–80 rate, is derived because the 1972 unemployment rate was higher than 4.0 percent and because of the shortfall in productivity growth during 1968–72. Both are reflected in the slow GNP growth during 1968–72.

These projections indicate that if estimates of GNP were made for each year of the projection rather than for two points in time (1980 and 1985), the slowing in the rate of increase in GNP would begin about 1978 and continue at least through 1985. This slowdown reflects the labor force entry of children born in the late 1950's and 1960's when the birth rate was declining sharply.

Another change from the recent past is the relative growth of the public versus the private sector. The projected rate of increase in government GNP during 1968–85 is 1.6 percent per year. This slowdown from the 1955–68 rate of 3.1 is overstated by the choice of 1968—a peak year of our Vietnam involvement—as a reference year. Much of the slowdown will result from a decline in military and related civilian employment, but State and local employment also will increase more slowly than in the 1955–68 period. In contrast to the slow rate of growth in government gross national product, 1968–80 growth in the private sector is expected to be 4.3 percent a year, up from 3.8 percent a year during 1955–68. It will slow down again as labor force growth slows in the early 1980's.

Labor force. Economic growth depends on the size of the labor force and employment, of hours of work and productivity. To provide some perspective on expected growth of the labor force during the pro-

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Table 1. Changes in labor force, employment, productivity, and gross national product, selected years 1955–72 and projected to 1980 and 1985

Category	Actual				Projected		Average annual rate of growth[1]					
	1955	1960	1968	1972	1980	1985	1955–68	1968–72	1968–85	1968–80	1972–80	1980–85
Total labor force (including military)	68,072	72,142	82,272	88,991	101,809	107,716	1.47	1.98	1.60	1.79	1.70	1.13
Unemployed	2,852	3,852	2,817	4,840	3,992	4,229	−.09	14.49	2.42	2.95	−2.38	1.16
Employed (persons concept)[2]	65,220	68,290	79,455	84,151	97,817	103,487	1.53	1.45	1.57	1.75	1.90	1.13
Adjustment factor (persons to jobs)	4,032	3,502	5,418	4,355	6,259	6,622	2.30	−5.31	1.19	1.21	4.64	1.13
Employment (jobs concept)[2]	69,252	71,792	84,873	88,506	104,076	110,109	1.54	1.05	1.54	1.71	2.05	1.13
Government[3]	9,475	10,234	14,453	14,786	17,470	19,600	3.30	.57	1.81	1.59	2.10	2.33
Federal	4,741	4,261	5,609	4,423	4,070	4,100	1.30	−5.77	−1.83	−2.64	−1.03	.15
Military	3,025	2,516	3,517	2,403	2,000	2,000	1.17	−9.08	−3.27	−4.59	−2.27	.00
Civilian	1,716	1,745	2,092	2,020	2,070	2,100	1.54	−.87	.02	−.09	.31	.29
State and local	4,734	5,973	8,844	10,363	13,400	15,500	4.93	4.04	3.36	3.52	3.26	2.95
Private	59,777	61,558	70,420	73,720	86,606	90,509	1.27	1.15	1.49	1.74	2.03	.89
Agriculture	6,434	5,389	3,816	3,450	2,300	1,900	−3.94	−2.49	−4.02	−4.13	−4.94	−3.75
Nonagriculture	53,343	56,169	66,604	70,270	84,306	88,609	1.72	1.35	1.69	1.98	2.30	1.00
Average annual man-hours (private)[4]	2,130	2,067	2,000	1,965	1,920	1,888	−.48	−.44	−.34	−.34	−.29	−.34
Agriculture	2,480	2,366	2,314	2,267	2,180	2,127	−.53	−.51	−.49	−.50	−.49	−.49
Nonagriculture	2,088	2,039	1,982	1,950	1,913	1,883	−.40	−.41	−.30	−.29	−.24	−.32
Total private man-hours (millions)	127,344	127,265	140,870	144,824	166,291	170,892	.78	.69	1.14	1.39	1.74	.55
Agriculture	15,959	12,750	8,830	7,822	5,014	4,041	−4.45	−2.98	−4.61	−4.59	−5.41	−4.22
Nonagriculture	111,385	114,515	132,040	137,002	161,277	166,851	1.32	.93	1.39	1.68	2.06	.68
Private GNP per man-hour (1972 dollars)	4.36	4.88	6.42	7.04	9.02	10.34	3.02	2.33	2.84	2.87	3.15	2.77
Agriculture	1.83	2.40	3.69	4.40	7.04	9.18	5.54	4.50	5.51	5.53	6.05	5.45
Nonagriculture	4.72	5.15	6.60	7.19	9.09	10.37	2.61	2.16	2.69	2.70	2.97	2.67
Total GNP (billions of 1972 dollars)	$645.9	$717.1	$1,038.6	$1,155.2	$1,657.9	$1,942.5	3.72	2.69	3.75	3.97	4.62	3.22
Government	90.7	96.5	134.3	135.4	157.3	174.9	3.07	.20	1.57	1.33	1.89	2.14
Federal	51.9	47.5	61.7	50.3	47.2	47.6	1.34	−4.98	−1.51	−2.21	−.79	.17
Military	28.2	23.5	32.8	22.4	18.7	18.7	1.17	−9.09	−3.25	−4.57	−2.23	.00
Civilian	23.7	24.1	28.8	27.8	28.5	28.9	1.51	−.88	.02	−.09	.31	.28
State and local	38.8	49.0	72.7	85.1	110.1	127.3	4.95	4.02	3.35	3.52	3.27	2.95
Private	555.2	620.6	904.3	1,019.7	1,500.6	1,767.6	3.82	3.05	4.02	4.31	4.95	3.33
Agriculture	29.2	30.6	32.6	34.4	35.3	37.1	.85	1.25	.76	3.67	.33	1.00
Nonagriculture	526.0	590.0	871.7	985.3	1,465.3	1,730.5	3.96	3.11	4.12	4.42	5.09	3.38

[1] Compound interest rate between terminal years.

[2] Employment using a persons concept is a count of the number of persons holding jobs or looking for them. Employment based on a jobs concept is a count of the number of jobs held by people. Therefore, if persons hold more than one job, they are counted more than once.

[3] The government employment data shown here are from the U.S. Department of Commerce, Bureau of Economic Analysis, and are used to be consistent with the national income and product data. Government employment data shown elsewhere are consistent with BLS employment data.

[4] Limited to private because of the concept used to compute productivity and the assumption of no change in hours in government.

jected period, the following shows average annual rates of growth in the total labor force during selected periods:

Period	*Annual growth (in percent)*
1955–68	1.5
1968–80	1.8
1980–85	1.1

Chart 1 shows annual changes in the labor force from 1951 to 1985, particularly the graphic slowdown during 1980–85.

When resources are fully utilized, changes in historical and projected growth rates come about largely because of changes in the rate of increase in the labor force (assuming no sharp departure from the long-term trend in productivity and hours of work). Thus the annual growth in gross national product of 3.7 percent during 1955–68 was associated with an annual increase in the labor force of 1.5 percent. The diminution in economic growth expected during 1980–85 is associated with a sharply lower annual rate of increase in the labor force. It should be noted that the 1980–85 increase in gross national product (3.2 percent a year) is slower than most periods of comparable length in the postwar era, especially if those years with less than full (about 4-percent) unemployment are not considered.[4]

Employment. To project economic growth to 1985, it was necessary to estimate employment by assuming an unemployment rate. It was assumed the rate would be 4.0 percent by the mid-1970's and would remain there through the projection period. Separate

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employment estimates were made for each level of government and for the private farm and nonfarm sectors, because all have widely differing levels and rates of increase in labor productivity.[5] Federal civilian employment is projected to increase modestly throughout the 1972–85 period, but because of a projected decline in the military, overall Federal employment shows a slight decrease. State and local government employment is expected to continue to increase, but more slowly than it did during 1955–68. Then a surge of pupil enrollment (the baby boom) contributed to an employment expansion in public education, where about half of State and local employees work. Farm employment is expected to continue its long-term rate of decline—about 4 percent a year—with little change. Private nonfarm employment, largest component in the employment picture, is expected to rise about 2.0 percent a year during 1968–80, slowing to 1.0 percent a year during 1980–85. Employment growth for selected components is shown in the following tabulation:

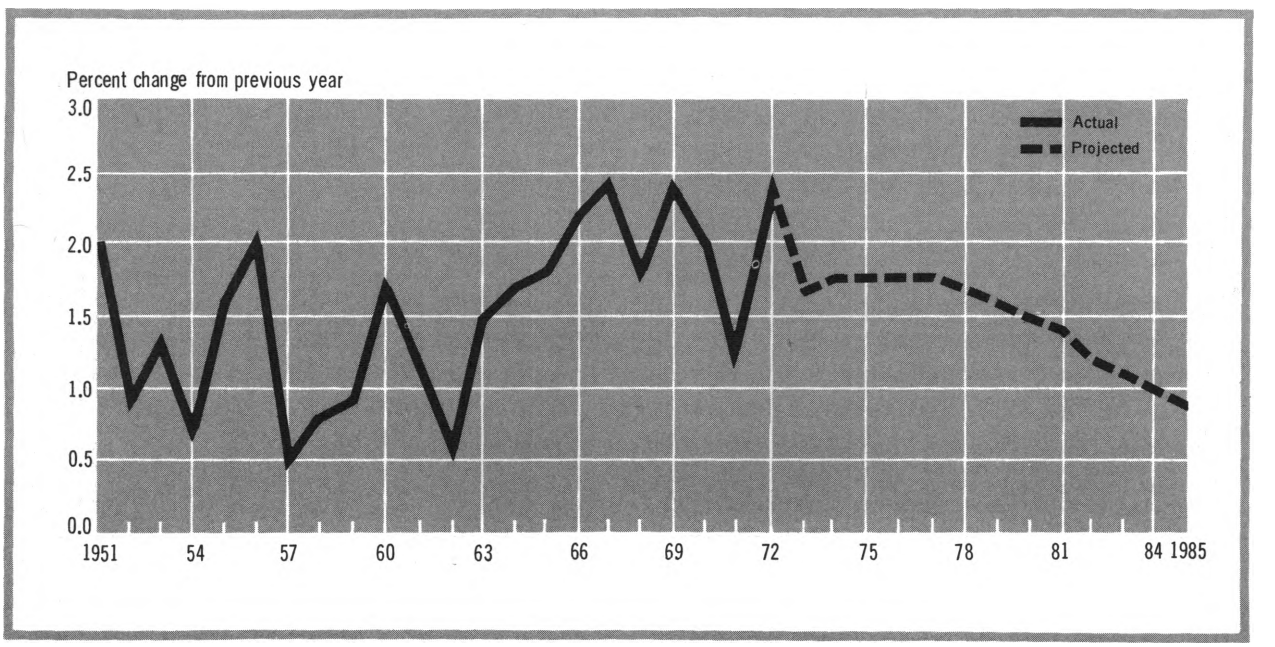
	1968–80	*1972–80*	*1980–85*
Public employment	1.6	2.1	2.3
Federal	−2.6	−1.0	.2
State and local	3.5	3.3	3.0
Private	1.7	2.0	.9

Average annual hours. The projected rate of decline in farm hours will continue at the long-term rate of about 0.5 percent a year.[6] However, the projected decline in hours in the private nonfarm sector of 0.3 percent a year is somewhat less than the 0.6 percent a year experienced in that sector over the 1965–72 period, but more in line with the longer term trend. This results from an expected retardation in the rate of increase in part-time employment, a major factor in the sharp decline in average hours in the 1960's.

Output per man-hour. Productivity growth in the farm sector is expected to continue in the range of 5.5 percent a year over the 1968–85 period (table 1). Productivity in the nonfarm sector is projected to continue at 2.7 percent a year. Because of the 1968–72 shortfall in productivity growth, the rate for 1972–80 is higher—nearly 3.0 percent a year.[7]

The rate of growth of productivity in the private sector (combined farm and nonfarm) in the postwar period has been 3.0 percent. When these sectors are combined for the projected period, the rates of productivity gradually decline to 2.9 percent a year during 1968–80 and 2.8 percent a year during 1980–85. As a consequence of the farm sector growing smaller in employment terms, the rate of productivity growth for the total private economy is expected to gradually approach that of the nonfarm sector.

Chart 1. Year-to-year change in total labor force, 1951–85



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Gross national product as income

Gross national product is a measure of the flow of goods and services produced and consumed annually. It can, therefore, be measured as it is produced or as it is consumed. Gross national product measured at the point of production—income GNP—consists of the earning of the factors of production. In this article, it is shown as the sources and uses of income by persons, business, and government.[8]

Personal income: sources and disposition. Personal income, the largest income category, is projected to increase at 8.0 percent a year from 1968 to 1980 (stated in current prices) or appreciably faster than over the 1955–68 period. This reflects both faster real growth and a projected faster rate of price increase. Growth in personal income slows down from 1980 to 1985 because of the expected slowing in growth of real GNP and because of a somewhat lower rate of price increase. (See table 2 for the relationships between the sources of personal income and its disposition.)

Most categories of personal income (wages, salaries, dividends, government transfers) follow the same pattern of growth as gross national product—appreciably faster during 1968–80 than during 1955–68, then slowing from 1980 to 1985 to a rate more nearly comparable to the 1955–68 period. The one major category not expected to follow this pattern is government transfers to persons, which are projected to grow at the 1955–68 rate over the 1968–80 period while the slowdown during 1980–85 is much sharper than for other income categories. Broadened social security coverage and more individuals on welfare contributed to recent sharp increases in transfer payments. In the projected period, such payments are expected to increase only as real benefits or prices increase.

Personal income goes for consumption, savings, interest, and taxes. Personal consumption expenditures will be discussed in detail in the next section. In the 1968–80 period, differences between growth in personal income and personal taxes is small because of tax reductions in the Tax Reform Act of 1969 and a slowing in the rate of growth in State and local tax collections. However, because of the progressive nature of the income tax system and the growth in social insurance contributions, taxes continue to take an increasing share of income. Over the 1980–85 period, the growth in taxes and the resulting increase in its share of income is more pro-

Table 2. Personal income: sources and disposition, selected years 1955–72 and projected to 1980 and 1985

[Billions of current dollars]

Component	Actual				Projected		Average annual rate of change[1]					
	1955	1960	1968	1972	1980	1985	1955–68	1968–72	1968–85	1968–80	1972–80	1980–85
Personal income: sources	$310.9	$401.0	$688.9	$939.2	$1,736.5	$2,376.9	6.3	8.1	7.6	8.0	8.0	6.5
Compensation of employees[2]	218.6	282.8	490.3	668.6	1,195.7	1,655.9	6.4	8.1	7.4	7.8	7.6	6.7
Government transfers to persons	16.1	26.6	56.1	98.3	178.4	227.6	10.1	15.1	8.6	10.1	7.7	5.0
Other sources[3]	87.3	112.3	189.6	246.0	484.6	650.1	6.1	6.7	7.5	8.2	8.9	6.0
Less total contributions for social insurance	11.1	20.7	47.1	73.7	129.3	164.1	11.8	12.6	7.6	8.8	7.2	4.9
Personal income: disposition	310.9	401.0	688.9	939.2	1,736.5	2,376.9	6.3	8.1	7.6	8.0	8.0	6.5
Personal tax and nontax payments	35.5	50.9	97.9	142.2	269.3	397.0	8.1	9.8	8.6	8.8	8.3	8.1
Personal outlays	259.5	330.0	551.2	747.2	1,365.9	1,845.6	6.0	7.9	7.4	7.9	7.8	6.2
Personal consumption expenditures	254.4	325.2	536.2	726.5	1,321.2	1,783.2	5.9	7.9	7.3	7.8	7.8	6.2
Interest paid by consumers	4.7	7.3	14.3	19.7	43.9	61.6	8.9	8.3	9.0	9.8	10.5	7.0
Personal transfers to foreigners	.5	.5	.8	1.0	.8	.8	3.7	5.7			−2.8	
Personal savings	15.8	17.0	39.8	49.7	101.3	134.3	7.4	5.7	7.4	8.1	9.3	5.8
Other items:												
Disposable personal income (DPI)	275.3	350.0	591.0	797.0	1,467.2	1,979.8	6.1	7.8	7.4	7.9	7.9	6.2
Saving rate (as percent of DPI)	5.7	4.9	6.7	6.2	6.9	6.8	1.3	−1.9	−.1	−.3	1.4	.3
DPI per capita (current dollars)	1,659.1	1,937.3	2,944.6	3,816.4	6,546.5	8,399.6	4.5	6.7	6.4	6.9	7.0	5.1
DPI per capita (constant 1972 dollars)	2,477.6	2,610.5	3,432.8	3,816.4	5,113.0	5,719.4	2.5	2.7	3.0	3.3	3.7	2.3

[1] Compound interest rates between terminal years.

[2] Covers wage and salary income and other labor income.

[3] Covers proprietors, income, rental income of persons, dividends, and personal interest income.

SOURCES: Historical data: U.S. Department of Commerce, Bureau of Economic Analysis; projections: Bureau of Labor Statistics.

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nounced because the effect of the 1969 tax change is no longer a factor. Saving, on the other hand, has had and is projected to continue to have a rather constant share of income. At the same time, interest has shown a modest increase in its share of income both historically and in the projected period. The result of the increase in the portion of income going to taxes and interest, and a fixed share to saving, is for personal consumption, past and projected, to represent a declining share of income. The percent distribution of income is highlighted in the following tabulation:

	1955	*1968*	*1972*	*1980*	*1985*
Personal income	100.0	100.0	100.0	100.0	100.0
Taxes (personal and social insurance contributions)	11.4	14.2	15.1	15.5	16.7
Savings	5.1	5.8	5.3	5.3	5.3
Other (interest and foreign transfers)	1.7	2.2	2.2	3.0	3.0
Personal consumption expenditures	81.8	77.8	77.4	76.2	75.0

Another interesting statistic derived from these projections is disposable personal income per capita, crudely used as a measure of the standard of living. Per capita disposable income in current dollars has grown from $1,659 in 1955 to $3,816 in 1972 (table 2). It is projected to increase to $6,546 in 1980 and to $8,400 by 1985. In constant (1972) dollars, the change is from $3,816 to $5,719 in 1985 or 3.1 percent a year—reflecting a truer measure of improving standards of living. However, this expansion—as is true with other elements of the projections—has an uneven pattern of growth within the projected period.

Gross saving and investment. In the projections, the 1968–80 growth in investment is appreciably higher than the 1955–68 rate—8.5 percent compared with 5.0 percent (current prices). While part of this is attributable to projected price increases of investment goods and an expansion in the rate of real growth in nonresidential investment, an additional factor is the projected increase in residential construction. The major question concerning the financing of this investment is the portion which is projected to come from personal savings compared to that from business (undistributed profits and capital consumption allowances). Over the 1968–80 period the business share of gross savings is expanding while the personal savings share is declining. In the 1980–85 period this is not true, principally because the personal savings growth is more nearly normal (table 3). The changing percent distribution of gross savings is highlighted in the following tabulation:

	1955	*1968*	*1972*	*1980*	*1985*
Gross savings	100.0	100.0	100.0	100.0	100.0
Personal	24.4	31.0	28.9	29.8	29.7
Business	71.5	74.3	72.7	74.3	73.3
Government (surplus or deficit)	4.2	−5.3	−1.6	−4.1	−3.0

Table 3. Gross saving and investment, selected years 1955–72 and projected to 1980 and 1985

[Billions of current dollars]

Component	Actual				Projected		Average annual rate of change[1]					
	1955	1960	1968	1972	1980	1985	1955–68	1968–72	1968–85	1968–80	1972–80	1980–85
Gross investment	$66.9	$76.5	$125.6	$170.6	$340.2	$452.8	5.0	8.0	7.8	8.7	9.0	5.9
Gross private domestic investment	67.4	74.8	126.0	178.3	344.6	445.3	4.9	9.1	7.7	8.5	8.2	5.9
Net foreign investment	−.5	1.7	−.4	−7.6	5.6	7.5	1.7	[2]	[2]	[2]	[2]	6.0
Gross saving	64.8	77.5	128.4	172.1	340.2	452.8	5.4	7.6	7.7	8.3	8.9	5.9
Personal saving	15.8	17.0	39.8	49.7	101.3	134.3	7.4	5.7	7.4	7.3	8.1	5.8
Government surplus or deficit	2.7	3.7	−6.8	−2.8	−13.8	−13.4	[2]	[2]	[2]	[2]	[2]	[2]
Other[3]	46.3	58.6	95.4	125.2	252.6	331.9	5.7	7.0	7.3	8.5	9.2	5.6
Statistical discrepancy	2.1	−1.0	−2.7	−1.5	0.0	0.0	[2]	[2]	[2]	[2]	[2]	[2]

[1] Compound interest rate between terminal years.

[2] Not applicable.

[3] Includes wage accruals less disbursements, undistributed profits, corporate inventory valuation adjustment, capital consumption allowances and capital grants received by the U.S.

SOURCES: Historical data: U.S. Department of Commerce, Bureau of Economic Analysis; projections: Bureau of Labor Statistics.

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Government expenditures and revenues. Over the 1968–80 period the projected rate of increase in Federal expenditures is a little less than revenues, with both projected to increase about 7½ percent a year (current prices), moderately less than the 1955–68 rate (table 4).[9] The implied 1972–80 rate is not appreciably different although revenues increase somewhat faster than expenditures. Between 1980 and 1985, both Federal expenditures and revenues are projected to grow at about 6 percent a year, in line with the expected slowing in the economy. By contrast, over the 1955–68 period, Federal expenditures increased somewhat faster than revenues.

Federal purchases of goods and services have been growing at a lower rate than that of all Federal expenditures. In the 1968–80 projections, Federal purchases of goods and services are projected to slow further to 4.5 percent, largely reflecting the projected lessening of the rate of expansion of military expenditures in the 1970's, particularly when measured from the peak Vietnam war year 1968. (See table 4.) On the other hand, transfer payments to persons and Federal grants-in-aid to State and local government are projected to continue to increase in the 1970's at rates very close to those prevailing over the 1955–68 period, although slower than 1968–72. Between 1980 and 1985, both transfers and grants slow as Federal revenues slacken. Purchases are not expected to show any significant fall off because defense requirements are not that directly affected by swings in the rate of growth.

The projections call for State and local government expenditures to increase at better than 10 percent a year (in current prices) for both revenues and expenditures.[10] (See table 4.) Between 1980 and 1985 the rate of increase of State and local revenues and expenditures slows to somewhat less than 8 percent a year.

Prices. The GNP deflator used in the projections was, by assumption, set at a 3.0-percent increase a year. The reduction to this rate would not be reached until 1975 but would remain at this rate through 1985. This implies an increase of 3.2 percent a year during 1972–80, considerably below the 1968–72 rate but above the longer term 1955–68 rate. Because of changes in the economy, particularly the shift away from goods-producing industries toward services and public sector employment, the earlier lower average level of price increase will be more difficult to achieve. Also, while there may be considerable discussion about what the long-term price outlook (consistent with a 4-percent rate of unemployment) might be, the crucial factor for these projections is the impact on the structure of demand. Evaluations made of various alternative rates of inflation show little difference in the structure of real demand. This follows because, in general, no particular changes in the pattern of prices among the major components of GNP are projected as they tend to keep their respective relationship to the total GNP deflator.[11]

Purchasers of GNP

GNP can be measured alternatively in terms of final purchasers of all goods and services. These purchasers are consumers, business, foreign purchasers, and government.

Table 4. Government revenues and expenditures, selected years and projected to 1980 and 1985

[Billions of current dollars]

Component	Actual				Projected		Average annual rate of growth[1]					
	1955	1960	1968	1972	1980	1985	1955–68	1968–72	1968–85	1968–80	1972–80	1980–85
Federal Government												
Expenditures[2]	$68.094	$93.016	$181.509	$244.576	$431.7	$574.5	7.8	7.7	7.0	7.5	7.4	6.0
Purchases of goods and services	44.090	53.531	98.768	104.446	166.6	218.5	6.4	1.4	4.8	4.5	6.0	5.6
Transfers and net interest	19.382	23.398	59.945	96.336	167.8	210.6	9.1	12.6	7.7	9.0	7.2	4.7
Grants to State and local government	3.120	6.521	18.675	37.677	90.2	137.5	14.8	19.2	12.5	14.0	11.5	8.8
Receipts	72.086	96.478	175.025	228.684	421.1	570.0	7.1	6.9	7.2	7.6	7.9	6.2
State and local government												
Expenditures	32.663	49.636	107.466	164.023	353.0	514.7	9.6	11.2	9.7	10.4	10.1	7.8
Receipts	31.393	49.856	107.120	177.155	349.8	505.8	9.9	13.4	9.6	10.4	8.9	7.7

[1] Compound interest rates between terminal years.

[2] Total Federal expenditures include subsidies less current surplus of government enterprises which is not shown separately.

SOURCE: Historical data: U.S. Department of Commerce, Bureau of Economic Analysis; projections: Bureau of Labor Statistics.

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Personal consumption expenditures. Consumers purchase nearly two-thirds of gross national product. The growth of consumer expenditures usually does not deviate substantially for very long periods from total GNP growth. The projected expansion of consumer expenditures is in keeping with the long-run trend—expansion at rates slightly faster than growth in gross national product. Between 1972 and 1980, growth in personal consumption expenditures is projected at 4.6 percent a year (1972 dollars), reflecting a catch up from the appreciable slowdown in gross national product and personal consumption during 1968–72 (table 5). The 1980–85 rate of increase for consumer expenditures is expected to slow to 3.3 percent a year.

The three major components of personal consumption expenditures—durables, nondurables, and services—each show the same pattern of strong growth during 1968–80, somewhat slower during 1980–85.[12] However, the relative amount of slowing varies among the three components (rates of growth in 1972 dollars):

	1955–68	*1968–80*	*1972–80*	*1980–85*
Total	3.9	4.3	4.5	3.3
Durables	5.0	5.1	4.4	3.1
Nondurables	3.1	3.6	3.9	2.8
Services	4.4	4.6	5.0	3.8

The marked 1980–85 slowdown in durable consumer goods is projected for each of the durable goods categories; however, the slowdown for automobiles is even more pronounced and is the major factor behind the very slow 1980–85 growth in durables. This slowdown in the growth of automobile purchases is partially attributable to the slowing in the growth in income, but also reflects the assumption that congestion in urban areas, energy shortages, pollution problems, and slower growth in the younger population all will work toward a dampening in auto purchases.

Nondurable goods, largely food and clothing, do not exhibit the same dramatic slowing. In general, these goods are relatively insensitive to changes in income, implying that as income increases a smaller part of the increase goes for food and clothing. Therefore, historically, consumers' purchases of nondurable goods have expanded slower than overall consumer expenditures.

No particular service dominates the category of services as automobiles dominate among durable goods and to some extent food among nondurables. The projected 1968–80 growth in services is expected to be faster than that for nondurable but slower than that for durable goods. This was the situation in the past, particularly in 1955–68. However, during 1980–85 growth for services is higher than the other consumption categories.

Investment. Another major part of private demand is gross private domestic investment which covers residential and nonresidential construction, producers' durable equipment, and the change in business inventories. While significantly smaller than consumption, having ranged from about 13 to 17 percent of gross national product, investment is still an important part of GNP because it represents the Nation's current commitment to future growth in the economy. It continues to play an important role in the capacity of the economy to maintain the rate of increase in productivity. The following shows the average annual rate of change in private investment (in 1972 dollars):

	1955–68	*1968–72*	*1968–80*	*1972–80*	*1980–85*
Total	2.4	4.0	4.7	5.1	3.0
Nonresidential	4.1	2.3	4.9	6.3	3.2
Structures	2.9	−.5	4.0	6.3	3.1
Equipment	5.0	3.9	5.5	6.2	3.3
Residential	−.7	10.6	4.2	1.1	3.4

Growth in construction of residential buildings during 1968–80 is projected at 4.2 percent a year and should be sufficient to permit enough housing starts to meet the housing goals.[13] Between 1968 and 1972, a very significant residential building expansion has already taken place so that the implied 1972–80 increase from this high level is only 1.1 percent a year (table 5). The 1980–85 rate for residential construction slows compared with the 1968–80 rate.

Nonresidential investment—business investment in equipment (trucks, computers, machinery) as well as in plants, commercial offices, shopping centers, and so forth—is projected to expand in keeping with the overall expansion in the rate of growth in gross national product during this period. The pattern of most of the postwar period has been for the investment in buildings to increase at a lower rate than equipment. In the projections, this pattern is continued although the difference between the two is narrowed sharply, primarily because of large outlays on structures projected for utilities, chiefly electric. Growth in producer durable equipment in the

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Table 5. Gross national product and major components by purchasers, selected years 1955–72 and projected to 1980 and 1985

[Billions of 1972 dollars]

Component	Actual				Projected	
	1955	1960	1968	1972	1980	1985
Gross national product (demand concept)	$645.9	$717.1	$1,038.6	$1,155.2	$1,657.9	$1,942.5
Personal consumption	379.9	438.2	625.1	726.5	1,032.0	1,214.2
Durable goods	48.8	50.5	91.5	117.4	165.4	192.3
Nondurable goods	178.8	202.2	266.9	299.9	408.7	469.0
Services	152.3	185.5	266.7	309.2	457.9	552.9
Gross private domestic investment	112.3	106.9	152.6	178.3	266.1	309.0
Fixed investment	103.8	102.5	144.2	172.3	250.9	294.3
Nonresidential	64.4	68.4	108.1	118.2	192.0	224.7
Structures	29.5	31.4	42.5	41.7	68.0	79.1
Producer durable equipment	34.9	37.0	65.6	76.5	123.9	145.5
Residential	39.4	34.1	36.1	54.0	58.9	69.7
Changed in business inventory	8.4	4.5	8.4	6.0	15.3	14.7
Net exports of goods and services	3.6	4.8	.3	−4.6	3.8	3.8
Exports	27.2	35.4	59.4	73.5	133.6	169.7
Imports	23.6	30.7	59.7	78.1	129.8	166.0
Government purchases of goods and services	150.2	167.2	261.2	255.0	356.1	415.5
Federal government	87.0	87.9	133.9	104.5	126.4	140.0
National defense	76.2	73.8	106.2	74.4	85.8	93.1
Other	10.8	14.1	27.7	30.1	40.7	46.9
State and local government	63.1	79.3	127.3	150.5	229.6	275.5
	Percent distribution					
Gross national product (demand concept)	100.0	100.0	100.0	100.0	100.0	100.0
Personal consumption	58.8	61.1	60.2	62.9	62.2	62.5
Durable goods	7.6	7.0	8.8	10.2	10.0	9.9
Nondurable goods	27.7	28.2	25.7	26.0	24.7	24.1
Services	23.6	25.9	25.7	26.8	27.6	28.5
Gross private domestic investment	17.4	14.9	14.7	15.4	16.1	15.9
Fixed investment	16.1	14.3	13.9	14.9	15.1	15.2
Nonresidential	10.0	9.5	10.4	10.2	11.6	11.6
Structures	4.6	4.4	4.1	3.6	4.1	4.1
Producer durable equipment	5.4	5.2	6.3	6.6	7.5	7.5
Residential	6.1	4.8	3.5	4.7	3.6	3.6
Changed in business inventory	1.3	.6	.8	.5	.9	.8
Net exports of goods and services	.6	.7	−0.0	−.4	.2	.2
Exports	4.2	4.9	5.7	6.4	8.1	8.7
Imports	3.7	4.3	5.7	6.8	7.8	8.5
Government purchases of goods and services	23.3	23.3	25.1	22.1	21.5	21.4
Federal government	13.5	12.3	12.9	9.0	7.6	7.2
National defense	11.8	10.3	10.2	6.4	5.2	4.8
Other	1.7	2.0	2.7	2.6	2.5	2.4
State and local government	9.8	11.1	12.3	13.0	13.8	14.2
	Average annual rate of change[1]					
	1955–68	1968–72	1968–80	1968–85	1972–80	1980–85
Gross national product (demand concept)	3.7	2.7	4.0	3.8	4.6	3.2
Personal consumption	3.9	3.8	4.3	4.0	4.5	3.3
Durable goods	5.0	6.4	5.1	4.5	4.4	3.1
Nondurable goods	3.1	3.0	3.6	3.4	3.9	2.8
Services	4.4	3.8	4.6	4.4	5.0	3.8
Gross private domestic investment	2.4	4.0	4.7	4.2	5.1	3.0
Fixed investment	2.6	4.6	4.7	4.3	4.8	3.3
Nonresidential	4.1	2.3	4.9	4.4	6.3	3.2
Structures	2.9	−.5	4.0	3.7	6.3	3.1
Producer durable equipment	5.0	3.9	5.5	4.8	6.2	3.3
Residential	−.7	10.6	4.2	3.9	1.1	3.4
Changed in business inventory	−0.0	−8.0	5.1	3.4	12.4	−.8
Net exports of goods and services	(2)	(2)	(2)	(2)	(2)	−.1
Exports	6.2	5.5	7.0	6.4	7.8	4.9
Imports	7.4	7.0	6.7	6.2	6.6	5.0
Government purchases of goods and services	4.4	−.6	2.6	2.8	4.3	3.1
Federal government	3.4	−6.0	−.5	.3	2.4	2.1
National defense	2.6	−8.5	−1.8	−.8	1.8	1.7
Other	7.5	2.1	3.2	3.1	3.8	2.9
State and local government	5.5	4.3	5.0	4.7	5.4	3.7

[1] Compound interest rate between terminal years.
[2] Not applicable.

SOURCE: Historical data: U.S. Department of Commerce, Bureau of Economic Analysis; projections: Bureau of Labor Statistics.

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projected period is led by computers and the ubiquitous photocopying equipment.

Net exports. The final component of private demand is net exports of goods and services. Both imports and exports are projected to increase faster than gross national product, thus over time constituting a gradually increasing share of GNP. Over the 1968–85 period, U.S. exports are projected to expand rapidly with agricultural exports and the nonmerchandise component, principally return on investments, leading the expansion. These increases are expected to offset the very large increase projected in oil imports. (See table 5.)

The projected turnaround in our import-export position is expected to flow, at least in the near term, from the recent devaluations of the U.S. dollar and revaluations of currencies of some of our major trading partners. Also, our exports, particularly agricultural products, are expected to increase in the new markets of Russia and China. At the same time, currency realignments will make U.S. imports more expensive, slowing the very high rates of increase recently experienced. An additional factor in the slowdown is the return of U.S. military expenditures abroad to pre-Vietnam levels.

The projections of imports for most industries assume that the 1972 ratio of imports to total supply will remain through 1980 and 1985. The exception to this is the crude petroleum and refined petroleum sectors, which are both increased significantly in line with Interior Department projections on use of imported crude and to a greater extent imported refined petroleum to meet our energy needs.[14] For exports, the projections are for return on investment to continue to be an increasing part of U.S. exports. Among individual industries, exports of aircraft, computers, office machines, and agricultural products are expected to have an increasingly important place.

Government. Public purchases of goods and services, projected separately for Federal, and State and local government, will change at the following average annual rates (computed in 1972 dollars):

	1955–68	*1968–80*	*1972–80*	*1980–85*
Total	4.4	2.6	4.3	3.1
Federal	3.4	− .5	2.4	2.1
Defense	2.6	−1.8	1.8	1.7
Nondefense	7.5	3.2	3.8	2.9
State and local	5.5	5.0	5.4	3.7

While Federal purchases of goods and services show little change during 1968–80, this results from defense and nondefense purchases moving in opposite directions, as the tabulation shows.[15] The slower growth projected for nondefense purchases than prevailed in 1955–68 follows from the peaking of the space program and the low growth potential which it offers for the future. Since military and civilian defense-related manpower will be at the same or lower levels, the increase in defense purchases is projected to be directed toward an increasingly sophisticated and costly military hardware, particularly ships as we replace our obsolete fleets. The projections for 1980–85 show defense purchases growing at less than 2 percent, nondefense purchases at about 3 percent a year.

State and local government purchases have been, over the past 15 years, one of the fastest growing components of demand. The anticipated slowing of the rate of increase masks some major changes in the pattern of expenditures. Perhaps the most important is the diminished role of educational services relative to other purchases. The number of students enrolled in public schools (elementary through college) is expected to peak in 1974 and decrease slowly for at least the next 5 years. Even allowing for significant quality improvements in the educational system (at least measured by real expenditures per pupil), real educational expenditures are projected to increase at an average annual rate of only 3.4 percent in the 1970's compared with 6.0 percent in the 1963–70 period.

Spending on the construction of streets and highways was actually less in real terms in 1970 than in 1963, and little growth is projected through 1980 and 1985. This follows from completion of the major portion of the Interstate Highway System, public resistance to further construction in urban areas, and increased emphasis on mass transit.[16]

The trends in these two major areas of traditional State and local responsibility—schools and highways—are, of course, offset to some extent by greatly increased demands for other public services (water and sanitary services, health care, mass transit, power generation, airport facilities, urban renewal and public housing, and parks and recreational facilities).

Output and employment

Composition of output by sector. Output shifts projected for 1968–85 are shown in table 6.[17] Overall,

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Table 6. Gross product originating [1] in various sectors of the private economy, selected years 1955–72 and projected to 1980 and 1985

Sector	1955	1960	1968	1972	1980	1985
	Billions of 1972 dollars					
Total	555.2	620.6	904.3	1,019.7	1,500.6	1,767.6
Agriculture	29.2	30.6	32.6	34.4	35.3	37.1
Nonagriculture	526.0	590.0	871.7	985.3	1,465.3	1,730.5
Mining	13.7	14.0	17.4	18.2	20.2	20.4
Contract construction	47.1	49.3	54.0	56.0	71.5	77.9
Manufacturing	159.6	168.1	261.9	290.7	428.6	499.1
Durable	98.2	98.5	160.4	170.7	268.5	313.5
Nondurable	61.4	69.6	101.5	119.9	160.1	185.6
Transportation, communication and public utilities	46.6	53.7	84.5	102.3	164.7	202.0
Transportation	27.9	28.5	42.1	45.8	71.8	83.6
Communication	8.2	11.0	20.3	28.5	50.5	64.8
Public utilities	10.5	14.2	22.1	28.0	42.4	53.6
Trade	100.5	115.0	167.8	194.5	281.1	318.9
Wholesale	34.5	42.1	67.0	77.7	116.0	132.6
Retail	66.0	72.9	100.8	116.7	165.1	186.3
Finance, insurance, and real estate	82.1	99.9	148.4	163.8	250.5	303.5
Other services	72.0	88.0	123.8	135.9	223.6	269.9
Government enterprises	8.9	9.3	15.3	18.0	25.8	30.9
Rest of world plus statistical discrepancy	−4.5	−7.3	−1.4	6.0	−.7	7.8
	Percent distribution					
Total	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture	5.3	4.9	3.6	3.4	2.4	2.1
Nonagriculture	94.7	95.1	96.4	96.6	97.6	97.9
Mining	2.5	2.3	1.9	1.8	1.3	1.2
Contract construction	8.5	7.9	6.0	5.5	4.8	4.4
Manufacturing	28.7	27.1	29.0	28.5	28.6	28.2
Durable	17.7	15.9	17.7	16.7	17.9	17.7
Nondurable	11.1	11.2	11.2	11.8	10.7	10.4
Transportation, communication, and public utilities	8.4	8.7	9.3	10.0	11.0	11.4
Transportation	5.0	4.6	4.7	4.5	4.8	4.7
Communication	1.5	1.8	2.2	2.8	3.4	3.7
Public utilities	1.9	2.3	2.4	2.7	2.8	3.0
Trade	18.1	18.5	18.6	19.1	18.7	18.0
Wholesale	6.2	6.8	7.4	7.6	7.7	7.5
Retail	11.9	11.7	11.1	11.4	11.0	10.5
Finance, insurance, and real estate	14.8	16.1	16.4	16.1	16.7	17.2
Other services	13.0	14.2	13.7	13.3	14.9	15.3
Government enterprises	1.6	1.5	1.7	1.8	1.7	1.7
Rest of world plus statistical discrepancy	−.8	−1.2	−.2	.6	.0	.4
	Average annual rate of change [2]					
	Actual		Projected			
	1955–68	1968–72	1968–85	1968–80	1972–80	1980–85
Total	3.8	3.0	4.0	4.3	4.9	3.3
Agriculture	.9	1.4	.8	.7	.3	1.0
Nonagriculture	4.0	3.1	4.1	4.4	5.1	3.4
Mining	1.9	1.1	.9	1.3	1.3	.2
Contract construction	1.1	.9	2.2	2.4	3.1	1.7
Manufacturing	3.9	2.6	3.9	4.2	5.0	3.1
Durable	3.8	1.6	4.0	4.4	5.8	3.1
Nondurable	3.9	4.3	3.6	3.9	3.7	2.9
Transportation, communication, and public utilities	4.7	4.9	5.3	5.7	6.1	4.2
Transportation	3.2	2.1	4.1	4.5	5.8	3.1
Communication	7.2	8.9	7.1	7.9	7.4	5.1
Public utilities	5.9	6.1	5.4	5.6	5.3	4.8
Trade	4.0	3.8	3.8	4.4	4.7	2.6
Wholesale	5.2	3.8	4.1	4.7	5.1	2.7
Retail	3.3	3.7	3.6	4.2	4.4	2.4
Finance, insurance, and real estate	4.7	2.5	4.3	4.5	5.5	3.9
Other services	4.3	2.4	4.7	5.1	6.4	3.8
Government enterprises	4.3	4.1	4.2	4.5	4.6	3.7

[1] The concept of gross product originating attributes to each industry only that part of income gross national product originating there.

[2] Compound interest between terminal years.

SOURCES: Historical data: U.S. Department of Commerce, Bureau of Economic Analysis; projections: Bureau of Labor Statistics.

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total private gross national product is projected, particularly during 1968–80, to grow more rapidly than during 1955–72. Thus, all other things being equal, most sectors will grow somewhat faster than in the past. However, within the speeding up (1972–80) and slowing down (1980–85), important shifts in the relative importance of sectors takes place. Agriculture and mining will continue to decline, but the decline in the relative importance of construction will be checked, principally by the projected expansion in residential housing and nonresidential structures. Manufacturing, which has accounted for about 27 to 29 percent of output over the past 15 years, is not expected to move outside that range in the projected period.

Wholesale and retail trade's share of total gross product originating, on the other hand, is expected to show a moderate decline—at least from the 1972 level—particularly in 1980–85 as the economy slows down and the amount of goods moved through trade channels moderates even more. With business and professional services and medical services all showing strong growth, services is projected to expand in the future. At the same time, finance, insurance, and real estate's share of gross national product has increased appreciably in the past and is expected to increase further during 1972–85. Thus, the shift to a service economy, which is particularly true of employment, is at least partially attributable to output shifts. The shifts in output structure are not as pronounced as the shifts in the structure of employment, yet they are a factor in the changing distribution of employment along with the relative growth in productivity.

Productivity changes by sector. Over the 15-year period beginning in 1955, the average annual rate of productivity change for the total private economy was 3.0 percent. This rate of increase declines to 2.9 percent a year in 1968–80 and 2.8 percent a year in 1980–85.[18] Table 7 shows the relative changes in productivity by sector historically and in the projected period.

Productivity growth in a sector relative to its past growth is important for its effect on employment shifts. The projections of productivity in mining reflect a considerably slower rate of increase than prevailed in earlier periods. Manufacturing productivity will grow during 1968–80 slightly faster than its historical rate but in line with its slightly faster growth in output. Also, productivity in trade, in services, and in construction over the projected period reflects an increase over their historical rates of gain. Relative growth in productivity among the sectors is also an important element in employment shifts. Therefore, the projection of lower-than-average productivity in the other services sector and in finance, insurance, and real estate, along with the

Table 7. Productivity change by sector, average rate during selected periods 1948–72 and projected to 1980 and 1985

Sector	Average annual growth rate[1]						
	Actual			Projected			
	1948–68[2]	1955–68	1968–72	1968–85	1968–80	1972–80	1980–85
Total private	3.2	3.0	2.3	2.8	2.9	3.2	2.8
Agriculture	5.8	5.5	4.5	5.5	5.5	6.1	5.5
Nonagriculture	2.7	2.6	2.2	2.7	2.7	3.0	2.7
Mining	4.0	3.6	1.0	.9	.9	.9	.8
Contract construction	[3]	[3]	[3]	.8	.8	1.5	.7
Manufacturing	2.9	2.7	3.8	2.9	3.1	2.7	2.6
Durable	[3]	2.4	3.3	2.9	3.2	3.1	2.4
Nondurable	[3]	3.2	4.7	2.9	2.9	2.0	2.8
Transportation, communication, and public utilities	[3]	4.5	3.9	4.3	4.4	4.6	4.0
Transportation	3.2	3.5	2.4	3.4	3.6	4.1	3.1
Communication	5.6	5.9	5.0	5.3	5.4	5.6	4.9
Public utilities	5.8	5.1	3.5	4.3	4.3	4.7	4.3
Trade	2.8	2.9	1.9	2.7	2.7	3.1	2.5
Wholesale	[3]	3.5	1.8	2.5	2.7	3.2	2.1
Retail	[3]	2.5	1.9	2.6	2.6	3.0	2.6
Finance, insurance, and real estate	[3]	[3]	[3]	1.6	1.4	2.8	1.9
Other services	[3]	[3]	[3]	2.5	2.5	3.6	2.4
Government enterprises	[3]	[3]	[3]	2.8	2.7	2.6	2.9

[1] Compound interest between terminal years.

[2] Least squares growth rates.

[3] Not available.

NOTE: Productivity data are GNP per man-hour with the GNP stated in constant 1972 prices.

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relative shifts in output to these sectors, contribute to their rapid growth in employment.

Changes in hours by sector. Average annual hours in the nonfarm economy are projected to decline somewhat less rapidly than the 0.4 percent of a year of the 1955–72 period (on an hours-paid-for basis). This rapid decline has brought about a drop in average weekly hours from 41.0 in 1955 to 37.5 by 1972. The projected decline in hours in the nonfarm economy of 0.3 percent a year anticipates a further drop in average hours to slightly over 36 per week by 1985. Most of the past decline has occurred in retail trade and services (table 8). The 1980–85 projection continues to show a more pronounced decline in hours in retail trade and other services than in the other major sectors. Historically, the sharper decline in hours in these sectors is related, at least in part, to an increase in part-time employment in retail trade and services. The projections in retail trade and other services continue the rather sharp decline in hours—albeit at diminishing rates —reflecting the decline projected in the rate of increase in part-time employees.

Composition of employment by sector. Employment is a primary focus of these projections. Between 1972 and 1980, projected growth in employment (on a job count basis) is expected to be 16 million or an average of 2.0 million jobs a year (2.2 percent a year).[19] From 1980 to 1985, the projections show an expected increase of 6 million more jobs or only 1.2 million a year, (1.2 percent a year), reaching over 107 million jobs by 1985 or 22 million more jobs than in 1972 (table 9). However, an important point of these projections is the dramatic difference in growth in jobs 1972–80 (2.0 million per year) compared to the 1980–85 (1.2 million a year). This compares with an employment growth of 1.2 million jobs a year 1955–72 (1.6 percent a year).

Generally, projections of employment, particularly in the major sectors, reflect continuation of employment shifts taking place for most of the postwar period (chart 2). Any changes tend to be in degree rather than direction. However, transportation and mining, which until recently experienced declines, are expected to show increases in the future. The employment turnaround in mining reflects both the resurgence of coal and a general dampening in mining productivity. The transportation turnaround results from increased importance of transportation modes other than rails, which are declining. Another employment category which had been increasing until about 1965 is private household help. Since then, the number of jobs in paid household employment declined, and this decline is projected to continue as this type of employment appeals to fewer and fewer.

Despite expected moderation, government

Table 8. Average annual hours by sector: average annual rate of change for selected periods 1948–72 and projected to 1980 and 1985

Sector	Actual			Projected			
	1948–68	1955–68	1968–72	1968–85	1968–80	1972–80	1980–85
Total private	−0.4	−0.5	−0.5	−0.3	−0.3	−0.3	−0.3
Agriculture	−.6	−.5	−.5	−.5	−.5	−.5	−.5
Nonagriculture	−.3	−.4	−.4	−.3	−.3	−.3	−.3
Mining	.6	.3	−.1	.1	.1	.1	.2
Contract construction	−.3	−.1	−.3	−.1	.1	.2	.1
Manufacturing	(1)	−.1	−.1	(1)	(1)	(1)	(1)
Durable	(2)	−.1	(1)	(1)	(1)	(1)	(1)
Nondurable	(2)	−.1	(1)	(1)	(1)	(1)	(1)
Transportation, communication, and public utilities	(2)	−.1	−.1	−.1	−.1	(1)	−.1
Transportation	−.2	−.2	−.1	−.1	−.1	−.1	(1)
Communication	−.1	(1)	−.3	(1)	(1)	.1	(1)
Public utilities	−.1	(1)	(1)	(1)	(1)	(1)	(1)
Trade	−.5	−.7	−.7	−.6	−.6	−.5	−.6
Wholesale	(2)	−.2	−.2	−.1	−.1	−.1	−.1
Retail	(2)	−1.0	−.9	−.8	−.8	−.7	−.8
Finance, insurance, and real estate	−.2	−.3	(1)	−.1	−.1	−.1	−.1
Other services (includes private household workers)	−.6	−.7	−.4	−.4	−.4	−.4	−.4

[1] Less than .05 per year change.

[2] Not applicable.

NOTE: Growth rates are compound interest rate between terminal years except for 1948–68 data which are least squares growth rate.

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Table 9. Total employment, by major sector, selected years 1955–72 and projected to 1980 and 1985

[Thousands of jobs]

Sector	Actual				Projected	
	1955	1960	1968	1972	1980	1985
Total	65,745	68,869	80,926	85,597	101,576	107,609
Government[1]	6,914	8,353	11,845	13,290	16,610	18,800
Total private	58,831	60,516	69,081	72,307	84,966	88,809
Agriculture	6,434	5,389	3,816	3,450	2,300	1,900
Nonagriculture	52,397	55,127	65,265	68,857	82,666	86,909
Mining	832	748	640	645	655	632
Construction	3,582	3,654	4,038	4,352	4,908	5,184
Manufacturing	17,309	17,197	20,138	19,281	22,923	23,499
Durable	9,782	9,681	11,828	11,091	13,629	14,154
Nondurable	7,527	7,516	8,310	8,190	9,294	9,345
Transportation, communication, and public utilities	4,353	4,214	4,519	4,726	5,321	5,368
Transportation	2,918	2,743	2,868	2,842	3,250	3,266
Communication	832	844	986	1,150	1,300	1,312
Public utilities	603	624	665	734	771	790
Trade	13,201	14,177	16,655	18,432	21,695	22,381
Wholesale trade	3,063	3,295	3,894	4,235	4,946	5,123
Retail trade	10,138	10,882	12,761	14,197	16,749	17,258
Finance, insurance and real estate	2,652	2,985	3,720	4,303	5,349	5,932
Other services[2]	10,468	12,152	15,555	17,118	21,815	23,913
	Percent distribution[3]					
Total	100.0	100.0	100.0	100.0	100.0	100.0
Government[1]	10.5	12.1	14.6	15.5	16.4	17.5
Total private	89.5	87.9	85.4	84.5	83.6	82.5
Agriculture	9.8	7.8	4.7	4.0	2.3	1.8
Nonagriculture	79.7	80.0	80.6	80.4	81.4	80.8
Mining	1.3	1.1	.8	.8	.6	.6
Construction	5.4	5.3	5.0	5.1	4.8	4.8
Manufacturing	26.3	25.0	24.9	22.5	22.6	21.8
Durable	14.9	14.1	14.6	13.0	13.4	13.2
Nondurable	11.5	10.9	10.3	9.6	9.2	8.7
Transportation, communication, and public utilities	6.6	6.1	5.6	5.5	5.2	5.0
Transportation	4.4	4.0	3.5	3.3	3.2	3.0
Communication	1.3	1.2	1.2	1.3	1.3	1.2
Public utilities	.9	.8	.8	.9	.8	.7
Trade	20.1	20.6	21.6	21.5	21.4	20.8
Wholesale trade	4.7	4.8	4.8	4.9	4.9	4.8
Retail trade	15.4	15.8	15.8	16.6	16.5	16.0
Finance, insurance, and real estate	4.0	4.3	4.6	5.0	5.3	5.5
Other services	15.9	17.6	19.2	20.0	21.5	22.2
	Average annual rate of change[4]					
	1955–68	1968–72	1968–85	1968–80	1972–80	1980–85
Total	1.6	1.4	1.7	1.9	2.2	1.2
Government[1]	4.2	2.9	2.8	2.9	2.8	2.5
Total private	1.2	1.2	1.5	1.7	2.0	.9
Agriculture	−3.9	−2.5	−4.0	−4.1	−4.9	−3.7
Nonagriculture	1.7	1.4	1.7	2.0	2.3	1.0
Mining	−2.0	.2	−.1	−.2	−.4	−.7
Construction	.9	1.9	1.5	1.6	1.5	1.1
Manufacturing	1.2	−1.1	.9	1.1	2.2	.5
Durable	1.5	−1.6	1.1	1.2	2.6	.8
Nondurable	.8	−.4	.7	.9	1.6	.1
Transportation, communication, and public utilities	.3	1.1	1.0	1.4	1.5	.2
Transportation	−.1	−.2	.8	1.0	1.7	.1
Communication	1.3	3.9	1.7	2.3	1.5	.2
Public utilities	.8	2.1	1.0	1.2	.8	.5
Trade	1.8	2.6	1.8	2.2	2.1	.6
Wholesale trade	1.9	2.1	1.6	2.0	2.0	.7
Retail trade	1.8	2.7	1.8	2.3	2.1	.6
Finance, insurance, and real estate	2.6	3.7	2.8	3.1	2.8	2.1
Other services	3.1	2.4	2.6	2.9	3.1	1.9

[1] Government employment used in this table is based on the BLS concept to be consistent with other employment data. It is different from the government employment shown in table 1 because of inclusion of government enterprise employees as well as other statistical and coverage differences.

[2] Includes paid household employment.

[3] Components may not add to totals because of rounding.

[4] Compound interest rate between terminal years.

NOTE: Employment is on a jobs concept and includes wage and salary workers, the self-employed and unpaid family workers. Persons holding more than one job are counted in each job held.

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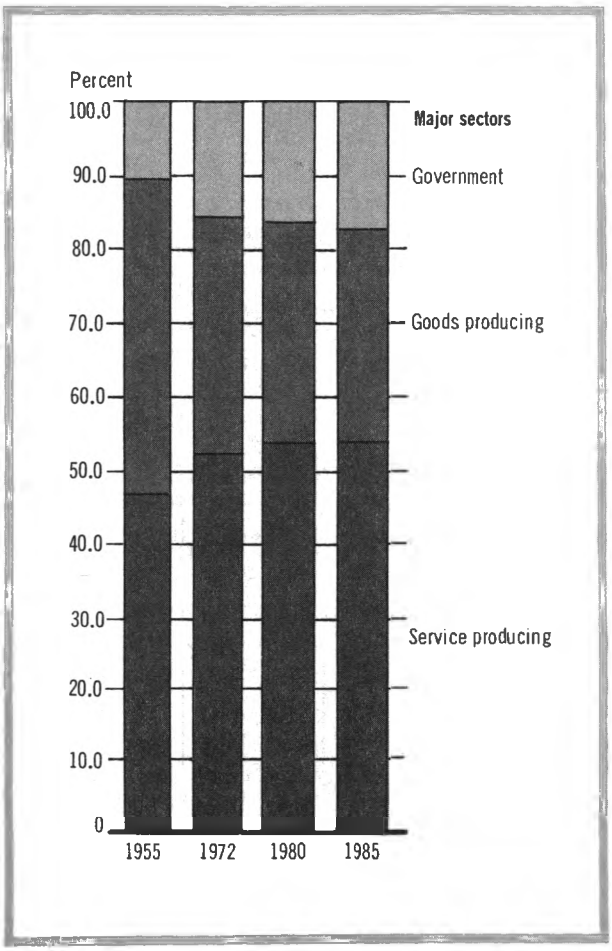
employment is projected to increase by over 5 million jobs by 1985. By contrast, growth in private sector employment is expected to rise from slightly over 1.2 percent a year during 1955–72 to about 2.0 percent a year during 1972–80, returning in 1980–85 close to the 1.0-percent pace.

Even though the rate of growth in manufacturing employment is less than 1.0 percent a year, because of the size of the sector nearly 3 million more jobs are protected from the peak level reached in 1969 and over 4 million from the 1972 level. Despite this increase, manufacturing's share of employment is projected to decline further. Retail trade is also projected to add nearly 3 million jobs between 1972–85. However, the big expansion in employment is projected to continue to be in other services —6 million—increasing its share to over 22 percent of total employment.

Chart 2. Percentage distribution of total employment (counting jobs rather than workers) for selected years and projected 1980 and 1985



NOTE: Government includes all Federal and State and local civilian employees. Goods producing includes agriculture, mining, construction, and manufacturing. Service producing includes transportation, communications, public utilities, trade, finance, insurance, and real estate, and other services.

Some implications

Potential GNP growth. Two aspects of the projections concerning the overall GNP growth rate should be emphasized. First, the 1968–80 projections assume that all of the shortfall in productivity, which occurred during 1968–72, and the less than full utilization of the labor force in 1972 will be made up by 1980. Therefore, one concern raised by these projections is the ability to reach and to maintain the full employment growth rate, particularly over the 1972–80 period.

A second implication is the effect of the projected dramatic slowing of the GNP growth rate during the 1980–85 period. Over most of the 1960's and 1970's the potential growth in the economy has been or is expected to be 4 percent or more a year. However, beginning in the late 1970's and continuing through 1985 and beyond, the potential growth rate in the economy will be about 3⅓ percent a year or less. This slowdown will affect the expected rate of growth in business sales, capital expansion, and other items closely related to the rate of economic growth in the economy. Thus, it will be difficult for business to first expand facilities to meet the increasing rate of expansion anticipated during the mid-1970's but not to overexpand in the late 1970's and early 1980's so that excess capacity will be an added cost factor.

The projected slowdown in growth in gross national product may not just produce problems but could presage some benefits; such as diminution of pollution which, even without treatment advances, should not increase as rapidly in a slower paced economy. Also, use of resources such as fuels, minerals, or timber will slow as the economy slows and thus lessen the rate of depletion.

A particularly important facet of the projections is the growth in real per capita income. The 1968–80 projected growth calls for an appreciably faster rate of increase over this period compared to the 1955–72 rate. This general indicator of the standard of living gives an unusually favorable outlook for the rest of the 1970's, with the early 1980's returning to a rate of increase more like the late 1950's and the 1960's.

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Growth in both exports and imports will continue to make the United States more dependent on changes in foreign countries. While the U.S. foreign sector is still small compared with those of most other countries, recent experience has made the United States mindful of the ramifications of changes in trading position among the industrial countries. The necessity of meeting part of our energy needs by imports from abroad may make the United States even more concerned with trading relationships around the world. Such imports will put constant pressure on our balance of payments, especially between 1972 and 1980.

Employment and related implications. These projections follow or reinforce many earlier projections developed by BLS and other research groups developing employment projections. For example, the continued decline projected for agriculture employment implies an associated movement of people from rural to urban areas. In some instances, this will put further pressure on overutilized public facilities in urban areas, while at the same time making maintenance of essential public services such as education and health care in sparsely settled rural areas increasingly difficult because of the lack of a supportive tax base.

The continuing growth of State and local government employment presents another type of challenge. For instance, labor-management relations in this sector are in an early stage of development. The problems of maintaining essential public services during strikes or "sick outs" present difficult challenges to local governments. As the sector grows in size, the potential for labor relations problems will expand until stable bargaining procedures have been established.[20]

As an increasing proportion of the work force moves into the service sector, there will be a two-fold impact. First, since service employment is generally more stable than employment in durable goods manufacturing, employment will be less sensitive to abrupt swings up or down in economic activity. At the same time, an economy with a high portion of its work force in services may have a higher built-in rate of inflation because of the difficulty of raising productivity in services. Thus, as wages advance in services, the lower productivity there will put increasing pressure on labor costs and prices.[21] This was a major element considered in assuming a higher rate of price increase in these projections than had prevailed in the economy over time.

The 1980–85 slowdown in employment growth does not present any greater difficulty for persons in the labor force, because the slowdown results from fewer entrants into the labor force. Perhaps, one could even envision a more orderly adjustment as the economy moves toward absorbing only 1.2 million new job entrants in the 1980's compared with 2.0 million in the 1970's. However, the slowdown does cause some structural changes in employment which could cause problems. Primary among these is the slower growth projected in retail trade. This sector has been a job source for many, particularly women, seeking only part-time employment. As this sector slows somewhat more than the economy, job entrants may have to seek full-time work in other sectors or not enter the labor force at all if they are only interested in part-time work. □

———FOOTNOTES———

[1] In these projections, 1968 is chosen as a reasonable base year with full employment of resources and with productivity advances at or near their long-run potential. The projections in this article replace or update those previously prepared by the Bureau of Labor Statistics. Further publications are planned to provide more detail for the 1980 and 1985 projections as well as a detailed description of the methodology used in developing them.

[2] The 1968–80 growth in real GNP is slightly higher if stated in 1963 or 1958 dollars—4.08 and 4.10 percent, respectively.

[3] These projections are of the potential output of an economy with fully employed resources, but the growth rates shown cannot be considered potential since the base year (1968) has not been adjusted to reflect deviation from potential. In any estimate of potential growth, the increase also should consider the probable expansion in the labor force which may result from a lowering of the unemployment rate. For a discussion of this, see Arthur M. Okun, "Upward Mobility, in a High-Pressure Economy," *Brookings Papers on Economy Activity, 1973,* pp. 207–61.

[4] Because labor force growth is expected to be slower at least through 1990, the 1985–90 rate of economic growth will be at least as low as that projected for 1980–85, if not lower. See Denis F. Johnston, "The U.S. labor force: projections to 1990," *Monthly Labor Review,* July 1973, pp. 3–13.

[5] The employment used in these projections begins with the labor force, a count of persons which is subsequently

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converted to a count of jobs because of the availability of greater industry detail needed in subsequent parts of the projection.

[6] The hours concept used is a measure of hours paid for rather than hours worked. Therefore, the decline projected might be more pronounced on an hours worked basis, particularly if the trend toward more time paid for but not worked continues into the future. A separate projection of hours is not made for government, because in general there has been no decline in government hours and the concept of productivity used in government is on a per-person basis.

[7] The projections of government GNP, in real terms, reflect only the change in employment. This is consistent with the concept used in the national accounts of no change in government productivity.

[8] The macroeconometric model used in these projections was developed originally by Lester C. Thurow and is described in "A Fiscal Model of the United States," *Survey of Current Business,* June 1969, pp. 45–64.

[9] Another category, not discussed in this article, is the foreign transactions account. Also, in the usual GNP tabulation, government demand includes only the purchases of goods and services. Other government components are incorporated in other categories of demand. For example, Federal grants to State and local governments are shown as part of State and local purchases.

[10] The projection of 1968–80 State and local government expenditures may seem to imply an acceleration in their rate of increase, but the difference lies in price change since real State and local government purchases are projected to slow down.

[11] The overall GNP deflator is set by assumption but the deflators for major demand components are developed based on the work of Richard Barth. See "The Development of Wage and Price Relationships for a Long-Term Econometric Model," *Survey of Current Business,* August 1972, pp. 15–20.

[12] Projections of overall consumption expenditures are derived by using the macro model but the components are not. They are sums of detailed projections developed for 80 categories.

[13] See the Housing and Urban Development Act of 1968 and the Second Annual Housing Report, updated by subsequent reports.

[14] *United States Energy through the Year 2000* (U.S. Department of the Interior, December 1972).

[15] In the demand system of GNP accounts, government demand covers only its purchases of goods and services. The difference between Federal purchases of goods and services and expenditures is quite sizeable.

[16] Even though the Interstate Highway Program is largely federally financed, in the GNP demand accounts shown here—which counts such expenditures at the point of final purchase—State and local government are shown as the purchasers of the Interstate Highway System.

[17] These projections are based on the input-output table for 1963 prepared by the Bureau of Economic Analysis, U.S. Department of Commerce. See the *Survey of Current Business,* November 1969. Summing output levels generated by the input-output model is not considered meaningful because of double counting of output. For this reason, gross product originating is used, an alternative way of viewing GNP. It is the value added (in real terms as used here) in each industry.

[18] Projections of productivity are made for private farm and nonfarm and for government in the initial stages of the projections. Later, industry output rates are calculated. Employment by industry is derived by projecting output per man hour and changes in annual hours by industry. The projected rates of change in productivity for each industry are aggregated to major sectors. Also, the output data are converted to the gross-product-originating basis to be consistent with the data discussed in the section on distribution of output by sector.

[19] In the job count concept of employment, anyone having more than one job is counted as many times as he or she hold jobs. To this count are added the self-employed, and unpaid family workers, adding up to total employment using a jobs concept. This differs from an "employment of persons" concept, principally because of dual jobholders. (See the chapter in this bulletin by Neal Rosenthal, pp. 18–26). There are other statistical and sample differences. For a discussion of these, see Gloria P. Green, "Comparing employment estimates from the household and payroll series," *Monthly Labor Review,* December 1969, pp. 9–20.

[20] For a discussion of some facets of this issue, see "Exploring alternatives to the strike," *Monthly Labor Review,* September 1973, pp. 43–51.

[21] This could be offset to some extent by the lower level of wages in services since the shift in employment to these sectors will, all else being equal, lower average wages in the economy.

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Appendix A. Projection Methods

This appendix describes the methods used in developing the 1980 and 1985 projections of economic growth and employment by industry.

Supply GNP

The first projection needed is for supply GNP, or a projection of the potential economic growth.[1] The potential economic growth refers to the potential output of the economy given its available resources—in particular, for this purpose, its human resources or manpower.

Thus, the first element in developing a projection of supply GNP is a projection of the labor force.[2] The labor force projections are based on projections of population and labor force participation rates by age and sex. An unemployment rate is assumed—4.0 percent in these projections—giving total employed as a residual. Total employment is separated into three components—government, farm, and nonfarm. The employment concept used in these projections is a count of jobs, converted from the labor force count-of-persons concept, because job, or payroll, data, are available in greater industry detail and this detail is needed in subsequent parts of the projection.

Next in developing a projection of supply GNP is a projection of average annual hours. The hours concept used in these projections is "hours paid for" rather than "hours worked." A separate rate is projected for the farm and private nonfarm sectors. A separate projection of hours is not made for the government because the concept of productivity used in government is on a per person, rather than a man-hours, basis.

The differing nature of productivity (or output per man-hour) change in the three major sectors was the primary consideration underlying the decision to project their employment separately. Each of these sectors has widely differing levels and rates of productivity growth. For example, using the conventions with respect to government productivity followed in the national income accounts and in these projections, the government sector has no change in its productivity. Therefore, projections of government GNP in real terms reflect only the change in employment.

The projections for each of these factors—labor force, unemployment rate, hours, and output per man-hour—are combined to derive the potential, or supply, GNP.

Macro model

After the potential GNP estimates for 1980 and 1985 are developed, they are used as inputs into a macroeconomic model to derive a set of balanced national income and product accounts.[3] These data include the income GNP (GNP measured at the point of production, or the earnings of the factors of production) and the components of income GNP in current prices; demand GNP (GNP measured when it is consumed) and the composition of demand GNP in current prices and constant dollars; and price deflators for GNP and the components of GNP. The major use of the macroeconomic model, at least as far as these projections are concerned, is to derive the distribution of demand GNP (in constant dollars).

In developing the projections, the sequence used by the macro model is for projected income to determine projected demand. The macro model is structured so that projected demand need not necessarily be equal to projected income, as it must in the normal national income accounting. If such an imbalance happens, policy variables (such as personal or corporate taxes or government transfer payments to persons) are changed and the model is rerun until demand and income GNP do equal each other. Initially, the projections of demand are made in current dollars and the projected price deflators are used to convert demand into real terms.

Conversion from demand into output and employment

Following the development of demand GNP by major component as described in the previous section, a projection of the composition of demand

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GNP by producing industry is developed. Thus, for each demand category such as personal consumption expenditures, total projected consumption is distributed into 134 separate industries representing food, housing, automobiles, clothing, medical care, legal services, drugs, or any of the other items on which consumers spend their income. A similar distribution is made for investment, exports, and for Federal, State, and local government.

The translation of these detailed projections of demand (referred to as input-output bill of goods) into industry output is accomplished by use of an input-output table. An input-output table is a matrix in which each industry is represented twice—first, showing its purchases from other sectors as inputs used in producing its output, and second, showing the distribution of its sales to all industries, including the amount, if any, sold directly to one of the final demand categories such as exports or investment.

The data from the input-output table are converted to a percent distribution of inputs called coefficients; these coefficients are the focal point for projections. An input-output table for any historical year specifies the interrelationships among the elements of the economy for that year. However, for a later year these relationships may have changed because of technology, changing relative prices, or other factors, making it necessary to project the coefficients, or input-output relationships, to 1980 and 1985 just as the detailed components of demand by producing industry are projected. With the projected input-output coefficients and the projected demand, it is possible to derive a projected level of output for each of the industries.[4]

Finally, by using projected rates of growth in industry productivity or output per man-hour and projected changes in annual hours, employment by sector is derived. The sum of the projected employment by industry must equal the total employment used in developing the supply GNP. If it does not, some or all of the projection sequence must be redone.

———*FOOTNOTES*———

[1] Although these projections are of the potential output of the economy with fully employed resources, the growth rates shown cannot be considered potential since the base period—1968—has not been adjusted to reflect deviation from full potential in employment, hours, or productivity. Also, any estimate of potential growth should consider the probable expansion in the labor force which may result from a lowering of the unemployment rate.

[2] See Denis F. Johnston, "U.S. Labor Force: Projections to 1990," *Monthly Labor Review,* July 1973, pp. 3–13.

[3] The macroeconometric model was developed by Lester C. Thurow and is described in the June 1969 issue of the *Survey of Current Business.* See "A Fiscal Model of the United States," *Survey of Current Business,* June 1969, pp. 45–64.

[4] The input-output bill of goods by demand component for selected historical years and projected for 1980 and 1985, projected input-output coefficient tables for 1980 and for 1985, and industry output and employment for each of 134 sectors will be shown in subsequent publications.

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Appendix B. Comparison of New and Earlier 1980 Projections

This appendix provides comparisons of new 1980 projections with the projections for 1980 previously published in *The U.S. Economy in 1980: A Summary of BLS Projections,* Bulletin 1673.[1] Projections compared include (1) the 1968–80 rate of change in gross national product (in constant prices); (2) distribution of gross national product among major components of demand; (3) distribution of employment among major industry sectors; and (4) distribution of occupations by major categories.

GNP growth rate

A major interest in the projections lies in the estimate of the growth rate in GNP over the long term. In the earlier projections, two rates of growth in real GNP for the 1968–80 period were given, based on alternative assumptions regarding unemployment rates, 3 percent and 4 percent. The earlier estimate consistent with the 4-percent unemployment assumption used in the revised projections showed a growth rate of 4.2 percent a year. Further, the estimate was based on GNP figures stated in 1968 prices. The revised projection of GNP is in 1972 prices. The adjustment of the earlier projections from 1968 to 1972 prices—to be comparable to the current projection—lowers the previously estimated growth rate to 4.1 percent. The reduction is due to the greater weight of the government "product" when stated in 1972 rather than 1968 prices. Giving great weight to the government sector, which by national income accounting conventions has no increase in productivity over time, results in lowering the previously published growth rate.

The revised projections for 1980 indicate a somewhat smaller growth rate during 1968–80, 4.0 percent rather than the previous estimate of 4.1 percent. The slight decline reflects largely offsetting changes in the factors affecting the growth rate in gross national product. The comparison of the rates of changes in these factors, based on the earlier and current set of projections, is given in table B–1.

Table B–1. Comparison of projections of rates of change of gross national product and underlying factors, 1968–80

Item	Average annual rate of change, 1968–80	
	Revised [1]	Earlier [2]
Total GNP (1972 dollars)	4.0	4.1
Government	1.3	1.8
Private	4.3	4.4
Total labor force (including military)	1.8	1.7
Employed (persons concept)	1.7	1.7
Employed (jobs concept)	1.7	1.5
Government	1.6	2.0
Private	1.7	1.4
Average annual man-hours—private	−0.3	−0.1
Total man-hours—private	1.4	1.4
GNP per man-hour—private	2.9	3.0

[1] See ch. 3 of this bulletin, p. 28, table 1.

[2] See **The U.S. Economy in 1980: A Summary of BLS Projections,** Bulletin 1673 (Bureau of Labor Statistics, 1970), p. 42, table A–6. The "earlier" 1980 projections are those based on the 4-percent unemployment, service-economy alternative, in 1968 dollars.

Distribution of demand

A comparison of the revised and earlier projections of the distribution of 1980 gross national product among major components of demand is shown in table B–2. Personal consumption expenditures in the current projections represent a somewhat higher proportion of GNP than previously, implicitly reflecting the impact on personal income and resulting consumption expenditures of substantial increases in transfer payments compared with the previous set of projections. Within consumption, the current projections have relatively higher durable goods purchases, particularly for mobile homes and campers. Nondurable goods are also a higher proportion of GNP in the current projections because of higher purchases of gasoline and pharmaceutical preparations and related medical items, toiletries, and so forth. Services are projected as a lower proportion of demand in this set of projections because the increases over the last few years for a wide range of services have been lower than expected.

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Table B–2. Comparison of projections of distribution of GNP among major components of demand for 1980

Major component	Billions of 1972 dollars		Percent distribution		
	Revised [1]	Earlier [2]	Revised	Earlier	Percent change [3]
Gross national product	1,657.9	1,676.6	100.0	100.0	-------
Personal consumption expenditures	1,032.0	1,035.1	62.2	61.7	0.8
Durable goods	165.4	147.3	10.0	8.8	13.6
Nondurable goods	408.7	393.5	24.7	23.5	5.1
Services	457.9	494.3	27.6	29.5	−6.4
Gross private domestic investment	266.1	262.9	16.1	15.7	2.5
Fixed investment	250.9	243.6	15.1	14.5	4.1
Nonresidential	192.0	181.0	11.6	10.8	7.4
Structures	68.0	65.0	4.1	3.9	5.1
Producers' durable equipment	123.9	116.0	7.5	6.9	8.7
Residential structures	58.9	62.6	3.6	3.7	−2.7
Change in business inventories	15.3	19.4	0.9	1.2	−25.0
Net exports of goods and services	3.8	9.9	0.2	0.6	−66.7
Exports	133.6	101.0	8.1	6.0	35.0
Imports	129.8	91.1	7.8	5.4	42.6
Government purchases of goods and services	356.1	368.7	21.5	22.0	−2.3
Federal	126.4	143.0	7.6	8.5	−10.6
State and local	229.6	225.7	13.8	13.5	2.2

[1] See ch. 3 of this bulletin, p. 34, table 5.

[2] See **The U.S. Economy in 1980: A Summary of BLS Projections**, Bulletin 1673 (Bureau of Labor Statistics, 1970), p. 6, table 1, converted to 1972 dollars. The "earlier" 1980 projections are those based on the 4-percent unemployment, services-economy alternative.

[3] $\frac{\text{Revised} - \text{earlier}}{\text{Earlier}} \times 100$

For gross private domestic investment, the major change in this set of projections is the larger share for producer durable goods. This expansion mostly reflects larger investment needs because of pollution abatement efforts. Both exports and imports have been increased sharply (with the net export estimate lowered somewhat), both changes reflecting experience of the last few years.

Projections of government expenditures in the current set of projections are sharply lower for the Federal component. The lower Federal estimate reflects the reduced manpower requirements of an all-volunteer Armed Forces accompanied by an assumption that defense purchases in real terms will not expand at high rates over the 1972–80 period. In addition, in the current set of projections, nondefense Federal expenditures have been lowered because space expenditures are not expected to expand much in the future.

Distribution of employment

The distribution of employment in the current set of projections is somewhat different from that in the earlier set. (See table B–3.) First, government represents a smaller proportion of total employment than in the previous projections, principally because of lower Federal employment. In the private sector, agricultural employment is projected to be lower as declines are expected to continue in this sector. Although in 1972 and 1973 agricultural employment did not decline, the projections are based on the belief that this is a short-run phenomenon and that the decline will continue after a few years of adjustment to higher production levels. Higher projected employment in mining arises from an expectation of more jobs in coal mining than previously, as a result of increased use of coal along with smaller increases in labor productivity. The rise in employment in coal mining is expected to continue at least through 1980.

The lower employment in construction reflects, among other factors, lower public construction; highway construction is not expected to show much growth and other construction is not expected to take up the slack. The current set of projections has higher employment in the transportation, communications, and public utilities categories because the experience of recent years indicates a higher rate of

Table B–3. Comparison of projections of sector employment for 1980

Sector	In thousands		Percent distribution		Percent change
	Revised [1]	Earlier [2]	Revised	Earlier	
Total (jobs concept)	101,576	98,600	100.0	100.0	-------
Government	16,610	16,632	16.4	16.9	−3.0
Total private	84,966	81,968	83.6	83.1	0.6
Agriculture	2,300	3,156	2.3	3.2	−28.0
Nonagriculture	82,666	78,812	81.4	79.9	1.9
Mining	655	584	0.6	0.6	0.0
Construction	4,908	5,427	4.8	5.5	−12.7
Manufacturing	22,923	22,133	22.6	22.4	0.9
Durable goods	13,629	13,141	13.4	13.3	0.8
Nondurable goods	9,294	8,992	9.2	9.1	1.1
Transportation, communications, and public utilities	5,321	4,926	5.2	5.0	4.0
Trade	21,695	20,282	21.4	20.6	3.8
Finance, insurance, and real estate	5,349	4,598	5.3	4.7	12.8
Other services	21,815	20,862	21.5	21.2	1.4

[1] See ch. 3 of this bulletin, p. 39, table 9.

[2] See **Patterns of U.S. Economic Growth**, Bulletin 1672 (Bureau of Labor Statistics, 1970), p. 37, table 26 (4-percent basic model).

[3] See footnote 3, table B–2.

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growth of output in these sectors, and a smaller increase in productivity, than previously projected. This results in larger employment increases. Recent experience is considered to be indicative of the longer-run trend rather than a short-term development. The relative increases in employment in wholesale and retail trade and in finance, insurance, and real estate reflect the strong growth that each of these categories has experienced over the past few years; these gains are expected to continue until 1980. In addition, the relative increase in trade employment reflects the increased proportion of personal consumption expenditures for goods compared with services.

Occupational distribution

Among the major occupational groups, the greatest proportional differences between the original and revised 1980 projections are in the two smallest groups, nonfarm laborers and farm workers. (See table B–4.) The number of farm workers was lowered 23 percent from the original projection. This parallels the projection of a continued reduction of employment in the sector. The 15-percent difference for nonfarm laborers reflects analysis of data that have become available since the original projections were developed. The more current data show that the slow decline in employment originally projected for this group as a result of increased substitution of machinery for unskilled labor did not take place in the early 1970's—in fact, a slow increase was experienced. This trend has been projected to 1980 in the revised projections. As a percent of total employment, however, nonfarm laborers are projected to decline as in the original projections.

Table B–4. Comparison of projections of occupational requirements for 1980

Occupational groups	In millions		Percent distribution		Percent change [3]
	Revised [1]	Earlier [2]	Revised	Earlier	
Total employment (persons concept)	95.8	95.1	100.0	100.0	—
White-collar workers	49.3	48.0	51.5	50.5	2.0
Professional and technical workers	15.0	15.3	15.7	16.1	−2.5
Managers and administrators	10.1	9.7	10.5	10.2	2.9
Salesworkers	6.3	6.0	6.6	6.3	4.8
Clerical workers	17.9	17.0	18.7	17.9	4.5
Blue-collar workers	31.8	30.7	33.1	32.3	2.5
Craft workers	12.3	12.2	12.8	12.8	0.0
Operatives	15.0	14.6	15.6	15.4	1.3
Nonfarm laborers	4.5	3.9	4.7	4.1	14.7
Service workers	12.7	13.8	13.3	14.5	−8.3
Farm workers	2.0	2.6	2.1	2.7	−22.3

[1] See ch. 2 of this bulletin, p. 19, table 1.

[2] See **The U.S. Economy in 1980: A Summary of BLS Projections**, Bulletin 1673 (Bureau of Labor Statistics, 1970), table A–24. Published data were on a 1960 Census base and have been adjusted to reflect 1970 Census occupational definitions.

[3] See footnote 3, table B–2.

The greatest absolute decline between the original and revised projections of employment is in the service worker group. This decline results primarily from a change in the direction of the projection for private household workers, who make up a significant proportion of the service group (13 percent in 1972). The original projection indicated a rise in employment for private household workers, along with an increase in demand stemming from rising family income and increased labor force participation of women. An increase in employment, however, has not taken place in recent years as individuals chose not to work as private household workers when other jobs were available. The revised projections for private household works reflect a continuation of the declining trend in employment.

The remainder of the differences between the original 1970 and revised 1980 occupational projections stem primarily from changes in projections of industry employment rather than changes in the projected occupational structure of the industries.

FOOTNOTE

[1] See also footnote 1 to the introductory chapter of this bulletin, p. 7.

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Appendix C. Detailed Tables

Table C–1. Estimated 1972 employment and projected 1985 requirements, by occupation

Occupation	Estimated employment, 1972	Projected requirements, 1985	Percent change, 1972–85	Annual rate of change, 1972–85
PROFESSIONAL AND RELATED OCCUPATIONS				
Business, administrative occupations:				
Accountants	714,000	935,000	31.0	2.1
Clergy:				
Protestant ministers	325,000	360,000	10.9	0.8
Rabbis	5,800	6,400	10.9	0.8
Roman Catholic priests	58,500	63,000	7.9	0.6
Conservation occupations:				
Foresters	22,000	28,000	26.0	1.8
Forestry aides	14,500	21,500	48.3	3.1
Range managers	4,000	4,500	12.5	0.9
Counseling occupations:				
Employment counselors	8,500	14,000	66.2	4.0
Rehabilitation counselors	16,000	26,000	59.8	3.7
School counselors	43,000	59,000	36.9	2.4
Engineers	1,100,000	1,500,000	41.5	2.7
Aerospace engineers	62,000	75,000	22.0	1.5
Agricultural engineers	12,000	15,000	29.1	2.0
Biomedical engineers	3,000	5,000	40.6	2.7
Ceramic engineers	10,000	14,000	41.7	2.8
Chemical engineers	47,000	59,000	25.4	1.8
Civil engineers	177,000	235,000	33.8	2.3
Electrical engineers	231,000	330,000	44.1	2.9
Industrial engineers	125,000	190,000	53.5	3.4
Mechanical engineers	209,000	280,000	33.5	2.2
Metallurgical engineers	10,000	14,000	41.7	2.7
Mining engineers	4,000	4,000	4.7	0.4
Health service occupations:				
Chiropractors	16,000	19,500	20.9	1.5
Dental assistants	115,000	155,000	35.0	2.3
Dental laboratory technicians	32,000	43,000	34.8	2.3
Dental hygienists	17,000	50,000	191.0	8.6
Dentists	105,000	140,000	32.0	2.2
Dietitians	33,000	44,000	32.0	2.2
Electrocardiographic technicians	10,000	15,000	50.0	3.2
Electroencephalographic technicians	3,500	5,500	57.1	3.5
Hospital administrators	17,000	26,600	56.4	3.5
Licensed practical nurses	425,000	835,000	96.0	5.3
Medical assistants	200,000	320,000	45.5	2.9
Medical laboratory workers	165,000	210,000	27.3	1.9
Medical record librarians	47,000	118,000	152.0	7.4
Occupational therapists	7,500	15,000	100.0	5.5
Occupational therapy assistants	6,000	15,500	160.9	7.7
Optometrists	18,700	23,300	24.7	1.7
Optometric assistants	11,000	20,000	78.8	4.6
Podiatrists	7,300	8,400	15.0	1.1
Pharmacists	131,000	163,000	24.5	1.7
Physical therapists	18,000	32,000	76.3	4.5
Physical therapy assistants	10,500	25,000	141.7	7.0
Physicians (M.D.'s and D.O.'s)	330,000	485,000	47.2	3.0
Respiratory therapists	17,000	30,000	77.0	4.5
Veterinarians	26,000	37,000	41.1	2.7
Radiologic technologists	55,000	87,000	58.0	3.6
Registered nurses	748,000	1,050,000	40.0	2.6
Sanitarians	17,000	30,000	76.8	4.5
Speech pathologists and audiologists	27,000	34,000	26.9	1.8
Mathematics and related occupations:				
Actuaries	5,500	9,000	62.0	3.8
Mathematicians	76,000	107,000	40.8	2.7
Statisticians	23,000	32,000	39.6	2.6
Natural science occupations:				
Geologists	23,000	32,000	37.5	2.5
Geophysicists	8,000	11,000	38.3	2.5
Meteorologists	5,000	6,000	29.2	2.0
Oceanographers	4,500	6,300	33.0	2.2
Biochemists	12,500	18,000	43.0	2.8
Life scientists	180,000	235,000	29.1	2.0

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Table C–1. Continued—Estimated 1972 employment and projected 1985 requirements, by occupation

Occupation	Estimated employment, 1972	Projected requirements, 1985	Percent change, 1972–85	Annual rate of change, 1972–85
Physical scientists:				
Astronomers	2,000	2,300	14.9	1.1
Chemists	134,000	184,000	38.0	2.5
Food scientists	7,500	9,500	29.7	2.0
Physicists	49,000	61,000	24.1	1.7
Performing artists:				
Actors and actresses	10,000	15,300	53.0	3.3
Dancers	5,000	6,100	22.0	1.5
Musicians and music teachers	85,000	111,000	30.6	2.1
Singers and singing teachers	36,000	49,500	37.5	2.5
Social scientists:				
Anthropologists	3,600	6,000	66.4	4.0
Economists	36,000	46,000	29.5	2.0
Geographers	7,500	9,200	22.6	1.6
Historians	24,000	30,000	25.3	1.7
Political scientists	10,000	12,200	22.0	1.5
Sociologists	15,000	23,000	53.1	3.3
Teachers:				
College and university teachers	525,000	630,000	20.4	1.4
Kindergarten and elementary school teachers	1,274,000	1,590,000	24.9	1.7
Secondary school teachers	1,023,000	1,045,000	2.1	0.1
Technicians:				
Draftsmen	327,000	485,000	48.0	3.1
Engineering and science technicians	707,000	1,050,000	48.9	3.1
Food processing technicians	4,500	5,500	24.0	1.7
Writing occupations:				
Newspaper reporters	39,000	50,000	28.0	1.9
Technical writers	20,000	26,000	29.9	2.0
Other professional and related occupations:				
Airline dispatchers	800	800	0.0	0.0
Air traffic controllers	19,500	26,000	33.8	2.3
Architects	37,000	65,000	76.0	4.4
Broadcast technicians	23,000	26,000	12.0	0.9
College career planning and placement counselors	3,800	5,000	32.5	2.2
Commercial artists	60,000	76,000	26.7	1.8
Flight engineers	7,000	9,500	35.7	2.4
Ground radio operators, and teletypists (civil aviation)	5,700	5,000	−13.0	−1.2
Home economists	120,000	140,000	14.0	1.0
Industrial designers	10,000	14,000	40.0	2.6
Interior designers and decorators	18,000	23,000	29.0	2.0
Landscape architects	12,000	21,000	75.8	4.1
Lawyers	303,000	380,000	25.8	1.8
Librarians	120,000	162,000	35.0	2.3
Photographers	77,000	88,000	14.3	1.0
Pilots and copilots	54,000	78,000	43.8	2.8
Programmers	186,000	290,000	55.9	3.5
Psychologists	57,000	90,000	55.5	3.5
Radio and television announcers	21,000	24,500	21.4	1.5
Recreation workers	55,000	90,000	63.0	3.8
Social workers	185,000	275,000	48.6	3.1
Surveyors	58,000	81,000	40.0	2.6
Systems analysts	103,000	185,000	79.6	4.6
Underwriters	61,000	71,000	16.6	1.2
Urban planners	12,000	18,500	54.2	3.4
MANAGERIAL OCCUPATIONS				
Bank officers	219,000	308,000	40.0	2.6
City managers	2,500	3,700	54.0	3.4
Conductors (railroad)	38,000	33,000	−12.6	−1.1
Licensed merchant marine officers	15,000	14,000	−9.8	−0.8
Managers and assistants (hotel)	110,000	160,000	41.2	2.7
CLERICAL AND RELATED OCCUPATIONS				
Bank clerks	473,000	665,000	40.4	2.6
Bank tellers	248,000	350,000	40.4	2.6
Bookkeeping workers	1,584,000	1,900,000	19.5	1.4
Cashiers	998,000	1,360,000	36.1	2.4
Claim adjusters	128,000	152,000	19.0	1.3
Claim examiners	31,000	28,500	−7.8	−0.7
Electronic computer operating personnel	480,000	531,000	10.6	0.8
File clerks	272,000	318,000	16.7	1.2
Front office clerks (hotel)	49,000	69,000	41.2	2.7
Office machine operators	195,000	230,000	17.9	1.3
Receptionists	436,000	650,000	50.0	3.2
Shipping and receiving clerks	451,000	490,000	9.1	0.7
Station agents (railroad)	8,700	6,500	−25.2	−2.3
Stenographers and secretaries	3,074,000	4,950,000	60.8	3.7
Stock clerks	511,000	750,000	46.2	3.0
Telegraphers, telephoners, and towermen (railroad)	11,200	7,500	−33.2	−3.3
Telephone operators	230,000	232,000	1.5	0.4
Traffic agents and clerks (civil aviation)	59,000	110,000	88.7	5.0
Typists	1,021,000	1,400,000	38.7	2.5
SALES OCCUPATIONS				
Automobile parts countermen	72,000	95,000	32.0	2.2
Automobile salesworkers	131,000	148,000	13.0	0.9
Automobile service advisors	21,000	28,000	32.6	2.2
Insurance agents and brokers	385,000	450,000	16.7	1.2
Manufacturers' salesworkers	423,000	545,000	28.9	2.0
Real estate salesworkers and brokers	349,000	435,000	25.4	1.6
Retail trade salesworkers	2,778,000	3,330,000	20.0	1.4
Securities salesworkers	220,000	290,000	28.0	1.9
Wholesale trade salesworkers	688,000	860,000	25.2	1.7
SERVICE OCCUPATIONS				
Barbers	157,000	147,000	−6.4	−0.6
Bartenders	200,000	235,000	16.8	1.2
Bellmen and bell captains (hotel)	16,000	18,000	13.0	0.9
Building custodians	1,885,000	2,430,000	29.0	2.0
Cooks and chefs	866,000	1,000,000	14.2	1.0
Cosmetologists	500,000	670,000	35.0	2.3
Firefighters	200,000	315,000	57.2	3.5
Flight attendants	39,000	76,000	92.4	5.2
Guards	250,000	320,000	29.3	2.0
Hospital attendants	900,000	1,360,000	51.0	3.2
Housekeepers and assistants (hotel)	17,000	24,000	41.2	2.7
Police officers (municipal)	370,000	490,000	32.3	2.2
Private household workers	1,437,000	1,000,000	−30.8	−3.0
Social service aides	100,000	150,000	50.0	3.2
State police officers	44,000	66,000	50.8	3.2
Waiters and waitresses	1,124,000	1,300,000	16.6	1.2
CRAFT and KINDRED WORKERS				
Building trades:				
Asbestos and insulating workers	30,000	40,000	33.3	2.2
Bricklayers	180,000	225,000	25.0	1.7
Carpenters	1,000,000	1,200,000	14.8	1.1
Cement masons (cement and concrete finishers)	75,000	110,000	46.7	3.0
Electricians (construction)	240,000	325,000	35.4	2.4
Elevator constructors	17,000	25,000	47.1	3.1
Floor covering installers	75,000	100,000	33.3	2.2
Glaziers	12,000	18,000	50.0	3.2
Lathers	30,000	40,000	33.3	2.2
Operating engineers (construction machinery operators)	435,000	570,000	31.0	2.0
Painters and paperhangers	420,000	460,000	9.5	0.7
Plasterers	30,000	32,000	6.6	0.4
Plumbers and pipefitters	400,000	500,000	25.0	1.7
Roofers	80,000	110,000	37.5	2.5
Sheet metal workers	65,000	80,000	23.1	1.6
Structural-, ornamental-, and reinforcing-iron workers, riggers, and machine movers	95,000	120,000	26.3	1.8
Machine occupations:				
All-round machinists	320,000	400,000	24.8	1.7
Instrument makers, mechanical	5,000	6,000	20.0	1.4
Machine tool operators	546,000	670,000	22.9	1.6
Set up men (machine tools)	43,000	59,000	37.2	2.5
Tool and die makers	172,000	183,000	6.4	0.5
Mechanics and repairers:				
Airconditioning, refrigeration, and heating mechanics	135,000	265,000	96.3	5.3

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Table C–1. Continued—Estimated 1972 employment and projected 1985 requirements, by occupation

Occupation	Estimated employment, 1972	Projected requirements, 1985	Percent change, 1972–85	Annual rate of change, 1972–85
Aircraft mechanics	123,000	190,000	53.0	3.3
Appliance servicemen	130,000	175,000	35.0	2.3
Automotive body repairers	161,000	187,000	16.1	1.1
Automobile mechanics	727,000	860,000	18.4	1.3
Bowling-pin-machine mechanics	6,000	6,600	10.8	0.8
Business machine servicemen	69,000	97,000	41.2	2.7
Diesel mechanics	92,000	125,000	36.8	2.4
Electric sign servicemen	8,000	11,700	46.3	3.0
Farm equipment mechanics	47,000	52,000	10.6	0.8
Industrial machinery repairers	430,000	850,000	98.6	5.4
Instrument repairers	100,000	140,000	38.5	2.5
Jewelers and jewelry repairers	18,000	19,000	4.0	0.4
Maintenance electricians	260,000	325,000	25.0	1.7
Millwrights	83,000	103,000	24.3	1.7
Motorcycle mechanics	9,600	19,000	97.9	5.4
Television and radio service technicians	144,000	170,000	18.1	1.3
Truck and bus mechanics	130,000	165,000	27.5	1.8
Vending machine mechanics	29,000	39,000	32.5	2.2
Watch repairers	16,000	17,000	4.0	0.3
Printing (graphic arts) occupations:				
Bookbinders and related workers	32,000	38,000	17.3	1.2
Composing room occupations	170,000	166,000	−2.3	−0.2
Electrotypers and stenotypers	7,000	6,000	−14.8	−1.3
Lithographic occupations	81,000	120,000	48.4	3.1
Photoengravers	16,000	15,000	−9.2	−0.8
Printing press operators and assistants	142,000	183,000	28.6	2.0
Telephone industry occupations:				
Central office craftworkers	105,000	119,000	11.3	0.8
Central office equipment installers	30,000	35,000	18.6	1.4
Linemen and cable splicers	50,000	54,000	10.7	0.8
Telephone and PBX installers and repairers	108,000	120,000	11.1	0.8
Other craft occupations:				
Blacksmiths	10,000	9,400	−6.4	−0.6
Boilermaking occupations	33,000	39,000	18.6	1.4
Coremakers (foundry)	23,000	23,000	1.5	0.1
Dispensing opticians and optical mechanics	30,000	46,000	52.0	3.3
Blue-collar worker supervisors	1,400,000	1,700,000	21.6	1.5
Furniture upholsterers	35,000	39,000	12.6	0.9
Locomotive engineers	35,000	33,500	−4.8	−0.4
Locomotive firemen (helpers)	14,900	9,000	−38.4	−3.9
Molders (foundry)	56,000	57,000	1.5	0.1
Motion picture projectionists	16,000	19,000	15.3	1.1
Patternmakers (foundry)	19,000	19,000	1.5	0.1
Shoe repairers	30,000	26,000	−13.0	−1.2
Shop trades (railroad)	78,000	67,000	−14.2	−1.2
Stationary engineers	178,000	178,000	0.0	0.0
OPERATIVES				
Driving occupations:				
Intercity busdrivers	25,000	24,500	−2.1	−0.2
Local-transit busdrivers	68,000	71,500	5.0	0.4
Local truckdrivers	1,600,000	1,800,000	17.6	1.3
Route workers	190,000	200,000	4.7	0.3
Taxi drivers	92,000	85,000	−7.6	−0.7
Truckdrivers, over-the road	570,000	670,000	17.6	1.3
Other operative occupations:				
Assemblers	1,017,000	1,100,000	7.2	0.5
Automobile painters	25,000	29,000	16.1	1.1
Brake operators and couplers (railroad)	73,000	64,000	−12.5	−1.1
Electroplaters	17,000	21,000	24.0	1.5
Gasoline service station attendants	435,000	545,000	25.2	1.8
Inspectors (manufacturing)	725,000	940,000	29.7	2.0
Meatcutters	200,000	198,000	−1.4	−0.1
Parking attendants	33,000	38,000	14.0	1.0
Production painters	180,000	197,000	9.4	0.7
Photographic laboratory occupations	38,000	52,000	36.4	2.4
Power truck operators	300,000	370,000	22.2	1.5
Signal department workers (railroad)	11,200	9,500	−14.9	−1.3
Furnace tenders and stokers, except metal	93,000	88,000	−5.0	−0.4
Unlicensed merchant seamen	42,000	35,000	−16.7	−1.5
Waste water treatment plant operators	20,000	31,000	54.0	3.4
Welders and oxygen and arc cutters	554,000	770,000	39.0	2.6
LABORERS (NONFARM)				
Bridge and building workers (railroad)	10,500	9,900	−5.6	−0.5
Track workers (railroad)	54,000	47,000	−13.0	−1.1
Construction laborers and hod carriers	876,000	1,000,000	14.2	1.0

NOTE: Rates of change calculated from unrounded data.

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Table C–2. Growth in domestic output by industry, actual and projected, selected periods, 1959–85

[Average annual percent change at producers' value in 1963 dollars]

	Industry matrix number and title	1959–68	1968–80	1980–85
1	Livestock and livestock products	1.4	2.9	1.0
2	Crops and other agricultural products	2.1	2.9	1.6
3	Forestry and fisheries	0.5	3.4	1.6
4	Agriculture, forestry, and fishery services	3.5	2.8	2.3
5	Iron ore mining	5.2	3.8	3.1
6	Copper ore mining	4.3	6.2	2.6
7	Other nonferrous metal ore mining	1.4	5.5	6.5
8	Coal mining	2.4	2.3	5.8
9	Crude petroleum	3.6	0.9	−0.2
10	Stone and clay mining and quarrying	3.0	4.1	3.0
11	Chemical and fertilizer mining	6.2	6.3	3.7
12	New residential buildings	0.6	3.7	3.6
13	New nonresidential buildings	5.6	3.5	3.4
14	New public utilities	6.3	6.4	3.3
15	New streets and highways	3.1	0.1	1.4
16	All other new construction	−1.4	2.2	3.8
17	Maintenance and repair construction	1.3	1.5	1.1
18	Guided missiles and space vehicles	6.2	−0.2	3.8
19	Other ordnance	12.9	−4.5	3.3
20	Food products	2.8	2.7	2.0
21	Tobacco manufacturing	0.9	1.7	0.6
22	Broad and narrow fabrics, yarn and thread mills	3.4	3.2	2.4
23	Miscellaneous textiles and floor coverings	7.9	5.2	3.1
24	Hosiery and knit goods	7.3	5.8	3.6
25	Apparel	3.5	2.7	2.2
26	Miscellaneous fabricated textile products	5.9	5.4	3.1
27	Logging, sawmills and planing mills	1.6	3.4	1.9
28	Millwork and plywood and miscellaneous wood products	4.9	5.1	3.1
29	Household furniture	3.1	3.8	2.3
30	Other furniture	5.6	4.5	2.4
31	Paper products	4.3	4.7	3.2
32	Paperboard	5.1	4.3	2.8
33	Publishing	3.8	3.2	2.6
34	Printing	4.3	4.4	3.2
35	Chemical products	5.9	5.9	4.2
36	Agricultural chemicals	6.2	5.6	3.8
37	Plastic materials and synthetic rubber	7.7	9.7	4.3
38	Synthetic fibers	11.5	5.2	3.8
39	Drugs	7.7	7.9	4.8
40	Cleaning and toilet preparations	6.4	6.5	4.6
41	Paint	3.0	4.0	2.6
42	Petroleum products	4.1	1.5	1.6
43	Rubber products	4.0	4.4	3.3
44	Plastic products	14.1	10.1	5.5
45	Leather footwear and leather products	1.1	1.1	1.9
46	Glass	3.8	3.3	2.8
47	Cement, clay, and concrete products	2.5	4.2	3.2
48	Miscellaneous stone and clay products	3.1	1.7	2.5
49	Blast furnaces and basic steel products	3.1	1.9	1.9
50	Iron and steel foundries, forging and misc	4.2	1.8	2.5
51	Primary copper metals	6.6	6.4	2.7
52	Primary aluminum	5.8	7.5	5.2
53	Other primary and secondary nonferrous metal	5.3	2.5	3.7
54	Copper rolling and drawing	1.6	2.4	2.4
55	Aluminum rolling and drawing	6.8	4.6	5.3
56	Other nonferrous rolling and drawing	4.5	4.8	3.7
57	Miscellaneous nonferrous metal products	5.5	2.0	2.5
58	Metal containers	4.4	4.5	2.1
59	Heating apparatus and plumbing fixtures	2.1	4.1	3.5
60	Fabricated structural metal	5.2	4.8	3.3
61	Screw machine products	3.1	3.2	2.0
62	Other fabricated metal products	4.8	4.3	3.4
63	Engines, turbines and generators	5.0	7.2	4.9
64	Farm machinery	3.6	3.7	3.2
65	Construction, mining and oil field machinery	3.3	4.3	2.9
66	Material handling equipment	6.6	5.3	5.1
67	Metal working machinery	5.5	3.7	3.1
68	Special industry machinery	5.0	3.4	2.0
69	General industrial machinery	4.6	5.2	4.3
70	Machine shop products	6.5	3.9	3.4
71	Computers and peripheral equipment	12.0	11.0	6.4
72	Typewriters and other office machines	6.8	7.0	4.6
73	Service industry machines	9.3	8.5	4.4
74	Electric transmission and distribution equipment	4.8	5.8	4.6
75	Electric industrial apparatus	5.9	5.0	4.0
76	Household appliances	6.5	4.2	4.0
77	Electric lighting and wiring	4.5	6.0	5.2
78	Radio and TV receiving sets	11.8	3.5	3.9
79	Telephone and telegraph apparatus	9.3	8.5	5.7
80	Radio and TV industrial equipment	12.1	3.3	4.2
81	Electronic components	12.7	6.9	5.8
82	Miscellaneous electrical machinery	5.6	5.2	5.3
83	Motor vehicles	6.7	4.2	2.6
84	Aircraft	4.1	1.7	3.6
85	Ship and boatbuilding and repair	4.0	6.9	0.4
86	Railroad and other miscellaneous transportation equipment	6.1	5.4	3.5
87	Transportation equipment, nec	13.2	11.5	3.6
88	Professional, scientific and controlling instruments	2.4	3.7	3.3
89	Medical and dental instruments	8.3	7.0	5.5
90	Optical and ophthalmic equipment	10.1	4.6	4.0
91	Photographic equipment and supplies	11.4	8.0	7.2
92	Miscellaneous manufactured products	4.6	4.2	3.6
93	Railroad transportation	2.0	2.4	1.2
94	Local, suburban and interurban highway transportation	−0.7	0.7	0.6
95	Truck transportation	3.6	4.7	3.0
96	Water transportation	0.6	2.4	0.3
97	Air transportation	13.6	9.1	7.1
98	Other transportation	5.3	4.6	3.9
99	Communications, except radio and TV	8.0	8.1	5.4
100	Radio and TV broadcasting	4.2	1.8	1.3
101	Electric utilities	6.6	6.9	5.6
102	Gas utilities	5.5	2.3	1.6
103	Water and sanitary services	3.3	2.3	2.4
104	Wholesale trade	5.1	4.9	3.2
105	Retail trade	4.1	4.2	2.7
106	Finance	5.9	5.6	4.4
107	Insurance	3.8	3.7	3.1
108	Owner occupied dwellings	4.8	4.6	4.4
109	Other real estate	5.2	4.4	3.2
110	Hotels and lodging places	4.7	3.5	3.0
111	Other personal services	2.6	2.0	2.1
112	Miscellaneous business services	7.3	7.2	5.6
113	Advertising	0.5	3.3	2.2
114	Miscellaneous professional services	6.6	5.4	5.0
115	Automobile repair	3.0	4.8	2.7
116	Motion pictures	−1.0	0.6	0.7
117	Other amusements	4.0	3.7	2.7
118	Doctors, dentists, and other medical services	5.2	5.6	3.7
119	Hospitals	6.5	7.2	5.5
120	Educational services	6.5	4.0	3.7
121	Nonprofit organizations	4.2	3.8	3.5
122	Post Office	5.2	5.2	4.1
123	Commodity Credit Corporation	0.0	0.0	0.0
124	Other Federal enterprises	5.5	4.7	3.9
125	State and local government enterprises	4.9	4.5	3.7

NOTE: The measure of output at the detailed industry level is gross duplicated output rather than gross product originating. Gross duplicated output differs from gross output originating in that it includes in the output of each industry its cost of materials and the products primary to its output which are made in other sectors as secondary products, in addition to value added.

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Table C–3. Civilian employment by industry, 1959, 1968, 1972, and projected for 1980 and 1985 [1]

[Employment in thousands]

Industry matrix number and title		Employment			Projected employment		Average annual percent change		
		1959	1968	1972	1980	1985	1959–68	1968–80	1980–85
	Total civilian employment [2]	67,820	80,926	85,597	101,576	107,609	2.0	1.9	1.2
1	Livestock and livestock products	2,467	1,637	1,381	960	790	−4.5	−4.3	−3.8
2	Crops and other agricultural products	3,052	2,179	2,069	1,340	1,110	−3.7	−4.0	−3.7
3	Forestry and fisheries	56	58	59	65	65	0.4	1.0	0.0
4	Agriculture, forestry, and fishery services	224	268	309	355	375	2.0	2.4	1.1
5	Iron ore mining	30	27	22	27	25	−1.2	0.0	−1.5
6	Copper ore mining	24	29	40	46	48	2.1	3.9	0.9
7	Other nonferrous metal ore mining	32	28	26	33	37	−1.5	1.5	2.3
8	Coal mining	207	140	155	156	156	−4.2	0.9	0.0
9	Crude petroleum	350	296	287	265	239	−1.8	−0.9	−2.0
10	Stone and clay mining and quarrying	105	101	97	107	105	−0.4	0.8	−0.4
11	Chemical and fertilizer mining	20	20	19	21	22	0.0	0.6	0.9
12	New residential buildings								
13	New nonresidential buildings	3,727	4,038	4,386	4,908	5,184	0.9	1.6	1.1
14	New public utilities								
15	New streets and highways								
16	All other new construction								
17	Maintenance and repair construction								
18	Guided missiles and space vehicles	110	150	90	120	143	3.5	−1.8	3.6
19	Other ordnance	93	188	99	84	83	8.1	−6.5	−0.2
20	Food products	1,845	1,818	1,785	1,804	1,760	−0.2	−0.1	−0.5
21	Tobacco manufacturing	95	85	72	68	68	−1.2	−1.8	0.0
22	Broad and narrow fabrics, yarn and thread mills	615	614	590	620	608	0.0	0.1	−0.4
23	Miscellaneous textiles and floor coverings	111	132	135	143	143	2.0	0.7	0.0
24	Hosiery and knit goods	220	247	268	275	275	1.3	0.9	0.0
25	Apparel	1,103	1,242	1,177	1,355	1,360	1.3	0.7	0.1
26	Miscellaneous fabricated textile products	149	188	181	218	218	2.6	1.3	0.0
27	Logging, sawmills and planing mills	474	372	348	328	290	−2.7	−1.0	−2.4
28	Millwork and plywood and miscellaneous wood products	274	302	339	366	370	1.1	1.6	0.2
29	Household furniture	290	343	365	456	473	1.9	2.4	0.7
30	Other furniture	115	145	142	173	171	2.6	1.5	−0.2
31	Paper products	414	469	475	555	567	1.4	1.4	0.4
32	Paperboard	174	222	223	298	317	2.8	2.5	1.2
33	Publishing	508	590	598	700	721	1.7	1.4	0.6
34	Printing	467	560	565	668	690	2.0	1.5	0.7
35	Chemical products	361	435	395	489	494	2.1	1.0	0.2
36	Agricultural chemicals	46	57	52	60	60	2.4	0.5	0.0
37	Plastic materials and synthetic rubber	71	106	103	150	150	3.0	3.0	0.0
38	Synthetic fibers	69	110	115	130	131	5.4	1.4	0.2
39	Drugs	105	137	147	195	200	3.0	3.0	0.5
40	Cleaning and toilet preparations	89	116	123	160	166	3.0	2.7	0.7
41	Paint	62	70	69	80	80	1.4	1.1	0.0
42	Petroleum products	216	187	190	165	160	−1.6	−1.0	−0.6
43	Rubber products	258	296	307	370	383	1.5	1.9	0.7
44	Plastic products	117	267	322	487	502	9.6	5.1	0.6
45	Leather footwear and leather products	376	357	306	304	292	−0.6	−1.3	−0.8
46	Glass	153	176	191	241	252	1.6	2.7	0.9
47	Cement, clay, and concrete products	292	292	304	349	367	0.0	1.5	1.0
48	Miscellaneous stone and clay products	175	183	182	215	221	0.5	1.4	0.6
49	Blast furnaces and basic steel products	587	636	573	605	589	0.9	−0.4	−0.5
50	Iron and steel foundries, forging and miscellaneous	267	296	284	285	285	1.2	−0.3	0.0
51	Primary copper metals	12	12	17	21	21	0.0	4.6	0.0
52	Primary aluminum	20	27	29	41	41	3.3	3.6	0.0
53	Other primary and secondary nonferrous metal	37	39	38	42	43	0.6	0.6	0.5
54	Copper rolling and drawing	49	43	40	42	41	−1.4	−0.3	−0.5
55	Aluminum rolling and drawing	59	71	67	80	80	2.1	−1.8	0.0
56	Other nonferrous rolling and drawing	77	96	100	121	126	2.5	1.9	0.8
57	Miscellaneous nonferrous metal products	73	99	91	106	116	3.4	0.6	1.8
58	Metal containers	73	80	81	97	97	1.1	1.6	0.0
59	Heating apparatus and plumbing fixtures	81	82	81	95	100	0.2	1.2	1.0
60	Fabricated structural metal	339	418	435	562	599	2.4	2.5	1.3

See footnotes at end of table.

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Table C–3. Continued—Civilian employment by industry, 1959, 1968, 1972, and projected for 1960 and 1985 [1]

[Employment in thousands]

Industry matrix number and title		Employment			Projected employment		Average annual percent change		
		1959	1968	1972	1980	1985	1959–68	1968–80	1980–85
61	Screw machine products	279	359	333	455	506	2.8	2.0	2.1
62	Other fabricated metal products	370	468	457	631	680	2.6	2.5	1.5
63	Engines, turbines and generators	90	110	110	158	167	2.3	3.1	1.1
64	Farm machinery	123	144	134	148	153	1.7	0.3	0.7
65	Construction, mining and oil field machinery	162	192	201	240	248	1.9	1.9	0.7
66	Material handling equipment	63	89	86	112	124	3.8	2.0	2.1
67	Metal working machinery	252	349	297	387	400	3.7	0.9	0.7
68	Special industry machinery	166	202	180	220	216	2.2	0.7	−0.4
69	General industrial machinery	224	285	268	377	402	2.7	2.3	1.3
70	Machine shop products	179	253	242	290	303	3.9	1.2	0.9
71	Computers and peripheral equipment	94	199	206	435	475	8.6	6.8	1.8
72	Typewriters and other office machines	44	51	40	59	59	1.7	1.2	0.0
73	Service industry machines	97	136	149	186	193	3.8	2.7	0.7
74	Electric transmission and distribution equipment	157	205	193	300	325	3.0	3.2	1.6
75	Electric industrial apparatus	176	213	209	250	259	2.1	1.3	0.7
76	Household appliances	157	179	196	205	215	1.5	1.1	1.0
77	Electric lighting and wiring	136	203	204	305	352	4.6	3.5	2.9
78	Radio and TV receiving sets	113	154	139	127	127	3.5	−1.6	0.0
79	Telephone and telegraph apparatus	105	132	149	161	161	2.6	1.7	0.0
80	Radio and TV industrial equipment	234	390	281	350	350	5.8	−0.9	0.0
81	Electronic components	214	382	342	465	480	6.6	1.6	0.6
82	Miscellaneous electrical machinery	106	119	125	131	139	1.3	0.8	1.2
83	Motor vehicles	693	875	862	1,030	1,006	2.6	1.4	−0.5
84	Aircraft	721	852	501	565	600	1.9	−3.4	1.2
85	Ship and boatbuilding and repair	149	186	183	320	330	2.5	4.6	0.6
86	Railroad and other miscellaneous transportation equipment	46	59	66	75	80	2.9	2.0	1.3
87	Transportation equipment, nec	30	72	136	140	150	10.4	5.6	1.4
88	Professional, scientific and controlling instruments	194	230	200	272	290	1.9	1.4	1.3
89	Medical and dental instruments	46	75	91	126	145	5.5	4.4	2.8
90	Optical and ophthalmic equipment	39	52	55	58	60	3.3	0.8	0.7
91	Photographic equipment and supplies	68	107	113	155	174	5.2	3.1	2.3
92	Miscellaneous manufactured products	414	457	446	467	477	1.1	0.2	0.4
93	Railroad transportation	928	661	575	455	364	−3.7	−3.1	−4.4
94	Local, suburban and interurban highway transportation	312	312	300	326	326	0.0	0.4	0.0
95	Truck transportation	998	1,203	1,278	1,628	1,705	2.1	2.6	0.9
96	Water transportation	242	245	217	225	225	0.1	−0.7	0.0
97	Air transportation	182	332	349	477	502	6.9	3.1	1.0
98	Other transportation	93	118	125	139	144	2.7	1.4	0.7
99	Communications, except radio and TV	750	861	1,014	1,150	1,150	1.5	2.4	0.0
100	Radio and TV broadcasting	91	125	136	150	162	3.6	1.5	1.6
101	Electric utilities	361	379	423	428	432	0.5	1.0	0.2
102	Gas utilities	216	222	230	255	261	0.3	1.2	0.5
103	Water and sanitary services	48	64	75	88	97	3.2	2.7	2.0
104	Wholesale trade	3,229	3,894	4,210	4,946	5,123	2.1	2.0	0.7
105	Retail trade	10,665	12,761	14,235	16,749	17,258	2.0	2.3	0.6
106	Finance	1,046	1,531	1,781	2,455	2,793	4.3	4.0	2.6
107	Insurance	1,110	1,342	1,504	1,764	1,910	2.1	2.3	1.6
108	Owner occupied dwellings								
109	Other real estate	746	846	1,020	1,130	1,229	1.4	2.4	1.7
110	Hotels and lodging places	694	859	984	1,194	1,296	2.4	2.8	1.7
111	Other personal services	1,665	1,996	1,912	2,171	2,214	2.0	0.7	0.4
112	Miscellaneous business services	776	1,507	1,810	3,019	3,647	7.7	6.0	3.9
113	Advertising	114	131	133	157	164	1.6	1.5	0.9
114	Miscellaneous professional services	733	1,061	1,287	1,710	1,932	4.2	4.1	2.5
115	Automobile repair	385	534	597	783	850	3.7	3.3	1.7
116	Motion pictures	215	217	212	218	215	0.1	0.0	−0.3
117	Other amusements	399	552	631	818	892	3.7	3.3	1.7
118	Doctors, dentists and other medical services	862	1,396	1,811	2,660	3,027	5.5	5.5	2.6
119	Hospitals	967	1,654	2,018	3,040	3,500	6.1	5.2	2.9
120	Educational services	803	1,178	1,287	1,500	1,571	4.3	2.0	0.9
121	Nonprofit organizations	1,323	1,692	1,823	2,300	2,505	2.8	2.5	1.7
122	Post Office								
123	Commodity Credit Corporation	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
124	Other Federal enterprises								
125	State and local government enterprises								

See footnotes at end of table.

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Table C–3. Continued—Civilian employment by industry, 1959, 1968, 1972, and projected for 1960 and 1985 [1]

[Employment in thousands]

Industry matrix number and title		Employment			Projected employment		Average annual percent change		
		1959	1968	1972	1980	1985	1959–68	1968–80	1980–85
131	Total government	8,083	11,845	13,290	16,610	18,800	4.3	2.9	2.5
	Total Federal Government	2,233	2,737	2,650	2,750	2,800	2.3	0.0	0.4
	Total State and local government	5,850	9,109	10,640	13,860	16,000	5.0	3.6	2.9
133	Household industry	2,575	2,437	2,191	1,825	1,660	−0.6	−2.3	−1.9

[1] Includes wage and salary employees, self-employed, and unpaid family workers.

[2] For the derivation of the civilian employment control totals, see table 9 of text.

[3] Employment in government enterprises (industries 122–125) is included in general civilian government.

Table C–4. Nonagricultural employment of wage and salary workers, by industry, 1959, 1968, 1972, and projected for 1980 and 1985

[Employment in thousands]

SIC code	Industry	Employment			Projected employment, 1980	Projected employment, 1985	Average annual percent change		
		1959	1968	1972			1959–68	1968–80	1980–85
	TOTAL NONAGRICULTURAL EMPLOYMENT	53,313.0	67,915.0	72,764.0	90,176.0	96,809.0	2.7	2.4	1.4
10–14	MINING	732.0	606.0	607.0	623.0	601.0	−2.1	0.2	−0.7
10	Metal mining	83.7	82.0	86.1	104.0	108.0	−0.2	2.0	0.8
101	Iron ores	27.7	25.3	20.1	22.0	20.0	−1.0	−1.2	1.9
102	Copper ores	23.3	28.1	38.9	45.0	47.0	2.1	4.0	0.9
103	Lead and zinc ores [1]	12.3	9.6	([2])	10.0	10.0	−2.7	0.3	0.0
104–6, 8, 9	Other metal ores [1]	20.6	18.4	([2])	27.0	31.0	−1.3	3.2	2.8
11, 12	Coal mining	198.2	132.2	146.9	150.0	150.0	−4.4	1.1	0.0
11	Anthracite mining [3]	19.7	5.8	3.7	5.0	5.0	−12.7	−1.2	0.0
12	Bituminous coal and lignite mining	178.5	126.4	143.2	145.0	145.0	−3.8	1.2	0.0
13	Oil and gas extraction	329.5	275.6	261.9	245.0	220.0	−2.0	−1.0	−2.2
131, 2	Crude petroleum and natural gas fields	185.4	148.1	137 8	125.0	120.0	−2.4	−1.4	−0.8
138	Oil and gas field services	144.2	127.5	124.1	120.0	100.0	−1.4	−0.5	−3.6
14	Nonmetallic minerals, except fuels	120.4	116.2	112.1	124.0	123.0	−0.4	0.5	−0.2
142	Crushed and broken stone	41.7	39.5	38.8	43.0	40.0	−0.6	0.7	−1.5
144	Sand and gravel	41.7	37.8	38.0	41.0	41.0	−1.1	0.7	0.0
141, 5, 7–9	Nonmetallic minerals, except fuels, nec [3]	37.0	38.9	35.3	40.0	42.0	0.6	0.2	1.0
15–17	CONTRACT CONSTRUCTION	2,960.0	3,285.0	3,521.0	4,050.0	4,332.0	1.2	1.8	1.4
15	General building contractors	959.0	999.8	1,036.5	1,121.0	1,200.0	0.5	1.0	1.4
16	Heavy construction contractors	586.5	678.7	732.4	842.0	900.0	1.6	1.8	1.3
161	Highway and street construction	310.4	317.3	331.9	326.0	348.0	0.2	0.2	1.3
162	Heavy construction, nec	276.1	361.5	400.5	516.0	552.0	3.0	3.0	1.4
17	Special trade contractors	1,414.1	1,606.0	1,751.7	2,087.0	2,232.0	1.4	2.2	1.4
171	Plumbing, heating, air conditioning	327.9	390.3	436.2	515.0	549.0	2.0	2.3	1.3
172	Painting, paperhanging, decorating	152.9	132.2	126.2	135.0	144.0	−1.6	0.2	1.3
173	Electrical work	194.7	266.8	318.5	395.0	422.0	3.6	3.3	1.3
174	Masonry, stonework, and plastering	247.4	227.9	208.5	230.0	248.0	−0.9	0.0	1.5
176	Roofing and sheet metal work	108.2	111.8	117.6	136.0	146.0	0.4	1.6	1.4
177	Concrete work [1]	52.3	61.5	([2])	107.0	114.0	1.8	4.7	1.3
175, 8, 9	Carpenters and other special trades [1]	292.2	379.7	([2])	569.0	609.0	3.0	3.4	1.4
19–39	MANUFACTURING	16,675.0	19,781.0	18,933.0	22,605.0	23,224.0	1.9	1.1	0.5
19. 24, 25, 32–39	DURABLE GOODS	9,373.0	11,626.0	10,884.0	13,440.0	13,983.0	2.4	1.2	0.8
19	Ordnance and accessories	203.5	338.0	188.2	204.0	226.0	5.8	−4.1	2.1
192	Ammunition, except for small arms	119.3	252.2	129.4	146.0	168.0	8.7	−4.5	2.8
1925	Complete guided missiles	110.1	150.0	90.3	121.0	143.0	3.5	−1.8	3.4

See footnotes at end of table.

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Table C–4. Continued—Nonagricultural employment of wage and salary workers, by industry, 1959, 1968, 1972, and projected for 1980 and 1985

[Employment in thousands]

SIC code	Industry	Employment			Projected employment, 1980	Projected employment, 1985	Average annual percent change		
		1959	1968	1972			1959–68	1968–80	1980–85
24	Lumber and wood products	658.8	600.1	612.0	628.0	599.0	−1.0	0.4	−1.0
241	Logging camps, and logging contractors	94.4	79.1	68.9	68.0	65.0	−2.0	−1.3	−0.9
242	Sawmills and planing mills	305.2	231.8	216.7	205.0	172.0	−3.0	−1.0	−3.5
2421	Sawmills and planing mills, general	268.9	194.2	184.0	174.0	140.0	−3.6	−0.9	−4.2
2426, 9	Special products sawmills and planing mills [1]	36.3	37.6	(2)	31.0	32.0	0.4	−1.6	0.6
243	Millwork, plywood, and related products	156.1	167.6	204.8	220.0	225.0	0.8	2.3	0.5
2431	Millwork	73.5	73.4	87.1	90.0	92.0	0.0	1.7	0.4
2432	Veneer and plywood	66.9	75.2	81.3	93.0	95.0	1.3	1.8	0.4
2433	Prefabricated wood structures [1]	12.6	16.9	(2)	37.0	38.0	3.3	6.7	0.5
244	Wooden containers	43.4	37.1	28.2	25.0	20.0	−1.8	−3.2	−4.4
2441, 2	Wooden boxes, shook, and crates	32.7	29.5	22.6	20.0	15.0	−1.2	−3.2	−5.6
2443, 5	Veneer, plywood containers, cooperage [1]	10.6	8.1	(2)	5.0	5.0	−2.9	−3.9	0.0
249	Miscellaneous wood products	59.8	84.5	93.4	110.0	117.0	3.9	2.2	1.2
25	Furniture and fixtures	385.0	471.6	492.7	611.0	631.0	2.3	2.2	0.6
251	Household furniture	277.8	332.3	355.9	445.0	465.0	2.0	2.5	0.9
2511	Wood household furniture	139.4	172.4	177.2	225.0	233.0	2.4	2.2	0.7
2512	Upholstered household furniture	67.7	86.0	101.0	131.0	140.0	2.7	3.6	1.3
2515	Mattresses and bedsprings	38.4	38.3	38.5	43.0	43.0	−0.1	1.0	0.0
2514, 9	Other household furniture [1]	34.1	36.8	(2)	46.0	49.0	0.8	1.9	1.3
252	Office furniture	26.6	36.1	38.6	45.0	45.0	3.5	1.9	0.0
254	Partitions and fixtures	36.8	49.5	50.6	60.0	60.0	3.3	1.6	0.0
253, 9	Other furniture and fixtures	43.9	53.7	47.6	61.0	61.0	2.3	1.1	0.0
253	Public building furniture [1]	20.9	28.4	(2)	38.0	38.0	3.5	2.5	0.0
259	Miscellaneous furniture and fixtures [1]	21.9	23.6	(2)	23.0	23.0	0.8	−0.2	0.0
32	Stone, clay, and glass products	604.0	635.5	660.0	795.0	830.0	0.6	1.9	0.9
321	Flat glass	34.3	26.7	24.5	22.0	20.0	−2.7	−1.6	1.9
322	Glass and glassware, pressed or blown	100.2	121.1	133.7	184.0	194.0	2.1	3.5	1.1
3221	Glass containers	57.2	68.7	76.2	107.0	116.0	2.1	3.8	1.6
3229	Pressed and blown glass, nec	43.0	56.3	57.5	77.0	78.0	3.0	2.6	0.3
323	Products of purchased glass [1]	17.0	27.2	(2)	34.0	37.0	5.4	1.9	1.7
324	Cement, hydraulic	43.9	34.7	33.6	29.0	25.0	−2.5	−1.5	−2.9
325	Structural clay products	77.8	63.9	58.8	52.0	42.0	−2.2	−1.7	−4.2
3251	Brick and structural clay tile	34.4	28.5	26.0	19.0	10.0	−2.1	−3.3	−12.0
3255	Clay refractories [1]	16.1	13.6	(2)	13.0	12.0	−1.9	−0.4	−1.7
3253, 9	Other structural clay products [1]	25.8	21.0	(2)	20.0	20.0	−2.2	−0.4	0.0
326	Pottery and related products	47.7	43.4	44.2	38.0	36.0	−1.1	−1.1	−1.1
327	Concrete, gypsum, and plaster products	159.0	182.0	198.7	259.0	291.0	1.5	3.0	2.4
328, 9	Other stone and nonmetal mineral products	124.0	136.5	134.6	177.0	185.0	1.1	2.2	0.9
328	Cut stone and stone products [1]	18.0	16.4	(2)	13.0	13.0	−1.0	−2.0	0.0
3291	Abrasive products	27.8	27.1	26.4	34.0	36.0	0.3	1.9	1.1
3292	Asbestos products [1]	22.2	25.8	(2)	30.0	31.0	1.7	1.3	0.7
3293, 5–7, 9	Miscellaneous nonmetallic mineral products, nec [1]	54.3	66.0	(2)	100.0	105.0	2.2	3.5	1.0
33	Primary metal industries	1,182.6	1,315.5	1,234.8	1,341.0	1,342.0	1.2	0.1	0.0
331	Blast furnaces and basic steel products	587.3	635.9	572.7	605.0	589.0	0.9	−0.4	−0.5
3312	Blast furnaces and steel mills	515.3	555.5	492.2	524.0	510.0	0.8	−0.5	−0.5
3317	Steel pipe and tubes [1]	26.6	28.9	(2)	30.0	29.0	0.9	0.3	−0.7
332	Iron and steel foundries	211.8	225.7	220.2	218.0	196.0	0.7	−0.3	−2.2
3321	Gray iron foundries	124.4	140.9	139.2	137.0	115.0	1.4	−0.2	−3.5
3322	Malleable iron foundries	28.4	22.8	24.9	24.0	24.0	−2.4	0.4	0.0
3323	Steel foundries	59.0	62.0	56.2	57.0	57.0	0.6	−0.7	0.0
333, 4	Nonferrous metals	67.9	78.1	83.6	98.0	105.0	1.6	1.9	1.4
3331	Primary copper [1]	14.9	12.3	(2)	21.0	21.0	−2.2	4.6	0.0
3332	Primary lead [1]	5.4	3.1	(2)	4.0	4.0	−6.0	2.1	0.0
3333	Primary zinc [1]	9.8	9.7	(2)	8.0	7.0	−0.1	−1.6	−2.6
3339	Primary nonferrous metals, nec [1]	8.8	9.0	(2)	10.0	10.0	0.3	0.9	0.0
334	Secondary nonferrous metals [1]	13.2	17.2	(2)	19.0	22.0	3.0	0.9	3.0
335	Nonferrous rolling and drawing	185.4	210.3	205.9	243.0	249.0	1.4	1.2	0.5
3351	Copper rolling and drawing	49.0	43.4	39.7	42.0	41.0	−1.4	−0.3	−0.5
3352	Aluminum rolling and drawing	58.9	70.6	66.6	80.0	82.0	2.0	1.0	0.5
3356	Nonferrous rolling and drawing, nec [1]	16.9	22.9	(2)	33.0	35.0	3.4	3.1	1.2
3357	Nonferrous wire drawing and insulating	60.2	73.4	79.2	88.0	91.0	2.2	1.5	0.7
336	Nonferrous foundries	68.3	90.7	83.7	93.0	103.0	3.2	0.2	2.1
3361	Aluminum castings	31.8	46.2	43.5	48.0	53.0	4.2	0.3	2.0
3362, 9	Other nonferrous castings	36.5	44.5	40.2	45.0	50.0	2.2	0.0	2.1
339	Miscellaneous primary metal products	61.9	74.9	68.7	84.0	100.0	2.1	1.0	3.5
3391	Iron and steel forgings	46.3	49.5	45.5	52.0	68.0	0.7	0.4	5.5
3392, 9	Miscellaneous primary metal products, nec [1]	14.8	25.1	(2)	32.0	32.0	6.1	2.0	0.0

See footnotes at end of table.

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Table C–4. Continued—Nonagricultural employment of wage and salary workers, by industry, 1959, 1968, 1972, and projected for 1980 and 1985

[Employment in thousands]

SIC code	Industry	Employment			Projected employment, 1980	Projected employment, 1985	Average annual percent change		
		1959	1968	1972			1959–68	1968–80	1980–85
34	Fabricated metal products	1,122.5	1,390.4	1,371.1	1,823.0	1,970.0	2.4	2.3	1.6
341	Metal cans	62.5	67.1	68.2	80.0	80.0	0.8	1.5	0.0
342	Cutlery, hand tools, and hardware	135.2	163.6	155.5	196.0	200.0	2.1	1.5	0.4
3421, 3, 5	Cutlery and hand tools, including saws	53.1	63.7	65.2	88.0	90.0	2.0	2.7	0.5
3429	Hardware, nec	82.1	99.7	90.2	108.0	110.0	2.2	0.7	0.4
343	Plumbing and heating, except electric	80.7	82.3	80.7	95.0	100.0	0.2	1.2	1.0
3431, 2	Sanitary ware and plumbers' brass goods	33.5	37.0	39.0	44.0	46.0	1.1	1.5	0.9
3433	Heating equipment, except electric	47.2	45.3	41.6	51.0	54.0	−0.5	1.0	1.1
344	Fabricated structural metal products	343.4	412.2	429.4	558.0	595.0	2.0	2.6	1.3
3441	Fabricated structural steel	92.4	109.8	101.8	136.0	145.0	1.9	1.8	1.3
3442	Metal doors, sash, and trim	63.7	66.9	75.9	87.0	88.0	0.5	2.2	0.2
3443	Fabricated plate work (boiler shops)	93.8	109.6	111.9	149.0	160.0	1.7	2.6	1.4
3444	Sheet metal work	53.0	78.5	84.0	117.0	125.0	4.5	3.4	1.3
3446, 9	Architectural and miscellaneous metal work	30.4	47.3	55.8	69.0	77.0	5.0	3.2	2.2
345	Screw machine products, bolts, etc	87.1	110.6	96.9	130.0	159.0	2.7	1.4	4.1
3451	Screw machine products	38.1	50.6	42.0	63.0	77.0	3.2	1.8	4.1
3452	Bolts, nuts, rivets, and washers	49.1	60.0	54.9	67.0	82.0	2.3	0.9	4.1
346	Metal stampings	188.4	245.8	234.0	318.0	345.0	3.0	2.2	1.6
347	Metal services, nec	63.2	90.7	85.7	126.0	139.0	4.1	2.8	2.0
348	Miscellaneous fabricated wire products	56.3	66.6	67.1	80.0	89.0	1.9	1.5	2.2
349	Miscellaneous fabricated metal products	115.9	151.6	153.7	240.0	263.0	3.0	3.9	1.8
3491	Metal barrels, drums, and pails [1]	10.1	13.3	[2]	17.0	17.0	3.1	2.1	0.0
3494, 8	Valves, pipe, and pipe fittings	72.4	92.6	95.9	143.0	157.0	2.8	3.7	1.9
3492, 3, 6, 7, 9	Miscellaneous fabricated metal products, nec [1]	32.0	44.6	[2]	80.0	89.0	3.8	5.0	2.2
35	Machinery, except electrical	1,452.1	1,969.9	1,864.2	2,563.0	2,692.0	3.4	2.2	1.0
351	Engines and turbines	89.7	109.7	110.3	158.0	167.0	2.3	3.1	1.1
3511	Steam engines and turbines	36.1	38.2	44.1	63.0	67.0	0.6	4.3	1.2
3519	Internal combustion engines, nec	53.7	71.5	66.3	95.0	100.0	3.2	2.4	1.0
352	Farm machinery	122.3	142.6	132.4	147.0	153.0	1.7	0.3	0.8
353	Construction and related machinery	225.6	280.5	287.2	352.0	372.0	2.4	1.9	1.1
3531, 2	Construction and mining machinery	126.6	150.1	155.7	182.0	188.0	1.9	1.6	0.7
3533	Oil field machinery	35.6	41.5	45.4	58.0	60.0	1.7	2.8	0.7
3534	Elevators and moving stairways [1]	13.3	14.7	[2]	20.0	20.0	1.1	2.6	0.0
3535, 6	Conveyors, hoists, cranes, monorails	29.3	42.2	39.2	50.0	56.0	4.1	1.4	2.3
354	Metalworking machinery	245.2	342.0	288.2	380.0	393.0	3.8	0.9	0.7
3541	Machine tools, metal cutting types	64.8	80.0	57.5	70.0	73.0	2.4	−1.1	0.8
3544	Special dies, tools, jigs and fixtures	85.1	124.0	112.8	155.0	160.0	4.3	1.9	0.6
3545	Machine tool accessories	40.8	60.8	48.3	72.0	74.0	4.5	1.4	0.5
3542, 8	Miscellaneous metal working machinery	54.5	77.3	69.6	83.0	86.0	4.0	0.6	0.7
355	Special industry machinery	160.9	199.5	178.1	218.0	214.0	2.4	0.7	−0.4
3551	Food products machinery	32.5	42.7	37.7	49.0	48.0	3.1	1.2	−0.4
3552	Textile machinery	37.2	41.0	369.9	37.0	36.0	1.1	−0.9	0.6
3554	Paper industries machinery [1]	15.8	21.8	[2]	24.0	24.0	3.6	0.8	0.0
3555	Printing trades machinery	21.9	31.4	26.7	39.0	38.0	4.1	1.8	−0.5
3553, 9	Other special industry machinery [1]	55.6	63.4	[2]	69.0	68.0	1.5	0.7	−0.3
356	General industrial machinery	221.0	282.4	264.8	374.0	399.0	2.8	2.4	1.3
3561	Pumps and compressors	59.9	77.3	75.4	93.0	100.0	2.9	1.6	1.5
3562	Ball and roller bearings	52.4	60.3	51.5	75.0	80.0	1.6	1.8	1.3
3566	Power transmission equipment	45.4	51.9	47.3	63.9	67.0	1.5	1.6	1.2
3565, 7, 9	Other general industrial machinery and equipment [1]	39.4	61.2	[2]	96.0	102.0	5.0	3.8	1.2
357	Office and computing machines	138.2	249.9	245.4	494.0	534.0	6.8	5.8	1.6
3572	Typewriters [1]	21.6	24.8	[2]	16.0	21.0	1.5	−3.6	5.6
3576, 9	Scales, balances, and office machines, nec [1]	22.8	28.1	[2]	44.0	38.0	2.3	3.8	−2.9
358	Service industry machines	97.2	135.5	148.6	185.0	192.0	3.8	2.6	0.7
3585	Refrigeration machinery	61.3	87.1	100.3	128.0	133.0	4.0	3.3	0.8
3581, 2, 6, 9	Other service industry machinery [1]	34.5	48.2	[2]	57.0	59.0	3.8	1.4	0.7
359	Miscellaneous machinery, except electrical	149.2	223.8	209.1	255.0	268.0	4.6	1.1	1.0
36	Electrical equipment and supplies	1,396.4	1,974.5	1,833.0	2,291.0	2,405.0	3.9	1.2	1.0
361	Electrical test and distributing equipment	157.0	204.9	192.8	300.0	325.0	3.0	3.2	1.6
3611	Electrical measuring instruments	46.2	66.4	66.2	114.0	124.0	4.1	4.6	1.7
3612	Transformers	43.2	56.9	52.5	78.0	84.0	3.1	2.7	1.5
3613	Switchgear and switchboard apparatus	67.6	81.5	74.1	108.0	117.0	2.1	2.4	1.6
362	Electrical industrial apparatus	175.5	213.0	208.9	250.0	259.0	2.2	1.3	0.7
3621	Motors and generators	100.4	116.1	113.9	125.0	130.0	1.6	0.6	0.8
3622	Industrial controls	42.3	58.0	58.0	74.0	77.0	3.6	2.1	0.8
3624	Carbon and graphite products [1]	10.5	13.4	[2]	17.0	17.0	2.7	2.0	0.0
3623, 9	Other electrical industrial apparatus [1]	20.6	24.9	[2]	34.0	35.0	2.1	2.6	0.6
363	Household appliances	157.0	179.3	196.4	205.0	215.0	1.5	1.1	1.0
3632	Household refrigerators and freezers	48.6	58.4	59.5	66.0	72.0	2.1	1.0	1.8
3633	Household laundry equipment	27.4	25.2	28.1	25.0	25.0	−0.9	−0.1	0.0
3634	Electric housewares and fans	32.6	44.1	50.4	58.0	62.0	3.4	2.3	1.3
3636	Sewing machines [1]	10.6	8.5	[2]	6.0	5.0	−2.4	−2.9	−3.6
3631, 5, 9	Other household appliances [1]	37.3	43.9	[2]	50.0	51.0	1.8	1.1	0.4

See footnotes at end of table.

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Table C–4. Continued—Nonagricultural employment of wage and salary workers, by industry, 1959, 1968, 1972, and projected for 1980 and 1985

[Employment in thousands]

SIC code	Industry	Employment			Projected employment, 1980	Projected employment, 1985	Average annual percent change		
		1959	1968	1972			1959–68	1968–80	1980–85
364	Electric lighting and wiring equipment	134.5	200.7	201.7	303.0	350.0	4.5	3.5	2.9
3641	Electric lamps	28.7	38.4	38.3	44.0	50.0	3.3	1.1	2.6
3642	Lighting fixtures	48.2	67.0	67.5	82.0	95.0	3.7	1.7	3.0
3643, 4	Wiring devices	57.6	99.6	98.0	177.0	205.0	6.3	4.9	3.0
365	Radio and TV receiving equipment	113.1	155.3	139.2	127.0	127.0	3.6	−1.7	0.0
366	Communication equipment	339.7	526.3	429.5	511.0	511.0	5.0	−0.3	0.0
3661	Telephone and telegraph apparatus	105.3	132.2	148.5	161.0	161.0	2.6	1.7	0.0
3662	Radio and TV communication equipment	234.4	390.3	281.0	350.0	350.0	5.8	−0.9	0.0
367	Electronic components and accessories	213.3	381.4	340.7	465.0	480.0	6.7	1.7	0.6
3671–3	Electron tubes	75.8	74.7	50.9	51.0	47.0	−0.2	−3.1	−1.6
3674, 9	Other electronic components	137.4	324.9	289.9	414.0	433.0	10.0	2.0	0.9
369	Miscellaneous electrical equipment and supplies	106.3	119.3	123.8	130.0	138.0	1.3	0.7	1.2
3691	Storage batteries [1]	21.1	16.1	(2)	23.0	24.0	−3.0	3.0	0.9
3692	Primary batteries, dry and wet [1]	9.4	11.8	(2)	16.0	17.0	2.6	2.6	1.2
3694	Engine electrical equipment	63.1	65.6	65.8	69.0	76.0	0.4	0.4	2.0
3693, 9	Other miscellaneous electrical equipment [1]	16.6	19.0	(2)	22.0	21.0	1.5	1.2	−0.9
37	Transportation equipment	1,635.0	2,038.6	1,746.8	2,125.0	2,161.0	2.5	0.3	0.3
371	Motor vehicles and equipment	692.3	873.7	860.9	1,030.0	1,006.0	2.6	1.4	−0.5
3711	Motor vehicles	272.5	373.1	381.3	448.0	438.0	3.6	1.5	−0.5
3712	Passenger car bodies	60.5	59.5	45.6	53.0	47.0	−0.2	−1.0	−2.3
3713	Truck and bus bodies	28.8	37.8	39.2	49.0	50.0	3.1	2.2	0.4
3714	Motor vehicle parts and accessories	309.4	376.1	369.4	445.0	436.0	2.2	1.4	−0.4
372	Aircraft and parts	720.6	852.0	501.1	565.0	600.0	1.9	−3.4	1.2
3721	Aircraft	399.3	487.8	272.2	307.0	326.0	2.2	−3.8	1.2
3722	Aircraft engines and engine parts	182.8	216.4	138.5	151.0	160.0	1.9	−2.9	1.2
3723, 9	Other aircraft parts and equipment	135.8	147.8	90.5	107.0	114.0	0.9	−2.6	1.3
373	Ship and boat building and repairing	146.5	181.6	178.0	315.0	325.0	2.4	4.7	0.6
3731	Ship building and repairing	117.5	141.0	134.5	242.0	250.0	2.0	4.6	0.7
3732	Boat building and repairing	29.0	40.6	43.4	73.0	75.0	3.8	5.0	0.5
374	Railroad equipment	40.7	46.8	51.6	56.0	60.0	1.6	1.5	1.4
3741	Locomotives and parts [1]	17.2	16.5	(2)	19.0	20.0	−0.5	1.2	1.0
3742	Railroad and street cars [1]	22.2	31.7	(2)	37.0	40.0	4.0	1.3	1.6
375, 9	Other transportation equipment	34.8	84.6	155.3	159.0	170.0	10.4	5.4	1.3
38	Instruments and related products	345.3	461.9	455.9	609.0	667.0	3.3	2.3	1.8
381	Engineering and scientific instruments	72.3	83.5	64.1	89.0	95.0	1.6	0.6	1.3
382	Mechanical measuring and control devices	92.4	110.2	103.7	144.0	154.0	2.0	2.3	1.4
3821	Mechanical measuring devices	61.0	68.5	65.6	90.0	96.0	1.3	2.3	1.3
3822	Automatic temperature controls	31.3	41.7	38.1	54.0	58.0	3.2	2.2	1.4
383, 5	Optical and ophthalmic goods	39.1	52.4	54.4	58.0	60.0	3.3	0.8	0.7
383	Optical instruments and lenses [1]	10.9	19.6	(2)	19.0	20.0	6.7	−0.3	1.0
385	Ophthalmic goods	28.0	32.9	38.5	39.0	40.0	1.8	1.4	0.5
384	Medical instruments and supplies	45.4	74.2	90.4	125.0	144.0	5.6	4.4	2.9
386	Photographic equipment and supplies	67.6	106.9	112.8	155.0	174.0	5.2	3.1	2.3
387	Watches, clocks, and watchcases	28.6	34.7	30.4	38.0	40.0	2.2	0.8	1.0
39	Miscellaneous manufacturing industries	387.7	433.4	425.2	450.0	460.0	1.2	0.3	0.4
391	Jewelry, silverware, and plated ware	43.3	52.2	53.0	52.0	53.0	2.1	0.0	0.4
3911–3	Precious metal jewelry and lapidary work [1]	27.6	37.0	(2)	42.0	43.0	3.3	1.1	0.5
3914	Silverware and plated ware [1]	15.0	15.0	(2)	10.0	10.0	0.0	−3.3	0.0
394	Toys and sporting goods	97.4	119.3	119.9	137.0	140.0	2.3	1.2	0.4
3941–3	Games, toys, dolls, and play vehicles	62.4	69.1	65.0	69.0	70.0	1.1	0.0	0.3
3949	Sporting and athletic goods, nec	35.1	50.1	54.8	68.0	70.0	4.0	2.6	0.6
395	Pens, pencils, office and art supplies	30.8	34.5	33.4	41.0	42.0	1.3	1.4	0.5
396	Costume jewelry and notions	60.0	60.3	54.5	50.0	50.0	0.1	−1.6	0.0
393, 9	Other manufacturing industries	156.2	167.2	164.4	170.0	175.0	0.8	0.1	0.6
393	Musical instruments and parts	19.0	24.5	23.7	20.0	20.0	2.9	−1.7	0.0
399	Miscellaneous manufactures [1]	136.5	142.6	(2)	150.0	155.0	0.5	0.4	0.6
20–23, 26–31	NONDURABLE GOODS	7,303.0	8,155.0	8,049.2	9,165.0	9,241.0	1.2	1.0	0.2
20	Food and kindred products	1,789.6	1,781.5	1,751.1	1,775.0	1,743.0	0.0	0.0	−0.4
201	Meat products	317.1	332.3	344.5	363.0	357.0	0.5	0.7	−0.3
2011	Meat packing plants	207.5	185.6	179.4	170.0	167.0	−1.2	−0.7	−0.4
2013	Sausages and other prepared meats	45.5	57.7	61.6	70.0	69.0	2.7	1.6	−0.3
2015	Poultry dressing plants	64.2	89.0	103.5	123.0	121.0	3.7	2.7	−0.3
202	Dairy products	317.3	258.6	224.6	171.0	168.0	−2.2	−3.4	−0.4
2023	Condensed and evaporated milk [1]	16.0	13.0	(2)	11.0	11.0	−2.2	−1.4	0.0
2024	Ice cream and frozen desserts	36.5	26.8	23.6	17.0	16.0	−3.3	−3.8	−1.2
2026	Fluid milk	224.3	183.9	155.5	112.0	110.0	−2.2	−4.0	−0.4
2021, 2	Cheese and creamery butter [1]	39.4	33.9	(2)	31.0	31.0	−1.7	−0.7	0.0

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[Employment in thousands]

SIC Code	Industry	Employment			Projected employment, 1980	Projected employment, 1985	Average annual percent change		
		1959	1968	1972			1959–68	1968–80	1980–85
203	Canned, cured, and frozen foods	245.9	279.8	282.4	339.0	333.0	1.4	1.6	−0.4
2031, 6	Canned, cured, and frozen sea foods	39.8	40.8	43.7	48.0	47.0	0.3	1.4	−0.4
2032, 3	Canned foods, except sea food	137.4	145.4	139.0	145.0	143.0	0.6	0.0	−0.3
2034, 5	Dehydrated and pickled foods [1]	25.6	29.4	(2)	38.0	37.0	1.5	2.2	−0.5
2037	Frozen fruits and vegetables	38.3	60.2	67.3	108.0	106.0	5.2	5.0	−0.4
204	Grain mill products	134.1	132.5	133.7	137.0	135.0	−0.1	0.3	−0.3
2041	Flour and other grain mill products	38.8	29.9	27.5	25.0	23.0	−2.8	−1.5	−1.7
2042	Prepared feeds for animals and fowl	57.2	62.7	66.8	70.0	70.0	1.0	0.9	0.0
2046	Wet corn milling [1]	17.2	17.0	(2)	16.0	16.0	−0.1	−0.5	0.0
2043–5	Other grain mill products [1]	20.8	22.4	(2)	26.0	26.0	0.8	1.2	0.0
205	Bakery products	300.5	280.1	271.1	245.0	240.0	−0.8	−1.1	−0.4
2051	Bread, cake, and related products	256.4	235.7	226.8	199.0	195.0	−0.9	−1.4	−0.4
2052	Cookies and crackers	44.1	44.4	44.3	46.0	45.0	0.1	0.3	−0.4
206	Sugar	38.1	36.5	39.3	36.0	35.0	−0.5	−0.1	−0.6
2061	Raw cane sugar [1]	9.6	9.2	(2)	7.0	6.0	−0.5	−2.2	−3.0
2062	Cane sugar refining [1]	16.3	11.8	(2)	9.0	9.0	−3.6	−2.2	0.0
2063	Beet sugar [1]	7.1	8.8	(2)	20.0	20.0	2.4	7.1	0.0
207	Confectionery and related products	78.5	84.1	78.6	86.0	85.0	0.8	0.2	−0.2
2071	Confectionery products	64.5	68.1	60.9	65.0	65.0	0.6	−0.4	0.0
2072, 3	Chocolate and cocoa products, chewing gum [1]	13.5	15.2	(2)	21.0	20.0	1.3	2.7	−1.0
208	Beverages	214.7	233.4	230.1	250.0	245.0	0.9	0.6	−0.4
2082	Malt liquors	72.1	59.9	55.0	48.0	46.0	−2.1	−1.9	−0.9
2085	Distilled liquor, except brandy [1]	21.3	20.4	(2)	23.0	23.0	−0.5	1.0	0.0
2086	Bottled and canned soft drinks	101.4	128.7	127.8	150.0	147.0	2.7	1.2	−0.4
2083, 4, 7	Other beverages and related products [1]	17.8	20.4	(2)	29.0	29.0	1.5	3.0	0.0
209	Miscellaneous foods and kindred products	143.4	144.2	146.7	148.0	145.0	0.1	0.2	−0.4
2091–3	Vegetable oil mills [1]	22.6	16.0	(2)	15.0	15.0	−3.8	−0.5	0.0
2094–9	Miscellaneous food preparations [1]	116.3	125.9	(2)	133.0	130.0	0.9	0.5	−0.5
21	Tobacco manufactures	94.5	84.6	72.0	68.0	68.0	−1.2	−1.8	0.0
211	Cigarettes	36.9	40.9	42.2	45.0	45.0	1.2	0.8	0.0
212	Cigars	29.6	20.1	13.8	10.0	10.0	−4.2	−5.7	0.0
213, 214	Other tobacco manufacturing [3]	28.0	23.6	16.0	13.0	13.0	−1.9	−4.9	0.0
22	Textile mill products	945.7	993.9	991.0	1,037.0	1,025.0	0.6	0.4	−0.2
221	Weaving mills, cotton	259.4	233.6	201.5	171.0	167.0	−1.2	−2.5	−0.5
222	Weaving mills, synthetics	81.0	101.2	105.1	115.0	113.0	2.5	1.1	−0.4
223	Weaving and finishing mills, wool	60.4	44.2	27.8	20.0	20.0	−3.5	−6.4	0.0
224	Narrow fabric mills	28.5	31.3	29.8	36.0	35.0	1.0	1.2	0.6
225	Knitting mills	219.8	247.2	266.4	275.0	275.0	1.3	0.9	0.0
2251	Women's hosiery, except socks	53.7	64.7	55.2	69.0	69.0	2.1	0.5	0.0
2252	Hosiery, nec	53.9	38.8	35.2	33.0	33.0	−3.6	−1.4	0.0
2253	Knit outerwear mills	59.5	75.5	77.2	73.0	73.0	2.7	−0.3	0.0
2254	Knit underwear mills	33.2	32.7	35.7	30.0	30.0	−0.2	−0.7	0.0
2256, 9	Knit fabric and knitting mills, nec [3]	19.5	35.5	63.0	70.0	70.0	6.9	5.8	0.0
226	Textile finishing, except wool	77.3	81.3	83.6	91.0	90.0	0.6	0.9	−0.2
227	Floor covering mills	37.6	51.0	61.5	65.0	65.0	3.4	2.0	0.0
228	Yarn and thread mills	108.3	122.9	142.4	187.0	183.0	1.4	3.6	−0.4
2281, 3	Yarn mills [1]	87.1	89.9	(2)	130.0	127.0	0.4	3.1	0.5
2282, 4	Yarn throwing, winding, and thread mills [1]	21.4	31.0	(2)	57.0	56.0	4.2	5.2	−0.4
229	Miscellaneous textile goods	73.5	81.2	72.3	77.0	77.0	1.1	−0.4	0.0
2298	Cordage and twine [1]	11.4	11.1	(2)	10.0	10.0	−0.3	−0.9	0.0
2291–7, 9	Miscellaneous textile goods, nec [1]	61.1	69.4	(2)	67.0	67.0	1.4	−0.3	0.0
23	Apparel and other textile products	1,225.9	1,405.8	1,335.3	1,552.0	1,562.0	1.5	0.8	0.1
231	Men's and boys' suits and coats	118.3	130.7	106.9	119.0	120.0	1.1	−0.8	0.2
232	Men's and boys' furnishings	297.0	364.4	385.0	480.0	484.0	2.3	2.3	0.2
2321	Men's and boys' shirts and nightwear	109.7	120.1	118.5	126.0	127.0	1.0	0.4	0.2
2322	Men's and boys' underwear [1]	12.4	17.9	(2)	29.0	30.0	4.2	4.1	0.7
2327	Men's and boys' separate trousers	53.8	79.6	85.2	124.0	125.0	4.4	3.8	0.2
2328	Men's and boys' work clothing	71.8	81.4	85.8	95.0	96.0	1.4	1.3	0.2
2323, 9	Men's and boys' neckwear and clothing, nec [1]	46.0	63.4	(2)	106.0	106.0	3.6	4.4	0.0
233	Women's and misses' outerwear	371.4	425.4	396.0	464.0	467.0	1.5	0.7	0.2
2331	Women's and misses' blouses and waists	41.3	52.0	42.0	66.0	66.0	2.6	2.0	0.0
2335	Women's and misses' dresses	192.8	202.5	190.2	219.0	221.0	0.5	0.7	0.2
2337	Women's and misses' suits and coats	84.7	87.0	66.1	67.0	67.0	0.3	−2.2	0.0
2339	Women's and misses' outerwear, nec	52.5	83.8	97.7	112.0	113.0	5.3	2.4	0.2
234	Women's and children's undergarments	118.5	125.6	114.1	117.0	118.0	0.6	−0.6	0.2
2341	Women's and children's underwear	78.7	84.7	81.7	82.0	82.0	0.8	−0.3	0.0
2342	Corsets and allied garments	39.8	40.8	32.5	35.0	36.0	0.3	−1.3	0.6
235	Hats, caps, and millinery	37.1	23.2	16.3	10.0	10.0	−5.1	−6.8	0.0
236	Children's outerwear	75.4	78.9	75.8	73.0	73.0	0.5	−0.7	0.0
2361	Children's dresses and blouses	34.6	34.5	31.4	28.0	28.0	0.0	−1.8	0.0
2363, 9	Children's other outerwear [1]	39.5	45.1	(2)	45.0	45.0	1.5	0.0	0.0

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		1959	1968	1972			1959–68	1968–80	1980–85
237, 8	Fur goods and miscellaneous apparel	74.1	80.8	70.7	77.0	78.0	1.0	−0.4	0.3
237	Fur goods [1]	8.8	7.5	(2)	3.0	3.0	−1.8	−7.3	0.0
2381	Fabric dress and work gloves [1]	14.4	15.6	(2)	14.0	14.0	0.9	−0.9	0.0
2384–7, 9	Other apparel and accessories [1]	45.2	56.7	(2)	60.0	61.0	2.6	0.5	0.3
239	Miscellaneous fabricated textile products	136.8	176.8	170.6	212.0	212.0	2.8	1.5	0.0
2391, 2	House furnishings	51.6	64.2	70.7	75.0	75.0	2.5	1.3	0.0
2393	Textile bags [1]	9.1	10.7	(2)	5.0	5.0	1.8	−6.1	0.0
2394–7, 9	Other fabricated textile products [1]	72.8	100.7	(2)	132.0	132.0	3.7	2.3	0.0
26	Paper and allied products	587.2	691.2	697.0	853.0	884.0	1.8	1.8	0.7
261, 2, 6	Paper and pulp mills	217.7	217.7	207.3	212.0	217.0	0.0	−0.2	0.5
263	Paperboard mills	70.6	72.0	70.9	78.0	79.0	0.2	0.7	0.3
264	Miscellaneous converted paper products	125.1	179.8	196.7	265.0	271.0	4.1	3.3	0.4
2643	Bags, except textile bags	30.1	41.9	44.3	63.0	64.0	3.7	3.5	0.3
2641, 2, 4–7, 9	Other converted paper products [1]	91.6	135.1	(2)	202.0	207.0	4.4	3.4	0.5
265	Paperboard containers and boxes	173.7	221.7	222.2	298.0	317.0	2.7	2.5	1.2
2651, 2	Folding and set-up paperboard boxes	68.8	68.6	61.4	66.0	70.0	0.0	−0.3	1.2
2653	Corrugated and solid fiber boxes	68.9	102.7	109.4	174.0	185.0	4.5	4.5	1.2
2655	Fiber cans, drums, and related material [1]	12.6	18.8	(2)	30.0	33.0	4.5	4.0	1.9
27	Printing and publishing	888.5	1,065.1	1,079.6	1,295.0	1,346.0	2.0	1.6	0.8
271	Newspapers	318.5	358.1	376.5	400.0	415.0	1.3	0.9	0.7
272	Periodicals	69.7	75.9	68.1	82.0	85.0	1.0	0.6	0.7
273	Books	66.8	95.3	99.1	145.0	150.0	4.0	3.6	0.7
275	Commercial printing	284.0	340.1	344.2	418.0	435.0	2.0	1.7	0.8
2751	Commercial printing, except lithographic	196.3	209.4	202.1	211.0	220.0	0.7	0.0	0.8
2752	Commercial printing, lithographic	76.7	119.4	131.3	195.0	203.0	5.0	4.2	0.8
2753	Engraving and plate printing [1]	10.5	11.4	(2)	12.0	12.0	0.9	0.4	0.0
278	Blankbooks and bookbinding	45.4	56.2	55.4	67.0	70.0	2.4	1.5	0.9
274, 6, 7, 9	Other publishing and printing industries	104.2	139.6	136.3	183.0	191.0	3.3	2.3	0.9
277	Greeting card publishing [1]	18.5	25.3	(2)	38.0	40.0	3.5	3.4	1.0
274, 6, 9	Miscellaneous publishing and printing industries [1]	83.7	113.5	(2)	145.0	151.0	3.4	2.1	0.8
28	Chemicals and allied products	809.2	1,029.9	1,002.2	1,263.0	1,280.0	2.7	1.7	0.3
281	Industrial chemicals	278.6	315.5	302.3	376.0	377.0	1.4	1.5	0.0
2812	Alkalies and chlorine	24.2	24.9	21.4	20.0	19.0	0.3	−1.8	−1.0
2818	Industrial organic chemicals, nec	107.9	128.0	121.9	165.0	166.0	1.9	2.1	0.1
2819	Industrial inorganic chemicals, nec	92.5	96.5	96.5	105.0	105.0	0.5	0.7	0.0
282	Plastics materials and synthetics	149.4	216.1	217.3	280.0	281.0	4.2	2.2	0.0
2821	Plastics materials and resins	70.0	91.9	89.7	130.0	130.0	3.1	2.9	0.0
2822	Synthetic rubber [1]	10.1	14.0	(2)	20.0	20.0	3.7	3.0	0.0
2823, 4	Synthetic fibers	68.7	110.2	114.6	130.0	131.0	5.4	1.4	0.1
283	Drugs	104.8	136.9	147.1	195.0	200.0	3.0	3.0	0.5
2834	Pharmaceutical preparations	75.7	105.6	118.1	161.0	165.0	3.8	3.6	0.5
2831, 3	Other drugs and medicines [1]	29.0	30.6	(2)	34.0	35.0	0.6	0.9	0.5
284	Soap, cleaners, and toilet goods	88.7	116.9	122.4	160.0	166.0	3.1	2.6	0.7
2841	Soap and other detergents	32.6	40.1	39.5	51.0	53.0	2.3	2.0	0.8
2842, 3	Polishing, sanitation, and finishing preparations [1]	24.2	29.1	(2)	37.0	38.0	2.1	2.0	0.5
2844	Toilet preparations	31.7	46.9	50.4	72.0	75.0	4.4	3.6	0.8
285	Paints and allied products	62.2	69.8	69.2	80.0	80.0	1.3	1.1	0.0
287	Agricultural chemicals	45.5	56.8	52.0	60.0	60.0	2.5	0.5	0.0
2871, 2	Fertilizers, complete and mixing only	36.1	39.7	35.8	40.0	40.0	1.1	0.0	0.0
2879	Agricultural chemicals, nec [1]	9.2	16.9	(2)	20.0	20.0	7.0	1.4	0.0
286, 9	Other chemical products	79.9	117.9	91.9	112.0	116.0	4.4	−0.4	0.7
286	Gum and wood chemicals [1]	7.7	6.9	(2)	5.0	5.0	−1.2	−2.6	0.0
2891, 3, 5, 9	Other chemical preparations [1]	52.5	62.9	(2)	82.0	84.0	2.0	2.2	0.5
29	Petroleum and coal products	215.5	186.8	189.6	165.0	160.0	−1.6	−1.0	−0.6
291	Petroleum refining	181.4	150.1	150.8	129.0	125.0	−2.1	−1.3	0.7
295, 9	Other petroleum and coal products	34.1	36.7	38.8	36.0	35.0	0.8	−0.2	−0.6
30	Rubber and plastics products, nec	372.7	561.3	627.0	855.0	883.0	4.7	3.6	0.6
301	Tires and inner tubes	104.5	113.5	128.2	174.0	180.0	0.9	3.6	0.7
302, 3, 6	Other rubber products	153.0	182.9	178.4	196.0	203.0	2.0	0.6	0.7
303, 6	Reclaimed and fabricated products [1]	128.3	153.5	(2)	167.0	173.0	2.0	0.7	0.7
307	Miscellaneous plastics products	115.1	265.0	320.4	485.0	500.0	9.7	5.2	0.6
31	Leather and leather products	374.0	355.2	304.4	302.0	290.0	−0.6	−1.4	−0.8
311	Leather tanning and finishing	36.3	30.7	25.4	21.0	20.0	−1.9	−3.1	−1.0
314	Footwear, except rubber	247.5	233.4	201.6	203.0	195.0	−0.7	−1.2	−0.8
312, 3, 5–7, 9	Other leather products	90.2	91.1	77.4	78.0	75.0	0.1	−1.3	−0.8
313	Footwear cut stock [1]	18.2	14.1	(2)	10.0	10.0	−2.7	−2.8	0.0
317	Handbags and personal leather goods	37.0	39.1	34.9	31.0	30.0	0.6	−2.0	−0.7
312, 5, 9	Other leather products, nec [1]	17.5	16.7	(2)	16.0	15.0	−0.5	−0.4	−1.3

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Table C–4. Continued—Nonagricultural employment of wage and salary workers, by industry, 1959, 1968, 1972, and projected for 1980 and 1985

[Employment in thousands]

SIC code	Industry	Employment			Projected employment, 1980	Projected employment, 1985	Average annual percent change		
		1959	1968	1972			1959–68	1968–80	1980–85
40–49	TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES	4,011.0	4,310.0	4,495.0	5,104.0	5,159.0	0.8	1.4	0.2
40	Railroad transportation	924.8	661.0	574.5	455.0	364.0	−3.7	−3.1	−4.4
4011–1	Class I railroads	815.2	583.3	519.3	416.0	331.0	−3.7	−2.8	−4.5
4011–2	Class II railroads [1]	17.5	14.5	(2)	9.0	7.0	−2.1	−3.9	−4.9
4013–1	Class I switching and terminal companies [1]	42.9	23.9	(2)	16.0	15.0	−6.3	−3.3	−1.3
4013–2	Class II switching and terminal companies [1]	10.2	13.4	(2)	7.0	6.0	3.1	−5.3	−3.0
41	Local and interurban passenger transit	281.3	281.5	267.6	300.0	300.0	0.0	0.5	0.0
411	Local and surburban transportation	103.0	81.4	69.8	76.0	76.0	−2.5	−0.6	0.0
412	Taxicabs	118.9	111.2	100.0	97.0	97.0	−0.7	−1.1	0.0
413	Intercity highway transportation	41.4	43.2	41.3	42.0	42.0	0.5	−0.2	0.0
414, 5, 7	Other passenger transit services [1]	19.0	49.0	(2)	85.0	85.0	11.1	4.7	0.0
42	Trucking and warehousing	844.3	1,044.5	1,101.8	1,465.0	1,550.0	2.3	2.9	1.1
422	Public warehousing	87.5	85.3	85.0	85.0	90.0	−0.3	0.0	1.1
45	Transportation by air	179.3	329.2	345.0	475.0	500.0	7.0	3.1	1.0
451, 2	Air transportation	160.9	279.9	312.0	439.0	462.0	6.3	3.8	1.0
458	Air transportation services [1]	17.2	30.8	(2)	36.0	38.0	6.7	1.3	1.1
46	Pipeline transportation	24.3	18.5	18.1	14.0	15.0	−3.0	−2.2	1.4
44, 47	Other transportation services	308.5	339.3	322.7	342.0	346.0	1.1	0.0	0.2
441, 2	Deep sea transportation [1]	83.3	82.7	(2)	52.0	52.0	−0.1	−3.8	0.0
443	Great Lakes transportation [1]	4.0	3.0	(2)	3.0	3.0	−3.1	0.0	0.0
444, 5	River, canal, and local water transportation [1]	29.5	34.6	(2)	49.0	49.0	1.8	2.7	0.0
446	Water transportation services [1]	114.9	110.5	(2)	117.0	117.0	−0.4	0.5	0.0
48	Communication	836.8	981.7	1,146.0	1,296.0	1,308.0	1.8	2.3	0.1
481	Telephone communication	707.1	812.4	961.0	1,092.0	1,092.0	1.6	2.5	0.0
482	Telegraph communication	39.0	32.8	26.1	20.0	20.0	−1.9	−4.0	0.0
483	Radio and television broadcasting	88.9	123.0	133.7	148.0	160.0	3.7	1.6	1.6
489	Communication services, nec [1]	1.6	12.6	(2)	36.0	36.0	26.0	9.1	0.0
49	Electric, gas, and sanitary services	612.2	653.8	719.5	757.0	776.0	0.7	1.2	0.5
491	Electric companies and systems	253.9	268.5	307.8	317.0	324.0	0.6	1.4	0.4
492	Gas companies and systems	154.1	158.4	163.1	170.0	175.0	0.3	0.6	0.6
493	Combination companies and systems	173.7	180.2	191.5	192.0	197.0	0.4	0.5	0.5
494–7	Water, steam, and sanitary systems	30.5	46.8	57.1	78.0	80.0	4.9	4.3	0.5
50, 52–59	WHOLESALE AND RETAIL TRADE	11,127.0	14,084.0	15,683.0	19,080.0	19,776.0	2.7	2.6	0.7
50	Wholesale trade	2,946.0	3,611.0	3,918.0	4,670.0	4,850.0	2.3	2.2	0.8
501	Motor vehicles and automotive equipment	207.2	289.1	349.1	481.0	500.0	3.8	4.3	0.8
502	Drugs, chemicals, and allied products	175.9	219.3	226.8	289.0	300.0	2.5	2.3	0.7
503	Dry goods and apparel	125.9	146.3	157.9	173.0	180.0	1.7	1.4	0.8
504	Groceries and related products	491.6	532.8	568.7	579.0	600.0	0.9	0.7	0.7
505	Farm product raw materials [1]	91.8	90.0	(2)	82.0	85.0	−0.2	−0.5	0.7
506	Electrical goods	202.3	289.7	325.2	481.0	500.0	4.1	4.3	0.8
507	Hardware; plumbing and heating equipment	146.0	163.8	178.0	190.0	185.0	1.3	1.2	−0.5
508	Machinery, equipment, and supplies	458.7	696.1	746.9	989.0	1,040.0	4.7	3.0	1.0
509	Miscellaneous wholesalers	1,030.2	1,177.5	1,260.9	1,406.0	1,460.0	1.5	1.5	0.8
52–59	Retail trade	8,182.0	10,473.0	11,765.0	14,410.0	14,926 0	2.8	2.7	0.7
53	Retail general merchandise	1,532.3	2,161.1	2,426.3	3,018.0	3,126.0	3.9	2.8	0.7
531	Department stores	896.9	1,406.3	1,594.1	2,053.0	2,126.0	5.1	3.2	0.7
532	Mail order houses	92.4	128.2	127.6	181.0	187.0	3.7	2.9	0.7
533	Variety stores	322.8	311.6	329.7	299.0	310.0	−0.4	−0.3	0.7
534, 5, 9	Other general merchandising [1]	202.8	294.4	(2)	485.0	503.0	4.2	4.2	0.7
54	Food stores	1,305.4	1,619.9	1,825.9	2,220.0	2,300.0	2.4	2.7	0.7
541–3	Grocery, meat, and vegetable stores	1,134.1	1,454.4	1,651.0	2,061.0	2,135.0	2.8	2.9	0.7
544	Candy, nut, and confectionery stores [1]	34.2	29.1	(2)	22.0	23.0	−1.8	−2.3	0.9
545, 6, 9	Retail bakeries and other food stores [1]	138.0	136.6	(2)	137.0	142.0	−0.1	0.0	0.7
56	Apparel and accessory stores	604.5	701.8	751.7	840.0	870.0	1.7	1.5	0.8
561	Men's and boys' clothing and furnishings	96.5	120.0	131.8	162.0	169.0	2.5	2.5	0.9
562	Women's ready-to-wear stores	233.3	260.8	287.2	316.0	327.0	1.2	1.6	0.7
565	Family clothing stores	89.7	108.4	105.1	124.0	128.0	2.1	1.1	0.6
566	Shoe stores	113.3	141.9	153.1	164.0	170.0	2.5	1.2	0.7
563, 4, 7–9	Accessory and other clothing stores [1]	75.2	68.2	(2)	74.0	76.0	−1.1	0.7	0.5

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Table C–4. Continued—Nonagricultural employment of wage and salary workers, by industry, 1959, 1968, 1972, and projected for 1980 and 1985

[Employment in thousands]

SIC code	Industry	Employment			Projected employment, 1980	Projected employment, 1985	Average annual percent change		
		1959	1968	1972			1959–68	1968–80	1980–85
57	Furniture and home furnishings stores	395.9	419.9	472.8	507.0	525.0	0.7	1.6	0.7
571	Furniture and home furnishings	246.1	278.8	297.3	324.0	336.0	1.4	1.3	0.7
572, 3	Home appliance stores [1]	147.5	157.9	(2)	183.0	189.0	0.8	1.2	0.5
58	Eating and drinking places	1,602.9	2,298.4	2,684.1	3,572.0	3,700.0	4.1	3.7	0.8
52, 55, 59	Other retail trade	2,740.5	3,253.5	3,604.3	4,253.0	4,405.0	1.9	2.3	0.7
52	Building materials and farm equipment	575.5	536.3	584.4	541.0	560.0	−0.8	0.0	0.7
55	Automotive dealers and service stations	1,243.6	1,547.5	1,693.3	2,109.0	2,185.0	2.5	2.6	0.7
551, 2	Motor vehicle dealers	652.6	749.3	794.7	958.0	992.0	1.5	2.1	0.7
553, 9	Other automotive and accessory dealers	141.9	212.5	264.3	355.0	368.0	4.6	4.4	0.7
554	Gasoline service stations	449.1	585.5	634.3	796.0	825.0	3.0	2.6	0.7
59	Miscellaneous retail stores	939.5	1,169.7	1,326.6	1,603.0	1,660.0	2.5	2.7	0.7
591	Drug stores and proprietary stores	354.8	435.4	470.2	580.0	600.0	2.3	2.4	0.7
596	Farm and garden supply stores	89.0	104.6	116.5	134.0	139.0	1.8	2.1	0.7
597	Jewelry stores [1]	64.1	75.0	(2)	104.0	108.0	1.8	2.8	0.8
598	Fuel and ice dealers	108.2	107.0	104.2	102.0	102.0	−0.1	−0.4	0.0
592, 3, 5, 9	Other retail stores [1]	256.4	364.6	(2)	601.0	626.0	4.0	4.3	0.8
60–67	FINANCE, INSURANCE, AND REAL ESTATE	2,594.0	3,382.0	3,927.0	4,987.0	5,569.0	3.0	3.3	2.2
60	Banking	640.0	916.2	1,105.2	1,515.0	1,725.0	4.1	4.3	2.6
61	Credit agencies other than banks	243.6	350.4	392.3	500.0	570.0	4.1	3.0	2.7
612	Savings and loan associations	66.4	100.0	128.7	161.0	183.0	4.7	4.0	2.6
614	Personal credit institutions	139.3	189.5	192.2	239.0	273.0	3.5	2.0	2.7
62	Security, commodity brokers and services	106.7	192.1	197.8	321.0	365.0	6.8	4.4	2.6
63	Insurance carriers	816.9	983.0	1,104.1	1,285.0	1,400.0	2.1	2.3	1.7
631	Life insurance	448.7	513.8	567.7	643.0	700.0	1.5	1.9	1.7
632	Accident and health insurance	49.8	81.1	99.4	142.0	155.0	5.6	4.8	1.8
633	Fire, marine, and casualty insurance	278.0	344.6	382.8	443.0	485.0	2.4	2.1	1.8
635, 6, 9	Other insurance carriers [1]	39.6	42.4	(2)	57.0	60.0	0.8	2.5	1.0
64	Insurance agents, brokers, and services	189.7	253.0	289.2	367.0	400.0	3.3	3.1	1.7
65	Real estate	520.2	609.4	746.2	893.0	989.0	1.8	3.2	2.1
656	Operative builders	44.7	43.5	59.4	67.0	71.0	−0.3	3.7	1.2
651, 3, 4	Other real estate dealers [1]	423.8	479.4	(2)	677.0	753.0	1.4	2.9	2.2
66, 67	Other finance, insurance, and real estate	76.3	77.4	91.6	106.0	120.0	0.2	2.7	2.5
67	Holding and other investment companies [1]	18.1	34.7	(2)	79.0	90.0	7.5	7.1	2.6
07–09, 70–86, 89, 99	SERVICES	7,130.0	10,623.0	12,309.0	17,117.0	19,348.0	4.5	4.1	2.5
07–09	Agricultural services, forestry, and fisheries [1]	119.1	155.0	(2)	280.0	300.0	3.0	5.1	1.4
70	Hotels and other lodging places	546.8	722.2	849.0	1,060.0	1,160.0	3.1	3.2	1.8
701	Hotels, tourist courts, and motels	490.3	648.5	708.0	905.0	1,000.0	3.2	2.8	2.0
702–4	Other lodging places	56.5	73.7	141.0	155.0	160.0	3.0	6.4	0.6
72	Personal services	890.7	1,031.4	913.0	1,027.0	1,055.0	1.6	−0.1	0.5
721	Laundries and dry cleaning plants	529.1	548.5	438.3	489.0	501.0	0.4	−1.0	0.5
73	Miscellaneous business services	700.5	1,405.5	1,662.7	2,894.0	3,526.0	8.0	6.2	4.0
731	Advertising	105.5	117.7	115.6	144.0	151.0	1.2	1.7	1.0
732	Credit reporting and collection	50.3	72.8	79.8	124.0	150.0	4.2	4.5	3.9
733, 5, 6, 9	Duplicating and other business services [3]	452.0	1,216.7	1,146.2	2,113.0	2,605.0	11.6	4.7	4.3
75	Auto repair, services, and garages [1]	239.7	349.9	(2)	600.0	667.0	4.3	4.6	2.1
751	Automobile rentals, without drivers [1]	19.5	49.6	(2)	129.0	144.0	10.9	8.3	2.2
752	Automobile parking [1]	33.2	38.8	(2)	50.0	56.0	1.7	2.1	2.3
753, 4	Automobile repair shops and services [1]	187.0	261.5	(2)	421.0	467.0	3.8	4.0	2.1
762	Electrical repair shops [1]	42.2	59.3	(2)	80.0	82.0	3.9	2.5	0.5
763, 4, 9	Other miscellaneous repair services [1]	81.9	113.8	(2)	163.0	168.0	3.7	3.0	0.6
78	Motion pictures	195.1	196.0	191.1	198.0	198.0	0.0	0.0	0.0
781	Motion picture filming and distributing	44.9	54.7	51.4	58.0	58.0	2.2	0.5	0.0
7813–15	Motion picture filming [1]	25.2	34.8	(2)	35.0	35.0	3.7	0.0	0.0
7816–18	Motion picture distributing [1]	18.3	13.3	(2)	23.0	23.0	3.7	4.7	0.0
782, 3	Motion picture theaters and services	150.2	141.3	139.7	140.0	140.0	−0.7	−0.1	0.0

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(Employment in thousands)

SIC code	Industry	Employment			Projected employment, 1980	Projected employment, 1985	Average annual percent change		
		1959	1968	1972			1959–68	1968–80	1980–85
79	Amusement and recreation services, nec [1]	281.2	393.0	([2])	653.0	725.0	3.8	4.3	2.1
791–3	Indoor amusements and recreation [1]	142.9	169.4	([2])	181.0	193.0	1.9	0.6	1.3
794	Miscellaneous amusement, recreation services [1]	138.3	223.6	([2])	472.0	532.0	5.5	6.4	2.4
80	Medical and other health services	1,453.7	2,638.6	3,441.5	5,280.0	6,100.0	6.8	6.0	2.9
806	Hospitals	976.3	1,653.9	2,017.5	3,040.0	3,500.0	6.0	5.2	2.9
801–4, 7, 9	Physicians, dentists, and other medical [3]	477.4	894.7	1,424.0	2,240.0	2,600.0	7.2	7.9	3.0
81	Legal services	139.0	207.7	261.9	353.0	415.0	4.6	4.5	3.3
82	Educational services	716.2	1,067.3	1,166.8	1,357.0	1,422.0	4.5	2.0	0.9
821	Elementary and secondary schools	242.4	360.3	391.1	469.0	491.0	4.5	2.2	0.9
822	Colleges and universities	418.1	619.1	638.3	790.0	828.0	4.5	2.1	0.9
823, 4, 9	Other schools and educational services [1]	57.8	86.9	([2])	98.0	103.0	4.6	1.0	1.0
84	Museums, botanical, zoological gardens [1]	7.9	15.1	([2])	28.0	30.0	7.5	5.3	1.4
86	Nonprofit membership organizations [1]	1,747.9	1,581.0	([2])	2,112.0	2,300.0	2.7	2.4	1.7
866	Religious organizations [1]	726.8	932.4	([2])	1,139.0	1,240.0	2.8	1.7	1.7
867	Charitable organizations [1]	217.3	244.5	([2])	340.0	370.0	1.3	2.8	1.7
861–5, 9	Business, labor, and other nonprofit organizations [1]	303.8	404.1	([2])	633.0	690.0	3.2	3.8	1.7
89	Miscellaneous services	335.6	579.0	704.1	1,032.0	1,200.0	6.4	4.9	3.1
891	Engineering and architectural services	183.7	289.3	318.3	437.0	514.0	5.2	3.5	3.3
893, 9	Other miscellaneous services [1]	113.1	189.6	([2])	435.0	511.0	5.9	7.2	3.3
91–93	GOVERNMENT	8,083.0	11,845.0	13,290.0	16,610.0	18,800 0	4.3	2.9	2.5
91	Federal Government	2,233.0	2,737.0	2,650.0	2,750.0	2,800.0	2.3	0.0	0.4
	Executive	2,205.2	2,702.0	2,609.0	2,700.0	2,750.0	2.3	0.0	0.4
	Department of Defense	966.2	1,107.1	983.0	933.0	950.0	1.5	−1.4	0.4
	Post Office Department	574.5	723.5	688.3	785.0	800.0	2.6	0.7	0.4
	Other agencies	664.5	871.4	937.8	982.0	1,000.0	3.1	1.0	0.4
	Legislative	22.5	28.1	32.5	41.0	41.0	2.5	3.2	0.0
	Judicial	4.8	6.6	8.2	9.0	9.0	3.6	2.6	0.0
92, 93	State and local government	5,850.0	9,109.0	10,640.0	13,860.0	16,000.0	5.0	3.5	2.9
92	State government	1,484.3	2,448.8	2,848.4	3,465.0	4,000.0	5.7	2.9	2.9
9282	State education	419.8	958.0	1,188.4	1,641.0	1,883.0	9.6	4.6	2.8
Other 92	Other State government	1,064.6	1,490.8	1,660.0	1,824.0	2,117.0	3.8	1.7	3.0
93	Local government	4,365.8	6,659.8	7,791.2	10,395.0	12,000.0	4.8	3.8	2.9
9382	Local education	2,249.9	3,735.6	4,396.1	5,271.0	7,100.0	5.8	2.9	6.1
Other 93	Other local government	2,116.0	2,924.2	3,395.1	5,124.0	4,900.0	3.7	4.8	−0.9

[1] Data refer to employment in March rather than annual average employment.

[2] Data comparable to other years are not available.

[3] Annual average data are not available for this industry classification. The figure was obtained by subtracting the sum of employment in individual industry for which data are published from total published employment in the major industry group.

NOTE: Items may not add to totals either because of rounding or because data are not presented for all industries.

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Table C–5. Relationship of industries in the 1970 interindustry employment matrix to industries in the Standard Industrial Classification (SIC) system

Industry number and title in employment matrix	Industry number in SIC system [1]
AGRICULTURE, FORESTRY, AND FISHERIES	
1 Livestock and livestock products	01
2 Crops and other agricultural products	
3 Forestry and fisheries	074, 08 and 091
4 Agriculture, forestry, and fishery services	071, 0723, 073 pt. 0729, 085 and 098
MINING	
5 Iron ore mining	101, 106
6 Copper ore mining	102
7 Other nonferrous metal ore mining	103–109, except 106
8 Coal mining	11, 12
9 Crude petroleum	1311, 1321, 138
10 Stone and clay mining and quarrying	141–145, 148 and 149
11 Chemical and fertilizer mining	147
CONSTRUCTION	
12 New residential buildings	15, 16 and 17
13 New nonresidential buildings	
14 New public utilities	
15 New streets and highways	
16 All other new construction	
17 Maintenance and repair	
MANUFACTURING	
18 Guided missiles and space vehicles	1925
19 Other ordnance	19 except 1925
20 Food products	20
21 Tobacco manufacturing	21
22 Broad and narrow fabrics, yarn and thread mills	221, 222, 223, 224, 226, and 228
23 Miscellaneous textiles and floor coverings	227 and 229
24 Hosiery and knit goods	225
25 Apparel	23 except 239
26 Miscellaneous fabricated textile products	239
27 Logging, sawmills and planing mills	241 and 242
28 Millwork and plywood and miscellaneous wood products	243, 244, and 249
29 Household furniture	251
30 Other furniture	25 except 251
31 Paper products	26 except 265
32 Paperboard	265
33 Publishing	271, 272, 273, and 274
34 Printing	275, 276, 277, 278, and 279
35 Chemical products	281, 286, and 289 except 28195
36 Agricultural chemicals	287
37 Plastic materials and synthetic rubber	2821, 2822
38 Synthetic fibers	2823, 2824
39 Drugs	283
40 Cleaning and toilet preparations	284
41 Paint	285
42 Petroleum products	29
43 Rubber products	30 except 307
44 Plastic products	307
45 Leather footwear and leather products	31
46 Glass	321, 322, and 323
47 Cement, clay, concrete products	324, 325, and 327
48 Miscellaneous stone and clay products	326, 328, and 329
49 Blast furnaces and basic steel products	331
50 Iron and steel foundries, forging and miscellaneous products	332, 3391, and 3399
51 Primary copper metals	3331
52 Primary aluminum	3334 and 28195
53 Other primary and secondary nonferrous metal	3332, 3339, and 334
54 Copper rolling and drawing	3351
55 Aluminum rolling and drawing	3352
56 Other nonferrous rolling and drawing	3356 and 3357
57 Miscellaneous nonferrous metal products	336 and 3392
58 Metal containers	341 and 3491
59 Heating apparatus and plumbing fixtures	343
60 Fabricated structural metal	344
61 Screw machine products	345 and 346
62 Other fabricated metal products	342, 347, 348, and 349 except 3491
63 Engines, turbines and generators	351
64 Farm machinery	352
65 Construction, mining and oil field machinery	3531, 3532, and 3533
66 Material handling equipment	3534, 3535, 3536, and 3537
67 Metal working machinery	354
68 Special industry machinery	355
69 General industrial machinery	356
70 Machine shop products	359
71 Computers and peripheral equipment	3573, 3574
72 Typewriters and other office machines	357, except 3573 and 3574
73 Service industry machines	358
74 Electric transmission and distribution equipment	361
75 Electrical industrial apparatus	362
76 Household appliances	363
77 Electric lighting and wiring	364
78 Radio and TV receiving sets	365
79 Telephone and telegraph apparatus	3661
80 Radio TV transmitting, signaling and detection equipment	3662
81 Electronic components	367
82 Miscellaneous electrical machinery	369
83 Motor vehicles	371
84 Aircraft	372
85 Ship and boat building and repair	373
86 Railroad and other miscellaneous transportation equipment	374 and 375
87 Transportation equipment, nec	379
88 Professional, scientific and controlling instruments	371, 382, and 387
89 Medical and dental instruments	384
90 Optical and ophthalmic equipment	383 and 385
91 Photographic equipment and supplies	386
92 Miscellaneous manufactured products	39
TRANSPORTATION	
93 Railroad transportation	40 and 474
94 Local, suburban and interurban highway transportation	41
95 Truck transportation	42 and 473
96 Water transportation	44
97 Air transportation	45
98 Other transportation	46, 47 except 473 and 474
COMMUNICATION AND PUBLIC UTILITIES	
99 Communications, except radio and TV	48 except 483
100 Radio and TV broadcasting	483
101 Electric utilities	491 and part 493
102 Gas utilities	492 and part 493
103 Water and sanitary services	494, 495, 496, 497, and part 493
WHOLESALE AND RETAIL TRADE	
104 Wholesale trade	50
105 Retail trade	52, 53, 54, 55, 56, 57, 58, and 59
FINANCE, INSURANCE, AND REAL ESTATE	
106 Finance	60, 61, 62, and 67
107 Insurance	63 and 64
108 Owner occupied dwellings	[2]
109 Other real estate	65 and 66
SERVICES	
110 Hotels and lodging places	70
111 Other personal services	72 and 76
112 Miscellaneous business services	73 except 731
113 Advertising	731
114 Miscellaneous professional services	81 and 89 except 892
115 Automobile repair	75
116 Motion pictures	78
117 Other amusements	79

See footnotes at end of table.

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Table C–5. Continued—Relationship of industries in the 1970 industry employment matrix to industries in the Standard Industrial Classification (SIC) system

Industry number and title in employment matrix	Industry number in SIC system [1]
118 Doctors, dentists, and other medical services	80 except 806
119 Hospitals	806
120 Educational services	82
121 Nonprofit organizations	84, 86, and 892
GOVERNMENT ENTERPRISES	
122 Post Office	[2]
123 Commodity Credit Corporation	[2]
124 Other Federal enterprises	[2]
125 State and local government enterprises	[2]
IMPORTS	
126 Directly allocated imports	[2]
127 Transferred imports	[2]
DUMMY INDUSTRIES	
128 Business travel, entertainment, and gifts	[2]
129 Office supplies	[2]
130 Scrap, used and secondhand	[2]
SPECIAL INDUSTRIES	
131 Government industry	[2]
132 Rest of world industry	[2]
133 Households	[2]
134 Inventory valuation adjustment	[2]

[1] 1967 edition.

[2] No comparable industry.

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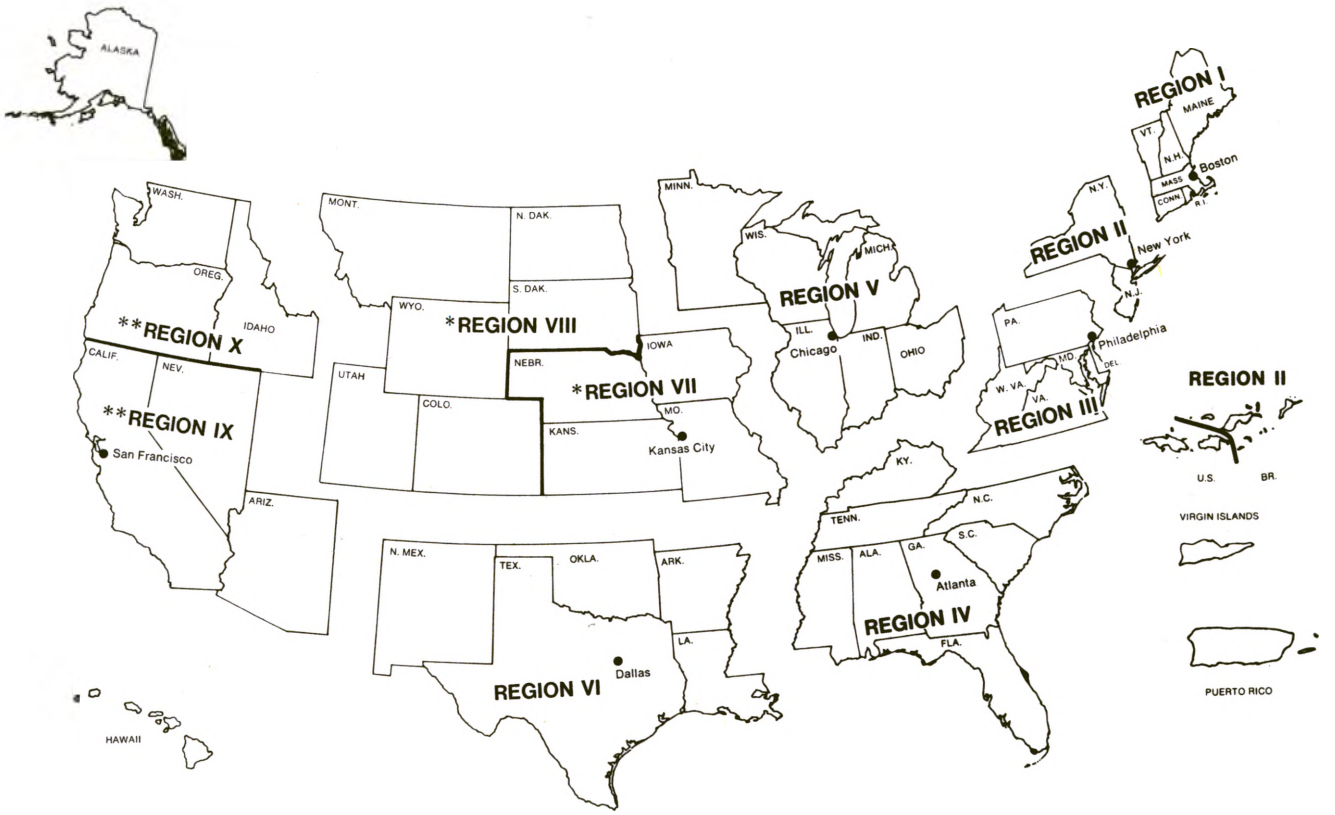

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