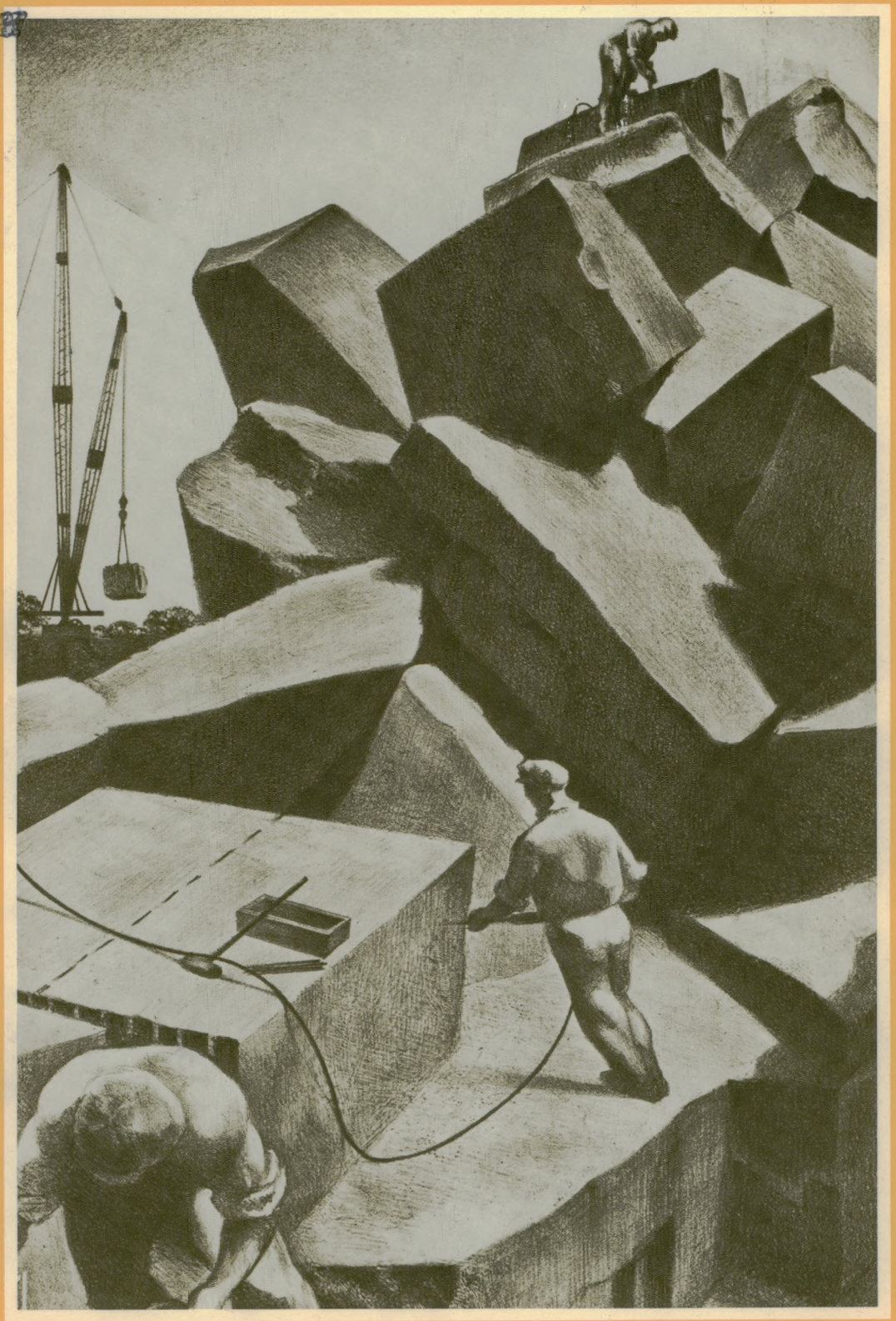
MONTHLY LABOR REVIEW

U.S. Department of Labor
Bureau of Labor Statistics
October 1987

In this issue:



U.S. DEPARTMENT OF LABOR
William E. Brock, *Secretary*

BUREAU OF LABOR STATISTICS
Janet L. Norwood, *Commissioner*

The Monthly Labor Review is published by the Bureau of Labor Statistics of the U.S. Department of Labor. Communications on editorial matters should be addressed to the Editor-in-Chief, Monthly Labor Review, Bureau of Labor Statistics, Washington, DC 20212. Phone: (202) 523-1327.

Subscription price per year—$16 domestic; $20 foreign.
Single copy $4.75 domestic; $5.94 foreign.
Subscription prices and distribution policies for the Monthly Labor Review (ISSN 0098–1818) and other Government publications are set by the Government Printing Office, an agency of the U.S. Congress. Send correspondence on circulation and subscription matters (including address changes) to:
Superintendent of Documents,
Government Printing Office,
Washington, DC 20402

Make checks payable to Superintendent of Documents.

The Secretary of Labor has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Second-class postage paid at Washington, DC, and at additional mailing addresses.

October cover:

"Granite for Monuments (for Future Monuments)"
a 1939 lithograph by Louis Lozowick,
photograph courtesy of the
National Museum of American Art,
Washington, D.C.

Cover design by Melvin B. Moxley.

Regional Commissioners for Bureau of Labor Statistics

Region I—Boston: *Anthony J. Ferrara*
Kennedy Federal Building, Suite 1603
Boston, MA 02203
Phone: (617) 565-2327
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Region II—New York: *Samuel M. Ehrenhalt*
1515 Broadway, Suite 3400, New York, NY 10036
Phone: (212) 944-3121
New Jersey
New York
Puerto Rico
Virgin Islands

Region III—Philadelphia: *Alvin I. Margulis*
3535 Market Street
P.O. Box 13309, Philadelphia, PA 19101
Phone: (215) 596-1154
Delaware
District of Columbia
Maryland
Pennsylvania
Virginia
West Virginia

Region IV—Atlanta: *Donald M. Cruse*
1371 Peachtree Street, N.E., Atlanta, GA 30367
Phone: (404) 347-4418
Alabama
Florida
Georgia
Kentucky
Mississippi
North Carolina
South Carolina
Tennessee

Region V—Chicago: *Lois L. Orr*
9th Floor, Federal Office Building, 230 S. Dearborn Street
Chicago, IL 60604
Phone: (312) 353-1880
Illinois
Indiana
Michigan
Minnesota
Ohio
Wisconsin

Region VI—Dallas: *Bryan Richey*
Federal Building, Room 221
525 Griffin Street, Dallas, TX 75202
Phone: (214) 767-6971
Arkansas
Louisiana
New Mexico
Oklahoma
Texas

Regions VII and VIII—Kansas City: *Gunnar Engen*
911 Walnut Street, Kansas City, MO 64106
Phone: (816) 374-2481

VII
Iowa
Kansas
Missouri
Nebraska

VIII
Colorado
Montana
North Dakota
South Dakota
Utah
Wyoming

Regions IX and X—San Francisco: *Sam M. Hirabayashi*
450 Golden Gate Avenue, Box 36017
San Francisco, CA 94102
Phone: (415) 556-4678

IX
American Samoa
Arizona
California
Guam
Hawaii
Nevada
Trust Territory of the Pacific Islands

X
Alaska
Idaho
Oregon
Washington

MONTHLY LABOR REVIEW

OCTOBER 1987
VOLUME 110, NUMBER 10

Henry Lowenstern, Editor-in-Chief
Robert W. Fisher, Executive Editor

Labor Month In Review

INDUSTRY PRODUCTIVITY. The Bureau of Labor Statistics reported that productivity, as measured by output per employee hour, increased in 1986 in more than three-fourths of the 88 industries surveyed.

Manufacturing. Among major manufacturing industries, both motor vehicles and steel registered small productivity gains in 1986. In motor vehicle manufacturing, productivity grew by 1.8 percent. Although output fell 2.2 percent in 1986, mainly due to a decline in automobile production, employee hours fell even more, dropping 4.0 percent. The productivity increase was the sixth consecutive annual gain in this industry. In steel manufacturing, productivity rose 1.7 percent, as output dropped 5.9 percent and employee hours fell 7.6 percent. The industry continued to retire less efficient plant and equipment, but encountered reduced demand from automobile manufacturers and from capital goods producers, such as the agricultural and industrial machinery industries, and from other markets.

Several important manufacturing industries posted large gains in productivity in 1986: petroleum refining (12.0 percent), sawmills (11.0 percent), synthetic fibers (9.1 percent), paper (7.1 percent), and major household appliances (6.7 percent). In petroleum refining, output rose 5.8 percent as demand was aided by a sharp drop in the price of petroleum products, and hours fell 5.6 percent as many less efficient refineries were closed. In synthetic fibers, output increased 3.1 percent and hours decreased 5.5 percent. Sawmills posted an output gain of 11.5 percent, resulting in part from increased demand from the single family housing market, while hours rose 0.5 percent. In the paper industry, output gained 5.9 percent, as demand was stimulated by favorable overall economic conditions, while hours declined 1.1 percent. The household appliance industry had an output gain of 10.7 percent, aided by a boost in new home construction, while hours increased 3.7 percent.

Only a small number of manufacturing industries registered productivity declines in 1986: down 8.7 percent in metal forming machine tools, 3.9 percent in steel foundries and nonwool yarn mills, 3.4 percent in oilfield machinery, 1.9 percent in gray iron foundries, and 0.2 percent in cigarettes.

Mining. Coal mining gained 8.7 percent in productivity, based on a small output increase of 0.6 percent and a more substantial change in employee hours, -7.4 percent. Demand for coal remained fairly stable between 1985 and 1986 while the industry continued to close less efficient mines. Nonmetallic minerals posted a productivity advance of 1.0 percent: output dropped 0.6 percent, as declining demand from the agricultural chemicals market more than offset a gain from the construction materials market, and hours fell 1.6 percent. In copper mining (recoverable metal), productivity climbed 22.5 percent as output grew 4.2 percent and hours dropped 14.9 percent. However, productivity in iron mining (usable ore) decreased 4.9 percent: output fell 19.5 percent, due to a continued decline in demand from the steel industry, while hours dropped 15.2 percent.

Transportation and Utilities. Railroads (revenue traffic) had a large productivity gain of 11.0 percent: output grew 1.9 percent and employee hours declined 8.2 percent. In air transportation, productivity increased 1.2 percent. Air traffic rose significantly in 1986: output grew 8.8 percent and employment grew 7.6 percent. Petroleum pipelines productivity gained 2.8 percent, as output rose 1.6 percent and employee hours fell 1.1 percent. In telephone communications, productivity was up 6.0 percent, based on an output gain of 2.2 percent and a drop in employee hours of 3.6 percent. Productivity in electric utilities grew 1.2 percent, with output increasing 2.2 percent and hours increasing 1.1 percent. However, gas utilities posted a productivity decline of 2.9 percent; output fell 5.9 percent, partly because of a warm winter and the shift of some customers to cheaper oil heat. Employee hours declined by 3.1 percent.

Trade and Services. Furniture, home furnishings, and equipment stores posted a 7.8-percent productivity gain as output grew 9.3 percent and hours rose 3.8 percent. The demand for furniture and appliances increased, due to the expansion in new and existing home sales, while home electronics also had a good year, fueling the large output gain. The appliance, radio, and TV component of this industry recorded an 11-percent gain in productivity. Apparel and accessory stores had a 7.0 percent gain in productivity: output rose 9.1 percent, as sales were good in all types of apparel stores and all person hours grew 2.0 percent. Changes in productivity among the components of this industry ranged from 10.1 percent in shoe stores to -0.8 percent in family clothing stores. The gasoline service station industry posted a 3.3-percent gain as output rose 5.0 percent, helped by lower gasoline prices, while hours were up 1.6 percent. Both eating and drinking places and liquor stores had 3.0-percent productivity increases, while new car dealers had a gain of 1.5 percent and beauty and barber shops, 0.2 percent.

Productivity in retail food stores declined by 1.3 percent: output increased 1.8 percent, while hours grew 3.1 percent as the industry continued to provide more service-oriented operations, such as delicatessens, salad bars, in-store bakeries, pharmacies, and photo departments. Other industries with declines in productivity were laundries and cleaning services (-2.4 percent), drug stores (-3.3 percent), and hotels and motels (-4.8 percent). □

Analyzing employers' costs for wages, salaries, and benefits

Employment Cost Index data now provide a breakdown of hourly costs incurred; in March 1987, employee benefits accounted for more than one-fourth of compensation in private industry

FELICIA NATHAN

Employee compensation in private industry cost employers $13.42 per hour worked in March 1987. Straight-time wages and salaries—73.2 percent of the costs—averaged $9.83, while benefit costs—the remaining 26.8 percent—averaged $3.60.

These costs are based on data from the Bureau of Labor Statistics Employment Cost Index (ECI) which measures quarterly changes in employer costs for employee compensation. The ECI is a fixed-weight Laspeyres index that uses 1980 census employment counts as weights. Data collected for the ECI can be used to derive compensation cost levels at no additional burden on survey respondents, but current employment weights are required. The BLS Current Employment Statistics survey in combination with the ECI sample provide the current weights.

The ECI's establishment sample has been recently expanded, making it possible to produce estimates of compensation cost levels that are sufficiently reliable for analysis and publication. The Bureau plans to publish compensation cost estimates from the ECI sample annually, using March as the reference period. The estimates will be available in midsummer.

Felicia Nathan is an economist in the Division of Employment Cost Trends, Bureau of Labor Statistics.

This article presents cost estimates for the components of compensation for private industry workers,[1] by industry division and occupational group. In addition, relative errors associated with the estimates and costs as a percent of total compensation are shown. This article also discusses highlights of the compensation cost estimates, illustrates how the estimates were calculated, and briefly explains the standard errors associated with the estimates.

Compensation costs

During the post-World War II era, employee benefits have become an important part of labor costs and worker income. Today, slightly more than one-fourth of employee compensation is in some form of benefit. The largest category is legally required benefits, which accounts for 8.4 percent of total compensation costs. (See chart 1.) These legally required benefits include Social Security, workers' compensation, and unemployment insurance as well as other less common benefits, such as railroad retirement and State temporary disability benefits. Employer costs for legally required benefits averaged $1.13 per hour worked in March 1987—nearly a third of all benefit costs.

Lump-sum payments, provided in lieu of wage increases or to offset wage decreases, are becoming more widespread, particularly in collective bargaining agreements. Neverthe-

Glossary

Following are definitions of the compensation components covered by the Employment Cost Index.

Wages and salaries:
The hourly straight-time wage rate, or, for workers not paid on an hourly basis, earnings divided by corresponding hours. Wages and salaries include production bonuses, incentive earnings, commission payments, and cost-of-living adjustments, but exclude supplemental pay.

Benefits:
Paid leave—Paid vacations, paid holidays, paid sick leave, and other paid leave.

Supplemental pay—premium pay for overtime and work on weekends and holidays, shift differentials, nonproduction bonuses, and lump-sum payments.

Insurance benefits—life, health, and sickness and accident insurance.

Retirement and savings benefits—pension and other retirement plans, and savings and thrift plans.

Legally required benefits—Social Security, railroad retirement and supplemental retirement, railroad unemployment insurance, Federal and State unemployment insurance, workers' compensation, and other benefits required by law, such as State temporary disability insurance.

Other benefits—Severance pay, supplemental unemployment plans, and merchandise discounts in department stores.

less, they still account for a very small part of total compensation. These payments are included in the supplemental pay category, which averaged less than 3 percent of employer compensation costs.

Wages and salaries plus benefits that are paid in cash to the employee (paid leave and supplemental pay) accounted for 82.5 percent of total compensation costs per hour worked. The remaining 17.5 percent of employer costs was made up of noncash benefits purchased for the employee. These noncash benefits include insurance, pensions and savings, legally required and other benefits, such as supplemental unemployment plans and merchandise discounts in department stores.

By industry division. Hourly employer compensation costs were, on average, higher in goods-producing industries ($15.86) than in service-producing industries ($12.41).[2] However, within the service-producing sector, there was substantial variation in compensation costs. Among the service-producing industries for which data were published, costs were highest in transportation and public utilities ($20.24 per hour worked) and wholesale trade ($15.15), and lowest in service industries ($12.34) and retail trade ($7.85). (See chart 2.)

As noted previously, wages and salaries alone make up the major portion of compensation costs in all industries. However, the wage and salary proportion of compensation costs was less in relatively high-paid industries than in other industries. Wages and salaries made up 68 percent of total compensation costs for workers in transportation and public utilities, compared with 74.2 percent in wholesale trade, 75.7 percent in service industries, and 77.3 percent in retail trade.[3]

Industries also differ in the cost and relative importance of the various benefits. Benefit costs are related, in part, to wages and salaries because the costs for a number of benefits (paid leave and Social Security, for example), are tied to wage rates or earnings. But other factors are also important in explaining the industry-to-industry differences.

To illustrate the effects of some other factors, consider paid leave. This benefit is typically paid at the employee's wage or salary rate, but its cost is influenced by the amount and type of leave granted. Differences among industries in the amount of paid leave reflect variation in paid leave plans, in employees' length of service with the company, and in the mix of full- and part-time workers.

The following tabulation compares average wage and salary rates and paid leave costs per hour worked in selected industries, March 1987:

		Paid leave	
	Wages and salaries	*Cost*	*As a percent of wages and salaries*
Private industry	$ 9.83	$0.93	9.5
Goods-producing	11.12	1.09	9.8
Manufacturing	10.77	1.21	11.2
Service-producing	9.29	.87	9.4
Transportation and public utilities	13.77	1.75	12.7
Wholesale trade	11.24	1.05	9.3
Retail trade	6.07	.37	6.1
Service	9.34	.91	9.7

Also, there is a striking variation among industries in employer costs for providing employees with insurance (life, health, and sickness and accident)—a benefit dominated by health insurance with costs usually not tied to wages and salaries. This variation reflects differences in the types and extent of insurance benefits provided, as well as differences in employee contributions to insurance, and the proportion of workers covered. Even though an employer's health insurance costs for a plan are about the same regardless of the employee's pay level, there is a positive relationship across industries between the costs of insurance and the wage and salary rate.

This relationship is illustrated in the following tabulation which shows average wage and salary rates and employer insurance costs per hour worked in selected industries, March 1987:

	Wages and salaries	*Insurance cost*
Private industry	$ 9.83	$0.72
Transportation and public utilities	13.77	1.32
Wholesale trade	11.24	.80
Manufacturing	10.77	1.06
Service	9.34	.53
Retail trade	6.07	.35

By occupational group. Employer compensation costs also varied substantially by occupational group, being highest for managers and lowest for service workers.[4] (See chart 2.) Compensation costs per hour worked averaged more for white-collar workers ($15.56) than for blue-collar workers ($13.43), with wages and salaries accounting for the difference. Wages and salaries for white-collar workers ($11.61) were 24 percent higher than for blue-collar workers ($9.38). Benefit costs were about the same for both ($3.95 and $4.05, respectively). Compensation costs for service workers averaged $6.43 per hour worked, less than half that for white-collar or blue-collar workers. As a proportion of total compensation, benefit costs for service workers (22.8 percent) were less than those for either white-collar workers (25.4 percent) or blue-collar workers (30.2 percent). Insurance costs per hour worked for service workers (27 cents) were about a third of those for white-collar workers (77 cents) and blue-collar workers (87 cents).

Differences among occupational categories in employer costs for some benefits are related to the work performed. The following tabulation shows costs per hour worked for selected benefits, by occupation, March 1987:

	White-collar	*Blue-collar*	*Service*
Workers' compensation	$0.11	$0.39	$0.16
State unemployment	.11	.15	.10
Premium pay	.08	.34	.04
Shift pay	.03	.06	.02

The costs of workers' compensation, State unemployment insurance, premium pay, and shift differentials were higher for blue-collar workers than for either white-collar or service workers. On average, occupational injury and unemployment rates are higher for blue-collar workers, exerting an upward influence on unemployment insurance and workers' compensation rates for these workers. Shift work and overtime tend to be a more integral part of blue-collar work, so naturally, shift differentials and premium pay are provided more frequently to blue-collar occupations. (These

Chart 1. Relative importance of components of employer costs for compensation in private industry, March 1987

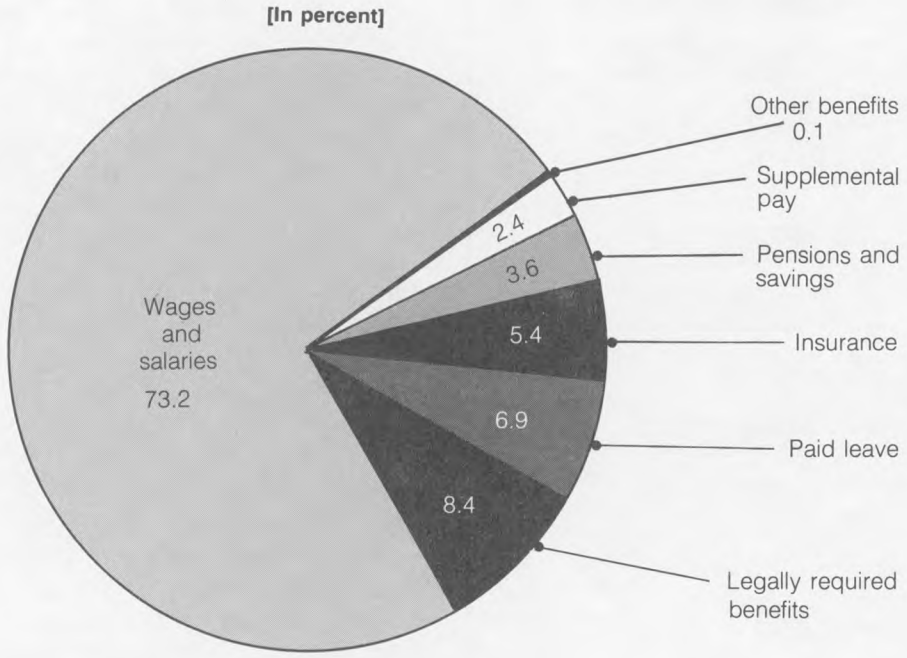
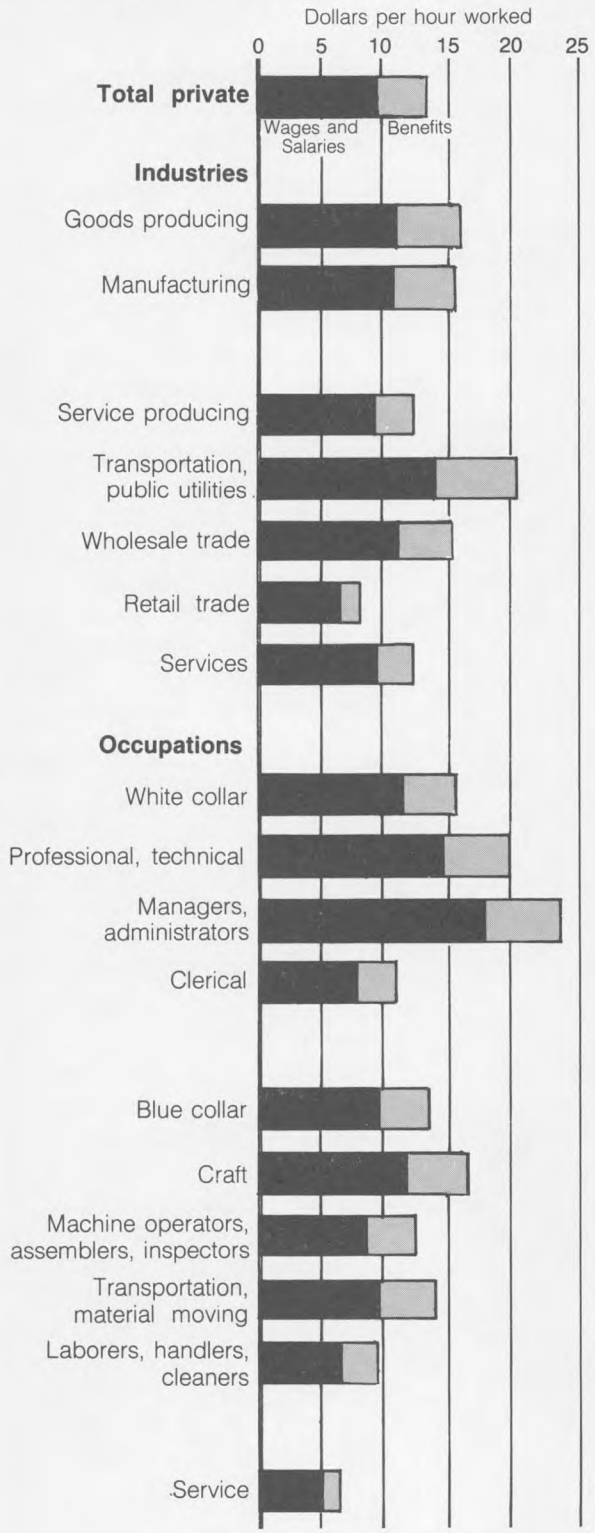


Chart 2. Employer costs for compensation in private industry by selected industries and occupations, March 1987



factors are also industry related—the higher costs reflecting the concentration of blue-collar workers in goods-producing industries.)

By occupation within industries. The wide variation in average compensation costs by industry and occupation persisted even when averages were examined by occupation within industries. For example, within each industry, compensation costs for the highest paid occupations were more than double those for the lowest paid.

The dispersion of compensation costs by occupation is illustrated in table 1, which categorizes average costs per hour worked into six ranges—under $5 per hour worked; $5–$9.99; $10–$14.99; $15–$19.99; $20–$24.99; and $25 or more. (The ranges are used because average compensation costs at this level of detail are not reliable for publication.) There was an overlap of occupational pay among industries with substantially different overall compensation costs. For example, the ranges for managers and professionals in service industries and retail trade—industries with relatively low overall compensation costs—equaled or exceeded the ranges for most occupational groups in manufacturing—an industry with relatively high overall compensation costs. This overlap demonstrates that analysis based on overall industry averages is insufficient for determining the impact on pay resulting from employment shifts occurring in the work force. The effect depends on which jobs are growing within each industry and which are declining.

How compensation costs are calculated

At least two approaches can be taken in measuring an employer's costs for employee compensation. One approach focuses on *past expenditures*—that is, the actual money an employer spent on compensation during a specified time, usually a past year. The other approach focuses on *current costs*—annual costs based on the current price of benefits under current plan provisions. The Bureau's previous measure of compensation cost levels, the Employer Expenditures for Employee Compensation survey, used the past expenditures approach.[5] Because the ECI measures change from one time to another, it uses the current cost approach.

To estimate the total compensation cost per hour worked, the ECI (1) identifies the benefits provided, (2) determines, from current cost information (current price and current plan provisions), the cost per hour worked for each benefit, then (3) sums the costs for the benefits with the straight-time wage or salary rate. The following examples illustrate how current costs are determined for specific benefit plans, and how they differ from costs based on past expenditures.

Example 1. For a given year, each employee in a company receives 10 paid holidays (five in each half of the year), and receives 8 hours of straight-time pay for each holiday. The hourly wage is $10 during the first half of the year, and increases to $11 on July 1. All employees work 2,000 hours a year.

The annualized current cost in this example is the rate at which each holiday is paid (8 hours of straight-time pay) times the number of holidays provided under current plan provisions. This annualized current cost is then divided by the annual hours worked to yield the current cost per hour worked. The formula for deriving the current cost is:

(number of holidays) × (hours of pay) × (hourly wage rate) = annualized current cost;

annualized current cost ÷ work hours per year = current cost per hour worked

Thus, in this example, the current cost at any time during the first half of the year is:

$10 \times 8 \times \$10 = \$800;$

$\$800 \div 2{,}000$ work hours $= \$.40$

At any time during the second half of the year (after the wage increase occurs), the current cost is;

$10 \times 8 \times \$11 = \$880;$

$\$880 \div 2{,}000 = \$.44$

The expenditure per hour worked, in contrast, is all holiday pay during the year divided by the number of hours worked—information that would not be available until the year ended:

(5 holidays × 8 hours of pay × $10 hourly wage) + (5 holidays × 8 hours of pay × $11 hourly wage) = $840;

$840 ÷ 2,000 annual hours worked = $.42 per hour worked

Another factor that would affect current costs and past expenditures differently in this example is a change in the number of holidays per year. For example, the current cost would reflect the higher cost of an added holiday at the point the new holiday becomes effective. In contrast, the annual expenditure would reflect a mix of the costs before and after the change becomes effective.

Example 2. A health insurance plan is provided all employees. The monthly premium for each employee is $120 for the first 6 months of a given year, and increases to $140 for the last 6 months. Each employee works 2,000 hours per year.

The formula for deriving the current cost is:

(12 months) × (monthly premium) = annualized current cost;

annualized current cost ÷ work hours per year = current cost per hour worked

In this example, the current cost at any time during the first half of the year is the annual premium divided by the annual hours worked:

$12 \times \$120 = \$1{,}440;$

$\$1{,}440 \div 2{,}000 = \$.72$

The current cost at any time during the second half, with the new premium rate, is:

$12 \times \$140 = \$1{,}680;$

$\$1{,}680 \div 2{,}000 = \$.84$

The expenditure per hour worked, in contrast, is the total premium paid over the year divided by hours worked—information that would not be available until the year ended:

(6 months × $120) + (6 months × $140) = $1,560;

$\$1{,}560 \div 2{,}000 = \$.78$

Other factors that would cause differences between current costs and past expenditures are the number of annual hours the employee works, changes in eligibility requirements affecting the employee, or the introduction or elimination of a plan.[6]

Employment weights. The ECI uses fixed employment weights from the 1980 census so that compensation cost changes can be measured, free from the influence of em-

Table 1. Compensation cost ranges, by occupational groups within industries, March 1987

Occupational group	Transportation, public utilities	Finance, insurance, real estate	Construction	Manufacturing	Wholesale trade	Services	Retail trade
Executive, managerial, administrative	$25 or more	$25 or more	$25 or more	$25 or more	$20–$24.99	$20–$24.99	$15–$19.99
Professional specialty, technical	25 or more	20–24.99	20–24.99	20–24.99	20–24.99	15–19.99	15–19.99
Precision production, craft, and repair	20–24.99	10–14.99	15–19.99	15–19.99	15–19.99	10–14.99	10–14.99
Transportation and material moving	15–19.99	5–9.99	10–14.99	15–19.99	10–14.99	5–9.99	10–14.99
Machine operators, assemblers, and inspectors	20–24.99	10–14.99	10–14.99	10–14.99	10–14.99	5–9.99	5–9.99
Administrative support, including clerical	15–19.99	10–14.99	10–14.99	10–14.99	10–14.99	10–14.99	5–9.99
Handlers, cleaners, helpers, laborers	15–19.99	5–9.99	10–14.99	10–14.99	5–9.99	5–9.99	5–9.99
Service	20–24.99	5–9.99	10–14.99	10–14.99	5–9.99	5–9.99	Under $5

NOTE: Ranges are based on compensation costs per hour worked. Ranges are used because average compensation costs at this level of detail are not reliable for publication.

Table 2. Employer costs for employee compensation per hour worked, relative errors,[1] and costs as a percent of total compensation, by major industry and occupational categories, March 1987

Compensation component	Private industry workers		Goods-producing industries		Service-producing industries		Manufacturing industries		Nonmanufacturing industries		White-collar workers		Blue-collar workers		Service workers	
	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error
Total compensation	$13.42	1.1	$15.86	1.5	$12.41	1.4	$15.51	1.3	$12.80	1.3	$15.56	1.6	$13.43	1.3	$6.43	1.6
Wages and salaries	9.83	1.2	11.12	1.3	9.29	1.6	10.77	1.2	9.55	1.5	11.61	1.8	9.38	1.1	4.96	1.6
Total benefits	3.60	1.1	4.74	2.0	3.12	1.3	4.73	1.7	3.26	1.2	3.95	1.4	4.05	1.9	1.47	2.4
Paid leave	.93	1.5	1.09	2.2	.87	2.0	1.21	2.2	.85	1.9	1.20	1.9	.82	2.0	.30	3.9
Vacation	.46	1.8	.55	2.3	.43	2.5	.61	2.2	.42	2.4	.58	2.5	.43	2.4	.15	3.4
Holiday	.31	1.3	.40	2.4	.28	1.7	.45	2.1	.27	1.6	.39	1.8	.30	2.1	.09	3.8
Sick	.12	2.5	.10	4.4	.12	3.0	.11	5.0	.12	2.9	.17	2.4	.06	3.3	.04	9.8
Other	.03	5.1	.03	6.9	.04	6.5	.04	7.6	.03	6.2	.05	4.4	.03	11.3	.02	15.7
Supplemental pay	.32	2.6	.53	3.6	.23	3.6	.52	4.0	.25	3.3	.28	4.7	.47	3.5	.08	6.4
Premium pay	.16	3.1	.33	3.8	.09	4.5	.34	3.9	.11	4.1	.08	4.1	.34	3.8	.04	9.7
Nonproduction bonuses	.12	6.1	.13	11.9	.11	6.8	.10	14.7	.12	7.2	.18	7.4	.07	8.3	.02	14.1
Shift pay	.04	4.6	.07	5.7	.02	6.5	.08	5.7	.02	6.4	.03	7.4	.06	5.5	.02	9.4
Insurance	.72	1.3	1.02	2.6	.60	1.6	1.06	2.4	.62	1.6	.77	1.6	.87	2.5	.27	5.7
Pensions and savings	.48	2.2	.64	4.5	.41	3.0	.58	3.5	.45	2.8	.57	2.8	.50	4.0	.12	8.4
Pensions	.42	2.3	.56	4.9	.36	3.3	.49	3.6	.40	3.0	.48	3.3	.47	4.2	.11	7.9
Savings and thrift	.06	5.6	.08	6.3	.05	8.6	.09	7.0	.05	8.1	.10	4.9	.03	6.7	[2]	[2]
Legally required[3]	1.13	.9	1.43	1.9	1.01	.9	1.31	1.5	1.08	1.0	1.12	1.1	1.37	1.6	.69	1.8
Social Security	.75	.8	.88	1.3	.69	.9	.87	1.2	.71	.9	.85	1.1	.75	1.2	.39	1.7
Federal unemployment	.03	.9	.03	1.3	.03	1.1	.03	1.6	.03	1.0	.03	1.5	.03	.9	.03	1.4
State unemployment	.12	1.8	.18	2.9	.10	2.1	.17	3.3	.10	2.1	.11	2.1	.15	2.6	.10	4.2
Workers' compensation	.21	2.4	.32	4.6	.16	2.5	.23	4.6	.20	2.5	.11	3.3	.39	3.2	.16	3.8
Other benefits[4]	.02	6.8	.04	9.5	[2]	[2]	.04	9.2	[2]	[2]	.02	7.7	.03	8.9	[2]	[2]
	Percent of total compensation															
Total compensation	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
Wages and salaries	73.2		70.1		74.8		69.5		74.6		74.6		69.8		77.2	
Total benefits	26.8		29.9		25.2		30.5		25.4		25.4		30.2		22.8	
Paid leave:	6.9		6.8		7.0		7.8		6.6		7.7		6.1		4.7	
Vacation	3.5		3.5		3.4		4.0		3.3		3.8		3.2		2.4	
Holiday	2.3		2.5		2.2		2.9		2.1		2.5		2.2		1.4	
Sick	.9		.6		1.0		.7		.9		1.1		.5		.7	
Other	.3		.2		.3		.2		.3		.3		.2		.2	
Supplemental pay:	2.4		3.3		1.8		3.4		2.0		1.8		3.5		1.3	
Premium pay	1.2		2.1		.7		2.2		.8		.5		2.5		.7	
Nonproduction bonuses	.9		.8		.9		.7		1.0		1.1		.5		.3	
Shift pay	.3		.4		.2		.5		.2		.2		.5		.3	
Insurance:	5.4		6.4		4.8		6.8		4.8		4.9		6.4		4.2	
Pensions and savings:	3.6		4.1		3.3		3.8		3.5		3.7		3.7		1.9	
Pensions	3.1		3.5		2.9		3.2		3.1		3.1		3.5		1.7	
Savings and thrift	.5		.5		.4		.6		.4		.6		.2		.2	
Legally required[3]	8.4		9.0		8.1		8.5		8.4		7.2		10.2		10.7	
Social Security	5.6		5.6		5.6		5.6		5.6		5.5		5.6		6.1	
Federal unemployment	.2		.2		.3		.2		.2		.2		.2		.5	
State unemployment	.9		1.1		.8		1.1		.8		.7		1.1		1.5	
Workers' compensation	1.6		2.0		1.3		1.5		1.6		.7		2.9		2.5	
Other benefits[4]	.1		.2		.1		.3		.1		.1		.2		.1	

[1] The relative error is the standard error expressed as a percent of the cost. We can be 95 percent confident the interval around the cost estimate bounded by two times plus and minus the relative error contains the "true" cost.

[2] Cost is $0.01 or less.

[3] Includes railroad retirement, railroad unemployment, railroad supplemental unemployment, and other legally required benefits, in addition to those shown separately.

[4] Includes severance pay, supplemental unemployment benefits, and merchandise discounts in department stores.

NOTE: Because of rounding, components may not sum to totals.

ployment shifts among occupations and industries. Compensation cost levels, however, should reflect the current industry and occupational mix each year they are published. Thus, to estimate current cost levels for the aggregate series, it is necessary to have employment data that refer to the current mix.

Such data are obtained by apportioning industry employment from the Bureau's Current Employment Statistics pro-

Table 3. Employer costs for employee compensation per hour worked, relative errors,[1] and costs as a percent of total compensation, selected major industry groups, March 1987

Compensation component	Private industry		Goods-producing industries				Service-producing industries									
			Total[2]		Manufacturing		Total[3]		Transportation and public utilities		Wholesale trade		Retail trade		Service	
	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error
Total compensation	$13.42	1.1	$15.86	1.5	$15.51	1.3	$12.41	1.4	$20.24	2.6	$15.15	2.8	$7.85	2.2	$12.34	2.0
Wages and salaries	9.83	1.2	11.12	1.3	10.77	1.2	9.29	1.6	13.77	2.3	11.24	2.8	6.07	2.0	9.34	2.0
Total benefits	3.60	1.1	4.74	2.0	4.73	1.7	3.12	1.3	6.47	3.8	3.91	3.4	1.78	3.4	3.00	2.3
Paid leave	.93	1.5	1.09	2.2	1.21	2.2	.87	2.0	1.75	3.9	1.05	5.0	.37	5.3	.91	4.1
Supplemental pay	.32	2.6	.53	3.6	.52	4.0	.23	3.6	.51	13.3	.35	6.1	.15	5.7	.19	5.3
Insurance	.72	1.3	1.02	2.6	1.06	2.4	.60	1.6	1.32	3.6	.80	3.4	.35	5.8	.53	2.9
Pensions and savings	.48	2.2	.64	4.5	.58	3.5	.41	3.0	1.17	6.9	.49	7.9	.14	8.8	.37	5.8
Legally required	1.13	.9	1.43	1.9	1.31	1.5	1.01	.9	1.70	2.3	1.21	1.9	.74	2.0	1.00	1.6
Other benefits[4]	.02	6.8	.04	9.5	.04	9.2	(5)	(5)	.03	23.9	(5)	(5)	.02	12.6	(5)	(5)
	Percent of total compensation															
Total compensation	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
Wages and salaries	73.2		70.1		69.5		74.8		68.0		74.2		77.3		75.7	
Total benefits	26.8		29.9		30.5		25.2		32.0		25.8		22.7		24.3	
Paid leave	6.9		6.8		7.8		7.0		8.6		6.9		4.8		7.4	
Supplemental pay	2.4		3.3		3.4		1.8		2.5		2.3		1.9		1.5	
Insurance	5.4		6.4		6.8		4.8		6.5		5.3		4.5		4.3	
Pensions and savings	3.6		4.1		3.8		3.3		5.8		3.3		1.8		3.0	
Legally required	8.4		9.0		8.5		8.1		8.4		8.0		9.5		8.1	
Other benefits[4]	.1		.2		.3		.1		.1		.1		.2		0	

[1] The relative error is the standard error expressed as a percent of the cost. We can be 95 percent confident the interval around the cost estimate bounded by two times plus and minus the relative error contains the "true" cost.

[2] Includes mining and construction, in addition to manufacturing.

[3] Includes finance, insurance, and real estate, in addition to the industries shown separately.

[4] Includes severance pay, supplemental unemployment insurance, and merchandise discounts in department stores.

[5] Cost is $0.01 or less.

NOTE: Because of rounding, components may not sum to totals.

gram, using occupational employment by industry from the ECI sample. Industry employment estimates from the Current Employment Statistics program are published monthly, and are adjusted each year to a universe of all nonfarm establishments from March of the previous year.

The March 1987 Current Employment Statistics data used to calculate the compensation costs were total employment estimates for 2-digit major industry groups (such as primary metal manufacturing or food stores), as defined by the U.S. Office of Management and Budget's Standard Industrial Classification system. The employment data from these 2-digit groups were distributed to major occupational groups (such as executives, administrators, and managers or machine operators, assemblers, and inspectors), using the relative importance of the groups as estimated from the ECI sample.[7]

It is important to emphasize that because weights for the ECI remain fixed while weights for cost levels change as employment shifts occur, year-to-year changes in the cost level estimates will differ from changes in the ECI. Employment shifts among industries and occupations with different wage and benefit levels do not affect the ECI, but they do affect cost levels. Thus, for example, if there is a shift in employment toward relatively high wage industries or occupations, the change in the cost levels will exceed the change in the ECI.[8]

Standard errors. As is the case for all sample surveys, compensation cost level estimates from the ECI will differ from the "true" values because data were collected from a sample rather than from all units within the ECI's private industry coverage.[9] To determine the precision of the cost levels, a standard error was calculated for each estimate using a balanced repeated replication method with 64 pseudo replicates.[10]

The standard error defines a range (confidence interval) around the cost estimate. The approximate 95-percent confidence interval is the estimate plus and minus twice the standard error. For example, the 95-percent confidence interval for a cost estimate of $10 with a standard error of 10 cents would be $9.80 to $10.20.

If repeated samples are taken from the population, each sample will have an estimate and confidence interval. Ninety-five percent of those confidence intervals will include the "true" cost. That is, we can be 95 percent confi-

Table 4. Employer costs for employee compensation per hour worked, relative errors,[1] and costs as a percent of total compensation, selected major occupational groups, March 1987

Compensation component	Private industry		White-collar workers								Blue-collar workers										Service workers	
			Total[2]		Professional specialty, technical		Executive, administrative, managerial		Administrative support, including clerical		Total		Precision production, craft, repair		Machine operators, assemblers, inspectors		Transportation, material moving		Handlers, equipment cleaners, helpers, laborers			
	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error	Cost	Relative error
Total compensation	$13.42	1.1	$15.56	1.6	$19.81	2.5	$23.81	2.7	$10.94	1.5	$13.43	1.3	$16.85	1.8	$12.44	1.8	$13.83	2.4	$9.81	3.0	$6.43	1.6
Wages and salaries	9.83	1.2	11.61	1.8	14.66	2.5	17.86	3.0	7.91	1.4	9.38	1.1	11.92	1.6	8.44	1.6	9.65	2.2	6.93	2.7	4.96	1.6
Total benefits	3.60	1.1	3.95	1.4	5.15	2.7	5.95	2.4	3.04	1.9	4.05	1.9	4.93	2.5	4.00	2.5	4.17	3.2	2.89	4.0	1.47	2.4
Paid leave	.93	1.5	1.20	1.9	1.66	3.6	1.99	2.8	.85	2.8	.82	2.0	.98	2.3	.89	3.0	.85	5.1	.51	5.2	.30	3.9
Supplemental pay	.32	2.6	.28	4.7	.32	6.1	.54	10.5	.20	3.9	.47	3.5	.57	4.4	.55	5.2	.39	6.9	.29	6.3	.08	6.4
Insurance	.72	1.3	.77	1.6	.92	3.1	.98	2.8	.72	2.0	.87	2.5	.99	3.6	.93	3.4	.84	4.2	.63	5.4	.27	5.7
Pensions and savings	.48	2.2	.57	2.8	.85	6.1	.88	4.5	.42	4.2	.50	4.0	.69	6.1	.42	4.9	.50	7.3	.36	8.5	.12	8.4
Legally required	1.13	.9	1.12	1.1	1.40	2.0	1.55	1.4	.85	1.4	1.37	1.6	1.67	2.3	1.17	1.9	1.58	3.4	1.08	3.1	.69	1.8
Other benefits[3]	.02	6.8	.02	7.7	(4)	(4)	.02	11.8	(4)	(4)	.03	8.9	.04	13.4	.04	9.8	(4)	(4)	(4)	(4)	(4)	(4)
	Percent of total compensation																					
Total compensation	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	
Wages and salaries	73.2		74.6		74.0		75.0		72.3		69.8		70.8		67.9		69.8		70.6		77.2	
Total benefits	26.8		25.4		26.0		25.0		27.7		30.2		29.2		32.1		30.2		29.4		22.8	
Paid leave	6.9		7.7		8.4		8.4		7.7		6.1		5.8		7.1		6.1		5.2		4.7	
Supplemental pay	2.4		1.8		1.6		2.3		1.8		3.5		3.4		4.4		2.8		3.0		1.3	
Insurance	5.4		4.9		4.6		4.1		6.5		6.4		5.9		7.5		6.1		6.5		4.2	
Pensions and savings	3.6		3.7		4.3		3.7		3.8		3.7		4.1		3.3		3.6		3.7		1.9	
Legally required	8.4		7.2		7.0		6.5		7.8		10.2		9.9		9.4		11.5		11.0		10.7	
Other benefits[3]	.1		.1		.1		.1		.1		.2		.2		.3		.1		.1		.1	

[1] The relative error is the standard error expressed as a percent of the cost. We can be 95 percent confident the interval around the cost estimate bounded by two times plus and two times minus the relative error contains the "true" cost.

[2] Includes salesworkers, in addition to occupations shown separately.

[3] Includes severance pay, supplemental unemployment benefits, and merchandise discounts in department stores.

[4] Cost is $0.01 or less.

NOTE: Because of rounding, components may not sum to totals.

dent that the interval derived for each cost estimate from the ECI sample includes the "true" cost.

The standard error can also be expressed as a percent of the estimate, that is, as the relative error. The relative error is shown with each cost estimate in table 2 (page 8), table 3 (page 9), and table 4 (page 10). Table 2 shows, for example, that total compensation for private industry workers averaged $13.42 per hour worked with a relative error of 1.1 percent. That is, the approximate 95-percent confidence interval is $13.42 plus and minus 2.2 percent (2 times 1.1 percent), or $13.12 to $13.72. At the 95-percent confidence level, this range contains the "true" cost. □

FOOTNOTES

[1] For some individual benefits, the cost is not published. Individual benefits with costs less than 1 cent per hour worked, such as severance pay and supplemental unemployment benefits, are not provided, and life, health, and sickness and accident insurance are reported as one cost. The reason for combining insurance is that a large proportion of respondents (approximately 25 percent) report the cost of these benefits together.

[2] Goods-producing industries include mining, construction, and manufacturing. Service-producing industries include transportation, public utilities, trade, finance, insurance, real estate, and services.

[3] The wage rates presented in this article differ from the earnings published in the Bureau's Average Hourly Earnings series. The Average Hourly Earnings series excludes executive, managerial, and administrative employees in all industries and all white-collar employees in goods-producing industries, while the ECI sample includes all occupational groups in all industries. Also, the Average Hourly Earnings series measures gross earnings, derived by dividing gross payroll by payroll hours, whereas wages and salaries from the ECI are straight-time wages or, for workers not paid on an hourly basis, earnings divided by corresponding hours, excluding supplemental pay. (Both the Average Hourly Earnings series and wages and salaries from the ECI exclude nonproduction bonuses and lump-sum payments.)

[4] Service workers are found in a variety of industries and perform a variety of duties, such as food, health, cleaning, and guard services. Service industries, in contrast, consist of establishments which employ workers from all occupational groups and have the function of providing services for individuals and businesses and other agencies.

[5] The Employer Expenditures for Employee Compensation (EEEC) survey was discontinued in 1977. While differing from the ECI in that it measured expenditures rather than current costs, the EEEC survey had other characteristics similar to those of the ECI. It covered virtually the same benefits and reported the costs on a work-hour basis. The scope of the EEEC survey was also similar to that of the ECI in that it covered the private nonfarm work force.

[6] For a more complete description of how ECI benefit costs are calculated, see *BLS Handbook of Methods*, Bulletin 2134, Volume I (Bureau of Labor Statistics, 1982), pp. 78-87.

[7] The major occupational group employment counts from the ECI are, on average, 2 to 3 years old. However, comparisons of cost level estimates showed that differences of a few years in the age of occupation data within industries have a negligible impact on the estimates.

Some potential bias (systematic error) may affect the cost estimates because of the age of the ECI sample. (Industry samples are replaced on a 4-year cycle.) To evaluate the extent of potential bias, a detailed analysis was conducted comparing compensation costs and other data between 4-year-old and current industry samples. Because the current samples had no bias resulting from age, the differences in cost levels between the old and new samples would reflect bias in the older samples. In most cases, no significant probability of bias was found. In those instances when the hypothesis that the bias equaled zero could not be rejected, the magnitude and nature of the bias was not such that it raised any concern about the series recommended for publication.

[8] By comparing year-to-year changes in compensation cost levels with year-to-year changes in the ECI, it will be possible to gain insights into the effect of employment shifts on compensation cost levels. Thus, for example, if the change in the cost levels is greater than that in the index, then the shift has been toward the relatively high-paying industries or occupations or both.

[9] The "true" value is also subject to nonsampling error.

[10] Kirk M. Wolter, *Introduction to Variance Estimation* (New York, Springer–Verlag, 1985).

Research fellowships

The American Statistical Association and the Bureau of Labor Statistics, under a grant from the National Science Foundation, are sponsoring a Senior Research Fellow and Associate Program for 1988–89. The terms of appointment range from 1 semester to 1 year and are part or full time. Research will be conducted at BLS in Washington, DC.

Fellowship applicants should have a recognized research record and considerable expertise in their area of proposed research. Senior Research Fellows will be selected by a review board consisting of representatives of ASA, BLS, the American Economic Association, the Committee on National Statistics, and the Social Science Research Council. Associates will assist the Fellows on their projects. Associate applicants should have a Ph.D in an appropriate field or have made significant progress toward the degree (at least 2 years of graduate study). Substantial computer experience will, in most cases, be required of Associates. Associates will be selected by the Senior Research Fellows with the approval of the review board.

The program is coordinated by the BLS Office of Research and Evaluation. Current research being conducted by this office includes index number theory and measurement, price measurement, cost-of-living and demand studies, survey response error, workers' compensation, compensating wage differentials, productivity analysis, relationship of union membership to employment variability, model-based seasonal adjustment, prediction properties of index estimators, measures of central location based on censored data, upper and lower probability inferences for outliers, and variance estimation.

For further information, contact Dr. Cathryn Dippo or Dr. Marilyn Manser, Bureau of Labor Statistics, Office of Research and Evaluation, Room 2126, 441 G Street, NW, Washington, DC, 20212; (202) 523–1874 or (202) 523–1347.

A profile of husbands in today's labor market

Historically, high earnings and low unemployment have typified the labor market experience of married men, yet, their labor force participation rate is much lower today than in the past

HOWARD V. HAYGHE AND STEVEN E. HAUGEN

By most measures, married men have always epitomized labor market success. At any time, the vast majority are in the labor force working full-time, and their earnings are generally much higher than those of other major labor force groups. Furthermore, their unemployment rate is usually well below the national average. Despite husbands' relative labor market advantages, the proportion who are labor force participants has been falling for several decades.

Relatively little attention has been focused on husbands' labor force characteristics in recent years, partly because they have been overshadowed by the dramatic labor market developments among women, especially wives. To restore some balance to the analysis of family labor force data, this article discusses the 1987 labor force experience of married men (excluding those not living with their wives) and reviews the long-term downward trend in their labor force participation. The information is based largely on data collected each March in the Current Population Survey (CPS).[1]

Labor force: husbands versus other men

Three out of five men are husbands. Because they are such a large proportion of all men, aggregate labor force statistics for men usually reflect husbands' experience. However, the labor force characteristics of married men are different from those of other men. (See table 1.) For example, in most age groups, husbands are more likely to be in the labor force. Among men 35 to 44 years old, for instance, husbands' labor force participation rate (96 percent in March 1987) is well above the rate for never-married men (84 percent) and slightly above that for other ever-married men (91 percent).

To a certain extent, education helps explain these differences. For instance, as shown in the following tabulation, husbands in almost all age groups are more likely to have completed high school than their single or other ever-married counterparts and, in most cases, the more years of school completed, the more likely an individual is to be in the labor force.

	Percent completed high school		
Age	*Husbands*	*Single*	*Other ever-married*
20 to 24	78	85	67
25 to 34	87	86	80
35 to 44	87	82	84
45 to 54	79	68	73
55 to 64	69	54	53
65 and over	54	44	40

However, whatever their age group or educational level, husbands are almost invariably more likely to be in the labor force than men in other marital-status categories. This suggests that factors other than education are significant in explaining these labor force participation differences. Indeed, the results of earlier research into the determinants of

Howard V. Hayghe and Steven E. Haugen are economists in the Division of Labor Force Statistics, Bureau of Labor Statistics.

Table 1. Employment status of men by marital status and age, March 1987
[Numbers in thousands, not seasonally adjusted]

Employment and marital status	Total, 16 years and over	16 to 24 years	25 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	65 years and over
Civilian noninstitutional population:							
Husbands	50,757	1,602	11,401	12,013	8,876	8,289	8,573
Never married	24,898	14,565	6,914	1,644	658	591	527
Other marital status	10,268	339	2,169	2,537	1,521	1,327	2,375
Civilian labor force:							
Husbands	39,826	1,527	11,076	11,552	8,318	5,849	1,504
Never married	17,847	9,498	6,048	1,376	472	331	86
Other marital status	6,968	297	2,014	2,311	1,309	772	263
Labor force participation rate:							
Husbands	78.5	95.3	97.1	96.2	93.7	70.6	17.5
Never married	71.7	65.2	88.0	83.7	71.7	56.0	16.3
Other marital status	67.9	87.6	92.9	91.1	86.1	58.2	11.1
Unemployment rate:							
Husbands	4.5	7.4	5.0	4.1	4.5	4.0	3.1
Never married	12.9	15.5	10.4	9.4	9.7	5.1	2.3
Other marital status	9.2	13.1	10.0	9.2	8.9	7.6	4.9

labor force participation among men ages 25 to 54 showed that even after controlling for variables such as education, experience, other household income, and so forth, a difference between the participation rates of husbands and other men remained.[2] This, at least, lends tacit support to the popular notion that the relatively high labor force participation of husbands may be partially motivated by the need to contribute to the economic well-being of their families and by their notions of their family role. (Alternatively, it has also been suggested that the personality characteristics necessary for marital success are also important prerequisites in the decision to participate in the labor market.)[3]

Not only are husbands more likely to be labor market participants than other men, but they also tend to be more economically successful. Regardless of age, husbands' unemployment rates are much lower than the rates for other men. For example, focusing again on the 35–44 age cohort, the unemployment rate for husbands (4.1 percent) was less than half the rates of the other two marital-status groups (table 1).

The comparative economic success of husbands is also evidenced by the fact that employed husbands are more highly concentrated in the higher paying occupational categories. About half of all husbands work in three broad groups: precision production, craft, and repair (21 percent); executive, administrative, and managerial (16 percent); and the professional specialties (13 percent). For other men, the corresponding proportions were 18, 9, and 9 percent. This concentration shows up in their earnings; in 1986, about 46 percent of husbands who were full-time wage and salary workers had weekly earning of $500 or more, compared with 25 percent for other men. While these two characteristics of husbands' labor market experience are also related to the factors discussed earlier, such as their higher levels of educational attainment, it should also be noted that husbands are older, on average, than other men, and hence likely to be further along in their careers.

Family situations

Husbands with children under 18 typically have both higher labor force participation rates and higher unemployment rates than do those without children. (See table 2.) Again, part of the disparity in labor force participation may be associated with the added financial responsibilities that go along with parenthood. To a large degree, however, these differences reflect age-specific labor force patterns in general. Fathers are, on average, younger than husbands without children, and both unemployment and labor force participation generally peak early in the life cycle, and then decline with age. (Unemployment rates decline as persons accumulate work experience and settle into a career, while labor force participation rates usually remain high until health problems limit the ability to work or until retirement.) The same age factor may also explain the higher labor force participation and unemployment rates of fathers with children under age 6, when compared with fathers with school-age children—the former are younger.

About 56 percent of all husbands have wives in the labor force. The proportion is lowest for husbands who are not in the labor force (most of whom are older than 60) and highest for those who are employed. Not surprisingly, wives' employment status appears to be related to that of their husbands. About 63 percent of employed husbands have wives who are employed, compared with 56 percent of unemployed husbands. The reasons behind this difference are not entirely clear, but the economic conditions that exist in local job markets are likely to have similar effects on the employment status of both spouses.

To a limited extent, for couples in which each spouse is employed, both the husband and wife work in similar occupational categories, a factor which has an important influence on family earnings. Table 3 shows that professional specialty and managerial workers tend to be married to other professionals or managers. In contrast, it is far less common to find male precision production workers married to

women professionals or managers; instead, their wives are more likely to be clerical, service, operative, or sales workers. The economic result of these marriages was investigated in a study of the 1983 earnings of married couples, which showed that mean (average) earnings of couples in which the husband was a professional and the wife a manager were about $50,290.[4] However, for cases in which the husband was a professional and the wife a service worker, mean earnings were about $30,740. The lowest mean occurred for those couples with both spouses employed in farming, forestry, or fishing occupations. Generally speaking, earnings were highest (more than $40,000) for families in which both spouses were in managerial or professional specialty occupations.

Black and Hispanic husbands

As can be seen in table 4, the labor force participation rates of white and black husbands are lower than those of their Hispanic counterparts. This is mainly because Hispanic husbands are, on average, younger than either black or white husbands; the median age of Hispanic husbands in 1987 was 39, compared with 44 for black and 45 for white husbands.

Also reflecting their relative youthfulness, Hispanic husbands experience higher rates of unemployment (7.7 percent in March 1987) than do either black (6.9 percent) or white (4.3 percent) husbands. The most prominent feature underlying the black-Hispanic difference is that the unemployment rate for young (16 to 24 years old) black husbands is nearly twice that of their Hispanic counterparts. Thus, even though the unemployment rate for blacks drops far more sharply with age than for Hispanics (or whites), the decline does not completely offset the effect of the very high jobless rate of young blacks on the overall rate for the group:

Age	*Unemployment rates of husbands*		
	White	*Black*	*Hispanic*
16 to 24	8.2	13.6	8.0
25 to 34	4.9	6.4	7.7
35 to 44	3.9	7.2	7.3
45 to 54	4.4	6.0	7.8
55 and over	3.5	8.0	7.7

Besides having higher unemployment rates than whites, black and Hispanic husbands are also concentrated in occupational categories that are typified by relatively low wages. About half the employed black and 40 percent of Hispanic husbands are either in service jobs or work as operators, fabricators, or laborers. In contrast, slightly fewer than one-fourth of white husbands are in such jobs.

The occupational distribution of husbands was only part of the reason 1986 median income for white married couples ($33,630) was higher than for either black couples ($26,780) or Hispanic couples ($23,790). Another reason is that white husbands are more likely to work all year at full-time jobs and less likely to experience unemployment than blacks and Hispanics. Wives' earnings, however, have an equalizing influence on family income. Thus, while family income of whites was 47 percent greater than that of blacks and 86 percent greater than that of Hispanics when only the husbands worked during the year, the gap narrowed considerably—to 19 percent between white and black families, and to 30 percent between white and Hispanic families—when the wives were also earners.

Decline in participation

Labor force participation among men has declined substantially over the past several decades. This trend is probably less well-known to the public at large than the dramatic

Table 2. Employment status of husbands by presence and age of own children and employment status of wives, March 1987
[Numbers in thousands, not seasonally adjusted]

Characteristic	Civilian noninstitutional population	Civilian labor force					Not in the labor force
		Total	Labor force paticipation rate	Employed	Unemployed		
					Total	Unemployment rate	
Presence and age of own children[1]							
With no own children under 18	26,694	16,826	63.0	16,081	746	4.4	9,865
With own children under 18	24,063	23,000	95.6	21,943	1,058	4.6	1,063
With children 6 to 17 years, none younger	12,438	11,777	94.7	11,240	537	4.6	660
With children under 6 years	11,625	11,223	96.5	10,703	520	4.6	402
Employment status of wives							
Civilian noninstitutional population	50,757	39,829	78.5	38,024	1,804	4.5	10,928
Civilian labor force	28,310	25,993	91.8	24,820	1,172	4.5	2,317
Labor force participation rate	55.4	65.3	—	65.3	65.0	—	21.2
Employed	27,076	24,870	91.9	23,865	1,005	4.0	2,206
Unemployed	1,234	1,123	91.0	955	168	15.0	111
Unemployment rate	4.4	4.3	—	3.8	14.3	—	4.8
Not in the labor force	22,447	13,836	61.6	13,204	632	4.6	8,611

[1]Children are defined as "own" children of householder and include sons, daughters, stepchildren, and adopted children. Not included are nieces, nephews, grandchildren, and other related children, and unrelated children.

Table 3. Occupation of employed husbands with employed wives by occupation of wives, March 1987
[Not seasonally adjusted]

Occupation of husbands	Number (thousand)	Occupation of wives (In percent)									
		Percent	Executive, administrative, and managerial	Professional specialty	Technicians and related support	Sales	Administrative support, including clerical	Service	Precision production, craft, and repair	Operators, fabricators, and laborers	Farming, forestry, and fishing
Employed husbands with employed wives, total	24,128	100.0	10.9	17.5	3.4	11.4	31.5	13.8	2.1	8.2	1.3
Executive, administrative, and managerial	4,099	100.0	18.5	22.0	3.6	11.9	31.3	7.6	1.6	2.6	.6
Professional specialty	3,405	100.0	13.1	41.5	3.8	7.5	25.1	5.4	1.3	1.9	.4
Technicians and related support	620	100.0	8.1	20.5	7.9	8.2	35.5	11.1	2.2	5.5	1.0
Sales	3,003	100.0	13.1	16.4	2.5	19.6	33.8	9.8	.9	3.5	.3
Administrative support, including clerical	1,326	100.0	8.7	16.6	3.7	11.2	36.9	13.6	1.9	7.4	.2
Service	1,732	100.0	8.2	10.5	3.6	9.5	29.5	29.7	1.9	6.7	.2
Precision production, craft, and repair	4,812	100.0	8.4	9.3	3.7	11.3	34.9	16.6	3.7	11.4	.9
Operators, fabricators, and laborers	4,278	100.0	5.7	7.6	2.8	10.4	31.4	19.6	2.5	19.0	1.0
Farming, forestry, and fishing	852	100.0	7.7	12.1	2.5	7.7	24.6	16.4	2.1	8.3	18.5

participation increase exhibited by women over the same period, despite the extensive coverage it has been given in economic literature. While the magnitude and pattern of the participation decline varies little when cross-classified by marital status, it is still useful to review the trend for husbands specifically, because they account for the majority of all men.

The participation rate of husbands fell from 91 percent in 1955 to 79 percent in the 1985–87 period. As was the case for all men, this decline did not proceed at an even pace; rather, there were three distinct phases. Up until the late 1960's, the participation rate drifted slowly downward, with some leveling-off towards the end of the period. But, beginning about 1970, the rate began to fall much more rapidly, dropping nearly 5 percentage points in 7 years. Subsequently, the pace of the decline moderated substantially. In fact, the recent figures indicate that the rate has plateaued, at least temporarily. The variation in the trend during the three distinct stages of this period is shown in chart 1.

The long-term decline in the labor force participation rate of husbands, while fairly pervasive by age, was largely driven by older husbands (age 55 and older). The rate for those 65 and older fell roughly 27 percentage points over the 1955–85 period. The decline for 55- to 64-year-olds was nearly as dramatic—18 points. For both of these cohorts, there has been little definitive movement in their participation rates since 1985.

The long-term decline among the younger age groups was not nearly as extensive. Among 45- to 54-year-old husbands, the rate fell about 4 percentage points from the mid-1950's to the mid-1970's, but since then, it has remained essentially unchanged. This pattern of little change in participation since the mid-1970's held for ages 25–34 and 35–44 as well, although both groups posted declines of 1 to 2 points over the preceding period. Although the marked acceleration in the decline during the early to mid-1970's was most apparent for older husbands, it was also evident in the trend for their younger counterparts (table 5).

Reasons for the decline. Most analyses of men's participation decline focus on older men and suggest that increases in the level and availability of nonemployment income (such as Social Security retirement benefits, private pensions, and disability benefits) over the past several decades have simply allowed men to retire at earlier ages.[5] For example, there have been several amendments to the Social Security Act of 1935 which expanded both the coverage and level of Social Security retirement benefits. In fact, the substantial real increases in these payments which occurred during the early to mid-1970's are frequently cited as one reason for the distinct acceleration in the rate of the decline in labor force activity among older men during the same period.[6]

Private pension plans are another major source of retirement income, and such plans became available to an ever-widening share of the American work force throughout the period. The percentage of all private sector workers covered by pensions grew from 24 percent in 1950 to 49 percent in 1979. In addition, these plans have become increasingly liberal in their provisions for earlier retirement. Evidence indicates that more workers are taking advantage of these options to leave the labor force at younger ages.[7]

Some research indicates that increases in Social Security disability payments have also been an inducement for earlier exit from the labor force. These payments are generally contingent upon the determination that an individual's health condition is sufficiently debilitating so as to severely

Table 4. Employment status of husbands by race and Hispanic origin, March 1987
[Numbers in thousands, not seasonally adjusted]

Employment status	White	Black	Hispanic origin
Civilian noninstitutional population	45,797	3,610	3,096
Civilian labor force	35,964	2,757	2,679
Labor force participation rate	78.5	76.4	86.5
Employed	34,420	2,567	2,474
Unemployed	1,544	190	205
Unemployment rate	4.3	6.9	7.7
Not in the labor force	9,834	853	417

NOTE: Detail for race and Hispanic-origin groups will not sum to totals because data for the "other races" group are not presented and Hispanics are included in both the white and black population groups.

Table 5. Labor force participation rates of husbands by age, in March of selected years, 1955–87
[Not seasonally adjusted]

Year	Total, 16 years and over	16 to 24 years	25 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years				65 years and older
						Total	55 to 59	60 and 61	62 to 64	
1955	90.7	94.9	98.8	98.8	97.4	88.8	(1)	(1)	(1)	44.2
1960	88.8	97.4	98.6	98.4	96.6	88.2	(1)	(1)	(1)	37.5
1965	87.5	96.3	98.6	98.3	96.8	87.2	(1)	(1)	(1)	31.6
1970	86.6	94.4	98.3	98.1	96.1	85.8	90.8	85.3	74.8	30.4
1975	82.9	95.4	97.4	97.2	93.9	79.0	86.7	79.5	63.3	23.9
1980	80.9	96.9	97.5	97.0	93.5	75.5	84.3	74.7	57.8	20.4
1985	78.6	95.5	97.4	96.6	92.6	70.4	82.0	71.1	49.0	17.5
1986	78.4	95.7	97.3	96.2	93.1	70.0	82.1	68.4	47.8	17.5
1987	78.5	95.4	97.1	96.2	93.7	70.6	83.4	69.1	48.9	17.5

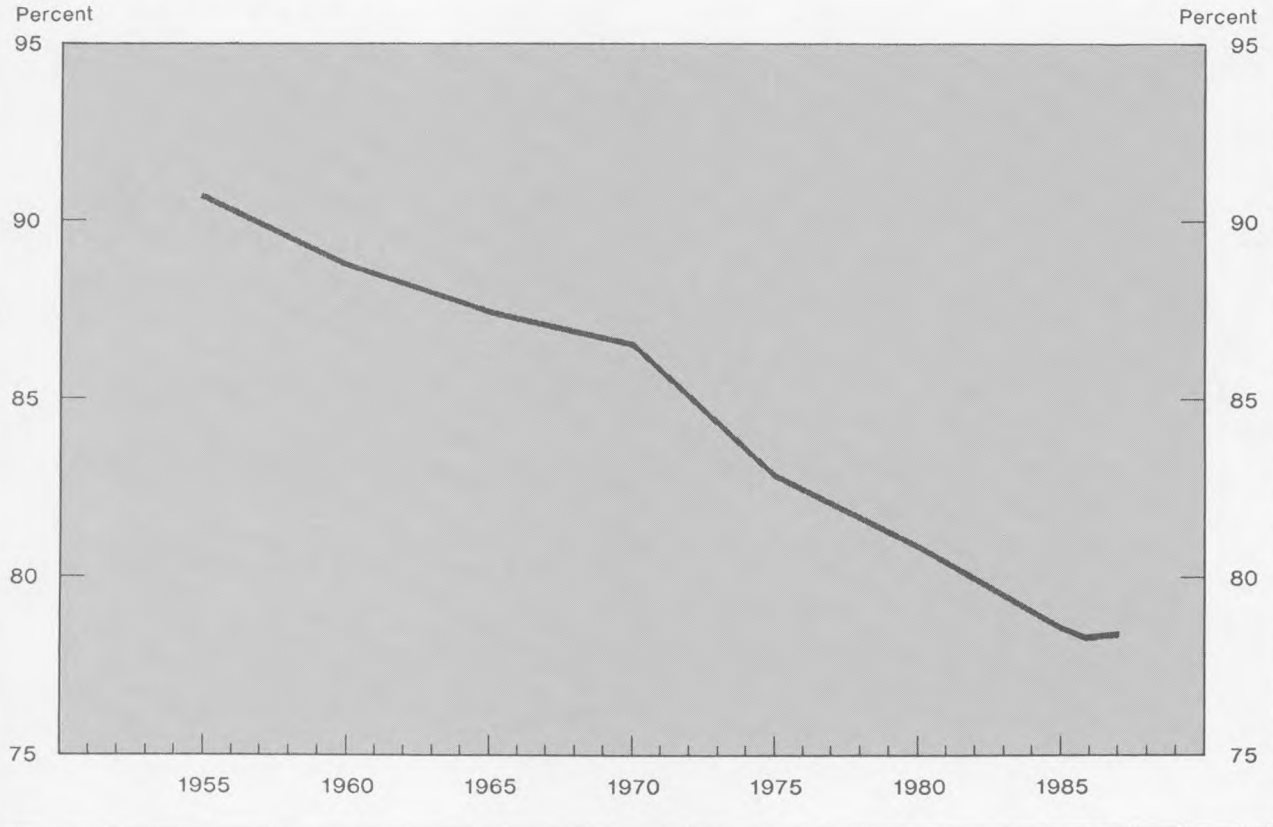
[1] Not available.

hinder the ability to work. Therefore, it is not surprising that older persons are heavily represented among recipients. It has been suggested that the marked increase in the amount of disability benefit payments during the mid-1960's to mid-1970's (which also parallels the observed increase in the rate of participation decline), together with liberalized criteria for determining eligibility and increased public awareness of the program, encouraged many more older workers with poor health to retire earlier than would have been likely otherwise.[8]

Unlike the case for the older men, the causes behind the declining labor force participation among prime working-age husbands during the mid-1950's to mid-1970's are more difficult to isolate. There are fewer sources of nonemployment income available to younger men. Moreover, of those that are available, few meet the financial needs of young families. For instance, it has been shown that although the increased availability of Social Security disability payments is probably still a factor in the participation decline of those below age 45, the effect tends to be rather small.[9]

One explanation for the decline that has been suggested (but, when scrutinized, does not appear convincing) is that it might be related to the dramatic increase in wives' labor force participation over the period. Between 1955 and 1975,

Chart 1. Labor force participation rates of husbands, selected years, March 1955–87



the participation rate for husbands ages 25–34 declined by about $1\frac{1}{2}$ percentage points, while that for their wives soared by more than 20 points. While it seems reasonable to assume that the increase in labor force activity among wives, in conjunction with the trend towards smaller families, may have facilitated nonparticipation among their husbands, this explanation is weakened considerably by the observation that single men in the same age cohort also exhibited a decline in participation over the period.

EVEN THOUGH HUSBANDS are less likely to be working or looking for work today than was the case 30 years ago, as a group they continue to be among the most successful labor market participants. Unlike the situation that existed during the 1950's, however, husbands no longer constitute the majority of the labor force. Then, husbands comprised a little more than half of all labor force participants and changes in aggregate labor force measures largely reflected their experience. Today, they account for only about a third of the labor force, and thus, their influence over the movements of aggregate labor force statistics has greatly diminished.

This dramatic change stems only partly from husbands' falling labor force participation rates. It also reflects the dramatic rise in wives' participation and the increase in the numbers of divorced, separated, and never-married persons that has resulted from changes in marital patterns. Indeed, Bureau of Labor Statistics' projections through the year 2000 show that the number of women in the labor force is expected to grow much more rapidly than the number of men, implying that husbands' share of the labor force will shrink further.[10] Thus, in view of such growing heterogeneity, it will become increasingly necessary to examine economic events in terms of each of the various groups, rather than rely on aggregate measures of economic change to assess the well-being of the population. □

——FOOTNOTES——

[1] This article is derived primarily from information collected in the March Current Population Survey (CPS). The CPS is the monthly household survey (presently including 59,500 households) conducted for the Bureau of Labor Statistics by the Bureau of the Census. Information obtained from this survey relates to the employment status of the noninstitutional population 16 years old and over.

Because it is a sample survey, estimates derived from the CPS may differ from the actual counts that could be obtained from a complete census. Therefore, small estimates or small differences between them should be interpreted with caution. For a more detailed explanation, see the Explanatory Note in *Families at Work: The Jobs and the Pay*, Bulletin 2209 (Bureau of Labor Statistics, 1984), pp. 30–34.

[2] See William G. Bowen and T. Aldrich Finegan, *The Economics of Labor Force Participation* (Princeton, NJ, Princeton University Press, 1969), pp. 39–74.

[3] See Bowen and Finegan, *The Economics*, pp. 40–49, for a discussion of these points and their relationship to labor force participation decisions.

[4] "Earnings in 1983 of Married-Couple Families by Characteristics of Husbands and Wives," *Current Population Reports*, Series P–60, No. 153 (Bureau of Census, 1986), table 2A, p. 12.

[5] While few studies have addressed the decline in participation rates for husbands, a large number have looked at the reasons for the decline among all men, usually focusing on either the younger or older groups. Because married men account for the majority of the men in these groups (ranging from about three-fifths for ages 25 to 34 to four-fifths for ages 55 and over), it seems reasonable to assume that explanations for the overall decline among all men also apply to husbands—especially to those in the older age groups.

For an overall discussion of the labor force participation decline among men and a comprehensive bibliography on the subject, see the following *Monthly Labor Review* articles: Robert W. Bednarzik and Deborah P. Klein, "Labor force trends: a synthesis and analysis," October 1977, pp. 3–12; Richard M. Devens, "Labor force trends: a bibliography," October 1977, pp. 12–15; and Philip L. Rones, "Older men—the choice between work and retirement," November 1978, pp. 3–10.

[6] See, for example, Michael D. Hurd and Michael J. Boskin, "The effect of Social Security on Retirement in the Early 1970's," *The Quarterly Journal of Economics*, November 1984, pp. 767–90.

[7] See "Retirement before age 65 is a growing trend in the private sector," HRD–85–81 (Washington, U.S. General Accounting Office, July 1985). Also, see Donald Bell and William Marclay, "Trends in retirement eligibility and pension benefits, 1974–83," *Monthly Labor Review*, April 1987, pp. 18–25, for a review of recent pension plan developments.

[8] See Martynas A. Ycas, "Recent Trends in Health Near the Age of Retirement: New Findings from the Health Interview Survey," *Social Security Bulletin*, February 1987, pp. 10–11, for a discussion of these points.

[9] See Frederic B. Siskind, "Labor force participation of men 25–54, by race," *Monthly Labor Review*, July 1975, pp. 40–42.

[10] See Howard N Fullerton Jr., "Labor force projections: 1986 to 2000," *Monthly Labor Review*, September 1987, pp. 19–29.

Multifactor productivity in U.S. manufacturing, 1949–83

New, more comprehensive measures of multifactor productivity permit the analysis of numerous issues, including developments at the detailed industry level and the importance of factor substitution in labor productivity growth

WILLIAM GULLICKSON AND MICHAEL J. HARPER

The strong labor productivity advance exhibited by the U.S. economy over the 25 years following World War II gave way to sluggish growth beginning in the early 1970's. The manufacturing sector, which accounts for about 20 percent of gross national product, has experienced a similar pattern. Prior to about 1973, the rapid productivity growth in manufacturing contributed to swift increases in the U.S. standard of living, and also to a favorable international balance of payments. After 1973, and particularly during the late 1970's, manufacturing productivity growth fell short of its earlier performance.

In this article, the Bureau of Labor Statistics introduces a new set of multifactor productivity measures designed to strengthen the statistical basis with which labor productivity, and production technology in general, can be analyzed. These new measures of multifactor productivity, available for 20 manufacturing industries, are defined as output per unit of combined capital, labor, energy, materials, and business service inputs (collectively identified by the acronym KLEMS). They expand the BLS manufacturing multifactor productivity measurement program in two important ways: First, they enhance the level of industry detail so that growth can be localized, rather than seen in the aggregate; and second, they consider intermediates—raw materials and business service inputs—explicitly, so that economies in those inputs can be assessed along with those in labor and capital.

Changes over time in these new multifactor measures reflect many influences, including variations in output (especially in the short term, during which most inputs are partially fixed), the utilization of capacity, changes in the characteristics and efforts of the work force, changes in managerial skill, and technological developments. Measures of multifactor productivity have a specific relationship to measures of labor productivity: Labor productivity growth can be seen as deriving from (1) growth in multifactor productivity and (2) changes in the ratios of labor to other inputs, or labor intensity ratios. These input ratios can change for several reasons, most notably in response to relative price change, even in the absence of multifactor productivity growth. Because changes in multifactor productivity and in the intensity of use of the various factors have occurred at different rates throughout the postwar period, the impact of these forces on labor productivity growth has varied also.

In the first section of this article, the methods and sources underlying the new multifactor measures, and their relation to other BLS productivity indexes, are discussed. The next section deals with input, output, and multifactor productivity growth, in the aggregate and by industry. Last, the effects of multifactor productivity growth and changes in

William Gullickson and Michael J. Harper are economists in the Division of Productivity Research, Bureau of Labor Statistics. Steve Rosenthal and Phyllis Otto of the division developed much of the data for this article.

factor intensity on labor productivity growth are explored, particularly with regard to attributing the productivity slowdown to those sources.

Comparison with other productivity measures

The new multifactor measures differ in one important way from the capital-labor multifactor measures for aggregate sectors (business, nonfarm business, and total manufacturing) which have been published by the BLS for several years.[1] For the capital-labor measures, multifactor productivity is defined as real gross product originating in a sector per unit of combined labor and capital inputs—with no explicit consideration of intermediate inputs.[2] The reason for this approach is that, for the largest aggregates, most intermediate transactions are between establishments within the sector and therefore cancel out in the computation of output leaving the sector; because intermediate purchases from outside the sector are a small proportion of total purchases by the large aggregates, all intermediates can safely be ignored in the calculation of productivity.

For industries, intermediate goods are not alway obtained from suppliers within the industry, and for this reason should not be ignored. For the measures presented in this article, therefore, output is defined as the real value of production (rather than value added) sold to purchasers outside the industry; industry output computed this way is referred to as sectoral output. Inputs are defined to include all intermediate purchases from outside the industry. Thus, the entire production process can be analyzed, including developments in intermediate inputs to the greatest extent possible, without double-counting.[3] The new 2-digit measures closely resemble a set of measures prepared previously by BLS for the steel and auto industries, which also reflect sectoral output per unit of combined capital, labor, energy, and other intermediate inputs.[4]

The BLS now publishes several different multifactor measures in addition to labor productivity and cost measures. No single productivity ratio can be regarded as best for all purposes. Because data users have a variety of analytical interests, it is the policy of BLS to make available a family of measures, together with detailed discussion of the assumptions and component data series used to compute them. For example, BLS now publishes three productivity series for total manufacturing: the quarterly labor productivity series, which uses a gross-product-originating measure; the annual capital-labor multifactor series, also based on gross product originating; and the new sectoral output and multifactor input measures. The three exhibit the following compound annual productivity growth rates over the postwar period:

Period	*Labor productivity*	*Capital-labor multifactor productivity*	*KLEMS multifactor productivity*
1949–83	2.5	1.7	1.1
1949–73	2.8	2.1	1.5
1973–83	1.8	.7	.3

The estimates underlying the three different measures are as follows: (1) labor productivity—gross product originating (numerator) and labor hours (denominator); (2) capital-labor multifactor productivity—gross product originating (numerator) and combined inputs of capital and labor (denominator); and (3) KLEMS sectoral multifactor productivity—sectoral output (numerator) and combined inputs of capital, labor, energy, materials, and purchased business services (denominator).

The difference between labor productivity (gross product originating per hour) and capital-labor multifactor productivity (gross product originating per unit of combined capital and labor inputs) reflects changes in the capital-labor ratio.[5] In effect, therefore, multifactor analysis based on gross product originating and capital and labor inputs allows the resolution of labor productivity change into two components: change in the multifactor measure, which reflects changes in output in excess of changes in capital and labor inputs combined, and a contribution from changes in the capital-labor ratio, which represents change in the relative intensity of use of the two factors, including the effects of substitution of capital for labor.

The difference between the multifactor measures based on gross product originating and the sectoral output measures is due to the inclusion of intermediates in both the numerator and denominator of the new sectoral measure.[6] For manufacturing measures based on gross product originating, output is, in effect, calculated by subtracting real intermediate input (materials used in the production process and purchased services) from the real value of production (output). The denominator for these measures, consisting of capital and labor inputs, also excludes intermediates. Because neither exclusion is made for the new sectoral measures, the difference between the two productivity measures can be said to derive from the fact that, in the gross-product-originating measures, the same quantity—intermediates—is subtracted from both numerator and denominator. Because of this, change over time in sectoral output-based measures is smaller in absolute terms, the relationship depending on the share of intermediates in sectoral output. Which of the multifactor estimates should be used depends on the subject being examined, as each measures something different. For some purposes, it is preferable to study the relationships between output and specific inputs rather than the summary multifactor ratios, and BLS therefore makes available the component series used to construct both the gross-product-originating and the sectoral multifactor measures.

Measurement framework and data

As with the major sector measures that include only labor and capital inputs, productivity growth in this study is defined as the difference between output growth and the growth of a composite of inputs, in this case a weighted combination of capital, labor, energy, materials, and busi-

ness services. Growth in the input composite is calculated as a weighted average of changes in individual inputs, where the weights are based on current factor shares. The general framework underlying the new measures draws on the microeconomic theory of the firm and the notion of a production function to support the use of output elasticities for input factor weights.[7] The weights used for input aggregation are approximated with factor cost shares which sum to 1 in each period. This multifactor productivity measurement work also draws on recent developments in index number theory,[8] which show that Tornqvist weighting—that is, aggregation using weights based on current costs—minimizes restrictive assumptions about the structure of production.

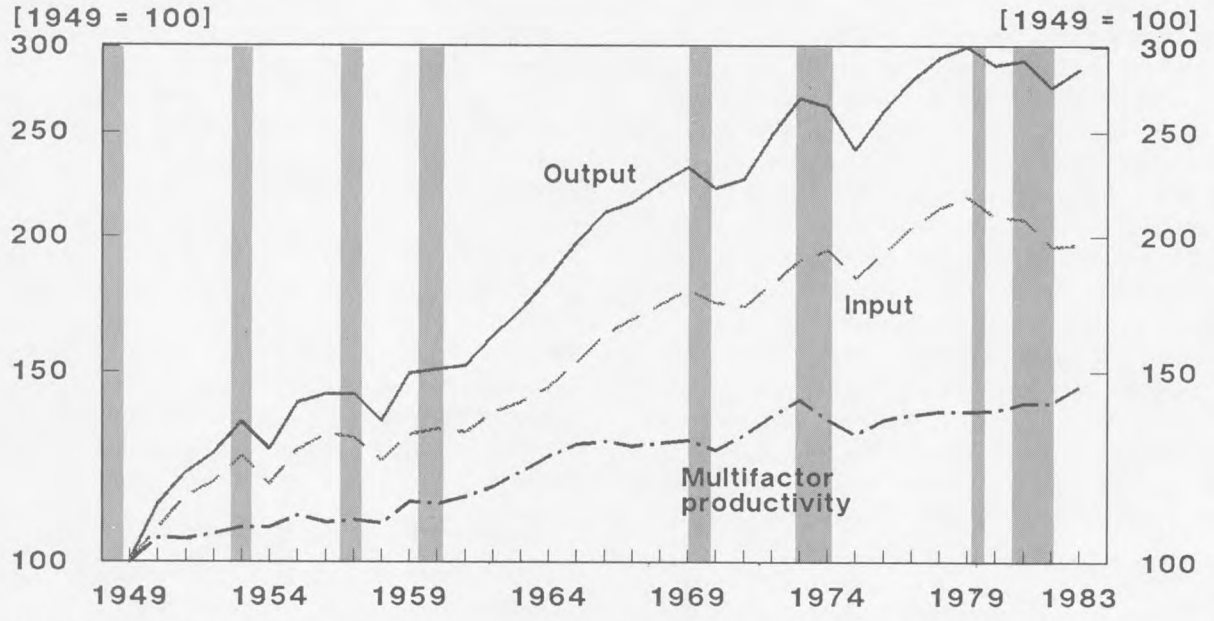
The new sectoral measures are based on indexes of real quantity and cost measures of sectoral output and capital, labor, energy, materials, and service inputs. Measures of capital and labor for the new 2-digit Standard Industrial Classification manufacturing measures employ the same general data sources and procedures used for major sector labor productivity and multifactor productivity measures. As these sources have been discussed previously,[9] they are reviewed only briefly here.

Labor is measured as the paid hours of all persons engaged in a sector. The sources for employment and average weekly hours data are the BLS Current Employment Statistics survey and the Current Population Survey. The BLS currently is developing measures of hours at work for incorporation into future measures.[10]

Capital input is defined as the flow of services from physical assets, which include equipment, structures, inventories, and land. Service flows are assumed proportional to stocks. For depreciable assets (equipment and structures), stocks are measured using the perpetual inventory method. The BLS method relates the services of older assets to those of new ones by assuming that efficiency of assets is a function of age, such that efficiency declines gradually early in an asset's life and more quickly later on.

Stocks of assets for 2-digit industries, as for the aggregate sectors, are combined using weights based on implicit rental price estimates—that is, estimates of the prices that various types of capital would bring on a rental market. The capital rental price formula consists essentially of the rate of return on assets plus the rate of depreciation minus capital gains, all in nominal terms.[11] Capital gains, usually computed as the annual change in the deflator for new investment from the National Accounts, was calculated as a 3-year moving average because of the volatility of that series. Because the rental price formula is derived under an assumption of perfect foresight, the use of a 3-year, moving-average estimate for capital gains is consistent with the view that producers anticipate price movements generally rather than annually.[12]

Chart 1. Indexes of output, input, and multifactor productivity, manufacturing industries, 1949–83



NOTE: Shaded areas indicate recessionary periods, as designated by the National Bureau of Economic Research.

Table 1. Selected measures of output and multifactor productivity change and the post-1973 productivity slowdown in total manufacturing, 1949–83

[Percent change at compound annual rate]

Periods		Output			Multifactor productivity		
Early	Late	Change		Slowdown (2) – (1)	Change		Slowdown (5) – (4)
		Early (1)	Late (2)		Early (4)	Late (5)	
1949–73	1973–83	4.2	0.6	–3.6	1.5	0.3	–1.2
1953–73	1973–83	3.5	0.6	–2.9	1.4	0.3	–1.1
1949–73	1973–79	4.2	1.8	–2.4	1.5	–0.4	–1.9
1953–73	1973–81	3.5	1.0	–2.5	1.4	–0.1	–1.5

"Sectoral" output is based on the deflated value of production, less that portion which is consumed in the same industry.[13] This treatment is consistent with a production function that represents the industry as if it were a single process.[14] Real production equals the deflated value of shipments and miscellaneous receipts plus inventory change.[15] Federal excise taxes are added so that production will be shown at market value.

Intrasector transactions are removed from all output and material input series used in this study, using transactions data contained in the various input-output tables for the economy prepared by the Bureau of Economic Analysis of the U.S. Department of Commerce.[16] It should be noted that the intrasector transaction for total manufacturing is greater than the sum of intrasector transactions for 2-digit industries. For each 2-digit industry, intrasector transactions are those between establishments in the same industry; for total manufacturing, the intrasector transaction consists of all shipments between domestic manufacturers, regardless of industry.

Energy input is contructed using data on price and quantity from the Commerce Department's Census of Manufactures and Annual Survey of Manufactures, together with appropriate BLS Producer Price Indexes used as price deflators. Data on the quantity and cost of fuels purchased for use as heat or power are collected in the Census of Manufactures and the Annual Survey of Manufacturing.[17] Data for the separate energy categories are then Tornqvist-aggregated.[18]

Nonenergy materials input represents all commodity inputs exclusive of fuel (electricity, fuel oil, coal, natural gas, and other miscellaneous fuels) but inclusive of fuel-type inputs used as raw materials in a manufacturing process, such as crude petroleum used by the refining industry. In addition to raw and processed materials, these measures include all incidental commodity inputs such as office supplies, vehicle parts bought for maintenance, and small tools, if these are allowable as current costs for computing business taxes.[19]

Directly collected data on *purchased business services* are relatively scant, and for that reason they have heretofore been ignored in studies of this type.[20] There is ample evidence of an increased use of purchased business services by industries over the postwar period, and there are two important aspects of this development to consider. The first, of course, is that a sizable and growing input should not be ignored in productivity measurement if aggregate inputs are not to be underestimated and productivity mismeasured. The other is the possibility of substitution between capital or labor and services purchased from outside. Examples of the latter are the substitution of leased equipment for owned capital and purchases of accounting, legal, and technical services in place of those services formerly provided by a firm's own employees.[21]

Results

The dramatic slowdown in productivity growth in the early 1970's found in previous studies by the BLS and other researchers[22] is also apparent in the 2-digit manufacturing industry indexes of multifactor productivity. (See chart 1.) Because one purpose of developing these new measures is to provide data on the slowdown for manufacturing industries, the following analysis examines the pre-1973 and post-1973 periods in detail.

Subperiod analysis. The choice of the starting date of the pre-1973 period and the closing date of the post-1973 period has an important effect on an analysis of the slowdown. One alternative is to choose the periods 1949–73 and 1973–83, so as to cover all years in the existing data set. Another is to choose years that are business cycle peaks, such as 1953, 1979, or 1981, for the initial and terminal years of the two

Table 2. Multifactor productivity growth and the post-1973 slowdown in manufacturing industries, selected periods, 1949–83

[Percent change at compound annual rate]

Industry	Change			Slowdown (3) – (2)
	1949–83 (1)	1949–73 (2)	1973–83 (3)	
Total manufacturing	1.1	1.5	0.3	–1.2
Food and kindred products	0.7	0.8	0.5	–0.3
Tobacco manufactures	0.2	1.0	–1.7	–2.7
Textile mill products	1.7	1.7	1.7	0.0
Apparel and related products	1.0	1.0	0.9	–0.1
Lumber and wood products	1.3	2.0	–0.5	–2.5
Furniture and fixtures	0.7	0.8	0.4	–0.4
Paper and allied products	0.9	1.2	0.2	–1.0
Printing and publishing	0.3	0.6	–0.3	–0.9
Chemicals and allied products	1.5	2.3	–0.4	–2.7
Petroleum products	0.4	0.9	–0.9	–1.8
Rubber and miscellaneous plastics	0.7	1.0	0.1	–0.9
Leather and leather products	0.4	0.5	0.2	–0.3
Stone, clay, and glass products	0.5	1.0	–0.7	–1.7
Primary metal industries	–0.5	0.2	–2.1	–2.3
Fabricated metal products	0.4	0.5	0.0	–0.5
Machinery, except electrical	1.2	1.1	1.4	0.3
Electrical and electronic equipment	1.9	1.9	2.0	0.1
Transportation equipment	1.0	1.3	0.3	–1.0
Instruments and related products	1.5	1.9	0.7	–1.2
Miscellaneous manufacturing	0.6	1.3	–1.0	–2.3

Table 3. Changes in output and input quantities and in output/input ratios in total manufacturing, selected periods, 1949–83
[Percent change at compound annual rate]

Period	Output (Q)	Aggregate input	Capital (K)	Labor (L)	Energy (E)	Materials (M)	Services (S)
1949–83	3.1	2.0	3.8	0.8	3.3	2.2	4.6
1949–73	4.2	2.7	3.9	1.5	5.1	3.1	5.4
1973–83	0.6	0.3	3.6	−1.0	−0.8	0.2	2.6

	KLEMS multifactor productivity	Output/input ratios				
		Q/K	Q/L	Q/E	Q/M	Q/S
1949–83	1.1	−0.6	2.4	−0.2	0.9	−1.4
1949–73	1.5	0.3	2.7	−0.8	1.1	−1.2
1973–83	0.3	−2.9	1.6	1.4	0.4	−1.9

periods to minimize the cyclical impact on the productivity movements.[23]

Table 1 shows the effects on the computed slowdown in total manufacturing of adopting different initial and terminal dates for the pre-1973 ("early") and post-1973 ("late") periods. If the terminal years 1949 and 1983 are used—that is, if the entire data set is used—the slowdown in output growth is 3.6 percent annually and in multifactor productivity, about 1.2 percent. If the cyclical peak years of 1953 and 1981 are chosen, the slowdown in output is about 1 percentage point less and the slowdown in multifactor productivity about a third of a percentage point greater. The following analysis is based on data for the whole period 1949–83 for two reasons: First, the choice of initial and terminal dates for the "early" and "late" periods does not change the magnitude of the productivity slowdown greatly; and second, using officially designated peak years is somewhat arbitrary for industry analysis because peak years for many industries do not coincide with the peaks for the whole economy.[24]

The differential growth of inputs. Multifactor productivity growth varies substantially across industries, both in terms of total postwar growth and the degree of slowdown after 1973. (See table 2.) At the high end of the growth spectrum for the period 1949–83 are electrical and electronic equipment (averaging 1.9 percent per year), textile mill products (1.7 percent), chemicals and allied products (1.5 percent), and instruments and related products (1.5 percent). Primary metal industries had an average multifactor productivity decline of half a percent per year and tobacco manufactures, an average annual rise of 0.2 percent.

Although there is substantial variation, most manufacturing industries have exhibited some degree of slowdown in multifactor productivity growth since 1973. Although other BLS productivity series for which more recent data are available show some recovery in the last few years, multifactor productivity growth rates by industry and for total manufacturing demonstrate a pervasive decline after 1973. In total manufacturing, the growth rate dropped from 1.5 to 0.3 percent per year (table 2); among the 20 industries, growth slowed by some degree in all but three—textile mill products, machinery except electrical, and electrical and electronic equipment. In apparel and related products, the decline was insignificant. In all of the other industries, growth slowed substantially, by at least 0.3 percentage points.

Trends in output and inputs have systematic relationships to the differences in multifactor productivity growth rates among industries. For example, industries with the fastest growing productivity also tend to show rapidly rising output levels (an exception is textile mill products); those with slow productivity growth (primary metals, tobacco manufactures, and leather products) also showed the slowest output growth rates. This association is borne out by formal testing. The rank correlation coefficient for the growth rates of mul-

Table 4. Changes in output and input quantities and in multifactor productivity, 20 manufacturing industries, 1949–83
[Percent change at compound annual rate]

Industry	Output	Aggregate input	Capital	Labor	Energy	Materials	Services	KLEMS multifactor productivity
Total manufacturing	3.1	2.0	3.8	0.8	3.3	2.2	4.6	1.1
Food and kindred products	2.4	1.7	1.8	−0.5	2.6	2.1	3.6	0.7
Tobacco manufactures	0.7	0.6	1.5	−1.4	4.0	−0.4	1.9	0.2
Textile mill products	3.0	1.3	0.9	−1.2	1.7	3.5	3.3	1.7
Apparel and related products	2.2	1.2	3.4	0.0	3.6	1.8	2.3	1.0
Lumber and wood products	2.5	1.2	2.9	−0.4	3.0	2.2	2.5	1.3
Furniture and fixtures	3.1	2.3	3.4	1.1	3.6	2.9	4.4	0.7
Paper and allied products	3.8	2.9	3.9	1.1	3.3	3.8	5.3	0.9
Printing and publishing	3.4	3.1	4.0	1.6	5.1	4.4	5.0	0.3
Chemicals and allied products	5.0	3.5	4.1	1.5	3.9	4.5	5.7	1.5
Petroleum products	2.7	2.3	3.4	−0.2	2.3	2.6	3.9	0.4
Rubber and miscellaneous plastics	5.1	4.3	5.3	2.9	5.6	4.9	5.6	0.7
Leather and leather products	−0.2	−0.6	0.9	−1.8	0.6	0.2	1.1	0.4
Stone, clay, and glass	2.4	1.9	3.4	0.4	1.5	2.9	3.8	0.5
Primary metal industries	0.4	0.9	3.2	−0.6	1.0	1.2	2.8	−0.5
Fabricated metal products	2.6	2.2	4.1	1.2	4.0	2.4	4.5	0.4
Machinery, except electrical	4.2	3.0	4.8	1.6	3.3	3.7	5.8	1.2
Electrical and electronic equipment	5.8	3.9	6.6	2.6	5.4	4.1	6.4	1.9
Transportation equipment	3.4	2.4	4.5	1.2	3.4	2.7	5.3	1.0
Instruments and related products	6.2	4.6	5.6	2.8	6.2	6.1	7.4	1.5
Miscellaneous manufacturing	2.4	1.8	3.4	0.0	1.5	2.6	4.8	0.6

tifactor productivity and of output for the period 1949–83 is positive and significant.[25]

The growth rates of the various inputs for total manufacturing provide important insights into several postwar developments. (See table 3.) First, laborsaving changes were made throughout the period; the annual growth rates of labor input in both the early and late periods were 1.2 to 1.4 percentage points lower than the growth rates of all inputs taken together. Second, the use of fuels is sensitive to price changes; in the early period, when fuel prices were rising relatively more slowly than other input prices, their use relative to other inputs rose substantially; later, economies in the use of fuels were instituted in response to dramatic fuel price increases.[26] Third, there was no significant reduction in the use of capital services, which rose 3.9 percent per year in the early period compared with 3.6 percent over the 1973–83 decade. Finally, the growth in the use of business services has been rapid throughout the postwar years; this is an especially significant finding in view of the possibility that purchased services are being substituted for primary inputs, that is, labor and capital employed directly.

Similar patterns emerge among industries, as table 4 indicates. First, the greatest economies have been evident in labor—in every industry, the growth rate of labor input has been slower than that of any other input. Second, for all industries, the growth rate of business services has been faster than that of all inputs together, and in 12 of the 20 industries, services are the fastest growing input. Third, for most industries (19 of 20), production is increasingly capital intensive, by the criterion of growth relative to that of all inputs together. These shifts in resource use, and the possible connection with labor use and productivity, will be discussed further in the next section.

The factor intensity connection

As described previously, the basic multifactor equation relating output and factor inputs can be reorganized to relate labor productivity to multifactor productivity and changes in the ratios of each nonlabor input to labor.[27] Using this decomposition, change in labor productivity is seen to have two fundamental sources: (1) the growth of the multifactor productivity residual, which includes the effects of advances in production technology and efficiency and the growth of worker and managerial skills, among other things, and (2) changing intensity of labor use, which includes the effects of relative input price change.[28] The intensity terms are defined as changes in nonlabor input/labor ratios, multiplied by the shares (in the value of production) paid for each nonlabor factor.

The decomposition of labor productivity change into multifactor productivity growth and changes in labor intensity is shown in table 5 for total manufacturing and for constituent industries. For total manufacturing, labor productivity grew at more than double the rate of multifactor productivity (2.4 percent versus 1.1 percent per year). Thus, over half—about 55 percent—of the growth of labor productivity is attributable to changes in nonlabor/labor ratios which reflect, most notably, substitution of nonlabor factors for labor.[29]

The use of labor has in fact declined relative to each of the other four inputs over the entire study period, as evidenced by the positive contribution estimates for each nonlabor factor. It should be noted especially that the substitution effects for capital and business services are large—over the postwar period, about 0.8 of the 1.3 annual percentage-point difference between labor and multifactor productivity growth can be accounted for by the rapid growth of capital and business service inputs relative to labor. Thus, about 65 percent of the difference between labor and multifactor productivity growth is accounted for by two inputs, which averaged only 27 percent of costs through the postwar period (table 6).

Conversely, relatively little of the difference for manufacturing as a whole is accounted for by materials and fuels inputs: The remaining 35 percent of the difference between multifactor and labor productivity growth is accounted for by these two inputs, which averaged about 28 percent of all costs.

The relative strength of multifactor productivity increases and nonlabor-for-labor substitution as forces underlying labor productivity growth varies somewhat from industry to industry, but for about half of the 2-digit industries, multifactor productivity accounts for 35 to 45 percent of the postwar labor productivity growth rate. For two industries—tobacco manufactures and primary metal industries—labor productivity growth was achieved mainly by intensifying the use of other, nonlabor inputs. At the other extreme, in electrical and electronic equipment, 60 percent of labor productivity growth was accounted for by multifactor productivity change.

The evidence in table 5 concerning the influence of change in factor intensity on labor productivity can be summarized by noting that over the postwar period, in all industries except one—electrical and electronic equipment—shifts between nonlabor and labor inputs are a stronger force in labor productivity growth than is multifactor productivity. In electrical and electronic equipment, a 3.1-percent-per-year increase in labor productivity resulted from 1.9-percent annual growth in multifactor productivity and a contribution from shifts between nonlabor and labor inputs totaling 1.2 percentage points. For all other industries, the summed contribution of substitution effects exceeded that of multifactor productivity growth, in some cases by a wide margin: In six cases, the contribution of shifts out of labor was at least triple the contribution of multifactor productivity growth; in an additional two, the shift contribution was at least double that of multifactor productivity.

Substitution effects and the labor productivity slowdown. For total manufacturing, labor productivity growth

Table 5. Attribution of labor productivity growth to multifactor productivity growth and substitution effects, total manufacturing and 20 manufacturing industries, 1949–83

[Percent changes at compound annual rate]

Period	Output per hour	Contributions of—					
		KLEMS multifactor productivity	Substitution effects				
			Sum of effects	Capital/labor	Energy/labor	Materials/labor	Services/labor
Total manufacturing							
1949–83	2.36	1.11	1.25	0.54	0.05	0.36	0.29
1949–73 (a)	2.67	1.46	1.21	0.47	0.07	0.38	0.27
1973–83 (b)	1.62	0.28	1.34	0.69	0.01	0.30	0.33
Change (b-a)	−1.05	−1.18	0.13	0.22	−0.06	−0.08	0.06
Food and kindred products (SIC 20)							
1949–83	2.86	0.69	2.17	0.27	0.03	1.66	0.18
1949–73 (a)	2.75	0.78	1.97	0.25	0.04	1.51	0.15
1973–83 (b)	3.10	0.47	2.63	0.32	0.01	2.03	0.24
Change (b-a)	0.35	−0.31	0.66	0.07	−0.03	0.52	0.09
Tobacco manufactures (SIC 21)							
1949–83	2.14	0.18	1.96	1.49	0.02	0.29	0.16
1949–73 (a)	2.60	0.98	1.62	1.14	0.01	0.28	0.18
1973–83 (b)	1.05	−1.73	2.78	2.36	0.03	0.31	0.12
Change (b-a)	−1.55	−2.71	1.16	1.22	0.02	0.03	−0.06
Textile mill products (SIC 22)							
1949–83	4.23	1.71	2.52	0.24	0.07	1.97	0.19
1949–73 (a)	4.24	1.73	2.51	0.21	0.07	2.01	0.17
1973–83 (b)	4.21	1.67	2.54	0.31	0.06	1.88	0.23
Change (b-a)	−0.03	−0.06	0.03	0.10	−0.01	−0.13	0.00
Apparel and other textile products (SIC 23)							
1949–83	2.23	1.02	1.21	0.21	0.02	0.85	0.12
1949–73 (a)	1.91	1.05	0.86	0.20	0.02	0.52	0.11
1973–83 (b)	2.99	0.94	2.05	0.24	0.02	1.62	0.15
Change (b-a)	1.08	−0.11	1.19	0.04	0.00	1.10	0.04
Lumber and wood products (SIC 24)							
1949–83	2.92	1.26	1.66	0.56	0.07	0.87	0.13
1949–73 (a)	3.68	2.00	1.68	0.53	0.11	0.89	0.11
1973–83 (b)	1.11	−0.48	1.59	0.63	−0.04	0.84	0.15
Change (b-a)	−2.57	−2.48	−0.09	0.10	−0.15	−0.05	0.04
Furniture and fixtures (SIC 25)							
1949–83	1.98	0.72	1.26	0.16	0.02	0.85	0.21
1949–73 (a)	2.10	0.84	1.26	0.14	0.03	0.92	0.17
1973–83 (b)	1.69	0.43	1.26	0.22	0.00	0.69	0.33
Change (b-a)	−0.41	−0.41	0.00	0.08	−0.03	−0.23	0.16
Paper and allied products (SIC 26)							
1949–83	2.67	0.90	1.77	0.46	0.88	1.02	0.19
1949–73 (a)	2.84	1.20	1.64	0.35	0.10	0.96	0.20
1973–83 (b)	2.26	0.18	2.08	0.71	0.03	1.15	0.18
Change (b-a)	−0.58	−1.02	0.44	0.36	−0.07	0.19	−0.02
Printing and publishing (SIC 27)							
1949–83	1.80	0.31	1.49	0.30	0.03	0.79	0.37
1949–73 (a)	2.33	0.57	1.76	0.36	0.04	0.92	0.42
1973–83 (b)	0.55	−0.32	0.87	0.17	−0.01	0.46	0.25
Change (b-a)	−1.78	−0.89	−0.89	−0.19	−0.05	−0.46	−0.17
Chemicals and allied products (SIC 28)							
1949–83	3.45	1.51	1.94	0.55	0.08	0.88	0.39
1949–73 (a)	4.60	2.33	2.27	0.47	0.17	1.11	0.44
1973–83 (b)	0.75	−0.43	1.18	0.74	−0.13	0.32	0.25
Change (b-a)	−3.85	−2.76	−1.09	0.27	−0.30	−0.79	−0.19
Petroleum and coal products (SIC 29)							
1949–83	2.29	0.39	2.53	0.39	0.04	1.90	0.18
1949–73 (a)	4.74	0.94	3.80	0.46	0.07	3.06	0.16
1973–83 (b)	−1.32	−0.93	−0.39	0.23	−0.02	−0.83	0.23
Change (b-a)	−6.06	−1.87	−4.19	−0.23	−0.09	−3.89	0.07
Rubber and miscellaneous plastics products (SIC 30)							
1949–83	2.10	0.72	1.38	0.29	0.05	0.90	0.12
1949–73 (a)	2.73	0.99	1.74	0.31	0.04	1.22	0.14
1973–83 (b)	0.59	0.07	0.52	0.24	0.07	0.14	0.07
Change (b-a)	−2.14	−0.92	−1.22	−0.07	0.03	−1.08	−0.07
Leather and leather products (SIC 31)							
1949–83	1.65	0.40	1.25	0.22	0.02	0.78	0.22
1949–73 (a)	1.79	0.47	1.32	0.17	0.03	0.98	0.14
1973–83 (b)	1.31	0.22	1.09	0.35	0.01	0.32	0.41
Change (b-a)	−0.48	−0.25	−0.23	0.18	−0.02	−0.66	0.27
Stone, clay, and glass products (SIC 32)							
1949–83	1.99	0.51	1.48	0.43	0.06	0.79	0.20
1949–73 (a)	2.62	1.00	1.62	0.31	0.09	1.01	0.19
1973–83 (b)	0.50	−0.66	1.16	0.70	−0.03	0.29	0.21
Change (b-a)	−2.12	−1.66	−0.46	0.39	−0.12	−0.72	0.02
Primary metal industries (SIC 33)							
1949–83	1.06	−0.46	1.52	0.57	0.07	0.74	0.15
1949–73 (a)	1.80	0.24	1.56	0.50	0.08	0.81	0.16
1973–83 (b)	−0.69	−2.12	1.43	0.74	0.04	0.56	0.13
Change (b-a)	−2.49	−2.36	−0.13	0.24	−0.04	−0.25	−0.03
Fabricated metal products (SIC 34)							
1949–83	1.42	0.36	1.06	0.26	0.03	0.60	0.16
1949–73 (a)	1.64	0.52	1.12	0.18	0.04	0.76	0.14
1973–83 (b)	0.88	−0.02	0.90	0.45	0.02	0.22	0.21
Change (b-a)	−0.76	−0.54	−0.22	0.27	−0.02	−0.54	0.07
Machinery, except electrical (SIC 35)							
1949–83	2.57	1.16	1.41	0.39	0.02	0.77	0.20
1949–73 (a)	2.36	1.07	1.29	0.23	0.02	0.83	0.19
1973–83 (b)	3.07	1.39	1.68	0.79	0.01	0.65	0.20
Change (b-a)	0.71	0.32	0.39	0.56	−0.01	−0.18	0.01
Electrical and electronic equipment (SIC 36)							
1949–83	3.11	1.90	1.21	0.41	0.02	0.50	0.25
1949–73 (a)	2.92	1.88	1.04	0.34	0.03	0.43	0.22
1973–83 (b)	3.56	1.97	1.59	0.57	0.01	0.66	0.31
Change (b-a)	0.64	0.09	0.55	0.23	−0.02	0.23	0.09
Transportation equipment (SIC 37)							
1949–83	2.18	1.03	1.15	0.35	0.01	0.62	0.17
1949–73 (a)	2.89	1.33	1.56	0.47	0.02	0.88	0.17
1973–83 (b)	0.50	0.30	0.20	0.07	0.00	−0.01	0.17
Change (b-a)	−2.39	−1.03	−1.36	−0.40	−0.02	−0.89	0.00
Instruments and related products (SIC 38)							
1949–83	3.32	1.52	1.80	0.39	0.02	1.08	0.28
1949–73 (a)	3.74	1.87	1.87	0.39	0.03	1.13	0.27
1973–83 (b)	2.32	0.68	1.64	0.39	0.00	0.93	0.30
Change (b-a)	−1.42	−1.19	−0.23	0.00	−0.03	−0.20	0.03

Table 5—Continued. Attribution of labor productivity growth to multifactor productivity growth and substitution effects, total manufacturing and 20 manufacturing industries, 1949–83

Period	Output per hour	Contributions of—					
		KLEMS multifactor productivity	Substitution effects				
			Sum of effects	Capital/ labor	Energy/ labor	Materials/ labor	Services/ labor
	Miscellaneous manufacturing (SIC 39)						
1949–83	2.45	0.59	1.86	0.38	0.04	1.09	0.32
1949–73 (a)	3.40	1.25	2.15	0.37	0.06	1.31	0.37
1973–83 (b)	0.19	−0.98	1.17	0.41	−0.01	0.57	0.20
Change (b-a)	−3.21	−2.23	−0.98	0.04	−0.07	−0.74	−0.17

declined from 2.7 percent per year before 1973 to 1.6 percent after 1973 (a decrease of about 40 percent). The data for total manufacturing show at a glance that multifactor productivity and substitution components bear uneven responsibility for this slowdown. The shift from labor to nonlabor factors has proven to be a powerful source of labor productivity growth, even more powerful than multifactor productivity change, and there has been no cessation of these shifts in recent years. The tendency for production to become increasingly intensive in nonlabor factors, evident in the early postwar period, is still operating. The summed contribution of changes in nonlabor factor/labor ratios in the early years was 1.2 percentage points, and in the later period, 1.3 percentage points. Thus, the slowdown in manufacturing labor productivity must be seen as coming from the factors underlying change in multifactor productivity—that is, factors such as technological advance and changes in the characteristics of the work force, rather than a diminution of the tendency of businesses to make laborsaving changes.

The industry data largely conform to this overall judgment. First, it is notable that there are labor productivity slowdowns of some degree in 15 of the 20 industries, exceptions being food and kindred products, textile mill products, apparel and related products, machinery except electrical, and electrical and electronic equipment. In 10 of the remaining 15 industries, the contribution of substitution effects either increased after 1973 or was of less importance in the slowdown than was multifactor productivity. In only five cases (printing and publishing, petroleum refining, rubber and miscellaneous plastics, leather products, and transportation equipment) was a cessation of shift from labor to nonlabor factors as important as, or more important than, declining growth in multifactor productivity in explaining the slowdown in labor productivity. Hence, in most industries, as in total manufacturing, the post-1973 slowdown was not due mainly to a cessation of the shift from labor to nonlabor inputs.

Table 6. Factor shares[1] for total manufacturing, selected years, 1949–83

Year	Capital	Labor	Energy	Materials	Purchased services
1949–83[2]	19.3	44.8	2.4	25.5	7.8
1949	20.9	41.7	2.0	30.2	5.2
1955	21.3	44.1	1.9	26.5	6.2
1960	19.9	46.2	2.1	25.0	6.7
1965	23.2	45.3	2.0	21.8	7.6
1970	18.6	48.8	2.1	21.5	9.1
1975	17.4	43.1	3.0	27.4	9.1
1980	13.6	42.8	3.7	30.6	9.3
1983	16.2	42.8	4.4	26.2	10.4

[1] Factor cost as a percentage of the value of production.

[2] Mean of shares over all years 1949–83.

Conclusions

Underlying the new measures of multifactor productivity change is an important new set of detailed and conceptually matched time-series data permitting the analysis of numerous issues. This article has begun the task of analyzing these data, and several conclusions have been reached:

- These measures confirm that a slowdown occurred in multifactor productivity growth in total manufacturing after 1973, and show that a slowdown also occurred in most manufacturing industries.
- The slowdown was not due to a reduction in the growth rate of capital services inputs.
- The industries with the fastest growth in multifactor productivity tend to have had rapid output growth.
- The use of purchased business services rose rapidly throughout the postwar period.
- The use of fuels was sensitive to change in the price of fuels. Before 1973, fuel prices rose slowly and fuel use rose rapidly in total manufacturing. After 1973, fuel prices rose rapidly and use declined slightly.

Change in labor productivity can be decomposed into two fundamental sources: the growth in multifactor productivity and the effects of changes in the ratios of nonlabor to labor inputs:

- Over the entire period 1949–83, labor productivity growth was due mainly to changes in the ratios of nonlabor to labor inputs, for total manufacturing and for most industries. For about half of the 2-digit industries, multifactor productivity accounted for 35 to 45 percent of the labor productivity growth rate. In most others, it accounted for less than 35 percent.
- For total manufacturing, the post-1973 slowdown in labor productivity was due entirely to factors resulting in a slowdown in multifactor productivity growth, and not at all to a decrease in the contribution of increasing nonlabor/labor input ratios.
- Similarly, for most industries, the slowdown in labor productivity growth was not due primarily to a decrease in the contribution of nonlabor/labor ratios. □

FOOTNOTES

[1] These measures are described in *Trends in Multifactor Productivity, 1948–81,* Bulletin 2178 (Bureau of Labor Statistics, 1983). For the most recent data, see *Multifactor Productivity Measures, 1985,* USDL 86–402 (Bureau of Labor Statistics, 1986), or table 43 in the Current Labor Statistics section of the *Monthly Labor Review.*

[2] Gross product originating, taken from the National Income and Product Accounts, is the attribution of gross domestic product to industries or sectors of origin. Gross product originating in current dollars is compiled by summing income components—wages and salaries, capital consumption allowance, profits, and so forth—and therefore corresponds in concept to value added. However, it differs somewhat from value added estimates published by the Bureau of the Census, which include business services.

[3] At the industry level, a production function which is descriptive of the entire production process of that industry is generally assumed. This approaches an ideal, described by Paul A. Samuelson, "Parable and Realism in Capital Theory: The Surrogate Production Function," *Review of Economic Studies*, June 1962, pp. 193–206. In this ideal, there is a separate production function describing each process. Studies using these expanded production functions include Ernst R. Berndt and David O. Wood, "Technology, Prices, and the Derived Demand for Energy," *Review of Economics and Statistics*, August 1975, pp. 376–84; and Frank M. Gollop and Dale W. Jorgenson, " U.S. Productivity Growth by Industry 1947–73," in John W. Kendrick and Beatrice N. Vaccara, eds., *New Developments in Productivity Measurement and Analysis* (Chicago, University of Chicago Press, 1980), pp. 17–136.

[4] These measures are presented in Mark K. Sherwood, "Multifactor productivity in the steel and motor vehicles industries," *Monthly Labor Review,* August 1987, pp. 22–31.

[5] The relationship between labor productivity and multifactor productivity is derived by assuming a value added (N) production function:

$$N = f(K,L,t)$$

in which output is determined by capital (K), and labor (L) inputs using the technology available at time t. Assume that the function is differentiable and has constant returns to scale, that inputs are paid the value of their marginal products, and that technical change is "neutral" (that is, the relative marginal products of inputs are unaffected by technical change). The assumption that inputs are paid the value of their marginal products is consistent with an assumption of perfect competition. Using these assumptions, the growth rate of multifactor productivity (A) can be determined from:

$$\dot{\frac{A}{A}} = \dot{\frac{N}{N}} - s_K \dot{\frac{K}{K}} - s_L \dot{\frac{L}{L}}$$

where the notation $\dot{X}/X$ represents the growth rates of the respective variables. The weights, s_K and s_L are output elasticities with respect to inputs. Under constant returns to scale and under the assumption that inputs are paid their marginal products, these elasticities correspond to factor shares in the value of output and $s_K + s_L = 1$. An index, A, is then computed by designating the value of a base year to be 1.00 and by "chaining," that is, determining successive index values by multiplying by the growth rate of $\dot{A}/A$. The relationship between labor productivity and multifactor productivity is then given by:

$$\dot{\frac{N}{N}} - \dot{\frac{L}{L}} = \dot{\frac{A}{A}} + s_K \left(\dot{\frac{K}{K}} - \dot{\frac{L}{L}} \right)$$

That is, they differ by a weighted shift in the capital-labor ratio. This analysis is attributable to Jan Tinbergen and, independently, to Robert M. Solow. See Tinbergen, "Zur theorie der langristigen wirtschaftsentwicklung," *Weltwirtschaftliches Archiv*, Band 55:1, 1942, pp. 511–49 (English translation, "On the Theory of Trend Movements," in L.H. Klassen, L.M. Koyck, and H.J. Witteveen, eds., *Jan Tinbergen, Selected Papers* (Amsterdam, North Holland, 1959)); and Solow, "Technical Change and the Aggregate Production Function," *Review of Economics and Statistics*, vol. 39, no. 3, 1957, pp. 312–20.

[6] The relationship between value added and gross output productivity measures is demonstrated in Martin N. Baily, "Productivity Growth and Materials Use in U.S. Manufacturing," *Quarterly Journal of Economics*, February 1986, pp. 185–95.

[7] The sectoral output (Y) production function is:

$$Y = f(K,L,E,M,S,t)$$

where intermediate inputs of energy (E), materials (M), and purchased business services (S) are included. Using steps paralleling those in the value added model, a sectoral output multifactor productivity index (B) can be determined from:

$$\dot{\frac{B}{B}} = \dot{\frac{Y}{Y}} - s_K \dot{\frac{K}{K}} - s_L \dot{\frac{L}{L}} - s_E \dot{\frac{E}{E}} - s_M \dot{\frac{M}{M}} - s_S \dot{\frac{S}{S}}$$

The shares here are shares in the value of sectoral ouput. The derivation is slightly less restrictive than that of the value added multifactor productivity measure, A, in that functional separability of primary and intermediate inputs is not assumed.

[8] The Tornqvist index is a discrete approximation to a Divisia index in which growth rates are defined as the difference in natural logarithms of successive observations and weights are equal to the mean of the factor shares in the corresponding pair of years. W. Erwin Diewert, "Exact and Superlative Index Numbers," *Journal of Econometrics*, vol. 4, no. 4, 1976, pp. 115–45, shows that the Tornqvist index is consistent with a translog specification of the production function, which in turn is a second-order approximation to any production function, as shown in Laurits R. Christensen, Dale W. Jorgenson, and Lawrence J. Lau, "Transcendental Logarithmic Production Frontiers," *Review of Economics and Statistics*, February 1973, pp. 28–45. However, the maintained assumptions of separability and neutral technical change are implicit in the measure as shown by Charles R. Hulten, "Divisia Index Numbers," *Econometrica*, vol. 41, no. 6, 1973, pp. 1017–25.

[9] These procedures are described in appendices C and D of *Trends in Multifactor Productivity, 1948–81*.

[10] The hours paid data originate in the highly reliable BLS Current Employment Statistics survey. However, they do not reflect hours spent on the job. The difference, leave time paid by employers, is not an input into the production process. The ratio of hours worked to hours paid has gradually fallen over the postwar period (according to special BLS surveys) which implies a slight downward bias in productivity growth estimates. BLS has collected hours worked data since 1981 and is examining these and other available data on hours worked for manufacturing industries.

Labor is the only input category which is not adjusted for composition change. In order to maintain consistency with labor measures published previously by BLS, and because of limitations in the data available for adjustment of labor composition for industries at the 2-digit Standard Industrial Classification level, the labor input series used here are direct aggregates of hours paid, that is, the simple sum of hours, without regard to skill levels. Because of a significant shift toward use of more highly skilled labor throughout the U.S. economy, change in the composition of the labor force has historically been an important source of productivity growth. For the nonfarm business sector as a whole, BLS has estimated that changes in labor composition accounted for about one-tenth of multifactor productivity growth in the postwar period. See William H. Waldorf, Kent Kunze, Larry S. Rosenblum, and Michael B. Tannen, "New Measures of the Contribution of Education and Experience to U.S. Productivity Growth," paper presented at the annual meetings of the American Economic Association, New Orleans, December 1987.

[11] The implicit rental price of capital, c, is derived by assuming that the price of an asset will be recovered by the discounted stream of services (implicit rents) the asset will provide. It corresponds to the one-period user cost of capital:

$$c = T(pr + p\delta - \Delta p)$$

where p is the price of new capital goods, r is the discount rate, δ is the rate of economic depreciation, Δp is the rate of price change for new goods, and T is a factor reflecting tax incentives. Capital measurement methods are reviewed in detail in *Trends in Multifactor Productivity, 1948–81*, appendix C.

[12] The use of a 3-year moving average for the capital gains term is explained in Michael J. Harper, Ernst R. Berndt, and David O. Wood, "Rates of Return and Capital Aggregation Using Alternative Rental Prices," BLS working paper (1987, unpublished).

[13] Expanded discussions of the procedures used to measure sectoral output and intermediate inputs may be found in William Gullickson and Michael J. Harper, "Multifactor Productivity Measurement for Two-Digit Manufacturing Industries," paper presented at the meetings of the Western Economic Association, in San Francisco, CA, July 1986. The multifactor productivity measures presented in that paper were preliminary and are revised in this article.

[14] In this study, the material inputs of an industry consist only of materials purchased from suppliers outside that industry; transactions between establishments in the same industry (intrasector transactions) are excluded from intermediates and from sectoral output. This follows recommendations presented by Frank M. Gollop, "Growth Accounting in an Open Economy," Boston College Working Papers in Economics (Boston, 1981); and "Accounting for Intermediate Input: The Link Between Sectoral and Aggregate Measures of Productivity Growth," in National Research Council, *Measurement and Interpretation of Productivity* (Washington, National Academy of Sciences, 1979), pp. 318–33. Econometric evidence that the exclusion of intraindustry sales is important is presented in Richard G. Anderson, "On the Specification of Conditional Factor Demand Functions in Recent Studies of U.S. Manufacturing," in Ernst R. Berndt and Barry C. Field, eds., *Modeling and Measuring Natural Resource Substitution* (Cambridge, MA, The MIT Press, 1981), pp. 119–44.

[15] Receipts, value of shipments, inventory change, and cost of materials data (among other data) are published by the U.S. Bureau of the Census for about 400 4-digit establishment groups in manufacturing. These data are tabulated and deflated by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce for use in compiling the National Income and Product Accounts. BEA performs this work under the guidance of the Real Product Committee, whose membership includes BLS, BEA, the Federal Reserve Board, the Bureau of the Census, and the Office of Management and Budget. The Census Bureau also publishes annual values of shipments of 5-digit product classes, which allows the BEA to deflate these data at that level before aggregating. The BLS Producer Price Indexes are available at the same level of detail, supplemented in some cases by 5-digit prices estimated by BEA. Four-digit industry real output is aggregated by BEA from 5-digit indexes. The BLS then Tornqvist-aggregates from the 4-digit to the 2-digit level.

One substantial complication to time-series analysis is the periodic revision of the Standard Industrial Classification (SIC). Large revisions took place in 1957 and 1972, both of which caused some establishments to be reclassified to different 2-digit industries. In most cases, the effects of these revisions were trivial, but in a few cases adjustments had to be made to avoid large, spurious jumps in time series.

[16] Input-output tables are presently available for the years 1947, 1958, 1963, and for every year between 1967 and 1980. BLS modifies the published tables for mutual consistency and to reflect establishment output concepts; for years lacking published tables, estimates are obtained by interpolation using annual control totals for gross output, final demand, and value added. Published input-output tables incorporate the 4-digit census materials-consumed data directly and therefore reflect the establishment coding implicit in the census data. The portion of the value of production for each sector which is consumed by the same sector is estimated from the input-output tables. For this purpose, imported goods of all types included in intrasector consumption of a given industry are estimated and removed. The remainder, domestic consumption of materials produced by the same domestic industry, is then divided by total gross output of the industry, as given in the input-output tables. The resulting ratio is multiplied by the census value of production for the industry, as determined in the Census of Manufactures or the Annual Survey of Manufactures, to estimate intrasectoral sales. The result is then deflated at the 2-digit level and output net of intrasectoral transactions computed.

[17] These figures are available for five types of fuels (electricity, coal, fuel oil, natural gas, and miscellaneous fuels) annually for 1973–81, and for several years before 1973: 1947, 1954, 1958, 1962, 1967, and 1971. Quantity is reported in physical units (for example, tons of coal) and cost, in dollars. Quantities were interpolated between census years and extrapolated after 1981 using Producer Price Indexes and annual estimates of the total cost of purchased fuels published in the Annual Survey of Manufactures.

[18] Cost share weighting is particularly important for energy. While it is straightforward to aggregate energy in terms of BTU equivalents, Jack Alterman, *A Historical Perspective on Changes in U.S. Energy-Output Ratios*, Bulletin EA-3997 (Palo Also, CA, Electric Power Research Institute, 1985) has demonstrated a pronounced historical shift toward fuels with a higher price per BTU, such as electricity, and away from less refined fuels, such as coal. Thus, BTU weighting tends to understate substantially the growth rate of the quantity of energy and to overstate the growth rate of its price.

[19] Measures of costs of materials, based on Census of Manufactures and Annual Survey of Manufactures series, are deflated by BEA using materials composite prices. BLS makes substantial adjustments to the BEA data to avoid using fixed weights for aggregation of quantities.

[20] Services consist of the following nine types: communications; finance and insurance; real estate rental; hotel services; repair services; business services, including equipment rental, engineering and technical services, and advertising; vehicle repair; medical and educational services; and puchases from government enterprises. The BLS estimates these services from published input-output tables. The general approach to these estimates is to take service shares in the value of production from annual input-output tables at the greatest possible level of detail; to obtain service costs by multiplying these shares by the value of production as given in the Census of Manufactures or the Annual Survey of Manufactures; and to deflate these current cost estimates. It should be noted that there has been one important survey of service inputs to manufacturing industries, done in conjunction with the 1977 Census of Manufactures. This is incorporated into the input-output table for that year. Prices for many service inputs are available from the BLS price program, from the National Income and Product Accounts, or from private sources. For some services, such as the business service items in Standard Industrial Classification group 73, prices are unavailable. In these cases, prices are estimated as composites of prices of the inputs to those sectors shown in input-output tables.

[21] The measurement of inputs and outputs may not be exact in some cases. While the methods described were chosen deliberately to capture changes in the quality of inputs and outputs, these efforts may not have succeeded completely. Several input and output series are obtained by deflation, and while deflators are commonly prepared specifically to measure price change net of quality change, this effort is sometimes only partially successful. In addition, multifactor productivity measures for broad industries involve considerable aggregation of quantities and, to the extent that shifts at the detailed level are not captured by weighting procedures, a measurement bias can result. To the greatest degree possible, the measures presented here minimize the effects of these problems. For example, the output and input measures used in this article take into account composition change: Current weights are used for aggregating from the 4-digit levels in output products and for aggregating 25 capital asset types, 39 material inputs, 5 fuels, and 9 service inputs. Further, the BLS price program takes explicit account of quality change wherever possible.

[22] See, for example, *Trends in Multifactor Productivity, 1948–81*.

[23] For a discussion of cyclicality in productivity measures, see Lawrence J. Fulco, "U.S. productivity growth since 1982: the post-recession experience," *Monthly Labor Review*, December 1986, pp. 18–22. It should be noted that manufacturing demonstrates a greater reaction to the business cycle than do most other sectors of the economy. The average trough-to-peak growth in output in manufacturing in postwar recessions has been 9.3 percent, compared to 6.5 percent for the business sector as a whole. Total growth over the whole cycle is roughly equal for manufacturing and business as a whole.

The shaded areas in chart 1 represent periods of recession as determined by the National Bureau of Economic Research. These recessions follow peaks that occurred in the following quarters: 1948 IV, 1953 III, 1957 III, 1960 II, 1969 IV, 1973 IV, 1980 I, and 1981 III.

[24] Readers interested in using different initial and terminal years may write the Bureau of Labor Statistics for annual data. Measuring early and late period average growth rates in multifactor productivity for each industry according to its own peak years, then taking the arithmetic average of industry slowdown estimates gives an average industry slowdown of 0.9 percentage points per year. For comparison, the average of industry slow-

down estimates using the years 1949, 1973, and 1983 as terminal years is 1.2 percentage points.

Capital-labor multifactor productivity and output per hour series, for which data are available through 1985 and 1986, respectively, show growth for each year after 1982, the year in which the most recent business-cycle trough occurred. Thus, it is likely that extended versions of the KLEMS multifactor data will show a smaller slowdown. For a discussion of productivity cyclicality, see Fulco, "U.S. productivity growth."

[25] The value of Spearman's rank correlation coefficient is 0.62; this coefficient is significant at the 0.01 probability level.

[26] For total manufacturing, the price of energy rose at an average annual rate of only 1.5 percent during 1949–73 and at a rate of 17.8 percent during 1973–83.

[27] Just as labor productivity, multifactor productivity, and the capital-labor ratio may be related in the two-factor framework, so may labor productivity, multifactor productivity, and all nonlabor factor/labor ratios be related in the KLEMS framework used in this study:

$$\frac{\dot{Y}}{Y} - \frac{\dot{L}}{L} = \frac{\dot{B}}{B} + \Sigma S_i\left(\frac{\dot{I}_i}{I_i} - \frac{\dot{L}}{L}\right)$$

where Y is real gross output, and $i = K,L,E,M,S$.

This equation can be derived from the equation for $\dot{B}/B$ given in note 6 above. First, rearrange the equation in note 6 so that $\dot{Y}/Y$ is on the left-hand side and $\dot{B}/B$ on the right-hand side, along with all the share-weighted input growth rates, now entered with positive rather than negative signs. Then subtract $\dot{L}/L$ from both sides of the equation. Because the share weights sum to 1, apply the term $(s_K + s_L + s_E + s_M + s_S)$ to the $\dot{L}/L$ term inserted on the right-hand side. Gather terms with the same weight and derive the equation above in this note.

Many forces influence the mix of inputs in production. Factor substitution, although one of the most interesting, is only one of these. Others are (1) unmeasured composition change, such as a shift from low-skilled labor to high-skilled labor, which might reduce hours of labor input and thus change the measured nonlabor/labor input ratios without substitution; and (2) "nonneutrality" of technical change, in which technical advances are associated with the use of more or less of some input(s) regardless of relative prices. Where more than two factors are considered, ratio changes must be interpreted especially carefully, because change in individual nonlabor factor/labor ratios may result from substitution of nonlabor factors for each other.

[28] In addition to direct substitution of factors due to differences in relative price growth, price change can also operate through complementarities to affect factor proportions. The best-known example of this is the hypothesized effect of increasing energy prices in the early 1970's on capital formation. The authors have examined these effects based on econometric estimates of substitution elasticities, using a preliminary version of the data set described here. See Michael J. Harper and William Gullickson, "Cost Function Models and Accounting for Growth in U.S. Manufacturing, 1949–83," paper presented at the annual meetings of the Amerian Economic Association, New Orleans, December 1986.

[29] It is plausible to suggest that the increases in nonlabor-to-labor ratios resulted from increases in the price of labor relative to the prices of other factor inputs. Over the whole period 1949–83, the average annual rate of increase (compound rate) in the price of undifferentiated labor was 6.3 percent, while for capital, energy, materials, and purchased services, the rates of increase were 2.4, 6.0, 4.3, and 4.5 percent, respectively. See, however, the cautionary comment in note 27.

A note on communications

The *Monthly Labor Review* welcomes communications that supplement, challenge, or expand on research published in its pages. To be considered for publication, communications should be factual and analytical, not polemical in tone. Communications should be addressed to the Editor-in-Chief, *Monthly Labor Review*, Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC 20212.

An evaluation of State projections of industry, occupational employment

Analysis of the first projections by States using BLS occupational employment data identifies a number of causes of projection errors, and offers suggestions for improving the projections procedures

HARVEY A. GOLDSTEIN AND ALVIN M. CRUZE

State Employment Security Agencies develop and publish statewide and substate industry and occupational employment projections to help meet the information needs of planners and administrators in vocational education, Job Training Partnership Act programs, educational counseling, private sector training programs, and government economic development agencies. Almost all States now use the Occupational Employment Statistics (OES) program of the Bureau of Labor Statistics for the development of their projections. The methodological core of the Bureau program is the industry-occupational (or staffing pattern) matrix produced for each State from the results of the OES survey and other supplementary data.

Because data from the OES survey first became available in 1976, the State agencies had their first opportunity to develop projections using the OES results for the 1976–82 projection round. This article summarizes the results of an evaluation of the accuracy of those projections for 20 States.[1] Based on the evaluation results, we provide some recommendations to improve subsequent rounds of statewide projections.

Evaluation methodology

The basic approach of the analysis was to calculate the projection error by industry and occupation for each State in the sample by comparing the projected 1982 employment levels developed by the respective State agency and the actual 1982 employment levels directly calculated by BLS from State reports. The particular error measure used for each industry or occupation is the adjusted absolute percent error. The average error for various aggregates of industries or occupations is the weighted adjusted mean absolute error.[2] Projection errors were calculated for industries and occupations at all levels of detail. The focus, however, was on 3-digit Standard Industrial Classification (SIC) industry sectors and the most detailed occupational categories.[3]

The evaluation was complicated because many of the 1982 industry employment projections were based on the 1967 SIC coding system, while the actual 1982 industry employment estimates were based on 1972 SIC codes. So that the projected and actual employment data would be comparable, the 1982 industry employment projections were converted to the 1972 SIC code basis using conversion factors calculated from first-quarter 1975, dual-coded data for each State from the Bureau's ES-202 program. But because these conversion factors were more than 10 years old, some error unrelated to the projection error was introduced into the transformed 1982 industry employment projections. To minimize the effect of this spurious error in the evaluation but still retain as many industry sectors as possible to avoid biasing the sample, we deleted all observations for which the difference between the dual-coded employment levels was greater than 15 percent.

Harvey A. Goldstein is an associate professor of planning at the University of North Carolina, Chapel Hill. Alvin M. Cruze is a senior economist at the Research Triangle Institute, Research Triangle Park, NC.

To keep the evaluation manageable, other rules were used to reduce the number of observations involved. For industries, a minimum size cutoff of 500 employees in both the base and projection years was used. The final number of 3-digit SIC industries in the 20-State sample was 3,010; the number of 2-digit industries was 1,120. Occupations with fewer than 50 employees in both the base and projection years were deleted. Also, occupations for which there had been definitional changes between the two years were deleted for reasons of noncomparability. For the remaining observations, a stratified sample of occupations was drawn in each State. Each State sample included one subsample of occupations that were common to all of the States. On average, there were about 120 occupations from each State in the evaluation.[4]

In addition to the procedures and calculations described above, other methods were used for several specific aspects of the evaluation. These are described below, with the respective results.

Accuracy of industry projections

We attempted to explain variation in the magnitude of the projection error among all the industry observations in the sample, rather than focusing on the error magnitude itself. In other words, we wanted to see if there was a pattern to the projection errors that could be explained by different attributes of the industries themselves, by different projection techniques used, or by the economic conditions or other characteristics of the States during the projection period. The results of this approach should serve as a guide to identifying problem industries or occupations in future projection rounds and directing efforts to reduce projection errors for these industries and occupations.

The results indicated, first, that the more detailed the industry category, the larger the error, an intuitively reasonable result. (See table 1.) On average, sampling and reporting errors in the data and nonsystematic events (such as large establishment openings or closings, or strikes) will have larger proportional effects on projection errors at a more disaggregated industry level because of the smaller number of establishments. The projection error by employment size of the industry, with industry detail held constant, showed a similar pattern.

Projection errors varied significantly among major industry divisions. Mining and durable goods manufacturing, which tend to be the most volatile sectors of the economy, had the largest average errors. Wholesale trade, retail trade, and services had the lowest errors.

It had been expected that there would be significant differences in average projection error among the 20 States in the sample. This proved to be the case, but there were no obvious attributes of State economic performance, size, or location that accounted for the differences. No linear relationship was found between average projection error and a State's total employment, census region, total employment growth rate, percent of employment in manufacturing industries, or annual average unemployment rate during the projection period.

The differences in employment growth rates by industry explained by far the largest portion of the variation in projection error. Four industry growth rate categories for the period 1976–82 were formed: (1) −15.0 percent or under; (2) −14.9 percent to −0.1 percent; (3) 0.0 percent to 14.9 percent; and (4) 15.0 percent or over. It is clear from table 1 that if industry employment declined by over 15 percent during the projection period, the error, on average, was about twice the average projection error for all 3-digit SIC industries. However, if an industry experienced modest growth (0.0 percent to 14.9 percent) during the projection period, the projection error was about one-half the average error for all 3-digit industries. If an industry experienced either modest decline or high growth in employment, the projection error tended to be close to the overall average projection error.

There are several complementary interpretations of this result. The first is that the simple time-series regression models or shift-share techniques used extensively by the State agencies in the 1976–82 projection round implicitly assume that the historical employment growth trend will continue into the future. For the majority of industries, the historical data used tended to be for the 1960–76 period, a span characterized by modest but steady employment

Table 1. Industry employment projection error by selected characteristics, 20-State sample

[Error in percent]

Characteristic	Sample size	Mean absolute percent error	Standard deviation[1]	Weighted mean absolute percent error	Standard deviation[2]
Industry level					
Total, all industries	20	6.9	4.3	7.3	4.7
1-digit SIC	157	11.8	11.7	10.6	9.6
2-digit SIC	1,120	16.7	14.5	15.2	13.2
3-digit SIC	3,010	22.6	20.7	19.2	17.8
Industry sector					
Mining	35	32.0	22.0	66.8	24.1
Construction	139	23.5	20.3	20.5	15.6
Durable goods manufacturing	611	30.6	23.3	27.6	20.5
Nondurable goods manufacturing	540	23.4	20.1	20.6	15.7
Transportation	123	23.3	21.5	16.3	15.6
Communications and utilities	100	18.7	21.3	15.7	15.7
Wholesale trade	306	16.9	16.6	14.5	11.6
Retail trade	532	18.4	17.6	14.9	14.3
Finance, insurance, and real estate	208	20.8	19.2	16.8	15.5
Services	416	19.5	20.7	15.3	15.1
Growth rate					
−15.0 percent or less	550	45.7	24.7	39.1	19.4
−14.9 percent to −0.1 percent	591	20.2	12.1	18.5	10.6
0.0 percent to 14.9 percent	641	11.2	9.7	9.3	8.0
15.0 percent or more	1,228	19.3	18.5	19.2	18.6

[1] The standard deviation around the unweighted group mean.

[2] Standard deviation around the weighted group mean.

Table 2. Type of projection error, 3-digit SIC industries, 20-State sample

Type of error	Sample size	Percent distribution	Weighted mean absolute percent error
Total	3,010	100.0	19.2
Predicted 1982 employment > 1976 base year employment; actual 1982 employment > 1976 base year employment	1,778	59.1	16.3
Predicted 1982 employment > 1976 base year employment; actual 1982 employment < 1976 base year employment	956	31.8	29.1
Predicted 1982 employment < 1976 base year employment; actual 1982 employment > 1976 base year employment	91	3.0	21.2
Predicted 1982 employment < 1976 base year employment; actual 1982 employment < 1976 base year employment	185	6.1	16.0

growth in most industry sectors in most States. The employment effects of the structural changes in the U.S. economy, concentrated in the manufacturing industries, had already begun but were not yet large enough to show up in the time-series data as shifts in long-term trends.

The second interpretation is that there may be a systematic, optimistic bias in the projections process—specifically, an unwillingness on the part of analysts to project employment declines. There may indeed be a sincere fear of creating a self-fulfilling prophecy, because economic growth is less likely to occur where markets and overall local economic activity are seen to be stagnant or declining. The results of our evaluation do not confirm this interpretation but they do clearly show the overwhelming tendency for the State agencies to have predicted increases rather than decreases in industry employment for the 1976–82 period. (See table 2.) Employment had been projected to grow in 90.9 percent of the cases but actually did so in only 62.1 percent. Put another way, if employment in an industry sector actually declined, the chances that the decline had been predicted were less than 1 in 6.

Effect of the 1980–82 recessionary period. A third possible interpretation of the relation between industry employment growth rates and projection errors is that the target year of the projections, 1982, was the trough of the deepest national recession since the 1930's. One might then conclude that, except for the unfortunate timing of the 1980 and 1981–82 recessions, the overall projection errors (and particularly the errors for those industries most affected by the recessions) would have been much lower. Moreover, BLS and the State agencies acknowledge that they do not attempt to take into account cyclical fluctuations when making long-term (5- to 10-year) employment projections, but only attempt to project secular trends. For these reasons, we attempted to separate that portion of the projection errors that could be attributed to the recession alone from other sources of error.

A multiple regression model was developed to estimate the effects of the recessionary period on industry employment projection error. The model was fitted to cross-sectional data in which State-level industries were the units of observation. The sample of industries consisted of all 2-digit SIC industries for which monthly CES employment data were available in six sample States.[5] These States were selected, in part, for geographical representation, diversity of State industrial structure, and variation in the statewide severity of the 1980–82 recessionary period. The dependent variable was the projection error for the given industry. The independent variables were the cyclical severity (CS_i) experienced by the State industry during the 1979–82 period; and several control variables, including State industry growth rate category (GROCAT1, GROCAT2, and GROCAT4 as dummy variables), level of employment of the State industry (SIZE), and total State employment (STSIZE).[6] CS_i was measured as the percentage change in industry employment from peak to trough in the 1979–82 period after the trend (linear) component had been removed from the monthly, seasonally adjusted time series. The peak and trough were dated uniquely for each State industry.

The results of the estimated model (in reduced form) are presented below. **t**-ratios are indicted in parentheses.

Variable	*Parameter estimates (a_i)*
CS	−0.39
	(−7.7)
GROCAT1	24.53
	(7.7)
GROCAT2	6.82
	(2.6)
GROCAT4	−18.46
	(−8.6)
SIZE	−18.21
	(−4.7)
STSIZE	−4.10
	(−3.2)
R^2	0.74
Sample size (N)	183
F-statistic	83.9

The parameter estimates for CS_i indicate that, on average, for every full percentage-point decrease in industry employment due to recessionary conditions alone, the percent projection error increased by 0.39 points.

The parameter estimates then were used to simulate a counterfactual scenario of "no recession" for the full sample of industries and for each subsample by employment growth rate category. These results are shown in table 3. They indicate that both the absolute and relative effect of the recession years on the projection error varied considerably, depending on the growth rate of the industry. The lower the growth rate, the larger the effect of the recessionary period on the projection error. The percentage decline in the percent projection error with "no recession" gets larger with

increasing growth rates, except for the highest growth rate category. In the last case, recession conditions actually had the effect of lowering the projection error—that is, had there been no recession, the underprediction in high growth rate industries would have been even larger.

From these results, we infer that while recessionary conditions during the latter part of the projection period had a significant positive effect on the magnitude of the projection errors, they were not the most important factor. Indeed, the evidence from tables 1 and 3 lends support to the hypothesis that forces leading to changes in the long-term employment growth trends of many State industries in the late 1970's were more important in explaining the variation in industry employment projection errors. These structural, rather than cyclical, forces included changes in the international division of labor, the terms of international trade, technological change, rapid movements of capital among U.S. regions, and regional demographic shifts. The industries most affected by these structural changes in the national and international economies were more likely to be those with high rates of employment decline or growth. Because the "turning points" in the long-term employment trends occurred near the end of the historical time series, no statistically based projection models—shift-share, single-regression, or even fully specified econometric models—would have been able to project accurately 1982 employment in those industries affected by structural change. The implications of this plausible interpretation of the results for improving State and area projections are discussed below.

Occupational projections examined

In the OES program, projections of occupational employment are developed by multiplying projections of industry employment by staffing pattern estimates entered into an industry-occupation matrix. This method could lead to two major types of errors in projecting occupational employment: (1) errors in projecting industry employment totals, and (2) errors in projecting the distribution of employment by occupation within an industry—that is, errors in projecting staffing patterns to the target year.

Table 3. Estimated effects of the 1980 and 1981–82 recessions on percent projection error, by 1976–82 industry employment growth rate, 6-State sample

Growth rate category	$\overline{CS}$[1]	$\overline{PCERR}$[2]	PCERR*[3]	Reduction in PCERR (2) - (3)	Percent reduction in PCERR
	(1)	(2)	(3)	(4)	(5)
All industries	−12.2	5.2	0.4	4.8	92.3
−15.0 percent or less	−25.1	38.3	28.5	9.8	25.6
−14.9 percent to −0.1 percent	−19.1	17.3	9.9	7.4	42.8
0.0 percent to 14.9 percent	−9.6	6.8	3.1	3.7	54.4
15.0 percent or more	−5.7	−12.9	−15.1	−2.2	17.1

[1] Average percent decline in industry employment (peak to trough) due to recession.
[2] The average actual percent projection error (not absolute value).
[3] The simulated, "no recession" scenario projection error.

Table 4. Occupational employment projection error, 15-State sample

[In percent]

State	Mean absolute percent error	Standard deviation	Weighted mean absolute percent error	Standard deviation
A	25.3	23.2	13.7	13.6
B	27.1	27.9	14.9	16.5
C	23.9	20.6	16.1	14.3
D	27.6	23.6	16.5	13.6
E	30.7	32.0	16.6	16.9
F	27.4	27.4	17.4	13.8
G	23.7	21.9	17.5	15.3
H	29.6	26.2	18.1	15.2
I	23.5	19.4	18.4	16.1
J	33.8	30.3	19.6	17.5
K	30.9	31.0	19.8	16.4
L	28.0	24.6	19.8	16.2
M	26.3	21.8	20.7	15.9
N	31.7	25.5	20.8	16.5
O	34.3	29.4	22.8	21.1

NOTE: See footnotes to table 1 for definitions of the types of errors.

To evaluate the 1976–82 projections, we first examine the total occupational employment projection error, with particular emphasis on identifying factors that may be associated with systematic variation in the projection errors. Second, the total error is decomposed into (1) errors in projecting industry employment, and (2) errors in projecting staffing patterns within industries. Third, the effects of sampling error in the OES survey on occupational employment projection errors are analyzed. And fourth, the effects of industry and regional aggregation in the OES staffing pattern matrix on projection errors are evaluated.

Total occupational error. Adjusted absolute percentage errors in occupational employment projections for each of 15 sample States are presented in table 4. (Because data for Colorado, the District of Columbia, Kentucky, Missouri, and Oregon were not available, those jurisdictions are exluded from this portion of the analysis.) The weighted average projection error across the State sample is 18.6 percent, while the unweighted average error is 28.8 percent. On an individual State basis, the weighted average errors range from a low of 13.7 percent to a high of 22.8 percent. The unweighted averages range from 23.5 percent to 34.3 percent. In general, there is a high degree of correlation between the two measures. The product moment correlation coefficient is 0.59, while the rank correlation coefficient is 0.53. Both of these correlation coefficients are significantly different from zero at the 95-percent confidence level.

As indicated by the relative magnitudes of the percentage errors and their associated standard deviations, there are no statistically significant differences between these measures across the 15 States in our sample. For this reason, no formal tests of the statistical significance of these differences were made.

The next step in the evaluation was to identify factors that may be associated with systematic differences in the projection errors. In analyzing the relationships between occupational employment projection error and employment level, we formed four size categories of occupational employment: under 1,000, 1,000 to 1,999, 2,000 to 4,999, and 5,000 and over. As shown in table 5, there is a definite inverse relationship between the magnitude of the projection error and the size of occupational employment. The weighted projection error ranged from a high of 37.6 percent for occupations with fewer than 1,000 workers to a low of 16.4 percent for those with employment greater than 5,000. In fact, the results for our 15 sample States indicate that the projection error is a monotonically decreasing function of the size of employment. In addition, the variation in projection error decreased with size of employment.

In contrast to these findings, we noted a U-shaped relationship between projection error and occupational growth rate. As indicated in table 5, occupations with an employment decline greater than 15 percent over the 6-year projection period had the highest mean error—43.4 percent. At the other end of the distribution, occupations with a growth rate in excess of 15 percent had an average projection error of 19.7 percent. The lowest error, 9.2 percent, occurred for those occupations that grew less than 15 percent.

These results indicate that projections for occupations that exhibited significant turning points or changes in growth rates are more likely to be in error, a finding that is consistent with that reported in the evaluation of the accuracy of industry employment projections.

As in the analysis of industry employment projection errors, it is useful to examine an alternative measure of projection error—the extent to which the predicted direction of occupational employment change is the same as the actual direction. Overall, the direction of change was predicted correctly in only 61.8 percent of the cases. (See table 6.) Of these, a large majority (94.4 percent) were instances of correctly predicting increases in occupational employment. Of the cases in which the direction of change was incorrectly predicted, 97.5 percent were predictions of positive change when actual employment declined between 1976 and 1982. Expressed in another way, 95.6 percent of the sample occupations were predicted to have an increase in employment over the 6-year period, while only 59.2 percent actually did so.

Table 5. Occupational employment projection error by selected characteristics, 15-State sample

[Error in percent]

Characteristic	Sample size	Mean absolute percent error	Standard deviation	Weighted mean absolute percent error	Standard deviation
Occupation size					
Fewer than 1,000 workers	490	36.7	31.8	37.6	32.2
1,000 to 1,999 workers	384	32.8	28.4	30.1	24.8
2,000 to 4,999 workers	382	27.0	24.5	25.4	20.9
5,000 workers or more	534	19.9	17.0	16.4	13.6
Growth rate					
−15.0 percent or less	416	57.5	29.6	43.4	18.8
−14.9 percent to −0.1 percent	313	21.1	9.0	19.6	7.6
0.0 percent to 14.9 percent	307	10.1	7.0	9.2	6.1
15.0 percent or more	754	23.8	22.3	19.7	18.5

Decomposition of occupational projection error. The difference between actual and projected occupational employment may be decomposed into two components: the portion due to changes in staffing patterns and the portion due to errors in projecting industry employment. (See the appendix for a mathematical proof of this observation.) The second component can be readily calculated by multiplying the 1982 staffing patterns by errors in projections of industry employment. This component can then be subtracted from the total projection error to provide the portion of the total error due to changes in staffing patterns. These two sources of error can then be averaged across selected industry or occupational groups to identify and analyze patterns of sources of occupational projection error.

As shown in table 7, total projection error for our 1,790 sample occupations was 440,105, or an average of 246 per occupation. The industry component of this error was −185,299, while the occupational component was 625,404. In other words, although total occupational employment was overprojected, the component due to industry employment projections resulted in an underprojection of actual 1982 totals. The absolute value of the occupational component was approximately 3.4 times greater than the absolute value of the industry component, indicating that changes in staffing patterns over the 6-year period were a greater source of error in the occupational employment projections than were errors in projecting industry employment.

However, it should be noted that for the 1982 projection round, none of the States developed projections of staffing patterns. Instead, 1976 State-level staffing patterns were assumed to remain unchanged over the 1976–82 period. The effects of this assumption are vividly illustrated by this decomposition analysis. For later projection rounds, States are constructing projections of their staffing patterns, using change factors developed and estimated by BLS for projecting the national staffing pattern matrix.

By definition, the total projection error will be positive if the direction of error is greater than zero and negative if the direction of error is less than zero. According to the error decomposition, situations in which the direction of error is greater than zero arise more from changes in staffing patterns (average staffing pattern error component = 1,137) than from errors in projecting industry employment (average industry error component = 272). Occupations with a projection error less than zero (that is, actual 1982 employment was greater than the predicted value) were characterized by more equal industry and staffing pattern error components.

In other words, situations in which predicted 1982 employment exceeded actual values were due more to changes in staffing patterns than to errors in projecting industry employment.

OES sampling error. The OES staffing pattern matrices used to develop projections of occupational employment are based on surveys of a sample of establishments in each of the relevant industry sectors. The effects of survey sampling error on projection errors were measured by determining whether the projected values of occupational employment fell within statistically acceptable confidence limits around the actual values. The confidence limits were calculated from parameters of the OES sample survey design.

As indicated in the *OES Survey Manual*,[7] the sample design for the OES survey calls for a complete census of all establishments with more than 100 employees in an industry sector and a sample of the remaining establishments. Given the sample design implemented in each State, the standard error of the number of workers in occupation i in industry sector j, σ_{Eij}, can be readily calculated.[8] Given this standard error, the 90- and 95-percent confidence intervals around the actual 1982 estimate of the number of workers in this occupation in the industry sector can be calculated as follows:

$$\text{95-percent confidence interval: } E_{ij} \pm 1.96\ \sigma_{Eij}$$

$$\text{90-percent confidence interval: } E_{ij} \pm 1.645\ \sigma_{Eij}$$

where E_{ij} is employment in occupation i in industry j, and σ_{Eij} is the standard error of the estimate.

To undertake this analysis, the confidence intervals around the estimates of 1982 employment in individual industry-occupation cells are first computed, using results in the industry-occupation matrix benchmarked to 1982 actual industry employment totals. Projected 1982 employment totals for these cells are obtained by multiplying projected 1982 employment for relevant industry sectors by the (constant) staffing patterns from the 1976 matrix. Because this operation requires the use of an actual 1976 industry-occupation matrix, the analysis is restricted to: (1) the six southeastern States for which sufficient information was available to calculate standard errors; (2) the 59 occupations common to these States; and (3) industry employment projections for 2-digit SIC sectors. We also restricted our attention to occupations with at least 50 employees in the relevant matrix cell in 1982.

The results of the analysis are presented in table 8, in terms of the percentages of 1982 projected values that fall within 95-percent confidence intervals around actual 1982 values. To assist in interpretation, we classified these percentages according to the size of 1982 employment in the cell—50 to 99, 100 to 499, and 500 workers or more—and the year and sector in which the OES survey was conducted—1980, manufacturing; 1981, nonmanufacturing; and 1982, nonmanufacturing.

As indicated in the table, projected employment in 37.9 percent of the 2,479 industry-occupation cells falls within the 95-percent confidence intervals around the respective actual 1982 employment totals, as estimated from 1982 base year industry-occupation matrices developed from the OES surveys. This percentage is higher for the industry cells in the 1980 manufacturing survey (40.3 percent) than for the 1981 nonmanufacturing round (34.1 percent), and lower than for the 1982 nonmanufacturing round (40.0 percent). There is no consistent pattern across the six States when these percentages are broken out by size of employment in the industry-occupation cell.

These percentages do exhibit significant variations across the six States in our sample, however, with the statewide percentages of employment projections falling within the

Table 6. Type of projection error for sample occupations by employment size category, 15-State sample

Occupation size category	Total			Type of error											
				A[1]			B[2]			C[3]			D[4]		
	Sample size	Percent of total	Weighted mean absolute percent error	Sample size	Percent of total	Weighted mean absolute percent error	Sample size	Percent of total	Weighted mean absolute percent error	Sample size	Percent of total	Weighted mean absolute percent error	Sample size	Percent of total	Weighted mean absolute percent error
Total	1,790	100.0	18.6	1,044	58.3	16.0	667	37.3	27.1	17	0.9	14.5	62	3.5	23.8
Fewer than 1,000 workers	490	100.0	37.6	269	54.9	36.9	189	38.6	41.1	7	1.4	35.1	25	5.1	27.5
1,000 to 1,999 workers	384	100.0	30.1	206	53.6	26.8	160	41.7	39.3	5	1.3	28.8	13	3.4	22.0
2,000 to 4,999 workers	382	100.0	25.4	227	59.4	22.7	141	36.9	33.7	2	.5	19.8	12	3.1	22.0
5,000 workers or more	534	100.0	16.4	342	64.0	13.9	177	33.1	24.8	3	.6	9.9	12	2.2	24.2

[1] Predicted 1982 employment > 1976 base year employment; actual 1982 employment > 1976 base year employment.
[2] Predicted 1982 employment > 1976 base year employment; actual 1982 employment < 1976 base year employment.
[3] Predicted 1982 employment < 1976 base year employment; actual 1982 employment > 1976 base year employment.
[4] Predicted 1982 employment < 1976 base year employment; actual 1982 employment < 1976 base year employment.

Table 7. Decomposition of projection error, total and 13 selected States

State	Industry component of error		Staffing pattern component of error		Total projection error	
	Sum	Mean	Sum	Mean	Sum	Mean
Total	−185,299	−104	625,404	349	440,105	246
A	115,935	641	50,167	277	166,102	918
B	73,762	591	42,569	335	116,331	916
C	22,827	217	37,343	356	60,170	573
D	35,464	246	45,202	314	80,666	560
E	18,273	228	25,652	321	43,925	549
F	37,770	420	8,482	94	46,252	514
G	58,761	470	4,924	39	63,685	509
H	28,955	252	17,647	153	46,602	405
I	−153,027	−1,034	212,210	1,434	59,183	400
J	16,405	256	4,116	64	20,521	321
K	−392,395	−2,192	73,010	408	−319,375	−1,784
L	−311	−31	27,687	243	27,376	240
M	−41	−1	4,062	88	4,021	87

95-percent confidence interval ranging from 30.8 percent to 44.9 percent. On an individual State basis, there is no consistent pattern in these percentages across either survey rounds or size of employment in the matrix cells.

In general, these results indicate that it is extremely difficult to project employment for a given occupation in a particular industry sector with an acceptable degree of statistical precision. Factors such as small sample sizes and low response rates in the 1980–82 OES surveys result in wider confidence intervals, with a greater proportion of the projected values falling within these intervals. Conversely, recalling that the 1982 projected values were developed under the assumption of constant staffing patterns over the 6-year period, we would expect that industries undergoing rapid technological change would have a larger percentage of predicted values falling outside the confidence intervals around the 1982 estimates of actual employment. From available data, it is difficult to separate the effects of these two factors. The relative percentages for the manufacturing and nonmanufacturing rounds are, however, in the expected directions. Most likely, OES survey sampling frames are better developed and occupational titles and duties are better defined and understood in the manufacturing sector. Other things equal, each of these factors is expected to produce a higher proportion of projected values within our confidence limits in the manufacturing sector, which was indeed the case for the six States in this analysis.

Effects of aggregation

By industry. Table 9 presents a comparison of the weighted projection errors for the original, completely detailed matrix and for the 2-digit SIC level of industry aggregation. As indicated, all seven southeastern States are ranked in order of increasing weighted prediction errors calculated from the full matrix. Across the seven States, the weighted projection error increased by only 0.4 percentage points when the 2-digit industry matrix was used in place of the full matrix. Differences for individual States are also relatively small, the largest being 1.3 percentage points.

A number of factors account for these small differences. First, although the full matrices contain approximately 400 industry sectors per State, employment data are available only at the 2-digit level of detail for some of the sectors (such as government, education, and eating and drinking places). These sectors contain relatively large proportions of total employment. In fact, for the 59 common occupations across the seven southeastern States, 1976 employment in the industry sectors having only 2-digit level of detail accounted for an average of 26.9 percent of total employment. Therefore, slightly less than three-fourths of employment in these occupations can even by affected by the industry aggregations.

The second factor is that employment in the remaining 2-digit sectors may be concentrated in a single 3-digit industry. If this is the case, aggregation to the 2-digit level would not have much impact because the industry employment projections and associated staffing patterns would be dominated by the constituent 3-digit industry. This appears to be the case for the States in our sample. For all occupations, 13.2 percent of employment in 2-digit sectors with 3-digit detail is in a single 3-digit industry that accounts for over 75 percent of employment in the 2-digit sector. A total of 27.1 percent of employment is in a 3-digit industry that accounts for over 50 percent of employment in the higher-level sector.

Assuming that employment in our sample occupations follows similar patterns, between 46 percent and 59 percent of employment in the 59 common occupations could be affected by changes in the level of industry aggregation. With such distribution of industry employment across 2- and 3-digit sectors, it is not surprising that the projection errors from the 2-digit matrices are not significantly larger than those developed from the full matrices.

By region. A single regional matrix was built from staffing pattern data for the individual States and then applied to projected industry employment data for each of the seven southeastern States to develop a second set of simulated occupational projections for 1982. These simulated projections were then compared with projections developed with individual State matrices and actual 1982 occupation employment totals. Table 9 presents a comparison of the weighted projection errors for the 59 common occupations in the southeastern States that were developed from the regional matrix and from fully detailed matrices for each State.

As shown in the table, use of the regional matrix at the 2-digit industry level of detail increases the overall weighted projection error by 0.9 percentage points—from 15.8 percent to 16.7 percent. The effects on the weighted error of using the regional matrix alone are estimated at 0.5 percentage points because, as pointed out in the previous section,

the 2-digit matrices yielded a weighted error of 16.2 percent. There is no obvious pattern of differences in projection errors by State, occupational employment size, or occupational employment growth rate when we examine the effects of using the regional matrix in place of the individual State matrices. In one State, the combined use of industry aggregation and the regional matrix increased the weighted average projection error by 3.9 percentage points, of which 2.6 percentage points were due to use of the regional matrix. In another State, however, use of the regional matrix alone reduced the weighted average projection error by 2.2 percentage points. In reviewing these findings, it should be noted that these results will not necessarily hold for any arbitrary selection of States to make up a "region." Both the industry structure and associated staffing patterns should be relatively similar among the States in the region to minimize the possibility of significant differences in individual State projection errors when a regional matrix is substituted for the individual State matrix.

Suggested improvements

The results of this evaluation suggest a number of improvements that can be made to the State-level industry and occupational employment projection process. These improvements can be conveniently organized into two major categories: (1) methods for OES systems design and data collection, and (2) dissemination of projection results.

Methodology. The first recommendation to improve the methodology for developing industry and occupation projections is to make the entire process more analytical and to minimize the mechanical aspects that were prevalent when the 1976–82 State projections were prepared. The greater uncertainties in the national and international economies and markets, the increasing openness of State and substate economies to worldwide developments, a more rapid rate of technological change, and the increasing diversity of economic growth and performance among State and substate areas all require a more analytical approach to developing projections. This exercise of analytical judgment would include, for example, identifying special local factors or conditions that might require adjustment of rates or ratios derived from national data and choosing the most appropriate projection models based upon the validity of their underlying economic assumptions.

While the projection process should not be mechanical, it should still be highly systematic, rather than a series of ad hoc procedures. The process can and should be made analytical and systematic at the same time by recognizing that, at each step, there are choices among alternative procedures, models, or data. Analytical judgment is exercised in choosing the most appropriate option, such that the validity and utility of the projections will be maximized within the constraints of available resources. The judgment and experience of the State Employment Security Agencies' analysts become increasingly important under this approach, and efforts to train and retain these experienced staff should be emphasized.

In facing the reality of restraints on government spending, the State agencies must make difficult choices about how they best can use the limited resources available for developing projections. For example, this may mean setting priorities among industry and occupational groups, because it would not be efficient to spend an equal amount of time developing projections for each detailed industry and occupation. In addition, choices among alternative techniques for particular elements in the projection process should take into account differences in costs. The analyst should con-

Table 8. Projections of 1982 occupational employment falling within 95-percent confidence interval around actual 1982 estimates, by size of occupational group, 6 southeastern States
[In percent]

State	Manufacturing survey (1980)				Nonmanufacturing survey (1981)				Nonmanufacturing survey (1982)				Total
	Occupational employment			Total	Occupational employment			Total	Occupational employment			Total	
	50-99	100-499	500+		50-99	100-499	500+		50-99	100-499	500+		
Total ..	40.3 (258)	42.2 (384)	27.9 (61)	40.3 (703)	31.6 (247)	34.3 (464)	36.4 (214)	34.1 (925)	36.9 (149)	39.2 (362)	42.4 (340)	40.0 (851)	37.9 (2,479)
A	31.8 (44)	36.5 (85)	16.7 (18)	32.7 (147)	53.3 (30)	43.4 (99)	48.4 (93)	46.9 (222)	31.0 (29)	53.4 (73)	45.6 (90)	46.4 (192)	43.0 (561)
B	36.7 (49)	43.2 (74)	20.0 (16)	38.4 (138)	25.6 (39)	24.7 (89)	23.3 (43)	24.6 (171)	33.3 (21)	32.8 (64)	37.3 (67)	34.9 (152)	32.1 (461)
C	30.0 (30)	31.4 (35)	0.0 (1)	30.3 (66)	20.8 (48)	44.4 (54)	30.0 (10)	33.0 (112)	39.1 (23)	36.0 (50)	35.5 (31)	36.5 (104)	33.7 (282)
D	48.9 (45)	51.2 (86)	38.9 (18)	49.0 (149)	34.0 (47)	27.6 (76)	36.4 (33)	31.4 (156)	50.0 (20)	30.6 (62)	42.6 (61)	38.5 (143)	39.5 (448)
E	53.9 (52)	48.2 (56)	50.0 (4)	50.9 (112)	38.1 (42)	37.3 (75)	30.0 (20)	36.5 (137)	44.8 (29)	48.3 (60)	51.1 (45)	48.5 (134)	44.9 (383)
F	34.2 (38)	35.4 (48)	40.0 (5)	35.2 (91)	24.4 (41)	29.6 (71)	13.3 (15)	26.0 (127)	25.9 (27)	30.2 (63)	39.1 (46)	32.5 (126)	30.8 (344)

NOTE: Number of observations indicated in parentheses.

Table 9. Comparison of weighted mean absolute projection errors for detailed, industry aggregated, and geographically aggregated industry-occupation matrices, 7 southeastern States

[In percent]

State	Weighted projection error		
	Detailed matrix	Industry aggregation	Geographic aggregation
All States	15.8	16.2	16.7
A	12.3	12.3	13.8
B	15.4	16.7	19.3
C	15.4	15.5	16.8
D	15.9	17.1	18.2
E	17.1	17.1	15.9
F	17.6	17.5	15.3
G	18.1	18.1	17.0

sider whether the expected gain in accuracy from using a more sophisticated technique is justified by the increased cost. The maxim here is to use the simplest, least costly technique that "works." At the same time, it is hoped that continued research on and evaluation of the projections process, such as the evaluation summarized in this article, will lead to further innovations that will improve the cost-effectiveness of the projections.

The second recommended improvement is to develop better projections of staffing patterns that in turn will lead to improved occupational employment projections. As indicated above, the absolute value of the occupational component of projection error was approximately 3.4 times greater than the industry component. This finding provides a strong indication that changes in staffing patterns over the 6-year period were a greater souce of error in the occupational employment projections than were errors in projecting industry employment.

For the 1976–82 projection round, none of the States developed projections of staffing patterns. Instead, the 1976 State-level staffing patterns were assumed to remain unchanged over the projections period. The effects of this assumption are vividly illustrated by the findings of the decomposition analysis presented above. And, as noted earlier, for later projection rounds, many States have developed or are developing projections of their staffing patterns, using factors calculated from projections of national staffing patterns prepared by BLS. This type of Federal-State cooperation should be encouraged and expanded to ensure that all States have the capability to develop meaningful projections of staffing patterns.

Dissemination of projection results. The first recommendation for improving the dissemination of projection results is to develop better documentation of the entire process. This recommendation has a number of dimensions: description of results in a clear, straightforward manner; comprehensive documentation of all assumptions underlying the analyses; simple, nontechnical description of methods, accompanied by appropriate technical appendices; and consistent presentation of tabular materials, with appropriate rules for rounding off, suppression of unreliable data, and so forth.

The second suggestion with respect to dissemination of projection results is to include, where suitable, measures of the statistical reliability of the projected values in documentation of the results. This is particularly appropriate in the case of industry employment projections developed from regression models, for which it would be relatively simple to calculate the standard errors of the projected values. General indicators of the reliability of projection results (for example, low, medium, or high) should be devised and presented in the general documentation of projections results. Additional details, including specific values of the standard errors and other statistical properties of the regression equations, can be included in more detailed technical documentation to accompany the main descriptive results.

Finally, the use of OES projection data can be extended by developing improved mechanisms for sharing BLS results among various user constituencies. This information sharing should include both the preview of preliminary projection results and dissemination of final written products. The findings from a users survey component of our study indicated that State agencies and planning staffs are increasingly turning to the OES employment projections for their individual planning needs. More widespread dissemination of both BLS and State projection results, including documentation of their reliability as discussed above, and continuing efforts to improve the quality of the entire OES program should lead to even greater use of projections estimates. In particular, BLS efforts to develop micro-matrix formats for projection results and to disseminate all OES products in these formats should be encouraged. □

FOOTNOTES

[1] The industry employment projections were evaluated for the following 20 jurisdictions: Alabama, Colorado, Delaware, District of Columbia, Florida, Georgia, Indiana, Kentucky, Maine, Maryland, Mississippi, Missouri, North Carolina, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Other portions of the analysis are limited to selected subsets of these jurisdictions because of data availability or other technical reasons.

[2] The adjusted absolute percent error, ADJAPE, for case i is calculated as follows:

$$ADJAPE_i = \frac{|PREDICTED_i - ACTUAL_i|}{0.5\ (PREDICTED_i + ACTUAL_i)} \times 100$$

The weighted adjusted mean absolute percent error, WADJAPE, is calculated as follows:

$$WADJMAPE = \frac{\sum_{i=1}^{N} ADJMAPE_i * ACTUAL_i}{\sum_{i=1}^{N} ACTUAL_i}$$

where $$\text{ADJMAPE} = \frac{\sum_{i=1}^{N} \text{ADJAPE}_i}{N}$$

See J. Scott Armstrong, *Long Range Forecasting from Crystal Ball to Computer* (New York, John Wiley & Sons, Inc., 1978), for a detailed discussion of the merits of these and alternative measures of forecasting or projection accuracy.

[3] These are the levels of industry and occupational detail at which the State OES staffing pattern matrices yield occupational employment projections for program planning and decisionmaking.

[4] Complete details of the methods used in this evaluation are provided in Alvin M. Cruze, Harvey A. Goldstein, John E. S. Lawrence, Edward M. Bergman, and Katherine A. Desmond, *Evaluation of Industry and Occupational Employment Projections Made by State Employment Security Agencies*, RT1/2742/01-24F (Research Triangle Park, NC, Research Triangle Institute, 1985).

[5] The six States were Florida, Indiana, North Carolina, Oregon, Pennsylvania, and Texas.

[6] The full specification of the model was:

$$\text{PCERR}_i = a_0 + a_1\text{CS}_i + a_2\text{GROCAT1}_i + a_3\text{GROCAT2}_i + a_4\text{GROCAT4}_i + a_5\text{SIZE}_i + a_6\text{TIMING}_i + a_7\text{EXPORT}_i + a_8\text{STSIZE}_i + a_9\text{STUERATE}_i + a_{10}\text{STPCMFG}_i$$

where, for industry i:

$$\text{PCERR}_i = \frac{\text{Predicted } 1982_i - \text{Actual } 1982_i}{\text{Actual } 1982_i} \times 100$$

and:

CS_i is the percent change in industry employment from peak to trough in the 1979–82 period after removing the trend (linear) component. The peak and trough were uniquely dated for each State industry;

GROCAT1_i, GROCAT2_i, and GROCAT4_i are dummy variables for industry employment growth rate between 1976 and 1982. GROCAT1 = 1 if the growth rate was ≤15.0 percent; GROCAT2 = 1 if the growth rate was between −14.9 percent and −0.1 percent; and GROCAT4 = 1 if the growth rate was ≥15.0 percent;

SIZE_i is a dummy variable for size of State industry. An industry in which employment was less than 500 in the base year (1976) = 1, otherwise = 0;

TIMING_i is a dummy variable that refers to whether the detrended peak of the State industry's employment was before (=1) or after (=0) the U.S. peak for total nonagricultural employment in November 1979;

EXPORT_i is a dummy variable that refers to whether the State industry is primarily export-oriented (=1) or serves a State market (=0). These assignments were based on the magnitude of the location quotient computed for the State industry;

STSIZE_i is a dummy variable for the size of State measured by 1976 total nonagricultural employment, =1, if >2,000,000, =0 otherwise. This is a proxy for the resources and staff available to the State agency for developing projections;

STUERATE_i is a dummy variable indicating whether the State's 1982 average annual unemployment rate was above (=1) or below (=0) the U.S. average unemployment rate;

STPCMFG_i is a dummy variable indicating whether the State's proportion of nonagricultural employment in manufacturing was above (=1) or below (=0) the U.S. proportion.

[7] U.S. Department of Labor, *OES Survey Manual* (Bureau of Labor Statistics, 1975).

[8] The details of this calculation are provided in chapter 5 of the *OES Survey Manual*. It should be noted that these results are restricted to industry sectors surveyed in the regular OES cycle. Sectors such as railroads, education, hospitals, private households, and Federal Government are excluded because their staffing patterns are not obtained from OES sample surveys.

APPENDIX: Error decomposition technique

The approach to decomposing the projection error can be presented in terms of the following notation, where:

I_A is a $1 \times n$ vector of actual 1982 employment for n industry sectors;

I_p is a $1 \times n$ vector of projected 1982 employment for n industry sectors;

O_A is an $n \times m$ matrix of actual 1982 staffing patterns for m occupations in each of the n industry sectors (that is, the ratios of employment in each of the m occupations in a given industry sector divided by total employment in the industry sector); and

O_p is an $n \times m$ matrix of projected staffing patterns for m occupations in each of the n industry sectors.

Note that when the I_A vector is multiplied by the O_A matrix, we obtain a $(1 \times n) \times (n \times m) = 1 \times m$ vector of actual employment in each of the m occupations. The following derivations are presented in terms of this vector. However, conclusions will hold for each of the elements (separate occupations) of the vector.

In this notation, the error in occupation projections due to errors in projecting industry employment may be represented by:

$$I_p \cdot O_A - I_A \cdot O_A$$

Similarly, occupational projection errors due to errors in projecting the staffing pattern matrix may be represented by:

$$I_A \cdot O_p - I_A \cdot O_A$$

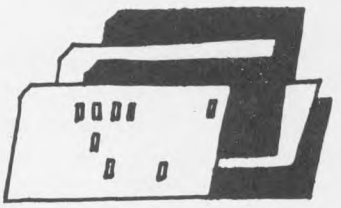
Adding these two components and simplifying, we obtain:

$$\{I_p \cdot O_A - I_A \cdot O_A\} + \{I_A \cdot O_p - I_A \cdot O_A\} =$$

$$(I_p - I_A)O_A + I_A(O_p - O_A)$$

Thus, the difference between actual and projected occupational employment may be decomposed into (1) the portion due to changes in staffing patterns, and (2) the portion due to errors in projecting industry employment.

Research Summaries



BLS surveys mass layoffs and plant closings in 1986

LEWIS B. SIEGEL

The Department of Labor has transmitted to the Congress the first annual report on the Bureau of Labor Statistics permanent mass layoff and plant closing reporting system.[1] The report presents the results of the 1986 data collection and analysis as required by Section 462(e) of the Job Training Partnership Act.

Data collected during 1986 show that, for the 11 States that submitted data in the program for the full year, a total of 1,335 layoff events[2] occurred in 926 establishments. This resulted in the separation of 274,343 workers from their jobs; 85 percent (233,199) of these workers filed claims for unemployment insurance benefits. In about 10 percent of the layoffs, the plants closed. The 11 States were Alabama, Arizona, Arkansas, Louisiana, Massachusetts, Nevada, New Mexico, Oklahoma, Texas, Washington, and Wisconsin. The relationships depicted by the mass layoff data should not be considered to be necessarily representative of the Nation as a whole.

The incidence of mass layoffs in manufacturing industries far exceeded that in any other major industry grouping. (See table 1.) About 2 out of 3 manufacturing layoffs occurred in the durable goods sector, with the largest percentage taking place in the machinery industry (29 percent), followed by transportation equipment and electrical equipment (15 percent each). Among nondurable goods industries, 2 out of 3 layoffs were in the food and apparel industries. Among nonmanufacturing industries, establishments in the construction and mining industries were most likely to have layoffs, accounting for 5 out of 10 nonmanufacturing layoffs.

"Slack work" was cited most often (31 percent of the time) by employers as the reason for layoff events. "Seasonal work" accounted for an additional 20 percent of the layoff situations, followed by "contract completion" and "energy-related disruptions." It is interesting to note that only about 2 percent of the layoffs were directly attributed to "import competition."

The data available from the mass layoff program not only provide information on the establishments having the layoff events, but also on the characteristics of two groups of workers directly affected by the layoffs—the initial claimants for unemployment insurance benefits and those who have exhausted their regular unemployment insurance benefits. Initial claimants are those who file for unemployment insurance benefits as the result of some employment termination. Benefit exhaustees are persons whose regular unemployment insurance benefits have expired.

Of the 233,199 initial claimants in the 11 States, about 1 of 7 were black, 1 of 10 were Hispanic, 1 of 4 were women, and 1 of 10 were over 55 years of age. A total of 49,968 persons exhausted their regular unemployment insurance benefits after being separated from a qualifying establishment. Greater proportions of the exhaustees were black (about 1 of 5) and Hispanic (1 of 8).

The permanent mass layoff and plant closing program is a Federal-State cooperative program that uses a standardized, automated approach to identifying, describing, and tracking the effect of major job cutbacks, using data from

Table 1. Mass layoff events, separations, and initial claimants for unemployment insurance, by selected industries, January-December 1986

Industry	Number of establishments	Layoff events	Separations	Initial claimants for unemployment insurance
Total, all industries[1]	926	1,335	274,343	233,199
Agriculture	20	32	4,560	2,292
Nonagriculture	906	1,303	269,783	230,907
Manufacturing	485	682	142,766	121,762
Durable goods	305	425	94,903	86,269
Nondurable goods	180	257	47,863	35,493
Nonmanufacturing	421	621	127,017	109,145
Mining	101	113	28,852	28,148
Construction	96	184	42,417	41,813
Transportation and public utilities	40	47	9,302	5,541
Wholesale and retail trade	69	120	21,241	14,388
Wholesale trade	17	21	2,550	2,198
Retail trade	52	99	18,691	12,190
Finance and services	90	126	17,970	13,766
Government	25	31	7,235	5,489

[1] Data on layoffs were reported by employers in Alabama, Arizona, Arkansas, Louisiana, Massachusetts, Nevada, New Mexico, Oklahoma, Texas, Washington, and Wisconsin.

Lewis B. Siegel is an economist in the Division of Local Area Unemployment Statistics, Bureau of Labor Statistics.

each State's unemployment insurance database. Establishments that have at least 50 initial claims filed against them during a 3-week period are targeted for contact by the State agency to determine the permanency of these separations, the total number of persons separated, and the reasons for these separations. Establishments are identified by industry and location and detailed socioeconomic characteristics of unemployment insurance claimants, such as age, race, sex, ethnic group, and place of residence, are noted. The program yields information on the entire period of insured unemployment of individuals, to the point where their regular unemployment insurance benefits are exhausted.

As indicated previously, 11 States provided data in the program for all of 1986; by the second half of that year, 26 States were fully participating. (Data are also provided in the report for those 26 States, aggregated over the last half of 1986.) Currently, 47 States and the District of Columbia are participating in the program.

Copies of the report to the Congress are available from the Bureau of Labor Statistics, Division of Local Area Unemployment Statistics, 441 G Street, NW, Room 2083, Washington, DC 20212.

FOOTNOTES

[1] For related information, see Sharon P. Brown, "How often do workers receive advance notice of layoffs?" *Monthly Labor Review*, June 1987, pp. 13–17.

[2] The reporting system covers layoff events of 30 days or more in which at least 50 initial claims for unemployment compensation were filed in a 3-week period by separated workers against their former employer.

Pay-for-knowledge compensation plans: hypotheses and survey results

NINA GUPTA, TIMOTHY P. SCHWEIZER, AND G. DOUGLAS JENKINS, JR.

In recent years, the U.S. business environment has been characterized by fierce international competition and rapid technological change. This has been accompanied by a surge of workplace innovations such as quality-of-worklife programs, autonomous work groups, and employee stock ownership plans, to name a few. One particular innovation which has received national attention is "pay-for-knowledge" compensation plans, also referred to as skill-based pay or knowledge-based pay plans.[1] Unlike traditional compensation systems which base employees' wages on the specific jobs they actually do, pay-for-knowledge plans base wages on the repertoire of jobs that the employee is trained to do. Under such plans, a typical employee starts at a base rate, and as he or she learns different jobs in the organization, the pay rate increases simultaneously. One respondent provided a description of the pay-for-knowledge system in his organization that is fairly typical of the structure of these systems:

> Our pay-for-knowledge system has seven levels of pay. LEVEL ONE is the level at which the employee is hired. LEVEL TWO is the next level that an employee progresses to once he or she has learned to complete one job in a work team in a satisfactory manner. The person progresses to LEVEL THREE when that person has learned to perform a sufficient number of jobs in that work team to be considered a flexible team member so that the person can move around and share work with other people, replace other people when they are absent, and so forth . . . . LEVEL FOUR is when the person has learned to perform all of the jobs in a team in a satisfactory manner. The person then reaches LEVEL FIVE by transferring to another team and achieving the requirements of level three on that new team . . . . The person then progresses to LEVEL SIX when they have learned all the jobs on the second team. The last level, which is LEVEL SEVEN, is a team coordinator or team leader type level. Typically, only one employee on the team can be designated as a team coordinator and the team is usually the one that designates which team member can function as a team leader.

Pay-for-knowledge plans have been hypothesized to offer many advantages to organizations and employees. For example, many analysts suggest that organizations experience greater work force flexibility, leaner staffing, greater work force stability, higher quality of output, lower absenteeism, less turnover, and higher productivity.[2] Likewise, analysts also say that employees in pay-for-knowledge systems may benefit from higher motivation, higher job satisfaction, higher pay satisfaction, increased feelings of self-worth, more opportunities for growth and development, increased job security, improvements in the quality of worklife, and higher organizational commitment.[3]

Unfortunately, to date, only limited information about pay-for-knowledge systems has been available to assess the validity of these claims. To be sure, much of the information known about these systems comes from case reports, anecdotes, and speculation. Systematic, empirical data on these compensation plans are rare. In an effort to begin remedying this deficiency, we studied pay-for-knowledge plans in 20 plants.[4] A detailed questionnaire on the workings of pay-for-knowledge systems was completed by the personnel directors of these plants.

Of the plants surveyed, 19 were manufacturing facilities and one was in a service industry. Only two plants were unionized.[5] The plants employed an average of 500 people, of whom about two-thirds were men. About 70 percent of all employees were covered by the pay-for-knowledge plan, and most had at least a high school education.

Nina Gupta is assistant professor, College of Business Administration, University of Arkansas; Timothy P. Schweizer is assistant professor, Department of Economics, Accounting, and Management, Luther College; and G. Douglas Jenkins, Jr. is associate professor, College of Business Administration, University of Arkansas. This report is based on a paper the authors presented at the annual meeting of the National Academy of Management in Chicago, August 1986.

Hypotheses versus survey findings

The data from the 20 plants were used to assess the accuracy of a variety of speculations and hypotheses regarding pay-for-knowledge plans.

It has been argued that pay-for-knowledge plans are used with production employees only. The data did not support this claim. Although production employees were covered most often, clerical and skilled trades employees were also covered in several instances. Further, three plants had professional and technical employees in their pay-for-knowledge plan, and two included managerial employees or first-line supervisors, or both.

Lack of support from first-line supervisors is a common problem with pay-for-knowledge plans, largely because the system may threaten traditional roles.[6] The data did not confirm this notion. The following tabulation shows the attitudes of first-line supervisors toward pay-for-knowledge plans. Responses ranged from 1 (strongly disagree with statement) to 7 (strongly agree):

	Mean response
Our first-line supervisors are very supportive of the pay-for-knowledge plan	5.5
Using pay-for-knowledge has caused many tensions among our first-line supervisors	2.9
Our first-line supervisors don't like our pay-for-knowledge plan	2.1

In general, respondents disagreed with the statements that such plans created tension among first-line supervisors, or that the supervisors did not like the plan. Alternatively, they agreed that first-line supervisors supported the plan.

Pay-for-knowledge plans require "start-up" situations (plans put in effect when the plants first open), so that the organization does not have to overcome problems of history, culture, and tradition.[7] In our sample, about three-quarters of the pay-for-knowledge plans were "start-ups"; the remainder were changed from a traditional to a pay-for-knowledge compensation system.

The "start-up" plants were compared with the change-over plants along several outcomes—absenteeism and turnover rates, quality of product, staffing levels, and employee attitudes, as well as the overall success of the plan. Interestingly, on none of these dimensions did the start-up plants appear significantly different from the change-over plants.

The specific mechanics of the pay-for-knowledge plan make a difference in the plan's overall effectiveness.[8] Generally, the typical pay-for-knowledge plan had about 10 skill units, although the actual numbers ranged from 4 to 100. The maximum number of skills an employee was allowed to learn was about 15, and the minimum number required was about three. Employees generally learned about four skills or jobs. The time required to learn the maximum number of skill units was approximately 49 months.

Companies normally spend a lot of time working out the mechanical details of their pay-for-knowledge plans. Presumably, how these details are handled affects the success of the plan. The data, however, did not confirm this. The only factor that had a significant correlation with the various outcome measures was the number of skill units in the plan. It appeared that plants with a large number of skill units had less successful plans than did plants with fewer skill units. It may be that after seven or eight skill units, the pay-for-knowledge plan starts becoming unmanageable, or that employees cannot understand the pay system.

In any case, the number of skill units was the sole predictor of success among the plan characteristics measured in this study. From an administrative perspective, this finding could be viewed as disappointing. Clearly, it would benefit those involved in administering or designing the plan to know on what details they should focus. Unfortunately, the data do not leave the researchers in this position, but rather, in the position to say that it does not matter how pay-for-knowledge plans are operated.

Other success factors

We searched for factors that would discriminate between the more and less successful pay-for-knowledge plans. First, we tested length of time that the plan had been in operation, because it was hypothesized that more mature plans would have had time for the "kinks" in the system to show up. The results yielded no significant differences. Because pay-for-knowledge plans are usually embedded in a network of innovations, the analysis also involved looking at the other innovations that accompanied the plan—employee stock ownership plans, team approach to management, autonomous work groups, employee participation in major personnel decisions (hiring, performance appraisals, terminations) and alternative work schedules, to name a few. None of these innovations appeared to be related to plan success, however.

Pay-for-knowledge plans are hypothesized to succeed only with the "right" employees.[9] In our data, differences in the demographic and background characteristics of employees in the different plans provided no help in explaining the plan's success. The bottom line is that after exploring a variety of commonly held and intuitive hypotheses explaining the success of pay-for-knowledge plans, almost invariably the results did not confirm these hypotheses. The reported success of pay-for-knowledge plans simply did not correlate with any of these predictors.

Interpreting the results

What factors could be responsible for these "no results"? It may be that the size of our sample was too small. It is, after all, more difficult to find significant correlations using

Table 1. Factors contributing to the success of pay-for-knowledge plans

Factor	Mean response[1]
Emphasis on employee growth and development	5.6
Local managerial commitment to the plan	5.6
Employee commitment	5.5
The overall management philosophy of the organization	5.3
Ability to move employees from one job to another as needed	5.3
Emphasis on employee training	5.2
Employee selection procedures	5.2
Employee participation in the administration of the plan	5.1

[1] The question was: To what extent do the elements listed below account for any successes you have had using your pay-for-knowledge plan? Response options were: 1—not at all; 3—to some extent; 5—to a large extent; and 7—to a very great extent.

a sample size of 20 than with a sample size of, say, 200. While that may be so, the plants in the sample represent the gamut of pay-for-knowledge plans and environments. One might also posit that there was not enough variance in the outcome measures. The data did not support this notion, but instead, raised questions about whether some of the issues that people have discussed about pay-for-knowledge plans are in fact valid. Perhaps the thinking about pay-for-knowledge systems needs to be revised.

The results of this study suggest that, in the past, researchers and practitioners have misguidedly focused on "nitty-gritty" issues with respect to the use of pay-for-knowledge plans. Much attention has been directed at the importance of working out the specific details, anticipating potential problems, and monitoring the system closely. Such a focus has been predicated on the assumption that it is the specifics of the pay-for-knowledge plan that account for success or failure. It may be, however, that these specifics are merely the background, and that it is a number of intangibles that the use of pay-for-knowledge conveys that actually account for its effectiveness.

For instance, using pay-for-knowledge systems may be significant in that it signals employees that management cares about employee growth and development. One might argue that it does not matter whether the maximum pay rate can be attained in 50 weeks or in 100 weeks. Rather, what matters is that employees can increase their pay rates, that they can attain higher pay levels than possible in a traditional compensation system, and that the maximum rate is within reach.

Likewise, it may not matter that the pay-for-knowledge plan has "kinks" that show up periodically. Rather, what is important is how these kinks are handled—whether management retains its commitment to the pay-for-knowledge plan in the face of difficulties, whether employees are involved in making modifications, whether employees get blamed for difficulties, and so forth. In other words, management's way of handling the problems, rather than the problems themselves, may be critical in this regard.[10]

Although some of these issues were not addressed directly in the study, respondents were asked about factors they thought responsible for the relative success of their pay-for-knowledge plans. (See table 1.) Clearly, the "intangibles," the emphasis on employee growth and development, the commitment of employees and management, the overall managerial philosophy of the organization, and so forth, are viewed by the respondents as critical to the success of pay-for-knowledge plans.

These data suggest further that the emphasis in designing and implementing pay-for-knowledge plans should shift from the specifics to the general. That is, the focus should be on systemic issues with respect to the use of pay-for-knowledge. For example, the proposed Chrysler-UAW pay-for-knowledge plan undoubtedly involved hours of meticulous planning, as the United Auto Workers and management at Chrysler hammered out specific details of the plan. However, the results of this study suggest that attending to such specifics may be far less important than heretofore believed, and that such efforts may be better devoted to broad issues such as managerial attitudes, philosophies, and commitment.

Future of pay-for-knowledge plans

We asked the respondents several questions about the future of pay-for-knowledge plans. The respondents showed moderately positive attitudes toward their pay-for-knowledge plans. (See table 2.) Most indicated it would be

Table 2. Overall attitudes toward pay-for-knowledge plans

Statement	Mean response[1]
I think it would be a big mistake to discontinue our pay-for-knowledge plan	6.1
Pay-for-knowledge has given us greater flexibility to respond to changes in our product market	5.6
If we were to stop using pay-for-knowledge, I would seriously consider quitting	3.3
If we had things to do all over again, I would recommend against using a pay-for-knowledge plan	1.5
I really wish we didn't use a pay-for-knowledge plan	1.4
If I had my way, we would use pay-for-knowledge plans in all our facilities	5.1
Overall, our pay-for-knowledge plan has been very successful	5.4
If other companies knew of our experiences, they would want to begin using pay-for-knowledge plans immediately	4.6
I would try to use pay-for-knowledge in any other organization where I might work	5.2
All in all, the costs of pay-for-knowledge plans far outweigh the benefits	3.3
Pay for knowledge plans don't come anywhere near their touted benefits	2.6

[1] Response options were: 1—strongly disagree; 2—disagree; 3—slightly disagree; 4—neither agree nor disagree; 5—slightly agree; 6—agree; and 7—strongly agree.

Table 3. Relationship of anticipated benefits with actual benefits and overall success of pay-for-knowledge plans

Anticipated benefit	Relationship with actual benefit[1]	Relationship with overall success
Better labor-management relationships	.70	.26
More employee commitment	.64	.37
Enhanced employee motivation	.78	.35
Labor-cost reductions	.60	[2].44
Improved employee satisfaction	.61	.26
Smaller work force	.60	.04

[1] $p < .01$.
[2] $p < .05$.

a mistake to discontinue the plan, and many believed pay-for-knowledge should be used in all their facilities. Opinions were mixed about the cost-benefit balance of pay-for-knowledge plans, and about the discrepancy between the anticipated and actual benefits of the plan. The results shown in table 3 suggest, however, that the mixed feelings associated with anticipated versus actual benefits are not of great concern because the reasons for using pay-for-knowledge were significantly correlated with the outcomes they promoted.

In short, the future of pay-for-knowledge plans appears positive. Most users are reasonably happy with their plan and, given the right circumstances, would use these plans again.

More research needed

The results of this study support the notion that pay-for-knowledge plans are capable of providing significant benefits to the organization. Such benefits include increasing work force flexibility, promoting employee growth and development, leaner staffing, and lower absenteeism and turnover. The data also suggest that much of the established thinking about pay-for-knowledge may need to be revised. For instance, based on our survey of the 20 plants, we conclude that pay-for-knowledge plans can work in both start-up or change-over situations, with managerial as well as production employees, in manufacturing and service facilities, and in unionized and nonunionized plants.

Most important, however, the data suggest that for pay-for-knowledge plans to succeed, it is important to focus on attitudes and less tangible issues, rather than on specific details of the plan. Organizations considering such plans would be well-advised to look at their managerial philosophies, their commitment to pay-for-knowledge, their attitudes toward employees, and so forth, in at least as much depth as they do the kinds of plants and plans that generally typify pay-for-knowledge.

While exploratory in nature, this study has been useful in gathering and analyzing information relating to the dynamics and effectiveness of pay-for-knowledge systems. Clearly, more research is warranted in this area to develop a better understanding of these plans. □

——FOOTNOTES——

[1] G. D. Jenkins, Jr. and Nina Gupta, "The payoffs of paying for knowledge," *National Productivity Review*, Spring 1985, pp. 121–30; E. E. Lawler III and G. E. Ledford, Jr., "Skill-based pay: A concept that's catching on," *Personnel*, September 1985, pp. 30–37; and H. Tosi and L. Tosi, "What managers need to know about knowledge-based pay," *Organizational Dynamics*, Winter 1986, pp. 52–64.

[2] L. M. Apcar, "Work-rule programs spread to union plants," *The Wall Street Journal*, Apr. 16, 1985, p. 6; Jenkins and Gupta, "The Payoffs"; Nina Gupta, G. D. Jenkins, and W. P. Curington, "Paying for knowledge: Myths and realities," *National Productivity Review*, Spring 1986, pp. 107–23; T. S. Kochan, H. C. Katz, and N. R. Mower, *Worker participation in American unions* (Kalamazoo, MI, W. E. Upjohn Institute for Employment Research, 1984), pp. 12–96; Lawler and Ledford, "Skill-based pay"; and R. E. Walton, "The Topeka work system: Optimistic visions, pessimistic hypotheses, and reality," in R. E. Walton, ed., *The innovative organization: Productivity programs in action* (New York, Pergamon, 1982), pp. 260–87.

[3] Gupta and others, "Paying for knowledge"; Jenkins and Gupta, "The payoffs"; E. E. Lawler III, "Reward systems," in J. R. Hackman and J. L. Suttle, eds., *Improving life at work* (Santa Monica, Goodyear, 1977), pp. 163–226; E. E. Lawler III, G. D. Jenkins, and G. E. Herline, *Initial data feedback to General Foods Topeka pet food plant: Selected survey items* (Ann Arbor, MI, Institute for Social Research, 1977); E. J. Poza and M. L. Markus, "Success story: the team approach to work restructuring," *Organizational Dynamics*, Winter 1980, pp. 3–25; and R. E. Walton, "Work Innovations in the United States," *Harvard Business Review*, Winter 1979, pp. 88–98.

[4] The study was conducted in 1985 under contract with the U.S. Department of Labor, Bureau of Labor-Management Relations and Cooperative Programs.

[5] This suggests that pay-for-knowledge plans can be implemented in both nonunionized and unionized settings. The fact that the sample did not contain a greater proportion of unionized plants with pay-for-knowledge plans may be partially attributable to the commonly held myth that such plans are in inherent conflict with many union preferences (such as rigid jurisdictional boundaries). For a discussion of labor-related issues in pay-for-knowledge systems, see W. P. Curington, N. Gupta, and G. D. Jenkins, Jr., "Labor issues and skill-based compensation systems," *Labor Law Journal*, August 1986, pp. 581–86.

[6] Jenkins and Gupta, "The payoffs"; E. E. Lawler III, "The new plant revolution," *Organizational Dynamics*, Winter 1978, pp. 2–12; Poza and Markus, "Success story"; R. E. Walton, "The Topeka work system"; and R. E. Walton and L. A. Schlesinger, "Do supervisors thrive in participative work systems?" *Organizational Dynamics*, Winter 1979, pp. 24–38.

[7] Apcar, "Work-rule programs"; Jenkins and Gupta "The payoffs"; and Lawler and Ledford, "Skill-based pay."

[8] Jenkins and Gupta, "The payoffs."

[9] Walton, "The Topeka work system."

[10] E. E. Lawler III, *Pay and Organizational Development* (Reading, MA, Addison-Wesley, 1981).

Hospital occupational pay in 23 metropolitan areas

Occupational pay levels in hospitals spanned a broad range in August 1985, according to a Bureau of Labor Statistics

wage survey.[1] For each of the 23 metropolitan areas studied,[2] earnings information was developed for full- and part-time workers in 47 occupations. These occupations accounted for one-half of the total non-Federal hospital employment in most of the areas and were selected from two major employee categories—professional or technical and nonprofessional.

Full-time general duty nurses typically averaged between $11 and $13 an hour, with the lowest average recorded in Buffalo ($10.11) and the highest in San Francisco ($15.52). General duty nurses typically averaged 30 to 40 percent more than licensed practical nurses and 60 to 75 percent more than nursing aides in the same area. However, head nurses usually averaged 20 to 30 percent more than general duty nurses in the same area, while the corresponding pay advantages for supervisors of nurses were usually 30 to 40 percent.

Area pay levels varied widely among the other jobs surveyed. Pharmacists, supervisors of physical therapists, medical record administrators, and supervisors of radiographers generally averaged between $13 and $16 an hour among the areas studied. Physical therapists, medical and psychiatric social workers, dietitians, librarians, electricians, engineers, and biomedical technicians typically averaged between $11 and $14 an hour. Other technicians (pharmacy, medical record, EKG), surgical technologists, licensed practical nurses, and clerical and service workers (such as laundry and kitchen employees) commonly recorded area averages below $8.50 an hour. (See table 1.)

The 58,000 nursing aides—largest of the nonprofessional group—averaged from $5.43 an hour in Dallas-Fort Worth to $9.76 in San Francisco. Psychiatric aides averaged more than nursing aides in 10 of the 12 areas where comparisons were made, but their hourly pay advantages were less than 10 percent.

Even within the same occupation and area, earnings of full-time workers spanned broad ranges. For example, in private hospitals, the differences between the highest and lowest paid employee frequently exceeded $4 an hour. This reflects differences in pay levels of individual hospitals in the same area as well as the range-of-rate pay systems employed by most hospitals. Also contributing to differences in occupational pay among hospitals in the same area were type of facility; pay differentials for licensed, certified, or registered employees; size of facility; and whether the workers were covered by collective bargaining agreements.

Where comparisons were possible, occupational pay levels were usually higher in private hospitals than in State and local government hospitals. This continued the reversal of pay relationships between these two types of hospitals, first noted in the Bureau's August 1981 survey.[3] Examples of pay comparisons favoring private hospitals ranged from supervisors of nurses to ward clerks, with average differences usually falling below 10 percent. Areas where State and

Table 1. Pay ranges for selected occupations in hospitals, selected areas, August 1985

Occupation	Average hourly earnings[1]				
	Lowest-paying area	Pay levels	Highest-paying area	Pay levels	Mid-range of area pay levels[2]
Registered professional nurses:					
Supervisors of nursing	Buffalo	$13.28	Oakland	$19.53	$14.97–$16.46
Head nurses	Buffalo	11.69	San Francisco	18.39	13.68–15.15
General duty nurses	Buffalo	10.11	San Francisco	15.52	11.12–12.44
Technicians and technologists:					
EKG technicians	Houston	6.48	San Francisco	10.58	7.21–8.36
Laboratory technicians	Houston	7.24	San Francisco	13.75	8.38–9.60
Medical technologists	Baltimore	10.07	Oakland	15.98	10.52–12.26
Radiographers	Baltimore	8.41	Oakland	13.38	9.05–10.29
Surgical technologists	Atlanta	6.71	Oakland	10.74	7.63–8.94
Therapists and social workers:					
Occupational therapists	Boston	10.03	Oakland	14.17	10.61–11.73
Physical therapists	Boston	10.12	Oakland	14.52	11.07–12.69
Other professional and technical:					
Dietitians	Baltimore	10.34	San Francisco	14.22	10.64–11.81
Licensed practical nurses	Atlanta	7.20	San Francisco	10.80	8.33–9.16
Pharmacists	Boston	12.47	Los Angeles	20.68	14.07–16.87
Pharmacy technicians	Dallas	6.23	San Francisco	10.96	6.70–7.99
Nonprofessional health services:					
Nursing aides	Dallas	5.43	San Francisco	9.76	6.38–7.26
Ward clerks	Dallas	5.97	San Francisco	9.78	6.49–7.75
Office clerical:					
Admitting clerks	Atlanta	6.01	San Francisco	9.68	6.63–7.85
Switchboard operators	Houston	5.81	New York	9.24	6.55–7.48
Other nonprofessional:					
Cleaners	Dallas	4.88	San Francisco	9.35	5.86–7.13
Food service helpers	Atlanta	4.83	San Francisco	9.13	5.69–6.89

[1] See text footnote 1.

[2] Of the areas analyzed, one-fourth reported occupational averages above and one-fourth below the range of averages shown. Federal hospitals were not surveyed.

local government workers typically averaged more than their private counterparts included Buffalo, Denver, and Detroit.

All hospitals studied provided paid holidays. Private hospitals generally provided 8 to 12 days annually, compared with 10 to 13 days in non-Federal government hospitals. Paid vacations (after qualifying periods of service) also were provided by all hospitals covered by the survey. Typical provisions called for at least 2 weeks of vacation pay after 1 year of service, 3 weeks after 5 years, and at least 4 weeks after 15 years.

Life insurance and health plan coverage for employees, including hospitalization, surgical, medical, and major medical benefits, were nearly always provided by the hospitals studied. However, employees in private hospitals often received at least part of the health benefits package through direct care. For example, at least one-fifth of the employees in 10 metropolitan areas received full coverage through a combination of insurance and direct care. State and local government hospitals rarely dispensed care directly, relying almost exclusively on insurance coverage.

Retirement pension plans (in addition to Social Security) applied to virtually all private hospital employees in 14 areas. Coverage in the other locations was nine-tenths or more in six areas, approximately four-fifths in Miami and Los Angeles, and three-fifths in Dallas-Fort Worth. Some form of retirement plan was available to virtually all employees in the State and local government hospitals studied. Typically, a combination of an employer-sponsored pension plan and Social Security were provided.[4] In Boston, Cleveland, and Detroit, however, all hospital workers were covered exclusively by pension plans not funded through Social Security.

The 1,225 hospitals covered by the survey employed 1.3 million workers in August 1985, or nearly two-fifths of the 3.4 million private and State and local government hospital workers in the Nation. Of the survey's total, private hospitals employed just over four-fifths of the workers. In most areas, nine-tenths or more of all private hospital workers were employed in short-term, general hospitals that did not specialize in a particular type of care. Most of the remaining private hospital workers were in psychiatric, children's, and orthopedic facilities. Not-for-profit, secular institutions accounted for nearly two-thirds of the private hospital employment.

State, county, and city government hospitals each accounted for about three-tenths of the 219,737 government hospital workers covered by the survey. Hospital districts and city-county hospitals employed the remainder. Of the total, general hospitals employed four-fifths of the workers; psychiatric hospitals (typically long-term hospitals run by State governments), one-seventh; and the remainder were employed in chronic or convalescent and orthopedic hospitals.

Regularly scheduled part-time employees accounted for one-fourth of the total hospital work force studied. Minneapolis reported the largest ratio of part-timers (about one-half) and New York, the lowest proportion (about one-seventh). The following occupations were staffed with part-time workers totaling 20 percent or more: nurse anesthetists and practitioners; general duty and licensed practical nurses; EKG and medical laboratory technicians; medical technologists; radiographers; occupational, physical, respiratory, and speech therapists; medical librarians; pharmacists and pharmacy technicians; nursing and psychiatric aides; ward clerks; food service helpers; and several clerical occupations.

Collective bargaining agreements generally applied to greater proportions of workers in State and local government hospitals than in private hospitals. The extent of coverage, however, varied among the metropolitan areas and by occupational group. Surveywide, collective bargaining contracts in government facilities covered two-thirds of the nurses, seven-tenths of the other professional or technical personnel, three-fourths of the office clerical workers, and just over four-fifths of the nonprofessionals. The corresponding proportions in private hospitals were nearly one-fourth of the registered professional nurses; approximately one-fifth each of the other professional or technical employees and office clerical workers; and nearly two-fifths of the other nonprofessional employees.

A comprehensive report on the survey findings, *Industry Wage Survey: Hospitals, August 1985* (Bulletin 2273) may be purchased from the Superintendent of Documents, Washington, DC 20402, or from the Bureau of Labor Statistics, Publications Sales Center, P.O. Box 2145, Chicago, IL 60690. The bulletin provides additional information on occupational pay (including area earnings distributions and averages by type and size of facility and labor-management contract coverage); work schedules and hospital characteristics; and on the incidence of selected employee benefits for full-time workers. □

FOOTNOTES

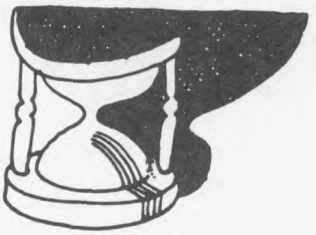
[1] The survey excluded all Federal Government facilities and hospitals with fewer than 100 workers. Earnings data exclude premium pay for overtime and for work on weekends, holidays, and late shifts, as well as the value of room, board, or other perquisites provided in addition to cash wages. Incentive payments, such as those resulting from piecework or production bonus systems, and cost-of-living pay increases (but not bonuses) were included as part of the worker's regular pay. Excluded are performance bonuses and lump-sum payments of the type negotiated in the auto and aerospace industries, as well as profit-sharing payments, attendance bonuses, Christmas or yearend bonuses, and other nonproduction bonuses.

[2] Refers to Metropolitan Statistical Areas as defined by the U.S. Office of Management and Budget through June 1983.

[3] For an account of the earlier study, see *Industry Wage Survey: Hospitals, October 1981*, Bulletin 2204 (Bureau of Labor Statistics, 1984).

[4] According to a 1983 amendment to the Social Security Act, effective January 1984, nonprofit hospitals are required to make contributions to Social Security. However, State or local government hospitals are not legally required to make Social Security contributions, but may do so voluntarily. The amendment specifies that any State or local government hospital that provided Social Security before the amendment became effective cannot terminate such coverage.

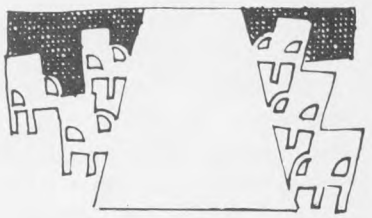
Major Agreements Expiring Next Month



This list of selected collective bargaining agreements expiring in November is based on information collected by the Bureau's Office of Wages and Industrial Relations. The list includes agreements covering 1,000 workers or more. Private industry is arranged in order of Standard Industrial Classification.

Industry or activity	Employer and location	Labor organization[1]	Number of workers
Private			
Food products	Pineapple companies (Hawaii)	Longshoremen and Warehousemen	5,500
Printing and publishing	National Sample Card Manufacturers Assn., Inc. (New York, NY)	Paperworkers	1,700
Fabricated metal products	Martin Marietta Corp., Aerospace Division (Interstate)	Auto Workers	4,800
Transportation equipment	General Dynamics Corp. (Fort Worth, TX)	Machinists	6,400
Air transportation	United Airlines, flight attendants (Interstate)	Air Line Pilots	11,000
Communication	General Telephone Co. of Ohio (Ohio)	Electrical Workers (IBEW)	1,000
	Carolina Telephone and Telegraph (North Carolina)	Communications Workers	2,750
Sanitary services	Industrial Refuse Collecting Contractors (New York, NY)	Teamsters (Ind.)	1,650
Retail trade	Kroger Food Stores, grocery department (Atlanta, GA)	Food and Commercial Workers	5,400
	Kroger Food Stores, meat department (Atlanta, GA)	Food and Commercial Workers	1,800
	Kings Markets (northern New Jersey)	Food and Commercial Workers	1,200
Finance	New York Stock Exchange, New York Futures Exchange and Securities Industry Automation Corp. (New York, NY)	Office and Professional Employees	1,350
Services	New York City laundries (New York)	Clothing and Textile Workers	5,000
Public			
General government	Illinois: Cook County general employees	Service Employees	2,200
Health services	Cook County registered nurses	Nurses Association (Ind.)	1,000
	Cook County hospital service employees	Service Employees	1,400
Law enforcement	Ohio: Columbus police	Police (Ind.)	1,150

[1] Affiliated with AFL-CIO except where noted as independent (Ind.).



Developments in Industrial Relations

Postal Service contract

Negotiators for the U.S. Postal Service and three major unions agreed on new contracts, thereby averting use of fact-finding and binding arbitration procedures. These procedures are triggered if the parties are unable to settle before the existing contract expires, and have been used three times—in 1971, 1978, and 1984.

Despite the peaceful resolution with the Postal Service, there were interunion differences, as the American Postal Workers and the Letter Carriers criticized the leadoff accord negotiated by the Mail Handlers unit of the Laborers union. That 3-year agreement, reached in mid-July, called for a $350 specified increase in annual pay on July 21, 1987, followed by a $400 increase on July 21, 1988, and a $500 increase on July 21, 1989. The 51,000 workers represented by the Mail Handlers also may receive possible semiannual pay adjustments under the cost-of-living formula, which was continued at the rate of 1 cent an hour for each 0.4-point movement in the BLS CPI-W (1967=100).

Leaders of the Postal Workers and the Letter Carriers denounced the Mail Handlers' contract, calling it "obscene" and the "most shameful contract in the 17 years of collective bargaining in the Postal Service." These unions were particularly critical of the 1.6-percent annual specified wage increases, in light of the 6.8-percent a year increases they were demanding.

Following the leadoff settlement, another dispute arose when the Postal Workers, backed by the Letter Carriers, accused the Mail Handlers and the Postal Service of planning to reclassify 10,000 Postal Workers' jobs so that they would fall within the jurisdiction of the Mail Handlers. This dispute was resolved when the Postal Service and the Postal Workers signed a memorandum assuring that the jobs would not be reclassified. In return, the Postal Workers and the Letter Carriers (who bargained as a unit) reduced their demand for specified wage increases to 4.5 percent a year.

Following this, the two unions returned to the bargaining table and settled with the Postal Service in late July, a few hours after the expiration of the prior contracts. The new 40-month contracts, a change from the parties' usual 3-year contracts, provided for specified wage increases totaling about 7 percent, plus possible cost-of-living adjustments totaling 11 to 12 percent, based on the unions' projection of movement of the CPI over the term. The specified wage increases, which totaled $1,700 to $1,866, consisted of a 2-percent immediate increase, $250 increases in July 1988 and January 1989, $300 increases in July 1989 and January 1990, and a $200 increase in July 1990, 4 months before the contract expiration date. Prior to the settlement, wages for the 350,000 Postal Workers and the 235,000 Letter Carriers ranged from $20,094 to $27,089 a year.

Other wage terms included continuation of the same cost-of-living pay adjustment formula as for the Mail Handlers, except an adjustment will be made in July 1990 because of the longer contract duration.

There were no changes in medical and life insurance plans, but there was a 10-percent increase in the uniform allowance over the term.

The economic terms negotiated by the Letter Carriers and the Postal Workers also applied to the Mail Handlers, whose contract included provisions for automatically raising their gains to any higher levels subsequently negotiated by the other unions.

These settlements concluded bargaining in the Postal Service except for one major unit, the Rural Letter Carriers, which represents 76,000 workers. Their contract expires in January 1988, with negotiations scheduled to begin 3 months earlier.

UPS lengthens pay progression schedule

More than 110,000 workers throughout the Nation were covered by a 3-year agreement between United Parcel Service, Inc., and the Teamsters union. Wages were increased by 30 cents an hour on August 1 of 1987, 1988, and 1989. There also was a provision for lump-sum payments of $1,000 for full-time employees and $500 for part-time employees (who make up about half of the work force) on September 1 of the same years. Under the prior 3-year contract, employees received wage increases totaling $1.68 an hour, in addition to a lump-sum payment of $1,000.

In a change in the pay progression schedule, new workers will start at 70 percent of the top rate for their job, move to 75 percent after 1 month, 80 percent after 12 months, 90 percent after 18 months, and 100 percent after 24 months. Previously, employees started at 70 percent of full pay and reached full pay after 6 to 12 months.

Reflecting the growth in United Parcel Service next-day air express operations, the parties agreed to a new air express driver classification which pays $12.50 an hour for

"Developments in Industrial Relations" is prepared by George Ruben of the Division of Developments in Labor-Management Relations, Bureau of Labor Statistics, and is largely based on information from secondary sources.

full-time employees and $10 for part-timers. Employees at the air hubs will be paid $8 an hour, and the company gained flexibility in setting work schedules.

The union was strengthened by a company agreement to add some 2,000 operating clerks to the bargaining unit. The clerks, previously not represented by a union, will earn $8 to $10 an hour.

Other terms included:

- Retention of the automatic cost-of-living pay adjustment provision. As under the prior contract, the clause becomes operative only after the allowance calculated under the formula exceeds the total cost of the specified wage increases, lump-sum payments, and improvements in benefits.
- Increases totaling 60 cents an hour in the company's financing of health and welfare and pension benefits.
- A clause specifying that the company will not "overly supervise or unfairly coerce employees in the performance of their duties." The clause was adopted in response to some employees' contention that supervisors exerted undue pressure to increase productivity.
- A requirement that company supervisors and union stewards wear identifying badges or name tags.

Ford subsidiary improves competitive position

Doubts about the future of Ford Motor Co.'s Rouge Steel subsidiary were eased when the Auto Workers agreed to some contract provisions designed to reduce operating costs. During the negotiations, which continued without a work stoppage after the previous contract expired, Ford had pressed for a $3 cut in the average $27 an hour employee compensation. In return, the company had promised to continue operating the Dearborn, MI, facility for at least the contract term. Although the company did not get the compensation cut, economies attained in other parts of the contract led the company's negotiator to conclude that the agreement "will go a long way toward improving our competitive position within the industry."

In addition to this improved outlook, the new contract specifies that any prospectve purchaser of the steelmaking operations must assume the full labor contract as a condition of sale. In the event of a sale, Rouge Steel employees could also "bump" into the auto manufacturing parts of the complex if they have enough seniority. Cost-reducing provisions of the settlement provide for:

- Consolidation of some job classifications and formation of new production teams.
- Replacement of absent workers only if necessary to maintain output.
- Adoption of a staggered downtime method for performing maintenance work.
- Employee responsibility for cleaning his or her immediate work area.
- Greater emphasis on team approaches to increasing productivity.

Guarantees and safeguards benefiting employees included:

- A company commitment to make capital investments necessary to maintain full operating capacity.
- Formation of a joint committee and adoption of additional restrictions on outsourcing to assure that as much work as possible will be performed in-house.
- Assurances that cuts in the work force will be achieved only through attrition, retirement, or special "opt-out" provisions.
- No layoffs as a result of negotiated productivity improvements.
- Protections against cuts in earning potentials under incentive plans.

The agreement, which runs to September 1990, did not provide for increases in pay rates, but the employees received an immediate $500 lump-sum payment, to be followed by $500 payments in July of 1988 and 1989. Other terms included a variety of improvements in the pension plan and establishment of a legal services plan.

The contract covers 3,000 workers. The ratification vote was 1,333 to 1,326.

Soft drink bottlers, Teamsters settle

In Los Angeles and Orange counties, CA, three soft drink bottlers and six Teamsters locals negotiated a 3-year contract that reduced the companies' funding of health and welfare benefits to $200 a month, from $408.27, for each of the 1,600 employees. The $200 rate was possible because of the high level of fund reserves. The companies' funding will increase to $300 on April 1, 1988, and will increase to the level necessary to cover benefit costs on April 1, 1989. An official of the Food Employers Council, the employers' bargaining association, said that the final level is expected to be about $395 a month.

The contract provides for an immediate lump-sum payment of $1,000 to employees with at least 1 year of service and prorated amounts to those with less service. All employees will receive a 35-cent-an-hour wage increase in the second contract year and a 30-cent increase in the final year.

The contract also permits the companies to assign up to 30 percent of their employees to a Tuesday through Saturday workweek at straight-time pay rates. In another cost-savings change, new employees will be paid 80 percent of the top rate for their job during the first 6 months, 90 percent during the next 6 months, and the top rate thereafter. Previously, new workers received 90 percent of the top rate during the first 90 days and the top rate thereafter.

The companies involved in the settlement are Coca-Cola, Pepsi-Cola, and Royal Crown.

Minnesota nurses get pay increases

More than 6,000 nurses were covered by a 2-year agreement between the Minnesota Nurses Association and Health Employees, Inc., comprising 15 health care facilities in the Minneapolis-St. Paul area. The peaceful settlement, which contrasted with the 2-month strike that preceded the 1984 settlement, provided for 3-percent salary increases in both years. After the second increase, monthly salary rates for nurses with an associate degree or diploma will range from $1,967 for starting nurses to $2,669 for nurses with 12 years' experience. For nurses with 4-year college degrees, the range will be $2,015 to $2,735.

Other terms included:

- A 15-cent-an-hour increase in the night shift differential, beginning in the second year.
- An additional $2\frac{1}{2}$ days of paid vacation after each 6 months for nurses who work permanent night shifts.
- New joint committees in each hospital to advise management on staff size and utilization.
- A provision prohibiting management from disciplining nurses who refuse to work overtime. (Nurses were not required to work overtime under the 1984 agreement but the union contended that some departments had been scheduling procedures in a way that pressured nurses to work overtime to avoid "abandoning" their patients.)
- New provisions prohibiting the hospitals from using on-call employees as substitutes for on-duty nurses, and from requiring nurses to be on-call on their regularly scheduled days off.
- A change in the paternity/maternity leave provision guaranteeing nurses their former position if they return within 4 months.
- A new requirement that the hospitals give the union 6 months' notice of decisions to merge, consolidate, close beds, or reorganize. Within 6 months of receiving the notice, the union has the right to reopen negotiations or seek mediation of the issue.
- A $10 increase in the pension rate, bringing it to $24 a month for each year of credited service.

New owners give returning strikers three options

A 4-year work stoppage against Magic Chef, Inc., in Cleveland, TN, ended when the Molders and Allied Workers reached agreement with Maytag Corp., which had purchased the kitchen range plant in 1986. Reportedly, the issue that triggered the strike was Magic Chef's demand that a dues checkoff provision be dropped from the initial contract when it expired in 1983. Immediately after the strike began, Magic Chef hired replacement workers and continued production.

The breakthrough in the dispute came when Maytag agreed to a proposal from the AFL-CIO's Industrial Union Department that it participate directly in the negotiations. In its proposal, the Industrial Union Department noted the harmonious bargaining relationships Maytag has with seven other unions.

Under the new contract, which runs to August 8, 1988, the 600 original strikers have three options:

- Return to their original (or equivalent) jobs and receive an immediate $2,000 lump-sum payment, followed by a $6,500 payment when they actually begin work.
- Retire immediately if their age plus years of service (including credit for the stoppage period) total 70 or more. Until they attain eligibility for Social Security at age 62, they will receive a $500 a month supplement to their regular pension.
- Do not return to work or draw a pension, in exchange for an $11,000 "buyout payment."

All of the replacement workers hired during the stoppage were expected to retain their jobs because Magic Chef was shifting work to the plant from one it was closing in California.

Other settlement terms included retention of the dues checkoff provision and a requirement that the union pay $1 million to Magic Chef to drop a lawsuit over a boycott campaign against company products, and other strike issues.

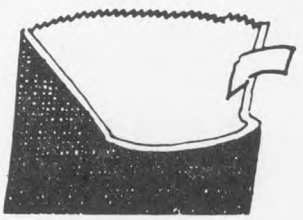
Union certification ends 25-year dispute

In Tennessee, there was a settlement of a long labor-management dispute, as 2,000 employees of Arcata Graphics voted by more than 2 to 1 to be represented by the Aluminum, Brick and Glass Workers. The dispute and resulting strike by 1,000 workers began more than 25 years ago, in 1963, when the company was known as Kingsport Press. The unions—the Bookbinders, Printing Pressmen, Machinists, Stereotypers, and Typographers—contended that Kingsport Press forced the strike by using unfair bargaining practices. Kingsport Press responded to the stoppage by hiring replacement workers, leading the AFL-CIO to launch a national boycott campaign against the books the company produced.

Decertification of the unions in a 1967 National Labor Relations Board election, in which only replacement workers were permitted to vote, was followed by several unsuccessful organizing drives by unions.

According to Aluminum, Brick and Glass Workers President Ernest J. LaBaff, the union's success in the 1987 election resulted from employee concern over job security. He said that earlier in the year, Arcata Graphics had terminated 283 employees and replaced them with lower paid temporary employees. □

Book Reviews



Resetting the framework

Unheard Voices: Labor and Economic Policy in a Competitive World. By Ray Marshall. New York, Basic Books, 1987. 304 pp. $19.95.

During the early 1980's, there were many books critical of Reaganomics and of classical liberalism and calling for a new national industrial policy. In the mid-1980's, these have been partially supplanted by books urging labor-management teamwork in response to America's foreign competition. Within the past year, reports have come from the National Academy of Science, the Office of Technology Assessment, and the U.S. Department of Labor, each recommending new cooperation between labor and management to best exploit new technologies and increase America's productivity and economic strength.

Ray Marshall, Secretary of Labor during the Carter administration, makes an especially important contribution by stressing the need for "A consensus-based policy with worker participation (which) could improve economic policymaking at the national or industry level just as worker participation improves management" (p. 215). While much of the literature emphasizes worker participation practices in other industrial democracies, Marshall presents the achievements in Austria, Germany, and Japan in terms of labor participation in economic decisionmaking.

He argues persuasively that the internationalizing of the economy and developments in new technology have altered the economic climate and demand a new industrial relations. What makes Marshall's call different from many others is his strong argument that it is in this country's best interest to substantially increase worker participation in basic economic policymaking. This, he proclaims, is a lesson the United States must learn from our industrial competitors. Workers must "have organized representation in arenas where national policies are formulated" (p. 5).

This book will be of considerable interest to all concerned with economic policymaking and the range of issues confronting the United States in terms of trade, labor relations, and national economic development. Some may feel that Marshall is insufficiently appreciative of post-1981 developments because he gives many illustrations of tripartite groups under the last administration and suggests precious little since. In fact, new initiatives in the U.S. Department of Labor have encouraged cooperative efforts not only in shop floor participation but also in economic development and worker retraining strategies. Some State programs have gone a good distance toward implementing some of Marshall's proposals, and it is disappointing that he gives these only a fleeting reference (p. 289).

His review of Japan is useful, avoiding either euphoria or Japan-bashing, and he challenges adaptations appropriate to the United States. He advocates more authentic power be given to labor for planning and coordination to work and, thus, reinforces those who see more logic in the Swedish vs. the Japanese system of labor relations. Marshall states, "Our current economic policies not only create instability and make us less competitive; they also shift most of the benefits of limited growth to nonworkers and most of the cost to workers" (p. 283). In his view, "U.S. policies should protect the national interest by giving more weight to a human resources development strategy" (p. 305). This last argument is one which we read in Marshall's books years ago and his analysis today is even more cogent than in earlier times. New technology, globalization of the economy, and other substantial changes make it ever more imperative that a national system of worker retraining and job skills upgrading be accomplished. In this area, America has much to learn and Marshall's analysis makes the point and helps direct the way.

My expectation is that this book will serve as a major stimulus for dialogue among policymakers, researchers, and practitioners in the next year or two. It is an important statement. We need to understand some of the causes of economic trauma and the alternative solutions. Marshall's argument that economic policymaking is too important to be left to economists and managers alone will be well received in many circles, and his call for labor representation, consensus decisionmaking, and more active and cooperative policies will challenge many.

——Steven Deutsch
Director, Center for the Study of Work, Economy and Community and Professor of Sociology
University of Oregon

Publications received

Agriculture and natural resources

de Janry, Alain and Elisabeth Sadoulet, "Agricultural Price Policy in General Equilibrium Models: Results and Comparisons," *American Journal of Agricultural Economics*, May 1987, pp. 230–46.

Runge, Carlisle Ford and Harold von Witzke, "Institutional Change in the Common Agricultural Policy of the European Community," *American Journal of Agricultural Economics*, May 1987, pp. 213–22.

Economic and social statistics

Exter, Thomas G. and Frederick Barber, "What Men and Women Think," *American Demographics*, August 1987, beginning on p. 34.

Isard, Peter, "Lessons from Empirical Models of Exchange Rates," *International Monetary Fund Staff Papers*, March 1987, pp. 1–28.

Townsend, Bickley and Martha Farnsworth Riche, "Two Paychecks and Seven Lifestyles," *American Demographics*, August 1987, pp. 24–29.

Economic growth and development

Buchanan, James M., "The Constitution of Economic Policy," *The American Economic Review*, June 1987, pp. 243–50.

U.S. Department of Agriculture, *Rural Economic Development in the 1980's: Preparing for the Future*. Washington, U.S. Department of Agriculture, Economic Research Service, Agriculture and Rural Economy Division, 1987, 403 pp. (ERS Staff Report, AGES870724.)

Health and safety

Committee for Economic Development, *Reforming Health Care: A Market Prescription*. New York, Committee for Economic Development, Research and Policy Committee, 1987, 100 pp.

Kahn, Shulamit, "Occupational Safety and Worker Preferences: Is There a Marginal Worker?" *The Review of Economics and Statistics*, May 1987, pp. 262–68.

Manning, Willard G. and others, "Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment," *The American Economic Review*, June 1987, pp. 251–77.

Industrial relations

Balfour, Alan, *Union-Management Relations in a Changing Economy*. Englewood Cliffs, NJ, Prentice-Hall, Inc., 1987, 482 pp.

Barth, Peter S., *The Tragedy of Black Lung: Federal Compensation for Occupational Disease*. Kalamazoo, MI, W. E. Upjohn Institute for Employment Research, 1987, 292 pp. $16.95, cloth; $11.95, paper.

Fiorito, Jack and Wallace E. Hendricks, "Union Characteristics and Bargaining Outcomes," *Industrial and Labor Relations Review*, July 1987, pp. 569–84.

Flaherty, Sean, "Strike Activity and Productivity Change: The U.S. Auto Industry," *Industrial Relations*, Spring 1987, pp. 174–85.

Krislov, Joseph and John Mead, "Changes in IR Programs Since the Mid-Sixties," *Industrial Relations*, Spring 1987, pp. 208–12.

Ozaki, M., "Labour Relations in the Public Service," *International Labour Review*, May-June 1987, pp. 277–99.

Spilsbury, M. and others, "A Note on the Trade Union Membership Patterns of Young Adults," *British Journal of Industrial Relations*, July 1987, pp. 267–74.

The Bureau of National Affairs, Inc., *Construction Craft Jurisdiction Agreements, 1987 Edition*. Washington, 1987, 208 pp. $33. Add State sales tax and $2.50 shipping charges. Available from BNA Books Distribution Center, Edison, NJ 08818.

—*Pregnancy and Employment: The Complete Handbook on Discrimination, Maternity Leave, and Health and Safety*. Washington, 1987, 210 pp. $65, paper. Distributed by BNA Customer Service Center, Rockville, MD 20850.

—*Primer on ERISA (the Employee Retirement Income Security Act of 1974)*. 2d ed. By Barbara J. Coleman. Washington, 1987, 164 pp. $23, paper. Add State sales tax and $2.50 shipping charges. Available from BNA Books Distribution Center, Edison, NJ 08818.

—*VDTS in the Workplace: New Issues, New Answers*. 2d ed. Washington, 1987, 231 pp., bibliography. $75, paper. Available from BNA's Customer Service Center, Rockville, MD 20850.

The Immigration Reform Law of 1986: Analysis, Text, and Legislative History. By Nancy Humel Montwieler. Washington, 1987, 557 pp. $48. Add State sales tax and $2.50 shipping charges. Available from BNA Books Distribution Center, Edison, NJ 08818.

Townley, Barbara, "Union Recognition: A Comparative Analysis of the Pros and Cons of a Legal Procedure," *British Journal of Industrial Relations*, July 1987, pp. 177–99.

Verma, Anil and Robert B. McKersie, "Employee Involvement: The Implications of Noninvolvement by Unions," *Industrial and Labor Relations Review*, July 1987, pp. 556–68.

International economics

Bond, Marian E., "An Econometric Study of Primary Commodity Exports from Developing Country Regions to the World," *International Monetary Fund Staff Papers*, June 1987, pp. 191–227.

Bovenberg, A. Lans, "Indirect Taxation in Developing Countries: A General Equilibrium Approach," *International Monetary Fund Staff Papers*, June 1987, pp. 333–73.

Clark, Don P., "Regulation of International Trade in the United States: The Tokyo Round," *The Journal of Business*, April 1987, pp. 297–306.

Cohen, Stephen S. and John Zysman, *Manufacturing Matters: The Myth of the Post-Industrial Economy*. New York, Basic Books, Inc., Publishers, 1987, 297 pp. $19.95.

Collyns, Charles and Steven Dunaway, "The Cost of Trade Restraints: The Case of Japanese Automobile Exports to the United States," *International Monetary Fund Staff Papers*, March 1987, pp. 150–75.

Labor and economic history

Beffel, John Nicholas, ed., *Bread Upon the Waters: Rose Pesotta*. Ithaca, NY, ILR Press, 1987, 472 pp. $32, cloth; $10.95, paper.

"Wage Effects of Unions in the Late Nineteenth Century: The Impact of Late Nineteenth Century Unions on Labor Earnings and Hours—Iowa in 1894," by Barry Eichengreen; "The Earnings Effects of Labor Organizations in 1890," by Patricia Dillion and Ira Gang, *Industrial and Labor Relations Review*, July 1987, pp. 501–27.

Labor force

Abraham, Katharine G. and Henry S. Farber, "Job Duration, Seniority, and Earnings," *The American Economic Review*, June 1987, pp. 278–97.

Campling, Robert F., *Employee Benefits and the Part-time Worker*. Kingston, Ontario, Canada, Queen's University, Industrial Relations Center, 1987, 100 pp., bibliography. (School of Industrial Relations Research Essay Series, 13.)

Great Britain, Department of Employment, "Helping People with Disabilities into Employment," by Jerry Leese, *Employment Gazette*, July 1987, pp. 320–24.

Holzer, Harry J., "Job Search by Employed and Unemployed Youth," *Industrial and Labor Relations Review*, July 1987, pp. 601–11.

The Bureau of National Affairs, Inc., *Older Americans in the Workforce: Challenges and Solutions*. Washington, 1987, 237 pp. $75, paper. Available from BNA Customer Service Center, Rockville, MD 20850.

Prices and living conditions

Gordon, Robert J., *The Postwar Evolution of Computer Prices*. Cambridge, MA, National Bureau of Economic Research, Inc., 1987, 55 pp. (Working Paper Series, 2227.) $2, paper.

Great Britain, Department of Employment, "Retail Prices Index: Historical Series, 1974 to 1986," *Employment Gazette*, July 1987, pp. 330–33.

Productivity and technological change

Allen, Steven G., *Productivity Levels and Productivity Change Under Unionism*. Cambridge MA, National Bureau of Economic Research, Inc., 1987, 29 pp., bibliography. (Working Paper 2304.) $2, paper.

Bergson, Abram, "Comparative Productivity: The USSR, Eastern Europe, and the West," *The American Economic Review*, June 1987, pp. 342–57.

Wages and compensation

Blyton, Paul, "The Working Time Debate in Western Europe," *Industrial Relations*, Spring 1987, pp. 201–07.

Drewes, Torben, "Regional Wage Spillover in Canada," *The Review of Economics and Statistics*, May 1987, pp. 224–31.

Farber, Stephen C. and Robert J. Newman, "Accounting for South/Non-South Real Wage Differentials and for Changes in Those Differentials Over Time," *The Review of Economics and Statistics*, May 1987, pp. 215–23.

Great Britain, Department of Employment, "Earnings and Hours of Agricultural Workers in 1986," *Employment Gazette*, July 1987, pp. 347–53.

Viscusi, W. Kip and Michael J. Moore, "Workers' Compensation: Wage Effects, Benefit Inadequacies, and the Value of Health Losses," *The Review of Economics and Statistics*, May 1987, pp. 249–61.

Welfare programs and social insurance

Euzeby, Chantal, "A Minimum Guaranteed Income: Experiments and Proposals," *International Labour Review*, May-June 1987, pp. 253–76.

Hiraishi, Nagahisa, *Social Security*. Tokyo, The Japan Institute of Labor, 1987, 34 pp. (Japanese Industrial Relations Series, 5.)

O'Neill, June A., Laurie J. Bassi, Douglas A. Wolf, "The Duration of Welfare Spells," *The Review of Economics and Statistics*, May 1987, pp. 241–48.

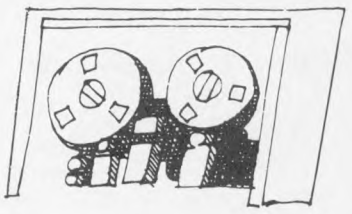
Worker training and development

Phillips, Jack J., *Recruiting, Training, and Retaining New Employees*. San Francisco, CA, Jossey-Bass Inc., Publishers, 1987, 324 pp. $27.95.

Stace, Sheila, "Vocational Rehabilitation for Women with Disabilities," *International Labour Review*, May-June 1987, pp. 301–16.

Steedman, Hilary, "Vocational Training in France and Britain: Office Work," *National Institute Economic Review*, May 1987, pp. 58–70.

Current Labor Statistics



Contents—Continued

Schedule of release dates for BLS statistical series

Series	Release date	Period covered	Release date	Period covered	Release date	Period covered	MLR table number
Employment situation	October 2	September	November 6	October	December 4	November	1; 4–21
Producer Price Index	October 16	September	November 13	October	December 11	November	2; 33–35
Consumer Price Index	October 23	September	November 20	October	December 18	November	2; 30–32
Real earnings	October 23	September	November 20	October	December 18	November	14–17
Major collective bargaining settlements	October 26	1st 9 months	.....	.....	.....	.....	3; 25–28
Employment Cost Index	October 27	3rd quarter	.....	.....	.....	.....	1–3; 22–24
U.S. Import and Export Price Indexes	October 29	3rd quarter	.....	.....	.....	.....	36–41
Productivity and costs: Nonfarm business and manufacturing	.....	.....	November 2	3rd quarter	.....	.....	2; 42–44
Nonfinancial corporations	.....	.....	.....	.....	December 3	3rd quarter	2; 42–44
Occupational illnesses and injuries	.....	.....	November 12	1986	.....	.....	48

NOTES ON CURRENT LABOR STATISTICS

This section of the *Review* presents the principal statistical series collected and calculated by the Bureau of Labor Statistics: series on labor force, employment, unemployment, collective bargaining settlements, consumer, producer, and international prices, productivity, international comparisons, and injury and illness statistics. In the notes that follow, the data in each group of tables are briefly described, key definitions are given, notes on the data are set forth, and sources of additional information are cited.

General notes

The following notes apply to several tables in this section:

Seasonal adjustment. Certain monthly and quarterly data are adjusted to eliminate the effect on the data of such factors as climatic conditions, industry production schedules, opening and closing of schools, holiday buying periods, and vacation practices, which might prevent short-term evaluation of the statistical series. Tables containing data that have been adjusted are identified as "seasonally adjusted." (All other data are not seasonally adjusted.) Seasonal effects are estimated on the basis of past experience. When new seasonal factors are computed each year, revisions may affect seasonally adjusted data for several preceding years. (Seasonally adjusted data appear in tables 1–3, 4–10, 13, 14, 17, and 18.) Beginning in January 1980, the BLS introduced two major modifications in the seasonal adjustment methodology for labor force data. First, the data are seasonally adjusted with a procedure called X–11 ARIMA, which was developed at Statistics Canada as an extension of the standard X–11 method previously used by BLS. A detailed description of the procedure appears in *The X–11 ARIMA Seasonal Adjustment Method* by Estela Bee Dagum (Statistics Canada, Catalogue No. 12–564E, February 1980). The second change is that seasonal factors are calculated for use during the first 6 months of the year, rather than for the entire year, and then are calculated at midyear for the July-December period. However, revisions of historical data continue to be made only at the end of each calendar year.

Seasonally adjusted labor force data in tables 1 and 4–10 were revised in the February 1987 issue of the *Review*, to reflect experience through 1986.

Annual revisions of the seasonally adjusted payroll data shown in tables 13, 14, and 18 were made in the July 1986 *Review* using the X–11 ARIMA seasonal adjustment methodology. New seasonal factors for productivity data in table 42 are usually introduced in the September issue. Seasonally adjusted indexes and percent changes from month to month and from quarter to quarter are published for numerous Consumer and Producer Price Index series. However, seasonally adjusted indexes are not published for the U.S. average All Items CPI. Only seasonally adjusted percent changes are available for this series.

Adjustments for price changes. Some data—such as the Hourly Earnings Index in table 17—are adjusted to eliminate the effect of changes in price. These adjustments are made by dividing current dollar values by the Consumer Price Index or the appropriate component of the index, then multiplying by 100. For example, given a current hourly wage rate of $3 and a current price index number of 150, where 1977 = 100, the hourly rate expressed in 1977 dollars is $2 ($3/150 × 100 = $2). The $2 (or any other resulting values) are described as "real," "constant," or "1977" dollars.

Additional information

Data that supplement the tables in this section are published by the Bureau in a variety of sources. News releases provide the latest statistical information published by the Bureau; the major recurring releases are published according to the schedule preceding these general notes. More information about labor force, employment, and unemployment data and the household and establishment surveys underlying the data are available in *Employment and Earnings*, a monthly publication of the Bureau. More data from the household survey are published in the two-volume data book—*Labor Force Statistics Derived From the Current Population Survey*, Bulletin 2096. More data from the establishment survey appear in two data books—*Employment, Hours, and Earnings, United States*, and *Employment, Hours, and Earnings, States and Areas*, and the annual supplements to these data books. More detailed information on employee compensation and collective bargaining settlements is published in the monthly periodical, *Current Wage Developments*. More detailed data on consumer and producer prices are published in the monthly periodicals, *The CPI Detailed Report*, and *Producer Prices and Price Indexes*. Detailed data on all of the series in this section are provided in the *Handbook of Labor Statistics*, which is published biennally by the Bureau. BLS bulletins are issued covering productivity, injury and illness, and other data in this section. Finally, the *Monthly Labor Review* carries analytical articles on annual and longer term developments in labor force, employment, and unemployment; employee compensation and collective bargaining; prices; productivity; international comparisons; and injury and illness data.

Symbols

p = preliminary. To increase the timeliness of some series, preliminary figures are issued based on representative but incomplete returns.
r = revised. Generally, this revision reflects the availability of later data but may also reflect other adjustments.
n.e.c. = not elsewhere classified.
n.e.s. = not elsewhere specified.

COMPARATIVE INDICATORS
(Tables 1–3)

Comparative indicators tables provide an overview and comparison of major BLS statistical series. Consequently, although many of the included series are available monthly, all measures in these comparative tables are presented quarterly and annually.

Labor market indicators include employment measures from two major surveys and information on rates of change in compensation provided by the Employment Cost Index (ECI) program. The labor force participation rate, the employment-to-population ratio, and unemployment rates for major demographic groups based on the Current Population ("household ") Survey are presented, while measures of employment and average weekly hours by major industry sector are given using nonagricultural payroll data. The Employment Cost Index (compensation), by major sector and by bargaining status, is chosen from a variety of BLS compensation and wage measures because it provides a comprehensive measure of employer costs for hiring labor, not just outlays for wages, and it is not affected by employment shifts among occupations and industries.

Data on **changes in compensation, prices, and productivity** are presented in table 2. Measures of rates of change of compensation and wages from the Employment Cost Index program are provided for all civilian nonfarm workers (excluding Federal and household workers) and for all private nonfarm workers. Measures of changes in: consumer prices for all urban consumers; producer prices by stage of processing; and the overall export and import price indexes are given. Measures of productivity (output per hour of all persons) are provided for major sectors.

Alternative measures of wage and compensation rates of change, which reflect the overall trend in labor costs, are summarized in table 3. Differences in concepts and scope, related to the specific purposes of the series, contribute to the variation in changes among the individual measures.

Notes on the data

Definitions of each series and notes on the data are contained in later sections of these notes describing each set of data. For detailed descriptions of each data series, see *BLS Handbook of Methods,* Volumes I and II, Bulletins 2134–1 and 2134–2 (Bureau of Labor Statistics, 1982 and 1984, respectively), as well as the additional bulletins, articles, and other publications noted in the separate sections of the *Review*'s "Current Labor Statistics Notes." Historical data for many series are provided in the *Handbook of Labor Statistics,* Bulletin 2217 (Bureau of Labor Statistics, 1985). Users may also wish to consult *Major Programs, Bureau of Labor Statistics,* Report 718 (Bureau of Labor Statistics, 1985).

EMPLOYMENT AND UNEMPLOYMENT DATA
(Tables 1; 4–21)

Household survey data

Description of the series

EMPLOYMENT DATA in this section are obtained from the Current Population Survey, a program of personal interviews conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics. The sample consists of about 59,500 households selected to represent the U.S. population 16 years of age and older. Households are interviewed on a rotating basis, so that three-fourths of the sample is the same for any 2 consecutive months.

Definitions

Employed persons include (1) all civilians who worked for pay any time during the week which includes the 12th day of the month or who worked unpaid for 15 hours or more in a family-operated enterprise and (2) those who were temporarily absent from their regular jobs because of illness, vacation, industrial dispute, or similar reasons. Members of the Armed Forces stationed in the United States are also included in the employed total. A person working at more than one job is counted only in the job at which he or she worked the greatest number of hours.

Unemployed persons are those who did not work during the survey week, but were available for work except for temporary illness and had looked for jobs within the preceding 4 weeks. Persons who did not look for work because they were on layoff or waiting to start new jobs within the next 30 days are also counted among the unemployed. The **overall unemployment rate** represents the number unemployed as a percent of the labor force, including the resident Armed Forces. The **civilian unemployment rate** represents the number unemployed as a percent of the civilian labor force.

The **labor force** consists of all employed or unemployed civilians plus members of the Armed Forces stationed in the United States. Persons **not in the labor force** are those not classified as employed or unemployed; this group includes persons who are retired, those engaged in their own housework, those not working while attending school, those unable to work because of long-term illness, those discouraged from seeking work because of personal or job-market factors, and those who are voluntarily idle. The **noninstitutional population** comprises all persons 16 years of age and older who are not inmates of penal or mental institutions, sanitariums, or homes for the aged, infirm, or needy, and members of the Armed Forces stationed in the United States. The **labor force participation rate** is the proportion of the noninstitutional population that is in the labor force. The **employment-population ratio** is total employment (including the resident Armed Forces) as a percent of the noninstitutional population.

Notes on the data

From time to time, and especially after a decennial census, adjustments are made in the Current Population Survey figures to correct for estimating errors during the preceding years. These adjustments affect the comparability of historical data. A description of these adjustments and their effect on the various data series appear in the Explanatory Notes of *Employment and Earnings*.

Data in tables 4–10 are seasonally adjusted, based on the seasonal experience through December 1986.

Additional sources of information

For detailed explanations of the data, see *BLS Handbook of Methods*, Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 1, and for additional data, *Handbook of Labor Statistics*, Bulletin 2217 (Bureau of Labor Statistics, 1985). A detailed description of the Current Population Survey as well as additional data are available in the monthly Bureau of Labor Statistics periodical, *Employment and Earnings*. Historical data from 1948 to 1981 are available in *Labor Force Statistics Derived from the Current Population Survey: A Databook*, Vols. I and II, Bulletin 2096 (Bureau of Labor Statistics, 1982).

A comprehensive discussion of the differences between household and establishment data on employment appears in Gloria P. Green, "Comparing employment estimates from household and payroll surveys," *Monthly Labor Review,* December 1969, pp. 9–20.

Establishment survey data

Description of the series

EMPLOYMENT, HOURS, AND EARNINGS DATA in this section are compiled from payroll records reported monthly on a voluntary basis to the Bureau of Labor Statistics and its cooperating State agencies by more than 290,000 establishments representing all industries except agriculture. In most industries, the sampling probabilities are based on the size of the establishment; most large establishments are therefore in the sample. (An establishment is not necessarily a firm; it may be a branch plant, for example, or warehouse.) Self-employed persons and others not on a regular civilian payroll are outside the scope of the survey because they are excluded from establishment records. This largely accounts for the difference in employment figures between the household and establishment surveys.

Definitions

An **establishment** is an economic unit which produces goods or services (such as a factory or store) at a single location and is engaged in one type of economic activity.

Employed persons are all persons who received pay (including holiday and sick pay) for any part of the payroll period including the 12th of the month. Persons holding more than one job (about 5 percent of all persons in the labor force) are counted in each establishment which reports them.

Production workers in manufacturing include working supervisors and all nonsupervisory workers closely associated with production operations. Those workers mentioned in tables 12–17 include production workers in manufacturing and mining; construction workers in construction; and nonsupervisory workers in the following industries: transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and

services. These groups account for about four-fifths of the total employment on private nonagricutural payrolls.

Earnings are the payments production or nonsupervisory workers receive during the survey period, including premium pay for overtime or late-shift work but excluding irregular bonuses and other special payments. **Real earnings** are earnings adjusted to reflect the effects of changes in consumer prices. The deflator for this series is derived from the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI–W). The **Hourly Earnings Index** is calculated from average hourly earnings data adjusted to exclude the effects of two types of changes that are unrelated to underlying wage-rate developments: fluctuations in overtime premiums in manufacturing (the only sector for which overtime data are available) and the effects of changes and seasonal factors in the proportion of workers in high-wage and low-wage industries.

Hours represent the average weekly hours of production or nonsupervisory workers for which pay was received and are different from standard or scheduled hours. **Overtime hours** represent the portion of average weekly hours which was in excess of regular hours and for which overtime premiums were paid.

The Diffusion Index, introduced in the May 1983 *Review*, represents the percent of 185 nonagricultural industries in which employment was rising over the indicated period. One-half of the industries with unchanged employment are counted as rising. In line with Bureau practice, data for the 1-, 3-, and 6-month spans are seasonally adjusted, while those for the 12-month span are unadjusted. The diffusion index is useful for measuring the dispersion of economic gains or losses and is also an economic indicator.

Notes on the data

Establishment data collected by the Bureau of Labor Statistics are periodically adjusted to comprehensive counts of employment (called "benchmarks"). The latest complete adjustment was made with the release of May 1987 data, published in the July 1987 issue of the *Review*. Consequently, data published in the *Review* prior to that issue are not necessarily comparable to current data. Unadjusted data have been revised back to April 1985; seasonally adjusted data have been revised back to January 1982. These revisions were published in the *Supplement to Employment and Earnings* (Bureau of Labor Statistics, 1987). Unadjusted data from April 1986 forward, and seasonally adjusted data from January 1983 forward are subject to revision in future benchmarks.

In the establishment survey, estimates for the 2 most recent months are based on incomplete returns and are published as preliminary in the tables (13 to 18 in the *Review*). When all returns have been received, the estimates are revised and published as final in the third month of their appearance. Thus, August data are published as preliminary in October and November and as final in December. For the same reason, quarterly establishment data (table 1) are preliminary for the first 2 months of publication and final in the third month. Thus, second-quarter data are published as preliminary in August and September and as final in October.

Additional sources of information

Detailed national data from the establishment survey are published monthly in the BLS periodical, *Employment and Earnings*. Earlier comparable unadjusted and seasonally adjusted data are published in *Employment, Hours, and Earnings, United States, 1909–84,* Bulletin 1312–12 (Bureau of Labor Statistics, 1985) and its annual supplement. For a detailed discussion of the methodology of the survey, see *BLS Handbook of Methods,* Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 2. For additional data, see *Handbook of Labor Statistics,* Bulletin 2217 (Bureau of Labor Statistics, 1985).

A comprehensive discussion of the differences between household and establishment data on employment appears in Gloria P. Green, "Comparing employment estimates from household and payroll surveys," *Monthly Labor Review,* December 1969, pp. 9–20.

Unemployment data by State

Description of the series

Data presented in this section are obtained from two major sources—the Current Population Survey (CPS) and the Local Area Unemployment Statistics (LAUS) program, which is conducted in cooperation with State employment security agencies.

Monthly estimates of the labor force, employment, and unemployment for States and sub-State areas are a key indicator of local economic conditions and form the basis for determining the eligibility of an area for benefits under Federal economic assistance programs such as the Job Training Partnership Act and the Public Works and Economic Development Act. Insofar as possible, the concepts and definitions underlying these data are those used in the national estimates obtained from the CPS.

Notes on the data

Data refer to State of residence. Monthly data for 11 States—California, Florida, Illinois, Massachusetts, Michigan, New York, New Jersey, North Carolina, Ohio, Pennsylvania, and Texas—are obtained directly from the CPS, because the size of the sample is large enough to meet BLS standards of reliability. Data for the remaining 39 States and the District of Columbia are derived using standardized procedures established by BLS. Once a year, estimates for the 11 States are revised to new population controls. For the remaining States and the District of Columbia, data are benchmarked to annual average CPS levels.

Additional sources of information

Information on the concepts, definitions, and technical procedures used to develop labor force data for States and sub-State areas as well as additional data on sub-States are provided in the monthly Bureau of Labor Statistics periodical, *Employment and Earnings,* and the annual report, *Geographic Profile of Employment and Unemployment* (Bureau of Labor Statistics). See also *BLS Handbook of Methods,* Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 4.

COMPENSATION AND WAGE DATA

(Tables 1–3; 22–29)

COMPENSATION AND WAGE DATA are gathered by the Bureau from business establishments, State and local governments, labor unions, collective bargaining agreements on file with the Bureau, and secondary sources.

Employment Cost Index

Description of the series

The **Employment Cost Index** (ECI) is a quarterly measure of the rate of change in compensation per hour worked and includes wages, salaries, and employer costs of employee benefits. It uses a fixed market basket of labor—similar in concept to the Consumer Price Index's fixed market basket of goods and services—to measure change over time in employer costs of employing labor. The index is not seasonally adjusted.

Statistical series on total compensation costs and on wages and salaries are available for private nonfarm workers excluding proprietors, the self-employed, and household workers. Both series are also available for State and local government workers and for the civilian nonfarm economy, which consists of private industry and State and local government workers combined. Federal workers are excluded.

The Employment Cost Index probability sample consists of about 2,200 private nonfarm establishments providing about 12,000 occupational observations and 700 State and local government establishments providing

3,500 occupational observations selected to represent total employment in each sector. On average, each reporting unit provides wage and compensation information on five well-specified occupations. Data are collected each quarter for the pay period including the 12th day of March, June, September, and December.

Beginning with June 1986 data, fixed employment weights from the 1980 Census of Population are used each quarter to calculate the indexes for civilian, private, and State and local governments. (Prior to June 1986, the employment weights are from the 1970 Census of Population.) These fixed weights, also used to derive all of the industry and occupation series indexes, ensure that changes in these indexes reflect only changes in compensation, not employment shifts among industries or occupations with different levels of wages and compensation. For the bargaining status, region, and metropolitan/nonmetropolitan area series, however, employment data by industry and occupation are not available from the census. Instead, the 1980 employment weights are reallocated within these series each quarter based on the current sample. Therefore, these indexes are not strictly comparable to those for the aggregate, industry, and occupation series.

Definitions

Total compensation costs include wages, salaries, and the employer's costs for employee benefits.

Wages and salaries consist of earnings before payroll deductions, including production bonuses, incentive earnings, commissions, and cost-of-living adjustments.

Benefits include the cost to employers for paid leave, supplemental pay (including nonproduction bonuses), insurance, retirement and savings plans, and legally required benefits (such as Social Security, workers' compensation, and unemployment insurance).

Excluded from wages and salaries and employee benefits are such items as payment-in-kind, free room and board, and tips.

Notes on the data

The Employment Cost Index data series began in the fourth quarter of 1975, with the quarterly percent change in wages and salaries in the private nonfarm sector. Data on employer costs for employee benefits were included in 1980 to produce, when combined with the wages and salaries series, a measure of the percent change in employer costs for employee total compensation. State and local government units were added to the ECI coverage in 1981, providing a measure of total compensation change in the *civilian* nonfarm economy (excluding Federal employees). Historical indexes (June 1981=100) of the quarterly rates of change are presented in the May issue of the BLS monthly periodical, *Current Wage Developments*.

Additional sources of information

For a more detailed discussion of the Employment Cost Index, see the *Handbook of Methods,* Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 11, and the following *Monthly Labor Review* articles: "Employment Cost Index: a measure of change in the 'price of labor'," July 1975; "How benefits will be incorporated into the Employment Cost Index," January 1978; "Estimation procedures for the Employment Cost Index," May 1982; and "Introducing new weights for the Employment Cost Index," June 1985.

Data on the ECI are also available in BLS quarterly press releases issued in the month following the reference months of March, June, September, and December; and from the *Handbook of Labor Statistics,* Bulletin 2217 (Bureau of Labor Statistics, 1985).

Collective bargaining settlements

Description of the series

Collective bargaining settlements data provide statistical measures of negotiated adjustments (increases, decreases, and freezes) in compensation (wage and benefit costs) and wages alone, quarterly for private industry and semiannually for State and local government. Compensation measures cover all collective bargaining situations involving 5,000 workers or more and wage measures cover all situations involving 1,000 workers or more. These data, covering private nonagricultural industries and State and local governments, are calculated using information obtained from bargaining agreements on file with the Bureau, parties to the agreements, and secondary sources, such as newspaper accounts. The data are not seasonally adjusted.

Settlement data are measured in terms of future specified adjustments: those that will occur within 12 months after contract ratification—first-year—and all adjustments that will occur over the life of the contract expressed as an average annual rate. Adjustments are worker weighted. Both first-year and over-the-life measures exclude wage changes that may occur under cost-of-living clauses that are triggered by future movements in the Consumer Price Index.

Effective wage adjustments measure all adjustments occurring in the reference period, regardless of the settlement date. Included are changes from settlements reached during the period, changes deferred from contracts negotiated in earlier periods, and changes under cost-of-living adjustment clauses. Each wage change is worker weighted. The changes are prorated over all workers under agreements during the reference period yielding the average adjustment.

Definitions

Wage rate changes are calculated by dividing newly negotiated wages by the average hourly earnings, excluding overtime, at the time the agreement is reached. Compensation changes are calculated by dividing the change in the value of the newly negotiated wage and benefit package by existing average hourly compensation, which includes the cost of previously negotiated benefits, legally required social insurance programs, and average hourly earnings.

Compensation changes are calculated by placing a value on the benefit portion of the settlements at the time they are reached. The cost estimates are based on the assumption that conditions existing at the time of settlement (for example, methods of financing pensions or composition of labor force) will remain constant. The data, therefore, are measures of negotiated changes and not of total changes in employer cost.

Contract duration runs from the effective date of the agreement to the expiration date or first wage reopening date, if applicable. Average annual percent changes over the contract term take account of the compounding of successive changes.

Notes on the data

Care should be exercised in comparing the size and nature of the settlements in State and local government with those in the private sector because of differences in bargaining practices and settlement characteristics. A principal difference is the incidence of cost-of-living adjustment (COLA) clauses which cover only about 2 percent of workers under a few local government settlements, but cover 50 percent of workers under private sector settlements. Agreements without COLA's tend to provide larger specified wage increases than those with COLA's. Another difference is that State and local government bargaining frequently excludes pension benefits which are often prescribed by law. In the private sector, in contrast, pensions are typically a bargaining issue.

Additional sources of information

For a more detailed discussion on the series, see the *BLS Handbook of Methods,* Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 10. Comprehensive data are published in press releases issued quarterly (in January, April, July, and October) for private industry, and semi-

annually (in February and August) for State and local government. Historical data and additional detailed tabulations for the prior calendar year appear in the April issue of the BLS monthly periodical, *Current Wage Developments*.

Work stoppages

Description of the series

Data on **work stoppages** measure the number and duration of major strikes or lockouts (involving 1,000 workers or more) occurring during the month (or year), the number of workers involved, and the amount of time lost because of stoppage.

Data are largely from newspaper accounts and cover only establishments directly involved in a stoppage. They do not measure the indirect or secondary effect of stoppages on other establishments whose employees are idle owing to material shortages or lack of service.

Definitions

Number of stoppages: The number of strikes and lockouts involving 1,000 workers or more and lasting a full shift or longer.

Workers involved: The number of workers directly involved in the stoppage.

Number of days idle: The aggregate number of workdays lost by workers involved in the stoppages.

Days of idleness as a percent of estimated working time: Aggregate workdays lost as a percent of the aggregate number of standard workdays in the period multiplied by total employment in the period.

Notes on the data

This series is not comparable with the one terminated in 1981 that covered strikes involving six workers or more.

Additional sources of information

Data for each calendar year are reported in a BLS press release issued in the first quarter of the following year. Monthly data appear in the BLS monthly periodical, *Current Wage Developments*. Historical data appear in the *BLS Handbook of Labor Statistics*.

Other compensation data

Other BLS data on pay and benefits, not included in the Current Labor Statistics section of the *Monthly Labor Review*, appear in and consist of the following:

Industry Wage Surveys provide data for specific occupations selected to represent an industry's wage structure and the types of activities performed by its workers. The Bureau collects information on weekly work schedules, shift operations and pay differentials, paid holiday and vacation practices, and information on incidence of health, insurance, and retirement plans. Reports are issued throughout the year as the surveys are completed. Summaries of the data and special analyses also appear in the *Monthly Labor Review*.

Area Wage Surveys annually provide data for selected office, clerical, professional, technical, maintenance, toolroom, powerplant, material movement, and custodial occupations common to a wide variety of industries in the areas (labor markets) surveyed. Reports are issued throughout the year as the surveys are completed. Summaries of the data and special analyses also appear in the *Review*.

The National Survey of Professional, Administrative, Technical, and Clerical Pay provides detailed information annually on salary levels and distributions for the types of jobs mentioned in the survey's title in private employment. Although the definitions of the jobs surveyed reflect the duties and responsibilities in private industry, they are designed to match specific pay grades of Federal white-collar employees under the General Schedule pay system. Accordingly, this survey provides the legally required information for comparing the pay of salaried employees in the Federal civil service with pay in private industry. (See Federal Pay Comparability Act of 1970, 5 U.S.C. 5305.) Data are published in a BLS news release issued in the summer and in a bulletin each fall; summaries and analytical articles also appear in the *Review*.

Employee Benefits Survey provides nationwide information on the incidence and characteristics of employee benefit plans in medium and large establishments in the United States, excluding Alaska and Hawaii. Data are published in an annual BLS news release and bulletin, as well as in special articles appearing in the *Review*.

PRICE DATA
(Tables 2; 30–41)

PRICE DATA are gathered by the Bureau of Labor Statistics from retail and primary markets in the United States. Price indexes are given in relation to a base period (1967 = 100, unless otherwise noted).

Consumer Price Indexes

Description of the series

The **Consumer Price Index** (CPI) is a measure of the average change in the prices paid by urban consumers for a fixed market basket of goods and services. The CPI is calculated monthly for two population groups, one consisting only of urban households whose primary source of income is derived from the employment of wage earners and clerical workers, and the other consisting of all urban households. The wage earner index (CPI–W) is a continuation of the historic index that was introduced well over a half-century ago for use in wage negotiations. As new uses were developed for the CPI in recent years, the need for a broader and more representative index became apparent. The all urban consumer index (CPI–U), introduced in 1978, is representative of the 1982–84 buying habits of about 80 percent of the noninstitutional population of the United States at that time, compared with 32 percent represented in the CPI–W. In addition to wage earners and clerical workers, the CPI–U covers professional, managerial, and technical workers, the self-employed, short-term workers, the unemployed, retirees, and others not in the labor force.

The CPI is based on prices of food, clothing, shelter, fuel, drugs, transportation fares, doctors' and dentists' fees, and other goods and services that people buy for day-to-day living. The quantity and quality of these items are kept essentially unchanged between major revisions so that only price changes will be measured. All taxes directly associated with the purchase and use of items are included in the index.

Data collected from more than 21,000 retail establishments and 60,000 housing units in 91 urban areas across the country are used to develop the "U.S. city average." Separate estimates for 27 major urban centers are presented in table 31. The areas listed are as indicated in footnote 1 to the table. The area indexes measure only the average change in prices for each area since the base period, and do not indicate differences in the level of prices among cities.

Notes on the data

In January 1983, the Bureau changed the way in which homeownership costs are measured for the CPI–U. A rental equivalence method replaced the

asset-price approach to homeownership costs for that series. In January 1985, the same change was made in the CPI-W. The central purpose of the change was to separate shelter costs from the investment component of homeownership so that the index would reflect only the cost of shelter services provided by owner-occupied homes. An updated CPI-U and CPI-W were introduced with release of the January 1987 data.

Additional sources of information

For a discussion of the general method for computing the CPI, see *BLS Handbook of Methods, Volume II, The Consumer Price Index*, Bulletin 2134–2 (Bureau of Labor Statistics, 1984). The recent change in the measurement of homeownership costs is discussed in Robert Gillingham and Walter Lane, "Changing the treatment of shelter costs for homeowners in the CPI," *Monthly Labor Review,* July 1982, pp. 9–14. An overview of the recently introduced revised CPI, reflecting 1982–84 expenditure patterns, is contained in *The Consumer Price Index: 1987 Revision*, Report 736 (Bureau of Labor Statistics, 1987).

Additional detailed CPI data and regular analyses of consumer price changes are provided in the *CPI Detailed Report,* a monthly publication of the Bureau. Historical data for the overall CPI and for selected groupings may be found in the *Handbook of Labor Statistics*, Bulletin 2217 (Bureau of Labor Statistics, 1985).

Producer Price Indexes

Description of the series

Producer Price Indexes (PPI) measure average changes in prices received in primary markets of the United States by producers of commodities in all stages of processing. The sample used for calculating these indexes currently contains about 3,200 commodities and about 60,000 quotations per month selected to represent the movement of prices of all commodities produced in the manufacturing, agriculture, forestry, fishing, mining, gas and electricity, and public utilities sectors. The stage of processing structure of Producer Price Indexes organizes products by class of buyer and degree of fabrication (that is, finished goods, intermediate goods, and crude materials). The traditional commodity structure of PPI organizes products by similarity of end use or material composition.

To the extent possible, prices used in calculating Producer Price Indexes apply to the first significant commercial transaction in the United States from the production or central marketing point. Price data are generally collected monthly, primarily by mail questionnaire. Most prices are obtained directly from producing companies on a voluntary and confidential basis. Prices generally are reported for the Tuesday of the week containing the 13th day of the month.

Since January 1987, price changes for the various commodities have been averaged together with implicit quantity weights representing their importance in the total net selling value of all commodities as of 1982. The detailed data are aggregated to obtain indexes for stage-of-processing groupings, commodity groupings, durability-of-product groupings, and a number of special composite groups. All Producer Price Index data are subject to revision 4 months after original publication.

Notes on the data

Beginning with the January 1986 issue, the *Review* is no longer presenting tables of Producer Price Indexes for commodity groupings, special composite groups, or SIC industries. However, these data will continue to be presented in the Bureau's monthly publication *Producer Price Indexes*.

The Bureau has completed the first major stage of its comprehensive overhaul of the theory, methods, and procedures used to construct the Producer Price Indexes. Changes include the replacement of judgment sampling with probability sampling techniques; expansion to systematic coverage of the net output of virtually all industries in the mining and manufacturing sectors; a shift from a commodity to an industry orientation; the exclusion of imports from, and the inclusion of exports in, the survey universe; and the respecification of commodities priced to conform to Bureau of the Census definitions. These and other changes have been phased in gradually since 1978. The result is a system of indexes that is easier to use in conjunction with data on wages, productivity, and employment and other series that are organized in terms of the Standard Industrial Classification and the Census product class designations.

Additional sources of information

For a discussion of the methodology for computing Producer Price Indexes, see *BLS Handbook of Methods*, Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 7.

Additional detailed data and analyses of price changes are provided monthly in *Producer Price Indexes*. Selected historical data may be found in the *Handbook of Labor Statistics,* Bulletin 2217 (Bureau of Labor Statistics, 1985).

International Price Indexes

Description of the series

The BLS **International Price Program** produces quarterly export and import price indexes for nonmilitary goods traded between the United States and the rest of the world. The export price index provides a measure of price change for all products sold by U.S. residents to foreign buyers. ("Residents" is defined as in the national income accounts: it includes corporations, businesses, and individuals but does not require the organizations to be U.S. owned nor the individuals to have U.S. citizenship.) The import price index provides a measure of price change for goods purchased from other countries by U.S. residents. With publication of an all-import index in February 1983 and an all-export index in February 1984, all U.S. merchandise imports and exports now are represented in these indexes. The reference period for the indexes is 1977 = 100, unless otherwise indicated.

The product universe for both the import and export indexes includes raw materials, agricultural products, semifinished manufactures, and finished manufactures, including both capital and consumer goods. Price data for these items are collected quarterly by mail questionnaire. In nearly all cases, the data are collected directly from the exporter or importer, although in a few cases, prices are obtained from other sources.

To the extent possible, the data gathered refer to prices at the U.S. border for exports and at either the foreign border or the U.S. border for imports. For nearly all products, the prices refer to transactions completed during the first 2 weeks of the third month of each calendar quarter—March, June, September, and December. Survey respondents are asked to indicate all discounts, allowances, and rebates applicable to the reported prices, so that the price used in the calculation of the indexes is the actual price for which the product was bought or sold.

In addition to general indexes of prices for U.S. exports and imports, indexes are also published for detailed product categories of exports and imports. These categories are defined by the 4- and 5-digit level of detail of the Standard Industrial Trade Classification System (SITC). The calculation of indexes by SITC category facilitates the comparison of U.S. price trends and sector production with similar data for other countries. Detailed indexes are also computed and published on a Standard Industrial Classification (SIC-based) basis, as well as by end-use class.

Notes on the data

The export and import price indexes are weighted indexes of the Laspeyres type. Price relatives are assigned equal importance within each weight category and are then aggregated to the SITC level. The values assigned to each weight category are based on trade value figures compiled

by the Bureau of the Census. The trade weights currently used to compute both indexes relate to 1980.

Because a price index depends on the same items being priced from period to period, it is necessary to recognize when a product's specifications or terms of transaction have been modified. For this reason, the Bureau's quarterly questionnaire requests detailed descriptions of the physical and functional characteristics of the products being priced, as well as information on the number of units bought or sold, discounts, credit terms, packaging, class of buyer or seller, and so forth. When there are changes in either the specifications or terms of transaction of a product, the dollar value of each change is deleted from the total price change to obtain the "pure" change. Once this value is determined, a linking procedure is employed which allows for the continued repricing of the item.

For the export price indexes, the preferred pricing basis is f.a.s. (free alongside ship) U.S. port of exportation. When firms report export prices f.o.b. (free on board), production point information is collected which enables the Bureau to calculate a shipment cost to the port of exportation. An attempt is made to collect two prices for imports. The first is the import price f.o.b. at the foreign port of exportation, which is consistent with the basis for valuation of imports in the national accounts. The second is the import price c.i.f. (cost, insurance, and freight) at the U.S. port of importation, which also includes the other costs associated with bringing the product to the U.S. border. It does not, however, include duty charges.

Additional sources of information

For a discussion of the general method of computing International Price Indexes, see *BLS Handbook of Methods*, Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 8.

Additional detailed data and analyses of international price developments are presented in the Bureau's quarterly publication *U.S. Import and Export Price Indexes* and in occasional *Monthly Labor Review* articles prepared by BLS analysts. Selected historical data may be found in the *Handbook of Labor Statistics*, Bulletin 2217 (Bureau of Labor Statistics, 1985).

PRODUCTIVITY DATA
(Tables 2; 42–47)

U. S. productivity and related data

Description of the series

The productivity measures relate real physical output to real input. As such, they encompass a family of measures which include single factor input measures, such as output per unit of labor input (output per hour) or output per unit of capital input, as well as measures of multifactor productivity (output per unit of labor and capital inputs combined). The Bureau indexes show the change in output relative to changes in the various inputs. The measures cover the business, nonfarm business, manufacturing, and nonfinancial corporate sectors.

Corresponding indexes of hourly compensation, unit labor costs, unit nonlabor payments, and prices are also provided.

Definitions

Output per hour of all persons (labor productivity) is the value of goods and services in constant prices produced per hour of labor input. **Output per unit of capital services** (capital productivity) is the value of goods and services in constant dollars produced per unit of capital services input.

Multifactor productivity is the ratio output per unit of labor and capital inputs combined. Changes in this measure reflect changes in a number of factors which affect the production process such as changes in technology, shifts in the composition of the labor force, changes in capacity utilization, research and development, skill and efforts of the work force, management, and so forth. Changes in the output per hour measures reflect the impact of these factors as well as the substitution of capital for labor.

Compensation per hour is the wages and salaries of employees plus employers' contributions for social insurance and private benefit plans, and the wages, salaries, and supplementary payments for the self-employed (except for nonfinancial corporations in which there are no self-employed)—the sum divided by hours paid for. **Real compensation per hour** is compensation per hour deflated by the change in the Consumer Price Index for All Urban Consumers.

Unit labor costs are the labor compensation costs expended in the production of a unit of output and are derived by dividing compensation by output. **Unit nonlabor payments** include profits, depreciation, interest, and indirect taxes per unit of output. They are computed by subtracting compensation of all persons from current dollar value of output and dividing by output. **Unit nonlabor costs** contain all the components of unit nonlabor payments *except* unit profits.

Unit profits include corporate profits and the value of inventory adjustments per unit of output.

Hours of all persons are the total hours paid of payroll workers, self-employed persons, and unpaid family workers.

Capital services is the flow of services from the capital stock used in production. It is developed from measures of the net stock of physical assets—equipment, structures, land, and inventories—weighted by rental prices for each type of asset.

Labor and capital inputs combined are derived by combining changes in labor and capital inputs with weights which represent each component's share of total output. The indexes for capital services and combined units of labor and capital are based on changing weights which are averages of the shares in the current and preceding year (the Tornquist index-number formula).

Notes on the data

Output measures for the business sector and the nonfarm businesss sector exclude the constant dollar value of owner-occupied housing, rest of world, households and institutions, and general government output from the constant dollar value of gross national product. The measures are derived from data supplied by the Bureau of Economic Analysis, U.S. Department of Commerce, and the Federal Reserve Board. Quarterly manufacturing output indexes are adjusted by the Bureau of Labor Statistics to annual estimates of output (gross product originating) from the Bureau of Economic Analysis. Compensation and hours data are developed from data of the Bureau of Labor Statistics and the Bureau of Economic Analysis.

The productivity and associated cost measures in tables 42–44 describe the relationship between output in real terms and the labor time and capital services involved in its production. They show the changes from period to period in the amount of goods and services produced per unit of input. Although these measures relate output to hours and capital services, they do not measure the contributions of labor, capital, or any other specific factor of production. Rather, they reflect the joint effect of many influences, including changes in technology; capital investment; level of output; utilization of capacity, energy, and materials; the organization of production; managerial skill; and the characteristics and efforts of the work force.

Additional sources of information

Descriptions of methodology underlying the measurement of output per hour and multifactor productivity are found in the *BLS Handbook of Methods*, Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 13. Historical data for selected industries are provided in the Bureau's *Handbook of Labor Statistics*, 1985, Bulletin 2217.

INTERNATIONAL COMPARISONS
(Tables 45–47)

Labor force and unemployment

Description of the series

Tables 45 and 46 present comparative measures of the labor force, employment, and unemployment—approximating U.S. concepts—for the United States, Canada, Australia, Japan, and six European countries. The unemployment statistics (and, to a lesser extent, employment statistics) published by other industrial countries are not, in most cases, comparable to U.S. unemployment statistics. Therefore, the Bureau adjusts the figures for selected countries, where necessary, for all known major definitional differences. Although precise comparability may not be achieved, these adjusted figures provide a better basis for international comparisons than the figures regularly published by each country.

Definitions

For the principal U.S. definitions of the **labor force**, **employment**, and **unemployment**, see the Notes section on EMPLOYMENT DATA: Household Survey Data.

Notes on the data

The adjusted statistics have been adapted to the age at which compulsory schooling ends in each country, rather than to the U.S. standard of 16 years of age and over. Therefore, the adjusted statistics relate to the population age 16 and over in France, Sweden, and from 1973 onward, the United Kingdom; 16 and over in Canada, Australia, Japan, Germany, the Netherlands, and prior to 1973, the United Kingdom; and 14 and over in Italy. The institutional population is included in the denominator of the labor force participation rates and employment-population ratios for Japan and Germany; it is excluded for the United States and the other countries.

In the U.S. labor force survey, persons on layoff who are awaiting recall to their job are classified as unemployed. European and Japanese layoff practices are quite different in nature from those in the United States; therefore, strict application of the U.S. definition has not been made on this point. For further information, see *Monthly Labor Review*, December 1981, pp. 8–11.

The figures for one or more recent years for France, Germany, Italy, the Netherlands, and the United Kingdom are calculated using adjustment factors based on labor force surveys for earlier years and are considered preliminary. The recent-year measures for these countries are, therefore, subject to revision whenever data from more current labor force surveys become available.

Additional sources of information

For further information, see *International Comparisons of Unemployment*, Bulletin 1979 (Bureau of Labor Statistics, 1978), Appendix B and unpublished Supplements to Appendix B available on request. The statistics are also analyzed periodically in the *Monthly Labor Review*. Additional historical data, generally beginning with 1959, are published in the *Handbook of Labor Statistics* and are available in unpublished statistical supplements to Bulletin 1979.

Manufacturing productivity and labor costs

Description of the series

Table 47 presents comparative measures of manufacturing labor productivity, hourly compensation costs, and unit labor costs for the United States, Canada, Japan, and nine European countries. These measures are limited to trend comparisons—that is, intercountry series of changes over time—rather than level comparisons because reliable international comparisons of the levels of manufacturing output are unavailable.

Definitions

Output is constant value output (value added), generally taken from the national accounts of each country. While the national accounting methods for measuring real output differ considerably among the 12 countries, the use of different procedures does not, in itself, connote lack of comparability—rather, it reflects differences among countries in the availability and reliability of underlying data series.

Hours refer to all employed persons including the self-employed in the United States and Canada; to all wage and salary employees in the other countries. The U.S. hours measure is hours paid; the hours measures for the other countries are hours worked.

Compensation (labor cost) includes all payments in cash or kind made directly to employees plus employer expenditures for legally required insurance programs and contractual and private benefit plans. In addition, for some countries, compensation is adjusted for other significant taxes on payrolls or employment (or reduced to reflect subsidies), even if they are not for the direct benefit of workers, because such taxes are regarded as labor costs. However, compensation does not include all items of labor cost. The costs of recruitment, employee training, and plant facilities and services—such as cafeterias and medical clinics—are not covered because data are not available for most countries. Self-employed workers are included in the U.S. and Canadian compensation figures by assuming that their hourly compensation is equal to the average for wage and salary employees.

Notes on the data

For most of the countries, the measures refer to total manufacturing as defined by the International Standard Industrial Classification. However, the measures for France (beginning 1959), Italy (beginning 1970), and the United Kingdom (beginning 1971), refer to manufacturing and mining less energy-related products and the figures for the Netherlands exclude petroleum refining from 1969 to 1976. For all countries, manufacturing includes the activities of government enterprises.

The figures for one or more recent years are generally based on current indicators of manufacturing output, employment, hours, and hourly compensation and are considered preliminary until the national accounts and other statistics used for the long-term measures become available.

Additional sources of information

For additional information, see the *BLS Handbook of Methods*, Bulletin 2134-1 (Bureau of Labor Statistics, 1982), chapter 16 and periodic *Monthly Labor Review* articles. Historical data are provided in the Bureau's *Handbook of Labor Statistics*, Bulletin 2217, 1985. The statistics are issued twice per year—in a news release (generally in May) and in a *Monthly Labor Review* article (generally in December).

OCCUPATIONAL INJURY AND ILLNESS DATA

(Table 48)

Description of the series

The Annual Survey of Occupational Injuries and Illnesses is designed to collect data on injuries and illnesses based on records which employers in the following industries maintain under the Occupational Safety and Health Act of 1970: agriculture, forestry, and fishing; oil and gas extraction; construction; manufacturing; transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services. Excluded from the survey are self-employed individuals, farmers with fewer than 11 employees, employers regulated by other Federal safety and health laws, and Federal, State, and local government agencies.

Because the survey is a Federal–State cooperative program and the data must meet the needs of participating State agencies, an independent sample is selected for each State. The sample is selected to represent all private industries in the States and territories. The sample size for the survey is dependent upon (1) the characteristics for which estimates are needed; (2) the industries for which estimates are desired; (3) the characteristics of the population being sampled; (4) the target reliability of the estimates; and (5) the survey design employed.

While there are many characteristics upon which the sample design could be based, the total recorded case incidence rate is used because it is one of the most important characteristics and the least variable; therefore, it requires the smallest sample size.

The survey is based on stratified random sampling with a Neyman allocation and a ratio estimator. The characteristics used to stratify the establishments are the Standard Industrial Classification (SIC) code and size of employment.

Definitions

Recordable occupational injuries and illnesses are: (1) occupational deaths, regardless of the time between injury and death, or the length of the illness; or (2) nonfatal occupational illnesses; or (3) nonfatal occupational injuries which involve one or more of the following: loss of consciousness, restriction of work or motion, transfer to another job, or medical treatment (other than first aid).

Occupational injury is any injury such as a cut, fracture, sprain, amputation, and so forth, which results from a work accident or from exposure involving a single incident in the work environment.

Occupational illness is an abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or disease which may be caused by inhalation, absorption, ingestion, or direct contact.

Lost workday cases are cases which involve days away from work, or days of restricted work activity, or both.

Lost workday cases involving restricted work activity are those cases which result in restricted work activity only.

Lost workdays away from work are the number of workdays (consecutive or not) on which the employee would have worked but could not because of occupational injury or illness.

Lost workdays—restricted work activity are the number of workdays (consecutive or not) on which, because of injury or illness: (1) the employee was assigned to another job on a temporary basis; or (2) the employee worked at a permanent job less than full time; or (3) the employee worked at a permanently assigned job but could not perform all duties normally connected with it.

The number of days away from work or days of restricted work activity does not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work.

Incidence rates represent the number of injuries and/or illnesses or lost workdays per 100 full-time workers.

Notes on the data

Estimates are made for industries and employment-size classes and for severity classification: fatalities, lost workday cases, and nonfatal cases without lost workdays. Lost workday cases are separated into those where the employee would have worked but could not and those in which work activity was restricted. Estimates of the number of cases and the number of days lost are made for both categories.

Most of the estimates are in the form of incidence rates, defined as the number of injuries and illnesses, or lost workdays, per 100 full-time employees. For this purpose, 200,000 employee hours represent 100 employee years (2,000 hours per employee). Only a few of the available measures are included in the *Handbook of Labor Statistics*. Full detail is presented in the annual bulletin, *Occupational Injuries and Illnesses in the United States, by Industry*.

Comparable data for individual States are available from the BLS Office of Occupational Safety and Health Statistics.

Mining and railroad data are furnished to BLS by the Mine Safety and Health Administration and the Federal Railroad Administration, respectively. Data from these organizations are included in BLS and State publications. Federal employee experience is compiled and published by the Occupational Safety and Health Administration. Data on State and local government employees are collected by about half of the States and territories; these data are not compiled nationally.

Additional sources of information

The Supplementary Data System provides detailed information describing various factors associated with work-related injuries and illnesses. These data are obtained from information reported by *employers* to State workers' compensation agencies. The Work Injury Report program examines selected types of accidents through an employee survey which focuses on the circumstances surrounding the injury. These data are not included in the *Handbook of Labor Statistics* but are available from the BLS Office of Occupational Safety and Health Statistics.

The definitions of occupational injuries and illnesses and lost workdays are from *Recordkeeping Requirements under the Occupational Safety and Health Act of 1970*. For additional data, see *Occupational Injuries and Illnesses in the United States, by Industry*, annual Bureau of Labor Statistics bulletin; BLS *Handbook of Methods*, Bulletin 2134–1 (Bureau of Labor Statistics, 1982), chapter 17; *Handbook of Labor Statistics*, Bulletin 2217 (Bureau of Labor Statistics, 1985), pp. 411–14; annual reports in the *Monthly Labor Review*; and annual U.S. Department of Labor press releases.

1. Labor market indicators

Selected indicators	1985	1986	1985		1986				1987	
			III	IV	I	II	III	IV	I	II
Employment data										
Employment status of the civilian noninstitutionalized population (household survey)[1]										
Labor force participation rate	64.8	65.3	64.7	64.9	65.1	65.2	65.3	65.4	65.5	65.5
Employment-population ratio	60.1	60.7	60.1	60.3	60.5	60.6	60.8	60.9	61.1	61.5
Unemployment rate	7.2	7.0	7.2	7.1	7.1	7.1	6.9	6.9	6.7	6.2
Men	7.0	6.9	7.0	6.9	6.9	7.0	6.9	6.9	6.7	6.3
16 to 24 years	14.1	13.7	14.0	14.2	13.5	14.2	13.7	13.4	13.4	13.1
25 years and over	5.3	5.4	5.3	5.2	5.3	5.3	5.4	5.4	5.2	4.8
Women	7.4	7.1	7.4	7.3	7.3	7.2	6.9	6.8	6.6	6.1
16 to 24 years	13.0	12.8	12.9	13.1	13.1	13.1	12.6	12.5	12.6	11.8
25 years and over	5.9	5.5	5.9	5.6	5.7	5.7	5.4	5.3	5.1	4.6
Unemployment rate, 15 weeks and over	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.7
Employment, nonagricultural (payroll data), in thousands:[1]										
Total	97,519	99,610	97,775	98,444	98,901	99,321	99,804	100,397	101,133	101,708
Private sector	81,125	82,900	81,303	81,905	82,299	82,670	83,119	83,498	84,183	84,675
Goods-producing	24,859	24,681	24,788	24,788	24,767	24,702	24,629	24,624	24,733	24,757
Manufacturing	19,260	18,994	19,183	19,133	19,086	19,003	18,939	18,953	18,979	19,015
Service-producing	72,660	74,930	72,987	73,656	74,134	74,619	75,175	75,773	76,399	76,951
Average hours:										
Private sector	34.9	34.8	34.9	34.9	34.9	34.8	34.7	34.7	34.8	34.8
Manufacturing	40.5	40.7	40.6	40.8	40.7	40.7	40.7	40.8	41.0	40.9
Overtime	3.3	3.4	3.3	3.4	3.4	3.4	3.5	3.5	3.6	3.7
Employment Cost Index										
Percent change in the ECI, compensation:										
All workers (excluding farm, household, and Federal workers)	4.3	3.6	1.6	.6	1.1	.7	1.1	.6	.9	.7
Private industry workers	3.9	3.2	1.3	.6	1.1	.8	.7	.6	1.0	.7
Goods-producing[2]	3.4	3.1	.6	.6	1.1	.9	.6	.5	.5	.7
Service-producing[2]	4.4	3.2	1.8	.5	1.1	.6	.8	.6	1.3	.7
State and local government workers	5.7	5.2	3.4	.7	1.0	.6	2.8	.8	.8	.3
Workers by bargaining status (private industry):										
Union	2.6	2.1	.8	.5	1.0	.2	.5	.3	.5	.5
Nonunion	4.6	3.6	1.4	.6	1.2	.9	.8	.7	1.1	.7

[1] Quarterly data seasonally adjusted.

[2] Goods-producing industries include mining, construction, and manufacturing. Service-producing industries include all other private sector industries.

2. Annual and quarterly percent changes in compensation, prices, and productivity

Selected measures	1985	1986	1985		1986				1987	
			III	IV	I	II	III	IV	I	II
Compensation data [1, 2]										
Employment Cost Index--compensation (wages, salaries, benefits):										
Civilian nonfarm	4.3	3.6	1.6	0.6	1.1	0.7	1.1	0.6	0.9	0.7
Private nonfarm	3.9	3.2	1.3	.6	1.1	.8	.7	.6	1.0	.7
Employment Cost Index--wages and salaries										
Civilian nonfarm	4.4	3.5	1.7	.6	1.0	.8	1.1	.6	1.0	.5
Private nonfarm	4.1	3.1	1.3	.6	1.0	.9	.7	.5	1.0	.7
Price data[1]										
Consumer Price Index (All urban consumers): All items	3.8	1.1	.7	.9	-.4	.6	.7	.3	1.4	1.3
Producer Price Index:										
Finished goods	1.8	-2.3	-1.4	2.5	-3.1	.5	-.7	1.1	.8	1.4
Finished consumer goods	1.5	-3.6	-1.4	2.5	-4.1	.4	-.7	.8	.9	1.8
Capital equipment	2.7	2.1	-1.4	2.5	.2	.6	-.7	2.0	.1	.4
Intermediate materials, supplies, components	-.3	-4.4	-.5	.4	-2.9	-.9	-.2	-.4	1.4	1.8
Crude materials	-5.6	-9.0	-4.5	4.3	-7.6	-1.5	-.5	.6	4.2	5.6
Productivity data[3]										
Output per hour of all persons:										
Business sector	1.8	1.9	2.5	1.9	2.8	2.3	1.3	1.5	.2	.4
Nonfarm business sector	1.2	1.6	1.7	1.0	2.3	1.9	1.1	1.5	-.1	.3
Nonfinancial corporations [4]	2.1	1.6	3.3	2.3	2.6	1.8	.7	1.5	-	.3

[1] Annual changes are December-to-December change. Quarterly changes are calculated using the last month of each quarter. Compensation and price data are not seasonally adjusted and the price data are not compounded.
[2] Excludes Federal and private household workers.
[3] Annual rates of change are computed by comparing annual averages. Quarterly percent changes reflect annual rates of change in quarterly indexes. The data are seasonally adjusted.
[4] Output per hour of all employees.
- Data not available.

3. Alternative measures of wage and compensation changes

Components	Quarterly average						Four quarters ended--					
	1986				1987		1986				1987	
	I	II	III	IV	I	II	I	II	III	IV	I	II
Average hourly compensation:[1]												
All persons, business sector	4.8	4.4	3.7	3.3	2.8	2.8	3.2	3.5	3.0	3.6	1.4	3.3
All employees, nonfarm business sector	4.5	4.1	3.6	3.4	2.7	2.7	3.9	2.9	2.8	4.0	1.1	3.0
Employment Cost Index--compensation:												
Civilian nonfarm [2]	1.1	.7	1.1	.6	.9	.7	4.1	4.0	3.6	3.6	3.4	3.3
Private nonfarm	1.1	.8	.7	.6	1.0	.7	3.8	3.8	3.2	3.2	3.1	3.0
Union	1.0	.2	.5	.3	.5	.5	2.9	2.5	2.3	2.1	1.6	1.9
Nonunion	1.2	.9	.8	.7	1.1	.7	4.2	4.2	3.5	3.6	3.6	3.4
State and local governments	1.0	.6	2.8	.8	.8	.3	5.5	5.8	5.2	5.2	5.0	4.7
Employment Cost Index--wages and salaries:												
Civilian nonfarm[2]	1.0	.8	1.1	.6	1.0	.5	4.2	4.1	3.5	3.5	3.5	3.2
Private nonfarm	1.0	.9	.7	.5	1.0	.7	3.9	3.7	3.1	3.1	3.2	3.0
Union	.7	.4	.6	.2	.4	.5	3.2	2.5	2.3	2.0	1.7	1.7
Nonunion	1.1	.9	.7	.7	1.2	.8	4.3	4.1	3.4	3.5	3.5	3.3
State and local governments	1.0	.4	3.2	.7	.8	.2	5.5	5.7	5.4	5.4	5.2	5.0
Total effective wage adjustments[3]	.6	.7	.5	.5	.4	1.0	3.1	2.9	2.3	2.3	2.0	2.2
From current settlements	(4)	.2	.1	.2	(4)	.1	.6	.5	.5	.5	.4	.3
From prior settlements	.4	.6	.5	.2	.3	.7	1.7	1.8	1.6	1.7	1.5	1.6
From cost-of-living provision	.2	(4)	(4)	.1	.1	.2	.8	.7	.2	.2	.1	.3
Negotiated wage adjustments from settlements:[3]												
First-year adjustments	.8	1.3	.8	2.0	1.2	2.6	2.0	1.6	1.2	1.2	1.2	1.5
Annual rate over life of contract	1.5	2.0	1.5	2.1	1.8	2.9	2.5	2.2	1.7	1.8	1.8	2.0
Negotiated wage and benefit adjustments from settlements:[5]												
First-year adjustment	.6	.7	.7	2.7	1.7	4.2	2.3	1.4	.9	1.1	1.2	1.9
Annual rate over life of contract	1.2	1.6	1.2	2.4	2.4	3.9	2.5	2.0	1.4	1.6	1.7	2.1

[1] Seasonally adjusted.
[2] Excludes Federal and household workers.
[3] Limited to major collective bargaining units of 1,000 workers or more. The most recent data are preliminary.
[4] Data round to zero.
[5] Limited to major collective bargaining units of 5,000 workers or more. The most recent data are preliminary.

4. Employment status of the total population, by sex, monthly data seasonally adjusted

(Numbers in thousands)

Employment status	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
TOTAL															
Noninstitutional population [1, 2]	179,912	182,293	182,525	182,713	182,935	183,114	183,297	183,575	183,738	183,915	184,079	184,259	184,421	184,605	184,738
Labor force [2]	117,167	119,540	119,821	119,988	120,163	120,426	120,336	120,782	121,089	120,958	121,070	121,719	121,235	121,672	122,038
Participation rate [3]	65.1	65.6	65.6	65.7	65.7	65.8	65.7	65.8	65.9	65.8	65.8	66.1	65.7	65.9	66.1
Total employed [2]	108,856	111,303	111,764	111,703	111,941	112,183	112,387	112,759	113,122	113,104	113,570	114,173	113,975	114,447	114,817
Employment-population ratio [4]	60.5	61.1	61.2	61.1	61.2	61.3	61.3	61.4	61.6	61.5	61.7	62.0	61.8	62.0	62.2
Resident Armed Forces [1]	1,706	1,706	1,697	1,716	1,749	1,751	1,750	1,748	1,740	1,736	1,735	1,726	1,718	1,720	1,736
Civilian employed	107,150	109,597	110,067	109,987	110,192	110,432	110,637	111,011	111,382	111,368	111,835	112,447	112,257	112,727	113,081
Agriculture	3,179	3,163	3,057	3,142	3,162	3,215	3,161	3,145	3,236	3,284	3,290	3,335	3,178	3,219	3,092
Nonagricultural industries	103,971	106,434	107,010	106,845	107,030	107,217	107,476	107,866	108,146	108,084	108,545	109,112	109,079	109,508	109,989
Unemployed	8,312	8,237	8,057	8,285	8,222	8,243	7,949	8,023	7,967	7,854	7,500	7,546	7,260	7,224	7,221
Unemployment rate [5]	7.1	6.9	6.7	6.9	6.8	6.8	6.6	6.6	6.6	6.5	6.2	6.2	6.0	5.9	5.9
Not in labor force	62,744	62,752	62,704	62,725	62,772	62,688	62,961	62,793	62,649	62,957	63,009	62,540	63,187	62,933	62,700
Men, 16 years and over															
Noninstitutional population [1, 2]	86,025	87,349	87,460	87,556	87,682	87,773	87,868	88,020	88,099	88,186	88,271	88,361	88,442	88,534	88,598
Labor force [2]	65,967	66,973	66,911	67,128	67,130	67,407	67,425	67,672	67,764	67,644	67,603	67,816	67,556	67,656	67,925
Participation rate [3]	76.7	76.7	76.5	76.7	76.6	76.8	76.7	76.9	76.9	76.7	76.6	76.7	76.4	76.4	76.7
Total employed [2]	61,447	62,443	62,483	62,528	62,565	62,833	62,986	63,187	63,335	63,282	63,417	63,562	63,471	63,715	63,918
Employment-population ratio [4]	71.4	71.5	71.4	71.4	71.4	71.6	71.7	71.8	71.9	71.8	71.8	71.9	71.8	72.0	72.1
Resident Armed Forces [1]	1,556	1,551	1,541	1,560	1,590	1,592	1,593	1,591	1,584	1,575	1,575	1,566	1,559	1,561	1,575
Civilian employed	59,891	60,892	60,942	60,968	60,975	61,241	61,393	61,596	61,751	61,707	61,842	61,996	61,912	62,154	62,343
Unemployed	4,521	4,530	4,428	4,600	4,565	4,574	4,439	4,484	4,429	4,362	4,186	4,254	4,085	3,941	4,007
Unemployment rate [5]	6.9	6.8	6.6	6.9	6.8	6.8	6.6	6.6	6.5	6.4	6.2	6.3	6.0	5.8	5.9
Women, 16 years and over															
Noninstitutional population [1, 2]	93,886	94,944	95,065	95,156	95,253	95,341	95,429	95,556	95,639	95,729	95,808	95,898	95,979	96,071	96,140
Labor force [2]	51,200	52,568	52,910	52,860	53,033	53,019	52,911	53,110	53,325	53,314	53,467	53,903	53,679	54,016	54,113
Participation rate [3]	54.5	55.4	55.7	55.6	55.7	55.6	55.4	55.6	55.8	55.7	55.8	56.2	55.9	56.2	56.3
Total employed [2]	47,409	48,861	49,281	49,175	49,376	49,350	49,401	49,572	49,787	49,822	50,153	50,611	50,504	50,733	50,899
Employment-population ratio [4]	50.5	51.5	51.8	51.7	51.8	51.8	51.8	51.9	52.1	52.0	52.3	52.8	52.6	52.8	52.9
Resident Armed Forces [1]	150	155	156	156	159	159	157	157	156	161	160	160	159	159	161
Civilian employed	47,259	48,706	49,125	49,019	49,217	49,191	49,244	49,415	49,631	49,661	49,993	50,451	50,345	50,574	50,738
Unemployed	3,791	3,707	3,629	3,685	3,657	3,669	3,510	3,538	3,538	3,492	3,314	3,292	3,175	3,283	3,213
Unemployment rate [5]	7.4	7.1	6.9	7.0	6.9	6.9	6.6	6.7	6.6	6.6	6.2	6.1	5.9	6.1	5.9

[1] The population and Armed Forces figures are not adjusted for seasonal variation.
[2] Includes members of the Armed Forces stationed in the United States.
[3] Labor force as a percent of the noninstitutional population.
[4] Total employed as a percent of the noninstitutional population.
[5] Unemployment as a percent of the labor force (including the resident Armed Forces).

5. Employment status of the civilian population, by sex, age, race and Hispanic origin, monthly data seasonally adjusted

(Numbers in thousands)

Employment status	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
TOTAL															
Civilian noninstitutional population[1]	178,206	180,587	180,828	180,997	181,186	181,363	181,547	181,827	181,998	182,179	182,344	182,533	182,703	182,885	183,002
Civilian labor force	115,461	117,834	118,124	118,272	118,414	118,675	118,586	119,034	119,349	119,222	119,335	119,993	119,517	119,952	120,302
Participation rate	64.8	65.3	65.3	65.3	65.4	65.4	65.3	65.5	65.6	65.4	65.4	65.7	65.4	65.6	65.7
Employed	107,150	109,597	110,067	109,987	110,192	110,432	110,637	111,011	111,382	111,368	111,835	112,447	112,257	112,727	113,081
Employment-population ratio[2]	60.1	60.7	60.9	60.8	60.8	60.9	60.9	61.1	61.2	61.1	61.3	61.6	61.4	61.6	61.8
Unemployed	8,312	8,237	8,057	8,285	8,222	8,243	7,949	8,023	7,967	7,854	7,500	7,546	7,260	7,224	7,221
Unemployment rate	7.2	7.0	6.8	7.0	6.9	6.9	6.7	6.7	6.7	6.6	6.3	6.3	6.1	6.0	6.0
Not in labor force	62,744	62,752	62,704	62,725	62,772	62,688	62,961	62,793	62,649	62,957	63,009	62,540	63,187	62,933	62,700
Men, 20 years and over															
Civilian noninstitutional population[1]	77,195	78,523	78,634	78,722	78,802	78,874	78,973	79,132	79,216	79,303	79,387	79,474	79,536	79,625	79,668
Civilian labor force	60,277	61,320	61,219	61,412	61,409	61,703	61,826	61,948	61,973	61,983	61,976	62,156	62,057	62,116	62,053
Participation rate	78.1	78.1	77.9	78.0	77.9	78.2	78.3	78.3	78.2	78.2	78.1	78.2	78.0	78.0	77.9
Employed	56,562	57,569	57,585	57,607	57,595	57,883	58,101	58,227	58,325	58,410	58,567	58,721	58,620	58,793	58,818
Employment-population ratio[2]	73.3	73.3	73.2	73.2	73.1	73.4	73.6	73.6	73.6	73.7	73.8	73.9	73.7	73.8	73.8
Agriculture	2,278	2,292	2,185	2,286	2,297	2,303	2,289	2,254	2,300	2,411	2,411	2,441	2,307	2,343	2,254
Nonagricultural industries	54,284	55,277	55,400	55,321	55,298	55,580	55,812	55,974	56,024	55,999	56,155	56,280	56,313	56,450	56,564
Unemployed	3,715	3,751	3,634	3,805	3,814	3,820	3,725	3,720	3,648	3,573	3,409	3,436	3,437	3,323	3,235
Unemployment rate	6.2	6.1	5.9	6.2	6.2	6.2	6.0	6.0	5.9	5.8	5.5	5.5	5.5	5.4	5.2
Women, 20 years ond over															
Civilian noninstitutional population[1]	86,506	87,567	87,689	87,779	87,856	87,933	88,016	88,150	88,237	88,321	88,395	88,464	88,546	88,632	88,685
Civilian labor force	47,283	48,589	48,950	48,920	49,014	49,043	48,923	49,161	49,348	49,355	49,466	49,774	49,714	49,971	49,989
Participation rate	54.7	55.5	55.8	55.7	55.8	55.8	55.6	55.8	55.9	55.9	56.0	56.3	56.1	56.4	56.4
Employed	44,154	45,556	45,956	45,905	46,020	46,067	46,058	46,261	46,475	46,498	46,751	47,094	47,126	47,288	47,324
Employment-population ratio[2]	51.0	52.0	52.4	52.3	52.4	52.4	52.3	52.5	52.7	52.6	52.9	53.2	53.2	53.4	53.4
Agriculture	596	614	622	614	612	675	621	628	641	589	587	634	615	619	603
Nonagricultural industries	43,558	44,943	45,334	45,291	45,408	45,392	45,437	45,633	45,835	45,909	46,164	46,460	46,512	46,669	46,722
Unemployed	3,129	3,032	2,994	3,015	2,994	2,976	2,865	2,900	2,873	2,857	2,715	2,680	2,588	2,683	2,664
Unemployment rate	6.6	6.2	6.1	6.2	6.1	6.1	5.9	5.9	5.8	5.8	5.5	5.4	5.2	5.4	5.3
Both sexes, 16 to 19 years															
Civilian noninstitutional population[1]	14,506	14,496	14,505	14,496	14,527	14,557	14,558	14,545	14,546	14,555	14,562	14,595	14,621	14,628	14,649
Civilian labor force	7,901	7,926	7,955	7,940	7,991	7,929	7,837	7,926	8,028	7,884	7,894	8,063	7,746	7,865	8,260
Participation rate	54.5	54.7	54.8	54.8	55.0	54.5	53.8	54.5	55.2	54.2	54.2	55.2	53.0	53.8	56.4
Employed	6,434	6,472	6,526	6,475	6,577	6,482	6,478	6,524	6,582	6,460	6,518	6,633	6,511	6,647	6,939
Employment-population ratio[2]	44.4	44.6	45.0	44.7	45.3	44.5	44.5	44.9	45.2	44.4	44.8	45.4	44.5	45.4	47.4
Agriculture	305	258	250	242	253	237	251	264	295	284	292	261	257	258	236
Nonagricultural industries	6,129	6,215	6,276	6,233	6,324	6,245	6,227	6,260	6,287	6,176	6,226	6,372	6,254	6,389	6,703
Unemployed	1,468	1,454	1,429	1,465	1,414	1,447	1,359	1,402	1,446	1,424	1,376	1,430	1,235	1,218	1,321
Unemployment rate	18.6	18.3	18.0	18.5	17.7	18.2	17.3	17.7	18.0	18.1	17.4	17.7	15.9	15.5	16.0
White															
Civilian noninstitutional population[1]	153,679	155,432	155,604	155,723	155,856	155,979	156,111	156,313	156,431	156,561	156,676	156,811	156,930	157,058	157,134
Civilian labor force	99,926	101,801	102,122	102,158	102,297	102,455	102,503	102,746	102,893	102,797	102,894	103,573	103,106	103,272	103,614
Participation rate	65.0	65.5	65.6	65.6	65.6	65.7	65.7	65.7	65.8	65.7	65.7	66.1	65.7	65.8	65.9
Employed	93,736	95,660	96,177	96,000	96,147	96,281	96,533	96,717	96,995	96,998	97,340	98,050	97,716	97,958	98,299
Employment-population ratio[2]	61.0	61.5	61.8	61.6	61.7	61.7	61.8	61.9	62.0	62.0	62.1	62.5	62.3	62.4	62.6
Unemployed	6,191	6,140	5,945	6,158	6,150	6,174	5,970	6,029	5,898	5,799	5,554	5,524	5,390	5,314	5,315
Unemployment rate	6.2	6.0	5.8	6.0	6.0	6.0	5.8	5.9	5.7	5.6	5.4	5.3	5.2	5.1	5.1
Black															
Civilian noninstitutional population[1]	19,664	19,989	20,028	20,056	20,089	20,120	20,152	20,187	20,218	20,249	20,279	20,312	20,341	20,373	20,396
Civilian labor force	12,364	12,654	12,553	12,652	12,720	12,719	12,707	12,831	12,957	12,844	12,743	12,860	12,863	13,047	13,194
Participation rate	62.9	63.3	62.7	63.1	63.3	63.2	63.1	63.6	64.1	63.4	62.8	63.3	63.2	64.0	64.7
Employed	10,501	10,814	10,716	10,799	10,895	10,910	10,968	10,997	11,101	11,053	11,090	11,080	11,223	11,401	11,563
Employment-population ratio[2]	53.4	54.1	53.5	53.8	54.2	54.2	54.4	54.5	54.9	54.6	54.7	54.6	55.2	56.0	56.7
Unemployed	1,864	1,840	1,837	1,853	1,825	1,809	1,739	1,833	1,855	1,791	1,653	1,779	1,640	1,647	1,630
Unemployment rate	15.1	14.5	14.6	14.6	14.3	14.2	13.7	14.3	14.3	13.9	13.0	13.8	12.7	12.6	12.4

See footnotes at end of table.

5. Continued— Employment status of the civilian population, by sex, age, race and Hispanic origin, monthly data seasonally adjusted

(Numbers in thousands)

Employment status	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Hispanic origin															
Civilian noninstitutional population[1]	11,915	12,344	12,397	12,432	12,469	12,505	12,540	12,653	12,692	12,732	12,770	12,809	12,848	12,887	12,925
Civilian labor force	7,698	8,076	8,130	8,179	8,200	8,226	8,320	8,431	8,457	8,392	8,484	8,586	8,452	8,411	8,544
Participation rate	64.6	65.4	65.6	65.8	65.8	65.8	66.3	66.6	66.6	65.9	66.4	67.0	65.8	65.3	66.1
Employed	6,888	7,219	7,248	7,286	7,345	7,437	7,446	7,538	7,644	7,639	7,701	7,838	7,730	7,744	7,864
Employment-population ratio[2]	57.8	58.5	58.5	58.6	58.9	59.5	59.4	59.6	60.2	60.0	60.3	61.2	60.2	60.1	60.8
Unemployed	811	857	882	893	855	789	874	893	813	753	783	748	722	667	680
Unemployment rate	10.5	10.6	10.8	10.9	10.4	9.6	10.5	10.6	9.6	9.0	9.2	8.7	8.5	7.9	8.0

[1] The population figures are not seasonally adjusted.
[2] Civilian employment as a percent of the civilian noninstitutional population.
NOTE: Detail for the above race and Hispanic-origin groups will not sum to totals because data for the "other races" groups are not presented and Hispanics are included in both the white and black population groups.

6. Selected employment indicators, monthly data seasonally adjusted

(In thousands)

Selected categories	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
CHARACTERISTIC															
Civilian employed, 16 years and over	107,150	109,597	110,067	109,987	110,192	110,432	110,637	111,011	111,382	111,368	111,835	112,447	112,257	112,727	113,081
Men	59,891	60,892	60,942	60,968	60,975	61,241	61,393	61,596	61,751	61,707	61,842	61,996	61,912	62,154	62,343
Women	47,259	48,706	49,125	49,019	49,217	49,191	49,244	49,415	49,631	49,661	49,993	50,451	50,345	50,574	50,738
Married men, spouse present	39,248	39,658	39,735	39,691	39,780	39,952	40,093	40,102	39,913	40,100	39,967	40,029	40,057	40,241	40,260
Married women, spouse present	26,336	27,144	27,388	27,249	27,323	27,333	27,400	27,525	27,817	27,965	28,213	28,495	28,458	28,426	28,196
Women who maintain families	5,597	5,837	5,832	5,926	6,016	6,041	6,005	5,985	5,906	5,933	5,972	5,921	5,939	6,013	6,108
MAJOR INDUSTRY AND CLASS OF WORKER															
Agriculture:															
Wage and salary workers	1,535	1,547	1,509	1,521	1,562	1,582	1,621	1,650	1,647	1,739	1,589	1,695	1,614	1,619	1,566
Self-employed workers	1,458	1,447	1,387	1,460	1,451	1,425	1,400	1,370	1,454	1,418	1,505	1,442	1,386	1,429	1,363
Unpaid family workers	185	169	174	159	164	198	152	136	126	150	175	170	165	154	159
Nonagricultural industries:															
Wage and salary workers	95,871	98,299	98,586	98,692	98,846	98,869	99,164	99,550	99,748	99,834	100,112	100,834	100,420	100,838	101,334
Government	16,031	16,342	16,446	16,333	16,264	16,457	16,443	16,412	16,532	16,568	16,484	16,710	16,956	16,931	16,760
Private industries	79,841	81,957	82,140	82,359	82,582	82,412	82,721	83,138	83,216	83,265	83,628	84,124	83,464	83,907	84,574
Private households	1,249	1,235	1,247	1,229	1,216	1,183	1,189	1,269	1,204	1,227	1,266	1,266	1,146	1,224	1,172
Other	78,592	80,722	80,893	81,130	81,366	81,229	81,532	81,869	82,012	82,038	82,362	82,858	82,318	82,683	83,402
Self-employed workers	7,811	7,881	7,956	7,939	7,993	8,179	8,056	8,192	8,187	8,050	8,117	8,142	8,328	8,205	8,216
Unpaid family workers	289	255	271	275	265	252	239	246	255	273	268	275	274	268	250
PERSONS AT WORK PART TIME[1]															
All industries:															
Part time for economic reasons	5,590	5,588	5,471	5,544	5,740	5,563	5,596	5,505	5,780	5,456	5,391	5,282	5,184	5,508	5,262
Slack work	2,430	2,456	2,417	2,472	2,481	2,510	2,444	2,473	2,535	2,440	2,322	2,223	2,317	2,456	2,515
Could only find part-time work	2,819	2,800	2,741	2,772	2,826	2,714	2,867	2,695	2,828	2,698	2,746	2,665	2,579	2,722	2,494
Voluntary part time	13,489	13,935	13,981	13,922	14,178	14,021	13,877	14,170	14,061	14,167	13,862	14,573	15,054	14,422	14,634
Nonagricultural industries:															
Part time for economic reasons	5,334	5,345	5,269	5,303	5,450	5,319	5,342	5,201	5,459	5,164	5,110	5,029	4,918	5,235	4,998
Slack work	2,273	2,305	2,283	2,314	2,314	2,366	2,286	2,281	2,340	2,218	2,137	2,071	2,155	2,295	2,306
Could only find part-time work	2,730	2,719	2,678	2,710	2,739	2,626	2,765	2,599	2,742	2,595	2,662	2,594	2,477	2,634	2,433
Voluntary part time	13,038	13,502	13,606	13,520	13,736	13,567	13,455	13,750	13,597	13,682	13,399	14,069	14,485	13,946	14,168

[1] Excludes persons "with a job but not at work" during the survey period for such reasons as vacation, illness, or industrial disputes.

7. Selected unemployment indicators, monthly data seasonally adjusted

(Unemployment rates)

Selected categories	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
CHARACTERISTIC															
Total, all civilian workers	7.2	7.0	6.8	7.0	6.9	6.9	6.7	6.7	6.7	6.6	6.3	6.3	6.1	6.0	6.0
Both sexes, 16 to 19 years	18.6	18.3	18.0	18.5	17.7	18.2	17.3	17.7	18.0	18.1	17.4	17.7	15.9	15.5	16.0
Men, 20 years and over	6.2	6.1	5.9	6.2	6.2	6.2	6.0	6.0	5.9	5.8	5.5	5.5	5.5	5.4	5.2
Women, 20 years and over	6.6	6.2	6.1	6.2	6.1	6.1	5.9	5.9	5.8	5.8	5.5	5.4	5.2	5.4	5.3
White, total	6.2	6.0	5.8	6.0	6.0	6.0	5.8	5.9	5.7	5.6	5.4	5.3	5.2	5.1	5.1
Both sexes, 16 to 19 years	15.7	15.6	15.4	15.9	15.4	16.0	15.1	15.0	15.2	15.5	14.9	15.2	13.6	13.0	14.0
Men, 16 to 19 years	16.5	16.3	16.6	16.6	15.7	16.3	15.5	16.1	16.0	17.1	16.7	17.3	14.5	13.0	15.4
Women, 16 to 19 years	14.8	14.9	14.2	15.1	15.2	15.7	14.6	13.8	14.3	13.9	13.1	13.1	12.7	13.0	12.5
Men, 20 years and over	5.4	5.3	5.1	5.4	5.4	5.4	5.3	5.3	5.2	5.1	4.8	4.7	4.9	4.7	4.5
Women, 20 years and over	5.7	5.4	5.2	5.3	5.2	5.2	5.0	5.1	4.9	4.8	4.6	4.5	4.4	4.5	4.4
Black, total	15.1	14.5	14.6	14.6	14.3	14.2	13.7	14.3	14.3	13.9	13.0	13.8	12.7	12.6	12.4
Both sexes, 16 to 19 years	40.2	39.3	40.3	38.4	35.8	36.0	36.5	39.5	38.9	37.6	38.0	39.0	33.3	31.5	29.2
Men, 16 to 19 years	41.0	39.3	38.8	38.6	37.8	35.0	36.1	36.5	38.3	36.5	39.3	40.3	31.5	31.5	32.6
Women, 16 to 19 years	39.2	39.2	41.9	38.3	33.8	37.0	36.9	43.2	39.5	38.8	36.5	37.6	35.1	31.4	25.3
Men, 20 years and over	13.2	12.9	13.2	13.4	13.1	12.9	11.8	12.2	12.0	11.5	10.9	12.5	11.5	11.3	10.7
Women, 20 years and over	13.1	12.4	12.5	12.4	12.4	12.5	12.3	12.8	12.9	13.0	11.5	11.6	11.1	11.4	11.3
Hispanic origin, total	10.5	10.6	10.8	10.9	10.4	9.6	10.5	10.6	9.6	9.0	9.2	8.7	8.5	7.9	8.0
Married men, spouse present	4.3	4.4	4.2	4.3	4.6	4.5	4.3	4.2	4.2	4.1	4.1	3.9	4.0	3.8	3.7
Married women, spouse present	5.6	5.2	5.1	5.1	5.0	5.0	4.8	4.8	4.8	4.5	4.4	4.1	4.0	4.2	4.3
Women who maintain families	10.4	9.8	10.1	9.8	8.9	9.7	9.8	9.8	9.5	9.7	9.3	9.6	9.7	9.4	9.0
Full-time workers	6.8	6.6	6.4	6.6	6.6	6.6	6.3	6.4	6.3	6.2	5.9	5.9	5.9	5.7	5.6
Part-time workers	9.3	9.1	9.3	9.3	9.2	9.1	8.8	9.0	8.7	9.2	8.6	8.7	6.9	7.9	8.2
Unemployed 15 weeks and over	2.0	1.9	1.9	2.0	1.8	1.9	1.8	1.8	1.8	1.7	1.7	1.8	1.7	1.6	1.6
Labor force time lost[1]	8.1	7.9	7.7	7.9	7.8	7.7	7.6	7.6	7.6	7.4	7.3	7.2	7.1	6.9	6.8
INDUSTRY															
Nonagricultural private wage and salary workers	7.2	7.0	6.9	7.0	7.0	7.0	6.8	6.7	6.6	6.5	6.2	6.3	6.2	6.1	5.9
Mining	9.5	13.5	16.6	13.9	14.5	14.5	14.1	14.0	12.4	9.3	11.1	12.9	10.8	7.8	8.9
Construction	13.1	13.1	12.4	12.9	13.8	15.1	13.7	12.2	11.6	12.5	11.9	12.1	11.6	10.7	11.2
Manufacturing	7.7	7.1	6.9	7.0	7.3	7.1	6.9	6.8	6.8	6.9	6.2	6.4	5.6	6.0	5.5
Durable goods	7.6	6.9	6.8	6.5	7.2	6.6	6.4	6.8	6.8	6.7	6.2	6.3	5.3	6.1	5.5
Nondurable goods	7.8	7.4	6.9	7.7	7.3	7.9	7.7	6.8	6.9	7.3	6.2	6.6	6.0	5.9	5.5
Transportation and public utilities	5.1	5.1	4.8	4.7	5.2	4.4	4.6	4.8	4.0	4.6	4.8	4.4	5.0	4.4	4.3
Wholesale and retail trade	7.6	7.6	7.5	7.6	7.4	7.2	7.2	7.5	7.2	7.3	7.0	6.9	7.2	6.8	7.0
Finance and service industries	5.6	5.5	5.6	5.6	5.4	5.4	5.1	5.2	5.4	4.9	4.7	4.8	4.8	5.1	4.6
Government workers	3.9	3.6	3.3	3.5	3.7	3.6	3.3	3.6	3.7	3.4	3.6	3.3	3.4	3.4	3.9
Agricultural wage and salary workers	13.2	12.5	13.3	12.9	11.9	10.1	11.5	11.6	11.2	10.7	9.0	8.7	8.8	11.3	10.8

[1] Aggregate hours lost by the unemployed and persons on part time for economic reasons as a percent of potentially available labor force hours.

8. Unemployment rates by sex and age, monthly data seasonally adjusted

(Civilian workers)

Sex and age	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Total, 16 years and over	7.2	7.0	6.8	7.0	6.9	6.9	6.7	6.7	6.7	6.6	6.3	6.3	6.1	6.0	6.0
16 to 24 years	13.6	13.3	12.9	13.6	13.0	12.9	12.9	13.1	13.1	12.9	12.6	12.6	12.2	11.7	11.6
16 to 19 years	18.6	18.3	18.0	18.5	17.7	18.2	17.3	17.7	18.0	18.1	17.4	17.7	15.9	15.5	16.0
16 to 17 years	21.0	20.2	19.8	20.0	19.3	20.6	18.8	20.1	20.3	20.0	19.2	21.4	18.8	17.1	18.0
18 to 19 years	17.0	17.0	16.8	17.2	16.5	16.7	16.3	16.2	16.6	16.5	16.3	15.0	13.7	13.9	14.7
20 to 24 years	11.1	10.7	10.3	11.1	10.5	10.2	10.7	10.7	10.5	10.2	10.1	9.8	10.2	9.8	9.1
25 years and over	5.6	5.4	5.4	5.4	5.5	5.5	5.2	5.2	5.1	5.1	4.8	4.8	4.6	4.7	4.7
25 to 54 years	5.8	5.7	5.7	5.6	5.7	5.8	5.5	5.6	5.5	5.4	5.0	5.0	4.9	5.0	5.0
55 years and over	4.1	3.9	3.7	4.0	4.1	3.8	3.5	3.2	3.0	3.4	3.4	3.7	3.2	3.1	3.2
Men, 16 years and over	7.0	6.9	6.8	7.0	7.0	6.9	6.7	6.8	6.7	6.6	6.3	6.4	6.2	6.0	6.0
16 to 24 years	14.1	13.7	13.3	14.3	13.2	13.4	13.4	13.4	13.6	13.2	13.2	13.4	12.6	11.9	12.4
16 to 19 years	19.5	19.0	19.1	19.1	18.2	18.3	17.8	18.5	18.6	19.3	19.2	20.0	16.4	15.5	18.0
16 to 17 years	21.9	20.8	20.9	21.0	19.8	21.3	19.1	21.4	21.2	20.2	21.5	23.2	18.7	16.6	20.6
18 to 19 years	17.9	17.7	18.0	17.5	17.0	16.2	17.0	16.9	17.0	18.6	17.5	17.7	14.4	13.8	16.3
20 to 24 years	11.4	11.0	10.3	11.9	10.7	10.9	11.3	10.7	11.1	10.1	10.1	10.0	10.7	10.0	9.3
25 years and over	5.3	5.4	5.3	5.4	5.5	5.5	5.2	5.4	5.1	5.1	4.8	4.9	4.7	4.7	4.7
25 to 54 years	5.6	5.6	5.6	5.5	5.7	5.7	5.5	5.7	5.4	5.4	5.0	5.1	5.0	4.9	4.9
55 years and over	4.1	4.1	4.1	4.2	4.4	4.1	4.0	3.5	3.3	3.6	3.7	4.1	3.4	3.4	3.4
Women, 16 years and over	7.4	7.1	6.9	7.0	6.9	6.9	6.7	6.7	6.7	6.6	6.2	6.1	5.9	6.1	6.0
16 to 24 years	13.0	12.8	12.4	12.8	12.7	12.4	12.4	12.7	12.4	12.5	12.0	11.7	11.7	11.6	10.7
16 to 19 years	17.6	17.6	16.7	17.7	17.2	18.2	16.8	16.8	17.4	16.7	15.6	15.4	15.4	15.4	13.9
16 to 17 years	20.0	19.6	18.7	18.8	18.6	19.8	18.4	18.7	19.2	19.7	16.7	19.6	18.9	17.7	15.3
18 to 19 years	16.0	16.3	15.4	16.9	16.0	17.2	15.7	15.3	16.1	14.2	15.1	12.4	13.0	14.0	12.9
20 to 24 years	10.7	10.3	10.2	10.2	10.3	9.4	10.0	10.6	9.8	10.3	10.1	9.7	9.7	9.5	8.9
25 years and over	5.9	5.5	5.4	5.5	5.4	5.5	5.2	5.1	5.1	5.0	4.7	4.7	4.4	4.7	4.7
25 to 54 years	6.2	5.9	5.8	5.8	5.7	5.8	5.5	5.5	5.6	5.4	5.0	4.9	4.7	5.0	5.0
55 years and over	4.1	3.6	3.3	3.6	3.6	3.4	2.9	2.7	2.6	3.2	3.0	3.0	2.8	2.6	2.9

9. Unemployed persons by reason for unemployment, monthly data seasonally adjusted

(Numbers in thousands)

Reason for unemployment	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Job losers	4,139	4,033	3,824	4,044	3,984	3,947	3,890	3,971	3,839	3,822	3,732	3,611	3,565	3,522	3,339
On layoff	1,157	1,090	1,017	1,029	1,072	1,073	1,078	1,118	998	1,011	958	906	901	918	850
Other job losers	2,982	2,943	2,807	3,015	2,912	2,874	2,812	2,854	2,842	2,811	2,774	2,705	2,664	2,604	2,489
Job leavers	877	1,015	990	1,041	1,027	1,056	1,036	891	1,046	1,000	923	906	949	1,007	1,006
Reentrants	2,256	2,160	2,199	2,145	2,190	2,119	2,019	2,054	2,042	2,111	1,940	2,018	1,969	1,913	1,997
New entrants	1,039	1,029	1,014	1,038	972	1,076	1,015	1,084	1,040	956	911	1,018	798	801	829
PERCENT OF UNEMPLOYED															
Job losers	49.8	48.9	47.6	48.9	48.7	48.1	48.9	49.6	48.2	48.4	49.7	47.8	49.0	48.6	46.6
On layoff	13.9	13.2	12.7	12.4	13.1	13.1	13.5	14.0	12.5	12.8	12.8	12.0	12.4	12.7	11.9
Other job losers	35.9	35.7	35.0	36.5	35.6	35.1	35.3	35.7	35.7	35.6	37.0	35.8	36.6	36.0	34.7
Job leavers	10.6	12.3	12.3	12.6	12.6	12.9	13.0	11.1	13.1	12.7	12.3	12.0	13.0	13.9	14.0
Reentrants	27.1	26.2	27.4	25.9	26.8	25.8	25.4	25.7	25.6	26.8	25.8	26.7	27.0	26.4	27.9
New entrants	12.5	12.5	12.6	12.6	11.9	13.1	12.8	13.6	13.1	12.1	12.1	13.5	11.0	11.1	11.6
PERCENT OF CIVILIAN LABOR FORCE															
Job losers	3.6	3.4	3.2	3.4	3.4	3.3	3.3	3.3	3.2	3.2	3.1	3.0	3.0	2.9	2.8
Job leavers	.8	.9	.8	.9	.9	.9	.9	.7	.9	.8	.8	.8	.8	.8	.8
Reentrants	2.0	1.8	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.6	1.7	1.6	1.6	1.7
New entrants	.9	.9	.9	.9	.8	.9	.9	.9	.9	.8	.8	.8	.7	.7	.7

10. Duration of unemployment, monthly data seasonally adjusted

(Numbers in thousands)

Weeks of unemployment	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Less than 5 weeks	3,498	3,448	3,436	3,415	3,418	3,382	3,355	3,416	3,361	3,383	3,143	3,349	3,085	3,168	3,197
5 to 14 weeks	2,509	2,557	2,407	2,524	2,563	2,613	2,389	2,530	2,477	2,447	2,232	2,118	2,114	2,141	2,170
15 weeks and over	2,305	2,232	2,272	2,373	2,168	2,217	2,171	2,200	2,131	2,050	2,075	2,101	2,055	1,907	1,884
15 to 26 weeks	1,025	1,045	1,068	1,110	950	1,045	1,023	1,022	1,008	945	1,025	1,003	998	945	814
27 weeks and over	1,280	1,187	1,204	1,263	1,218	1,172	1,148	1,178	1,123	1,105	1,049	1,098	1,057	962	1,070
Mean duration in weeks	15.6	15.0	15.6	15.5	15.2	14.8	15.0	15.0	14.6	14.9	14.9	14.9	14.8	14.0	14.3
Median duration in weeks	6.8	6.9	7.1	7.1	7.0	7.0	7.1	7.0	6.6	6.6	7.0	6.5	6.7	6.7	6.4

11. Unemployment rates of civilian workers by State, data not seasonally adjusted

State	July 1986	July 1987	State	July 1986	July 1987
Alabama	10.3	7.7	Montana	7.6	5.8
Alaska	10.2	9.7	Nebraska	4.5	4.4
Arizona	7.8	6.7	Nevada	5.4	5.8
Arkansas	8.6	7.9	New Hampshire	3.2	2.6
California	7.5	6.0	New Jersey	5.7	4.5
Colorado	7.4	7.1	New Mexico	9.6	8.9
Connecticut	3.9	3.4	New York	6.3	4.5
Delaware	5.1	3.4	North Carolina	5.1	4.7
District of Columbia	7.7	6.2	North Dakota	5.9	4.0
Florida	6.9	5.9	Ohio	7.8	6.7
Georgia	6.4	5.1	Oklahoma	8.6	7.1
Hawaii	5.0	4.0	Oregon	8.0	5.7
Idaho	8.5	7.4	Pennsylvania	6.7	5.8
Illinois	7.8	7.1	Rhode Island	4.6	4.0
Indiana	6.3	6.2	South Carolina	6.7	5.5
Iowa	6.5	4.5	South Dakota	4.0	3.8
Kansas	5.5	4.4	Tennessee	8.6	7.0
Kentucky	9.9	8.8	Texas	9.3	8.7
Louisiana	14.0	10.7	Utah	5.9	6.3
Maine	7.2	4.9	Vermont	4.3	3.2
Maryland	4.4	4.2	Virginia	5.1	4.3
Massachusetts	3.8	2.6	Washington	8.1	7.0
Michigan	9.2	8.8	West Virginia	11.5	9.7
Minnesota	4.7	4.6	Wisconsin	6.4	5.1
Mississippi	13.1	9.7			
Missouri	5.9	6.6	Wyoming	8.4	7.0

– Data not available.
NOTE: Some data in this table may differ from data published elsewhere because of the continual updating of the database.

12. Employment of workers on nonagricultural payrolls by State, data not seasonally adjusted

(In thousands)

State	July 1986	June 1987	July 1987[p]	State	July 1986	June 1987	July 1987[p]
Alabama	1,469.5	1,488.1	1,490.0	Nebraska	651.3	666.5	660.0
Alaska	237.9	219.3	226.0	Nevada	473.7	503.4	506.4
Arizona	1,323.2	1,351.7	1,341.5	New Hampshire	494.0	509.1	509.9
Arkansas	810.9	834.7	830.1	New Jersey	3,522.3	3,623.1	3,614.9
California	11,235.6	11,671.8	11,597.7	New Mexico	525.7	535.9	533.9
Colorado	1,396.0	1,403.9	1,387.7	New York	7,930.1	8,158.3	8,106.8
Connecticut	1,599.7	1,664.2	1,647.3	North Carolina	2,694.3	2,840.9	2,795.0
Delaware	305.4	319.1	316.8	North Dakota	249.9	254.1	252.2
District of Columbia	657.3	648.9	661.3	Ohio	4,478.3	4,614.8	4,583.4
Florida	4,530.2	4,786.7	4,737.3	Oklahoma	1,131.9	1,137.5	1,123.2
Georgia	2,672.7	2,757.4	2,747.3	Oregon	1,051.1	1,111.0	1,098.4
Hawaii	438.3	451.0	452.0	Pennsylvania	4,792.6	4,952.5	4,934.9
Idaho	335.0	343.9	339.7	Rhode Island	440.3	451.0	446.3
Illinois	4,785.9	4,874.2	4,871.6	South Carolina	1,333.6	1,394.0	1,377.2
Indiana	2,223.0	2,306.5	2,299.7	South Dakota	253.4	260.3	255.2
Iowa	1,070.9	1,108.7	1,098.2	Tennessee	1,923.9	2,011.1	1,999.3
Kansas	973.1	999.9	987.6	Texas	6,549.6	6,488.1	6,474.0
Kentucky	1,268.4	1,307.1	1,294.5	Utah	629.8	643.2	636.6
Louisiana	1,505.9	1,490.8	1,486.9	Vermont	233.8	239.3	239.0
Maine	485.6	505.9	500.7	Virginia	2,565.5	2,656.6	2,640.1
Maryland	1,970.9	2,008.3	1,999.0	Washington	1,775.0	1,854.0	1,838.1
Massachusetts	2,972.3	3,081.5	3,041.6	West Virginia	603.6	604.2	604.4
Michigan	3,602.2	3,709.0	3,640.0	Wisconsin	2,021.7	2,085.2	2,067.3
Minnesota	1,896.9	1,961.8	1,945.0	Wyoming	204.5	198.8	196.3
Mississippi	840.3	855.8	851.0	Puerto Rico	732.3	772.7	761.2
Missouri	2,130.3	2,160.2	2,144.3	Virgin Islands	38.0	37.6	37.5
Montana	275.7	280.3	274.9				

[p] = preliminary
NOTE: Some data in this table may differ from data published elsewhere because of the continual updating of the database.

13. Employment of workers on nonagricultural payrolls by industry, monthly data seasonally adjusted

(In thousands)

Industry	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July[p]	Aug.[p]
TOTAL	97,519	99,610	99,772	100,039	100,209	100,415	100,567	100,919	101,150	101,329	101,598	101,708	101,818	102,114	102,270
PRIVATE SECTOR	81,125	82,900	83,125	83,241	83,337	83,515	83,643	83,983	84,215	84,352	84,560	84,677	84,787	85,089	85,196
GOODS-PRODUCING	24,859	24,681	24,639	24,620	24,611	24,630	24,630	24,708	24,743	24,749	24,759	24,752	24,761	24,857	24,857
Mining	927	783	748	739	735	730	724	718	719	722	729	735	738	743	749
Oil and gas extraction	583	457	428	419	416	412	406	405	406	408	416	420	425	429	433
Construction	4,673	4,904	4,946	4,948	4,942	4,946	4,936	5,034	5,038	5,032	5,019	4,999	5,008	5,008	5,007
General building contractors	1,253	1,293	1,295	1,291	1,289	1,289	1,277	1,311	1,309	1,291	1,272	1,267	1,266	1,263	1,264
Manufacturing	19,260	18,994	18,945	18,933	18,934	18,954	18,970	18,956	18,986	18,995	19,011	19,018	19,015	19,106	19,101
Production workers	13,092	12,895	12,857	12,851	12,849	12,879	12,906	12,884	12,916	12,925	12,939	12,946	12,958	13,021	13,021
Durable goods	11,490	11,244	11,206	11,181	11,169	11,174	11,175	11,157	11,179	11,176	11,175	11,175	11,176	11,195	11,219
Production workers	7,644	7,432	7,399	7,382	7,369	7,385	7,393	7,370	7,398	7,399	7,406	7,409	7,421	7,424	7,457
Lumber and wood products	697	711	712	716	718	723	728	731	733	734	736	738	735	740	736
Furniture and fixtures	494	497	499	499	499	499	499	500	501	502	504	509	510	519	520
Stone, clay, and glass products	588	586	584	584	581	582	584	586	588	586	586	584	582	582	584
Primary metal industries	808	753	735	732	733	733	733	726	733	739	743	742	746	749	751
Blast furnaces and basic steel products	303	275	265	260	262	260	259	254	261	266	272	272	275	276	278
Fabricated metal products	1,465	1,431	1,423	1,424	1,421	1,419	1,422	1,422	1,419	1,419	1,423	1,420	1,424	1,425	1,423
Machinery, except electrical	2,174	2,060	2,051	2,031	2,022	2,015	2,011	2,007	2,018	2,015	2,022	2,025	2,028	2,032	2,041
Electrical and electronic equipment	2,197	2,123	2,123	2,118	2,120	2,119	2,118	2,111	2,106	2,099	2,092	2,087	2,080	2,087	2,089
Transportation equipment	1,980	2,015	2,016	2,015	2,013	2,023	2,018	2,014	2,022	2,022	2,011	2,011	2,010	1,994	2,012
Motor vehicles and equipment	884	865	861	857	850	858	853	851	859	854	847	843	842	813	833
Instruments and related products	720	707	703	703	702	700	698	697	695	694	694	693	693	696	694
Miscellaneous manufacturing industries	367	362	360	359	360	361	364	363	364	366	364	366	368	371	369
Nondurable goods	7,770	7,750	7,739	7,752	7,765	7,780	7,795	7,799	7,807	7,819	7,836	7,843	7,839	7,911	7,882
Production workers	5,449	5,463	5,458	5,469	5,480	5,494	5,513	5,514	5,518	5,526	5,533	5,537	5,537	5,597	5,564
Food and kindred products	1,603	1,617	1,616	1,619	1,621	1,627	1,631	1,628	1,630	1,635	1,642	1,633	1,634	1,646	1,637
Tobacco manufactures	64	59	58	58	58	59	58	58	58	57	56	57	57	58	56
Textile mill products	702	705	707	707	709	714	715	718	722	725	724	727	729	737	733
Apparel and other textile products	1,121	1,106	1,102	1,102	1,104	1,101	1,110	1,106	1,101	1,103	1,104	1,107	1,108	1,131	1,110
Paper and allied products	678	674	671	675	677	678	679	678	679	678	677	677	676	676	675
Printing and publishing	1,428	1,457	1,462	1,465	1,469	1,472	1,474	1,479	1,483	1,485	1,493	1,497	1,498	1,503	1,507
Chemicals and allied products	1,044	1,023	1,021	1,021	1,020	1,020	1,017	1,018	1,018	1,017	1,018	1,022	1,014	1,026	1,029
Petroleum and coal products	179	169	168	167	166	165	163	164	164	164	164	164	164	163	165
Rubber and misc. plastics products	786	790	786	791	794	797	800	803	805	807	809	809	810	816	817
Leather and leather products	165	151	148	147	147	147	148	147	147	148	149	150	149	155	153
SERVICE-PRODUCING	72,660	74,930	75,133	75,419	75,598	75,785	75,937	76,211	76,407	76,580	76,839	76,956	77,057	77,257	77,413
Transportation and public utilities	5,238	5,244	5,202	5,255	5,251	5,278	5,286	5,304	5,315	5,333	5,348	5,344	5,350	5,360	5,376
Transportation	3,003	3,041	3,035	3,050	3,053	3,071	3,078	3,089	3,097	3,112	3,124	3,120	3,128	3,131	3,144
Communication and public utilities	2,235	2,203	2,167	2,205	2,198	2,207	2,208	2,215	2,218	2,221	2,224	2,224	2,222	2,229	2,232
Wholesale trade	5,717	5,735	5,736	5,736	5,731	5,728	5,725	5,741	5,757	5,766	5,772	5,775	5,781	5,796	5,798
Durable goods	3,388	3,383	3,382	3,383	3,379	3,380	3,383	3,386	3,391	3,397	3,397	3,401	3,405	3,417	3,420
Nondurable goods	2,329	2,351	2,354	2,353	2,352	2,348	2,342	2,355	2,366	2,369	2,375	2,374	2,376	2,379	2,378
Retail trade	17,356	17,845	17,913	17,939	17,980	18,009	18,007	18,080	18,140	18,136	18,197	18,205	18,226	18,271	18,248
General merchandise stores	2,324	2,363	2,371	2,374	2,385	2,379	2,363	2,358	2,373	2,380	2,385	2,390	2,387	2,404	2,406
Food stores	2,775	2,873	2,889	2,892	2,901	2,906	2,916	2,929	2,940	2,944	2,953	2,956	2,960	2,959	2,958
Automotive dealers and service stations	1,890	1,943	1,949	1,958	1,960	1,963	1,970	1,978	1,979	1,979	1,978	1,978	1,983	1,984	1,986
Eating and drinking places	5,709	5,879	5,904	5,911	5,919	5,927	5,938	5,946	5,956	5,964	5,962	5,976	5,982	5,986	5,993
Finance, insurance, and real estate	5,955	6,297	6,351	6,374	6,395	6,418	6,451	6,480	6,501	6,526	6,558	6,576	6,586	6,607	6,630
Finance	2,977	3,152	3,183	3,193	3,204	3,212	3,227	3,235	3,243	3,256	3,272	3,276	3,280	3,290	3,298
Insurance	1,833	1,945	1,961	1,971	1,980	1,990	1,999	2,012	2,016	2,022	2,032	2,037	2,037	2,042	2,052
Real estate	1,146	1,200	1,207	1,210	1,211	1,216	1,225	1,233	1,242	1,248	1,254	1,263	1,269	1,275	1,280
Services	22,000	23,099	23,284	23,317	23,369	23,452	23,544	23,670	23,759	23,842	23,926	24,025	24,083	24,198	24,287
Business services	4,457	4,781	4,815	4,835	4,861	4,877	4,912	4,950	4,984	5,020	5,044	5,083	5,086	5,107	5,145
Health services	6,299	6,551	6,594	6,615	6,644	6,661	6,691	6,721	6,748	6,773	6,800	6,822	6,853	6,884	6,923
Government	16,394	16,711	16,647	16,798	16,872	16,900	16,924	16,936	16,935	16,977	17,038	17,031	17,031	17,025	17,074
Federal	2,875	2,899	2,882	2,902	2,897	2,900	2,904	2,912	2,916	2,922	2,933	2,935	2,935	2,930	2,944
State	3,832	3,888	3,881	3,890	3,907	3,915	3,927	3,929	3,927	3,930	3,943	3,947	3,932	3,950	3,951
Local	9,687	9,923	9,884	10,006	10,068	10,085	10,093	10,095	10,092	10,125	10,162	10,149	10,164	10,145	10,179

[p] = preliminary

NOTE: See notes on the data for a description of the most recent benchmark revision.

14. Average weekly hours of production or nonsupervisory workers on private nonagricultural payrolls by industry, monthly data seasonally adjusted

Industry	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July[p]	Aug.[p]
PRIVATE SECTOR	34.9	34.8	34.7	34.7	34.7	34.8	34.6	34.7	34.9	34.8	34.7	34.9	34.8	34.8	35.0
MANUFACTURING	40.5	40.7	40.8	40.8	40.7	40.8	40.8	40.9	41.1	40.9	40.6	41.0	41.0	41.0	41.0
Overtime hours	3.3	3.4	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.5	3.8	3.7	3.8	3.8
Durable goods	41.2	41.3	41.4	41.4	41.3	41.4	41.4	41.6	41.7	41.5	41.2	41.6	41.5	41.5	41.6
Overtime hours	3.5	3.5	3.6	3.6	3.5	3.5	3.6	3.7	3.7	3.7	3.6	3.9	3.8	3.8	4.0
Lumber and wood products	39.9	40.3	40.2	40.3	40.4	40.8	40.6	40.8	41.3	40.9	40.6	41.0	40.6	40.6	40.7
Furniture and fixtures	39.4	39.8	39.9	40.0	39.9	39.8	39.9	40.2	40.2	40.0	39.1	39.9	40.0	39.9	39.7
Stone, clay, and glass products	41.9	42.2	42.3	42.4	42.3	41.9	42.2	42.5	42.8	42.5	41.9	42.3	42.0	42.2	42.0
Primary metal industries	41.5	41.9	42.0	42.1	42.3	42.4	42.5	42.6	42.6	42.6	42.3	43.1	43.1	43.1	43.4
Blast furnaces and basic steel products	41.1	41.7	41.7	41.9	42.4	42.5	42.6	42.7	42.3	42.3	42.4	43.3	43.5	43.6	43.3
Fabricated metal products	41.3	41.3	41.3	41.5	41.3	41.4	41.2	41.6	41.6	41.5	41.2	41.6	41.5	41.4	41.8
Machinery except electrical	41.5	41.6	41.6	41.7	41.7	41.7	41.7	42.0	42.2	42.0	41.8	42.2	42.2	42.4	42.2
Electrical and electronic equipment	40.6	41.0	41.1	41.2	41.0	41.0	41.0	41.0	41.1	40.9	40.6	40.8	41.1	41.1	41.0
Transportation equipment	42.6	42.3	42.4	42.4	42.1	42.2	42.1	42.3	42.5	42.3	41.9	42.2	41.9	41.8	41.9
Motor vehicles and equipment	43.5	42.6	42.5	42.7	42.1	42.4	42.4	42.9	43.0	42.9	42.1	42.5	42.0	41.8	42.1
Instruments and related products	41.0	41.0	40.9	40.7	40.9	41.1	41.1	41.2	41.3	41.3	41.0	41.5	41.5	41.6	42.0
Nondurable goods	39.6	39.9	40.0	39.9	39.9	40.0	40.0	40.1	40.3	40.1	39.7	40.2	40.2	40.3	40.3
Overtime hours	3.1	3.3	3.4	3.3	3.4	3.5	3.5	3.5	3.5	3.5	3.3	3.7	3.6	3.7	3.7
Food and kindred products	40.0	40.0	40.2	39.8	39.8	40.0	39.8	40.0	40.1	40.0	39.8	40.1	40.1	39.9	40.3
Textile mill products	39.7	41.1	41.2	41.4	41.4	41.4	41.6	41.6	42.0	42.1	41.4	42.0	42.1	42.6	41.7
Apparel and other textile products	36.4	36.7	36.6	36.8	36.8	36.9	37.0	37.0	37.4	37.0	36.1	37.2	37.1	37.3	37.3
Paper and allied products	43.1	43.2	43.4	42.9	43.1	43.2	43.2	43.4	43.3	43.0	43.0	43.5	43.3	43.5	43.3
Printing and publishing	37.8	38.0	38.0	38.0	38.0	38.0	38.0	37.9	38.1	37.9	37.7	37.9	38.1	38.1	37.9
Chemicals and allied products	41.9	41.9	42.0	41.8	42.0	42.3	42.1	42.2	42.2	42.0	42.2	42.1	42.0	42.2	42.3
Petroleum and coal products	43.0	43.8	44.2	43.5	43.7	43.8	43.6	44.6	44.0	44.1	43.9	44.3	43.3	44.5	44.7
TRANSPORTATION AND PUBLIC UTILITIES	39.5	39.2	39.1	39.1	39.1	39.2	38.9	39.0	39.2	39.0	39.0	39.2	38.8	39.2	39.0
WHOLESALE TRADE	37.8	37.7	38.4	38.2	38.3	38.3	38.2	38.3	38.3	38.1	38.2	38.3	38.2	38.1	38.4
RETAIL TRADE	29.4	29.2	29.2	29.1	29.1	29.2	28.9	29.0	29.3	29.3	29.5	29.4	29.2	29.3	29.6
SERVICES	32.5	32.5	32.4	32.4	32.4	32.5	32.4	32.4	32.6	32.5	32.4	32.5	32.5	32.5	32.6

[p] = preliminary

NOTE: See "Notes on the data" for a description of the most recent benchmark adjustment.

15. Average hourly earnings of production or nonsupervisory workers on private nonagricultural payrolls by industry

Industry	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July[p]	Aug.[p]
PRIVATE SECTOR	$8.57	$8.76	$8.70	$8.82	$8.82	$8.88	$8.86	$8.90	$8.92	$8.92	$8.91	$8.93	$8.92	$8.91	$8.95
Seasonally adjusted	–	–	8.77	8.78	8.82	8.86	8.84	8.86	8.88	8.91	8.91	8.95	8.94	8.96	9.03
MINING	11.98	12.44	12.51	12.52	12.50	12.57	12.63	12.66	12.56	12.51	12.43	12.42	12.44	12.33	12.42
CONSTRUCTION	12.32	12.47	12.44	12.59	12.68	12.66	12.77	12.58	12.51	12.59	12.55	12.60	12.61	12.57	12.68
MANUFACTURING	9.54	9.73	9.68	9.73	9.72	9.78	9.85	9.84	9.84	9.85	9.87	9.87	9.87	9.88	9.86
Durable goods	10.10	10.29	10.22	10.29	10.27	10.33	10.40	10.38	10.39	10.39	10.39	10.40	10.42	10.41	10.40
Lumber and wood products	8.22	8.33	8.33	8.35	8.32	8.35	8.32	8.27	8.31	8.28	8.34	8.37	8.44	8.47	8.54
Furniture and fixtures	7.17	7.46	7.50	7.55	7.53	7.55	7.65	7.61	7.58	7.58	7.58	7.64	7.66	7.71	7.77
Stone, clay, and glass products	9.84	10.05	10.07	10.11	10.10	10.14	10.17	10.17	10.15	10.13	10.23	10.26	10.29	10.31	10.32
Primary metal industries	11.67	11.86	11.74	11.82	11.75	11.80	11.82	11.76	11.78	11.82	11.96	11.96	11.97	12.01	11.95
Blast furnaces and basic steel products	13.33	13.73	13.61	13.76	13.63	13.68	13.74	13.55	13.59	13.66	13.84	13.80	13.83	13.84	13.86
Fabricated metal products	9.70	9.89	9.82	9.88	9.88	9.94	10.02	9.98	9.99	9.99	9.98	9.97	10.00	9.96	9.92
Machinery, except electrical	10.29	10.59	10.59	10.61	10.58	10.62	10.67	10.64	10.68	10.72	10.70	10.70	10.76	10.74	10.73
Electrical and electronic equipment	9.46	9.65	9.64	9.70	9.67	9.73	9.82	9.84	9.84	9.84	9.82	9.83	9.84	9.89	9.89
Transportation equipment	12.71	12.81	12.70	12.82	12.82	12.88	12.96	12.93	12.88	12.86	12.80	12.85	12.88	12.83	12.91
Motor vehicles and equipment	13.39	13.45	13.29	13.42	13.42	13.44	13.56	13.58	13.49	13.49	13.40	13.42	13.47	13.35	13.43
Instruments and related products	9.17	9.47	9.47	9.54	9.56	9.63	9.65	9.64	9.67	9.67	9.67	9.69	9.70	9.74	9.72
Miscellaneous manufacturing	7.30	7.54	7.51	7.58	7.57	7.62	7.69	7.69	7.68	7.66	7.67	7.72	7.74	7.71	7.66
Nondurable goods	8.71	8.94	8.94	8.96	8.96	9.02	9.07	9.09	9.08	9.09	9.14	9.13	9.11	9.16	9.13
Food and kindred products	8.57	8.74	8.66	8.65	8.69	8.79	8.88	8.90	8.91	8.93	8.95	8.96	8.91	8.88	8.83
Tobacco manufactures	11.96	12.85	13.55	12.29	12.14	12.67	12.93	12.97	13.44	13.80	14.28	14.53	15.57	14.84	14.13
Textile mill products	6.70	6.93	6.97	7.02	7.02	7.05	7.10	7.10	7.11	7.12	7.12	7.13	7.15	7.14	7.19
Apparel and other textile products	5.73	5.84	5.83	5.91	5.87	5.87	5.90	5.94	5.93	5.93	5.94	5.89	5.91	5.89	5.88
Paper and allied products	10.83	11.18	11.19	11.23	11.25	11.27	11.34	11.26	11.26	11.27	11.37	11.40	11.41	11.50	11.46
Printing and publishing	9.71	9.99	10.02	10.12	10.09	10.11	10.15	10.14	10.16	10.17	10.14	10.19	10.19	10.24	10.28
Chemicals and allied products	11.56	11.98	11.99	12.03	12.08	12.17	12.20	12.18	12.21	12.24	12.30	12.31	12.27	12.36	12.35
Petroleum and coal products	14.06	14.18	14.06	14.18	14.19	14.32	14.41	14.57	14.51	14.50	14.50	14.52	14.43	14.46	14.46
Rubber and miscellaneous plastics products	8.54	8.73	8.77	8.72	8.73	8.77	8.82	8.83	8.79	8.80	8.82	8.84	8.87	8.94	8.90
Leather and leather products	5.83	5.92	5.92	5.95	5.95	5.98	5.98	6.04	6.01	6.06	6.12	6.05	6.04	5.97	6.05
TRANSPORTATION AND PUBLIC UTILITIES	11.40	11.70	11.67	11.77	11.77	11.90	11.90	11.89	11.93	11.90	11.94	11.95	11.91	11.99	12.07
WHOLESALE TRADE	9.16	9.35	9.32	9.37	9.36	9.47	9.47	9.49	9.55	9.53	9.53	9.57	9.57	9.57	9.63
RETAIL TRADE	5.94	6.03	5.97	6.06	6.06	6.08	6.07	6.09	6.09	6.08	6.09	6.09	6.08	6.07	6.06
FINANCE, INSURANCE, AND REAL ESTATE	7.94	8.35	8.34	8.39	8.39	8.57	8.48	8.60	8.75	8.72	8.71	8.72	8.68	8.66	8.79
SERVICES	7.90	8.16	8.04	8.19	8.23	8.33	8.32	8.37	8.43	8.41	8.40	8.38	8.35	8.33	8.40

– Data not available.
[p] = preliminary

NOTE: See "Notes on the data" for a description of the most recent benchmark revision.

16. Average weekly earnings of production or nonsupervisory workers on private nonagricultural payrolls by industry

Industry	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July[p]	Aug.[p]
PRIVATE SECTOR															
Current dollars	$299.09	$304.85	$305.37	$306.94	$306.05	$308.14	$308.33	$306.16	$307.74	$308.63	$308.29	$310.76	$312.20	$311.85	$315.94
Seasonally adjusted	–	–	304.32	304.67	306.05	308.33	305.86	307.44	309.91	310.07	309.18	312.36	311.11	311.81	316.05
Constant (1977) dollars	170.42	171.07	171.36	171.47	170.88	171.86	171.87	169.52	169.74	169.48	168.28	169.17	169.21	168.66	–
MINING	519.93	524.97	529.17	527.09	526.25	520.40	535.51	538.05	527.52	522.92	519.57	526.61	527.46	521.56	536.54
CONSTRUCTION	464.46	466.38	476.45	484.72	480.57	462.09	469.94	467.98	460.37	470.87	469.37	485.10	480.44	485.20	489.45
MANUFACTURING															
Current dollars	386.37	396.01	393.98	398.93	395.60	400.98	408.78	401.47	401.47	402.87	398.75	403.68	405.66	401.13	403.27
Constant (1977) dollars	220.15	222.23	221.09	222.87	220.88	223.64	227.86	222.30	221.44	221.24	217.78	219.75	219.87	216.94	–
Durable goods	416.12	424.98	420.04	428.06	424.15	429.73	439.92	430.77	431.19	432.22	427.03	431.60	434.51	426.81	429.52
Lumber and wood products	327.98	335.70	338.20	340.68	337.79	337.34	337.79	331.63	337.39	337.00	338.60	345.68	348.57	342.19	350.14
Furniture and fixtures	282.50	296.91	300.75	305.78	304.97	303.51	314.42	302.88	299.41	301.68	294.10	301.78	306.40	301.46	310.02
Stone, clay, and glass products	412.30	424.11	431.00	434.73	430.26	423.85	427.14	421.04	423.26	425.46	430.68	439.13	437.33	438.18	438.60
Primary metal industries	484.31	496.93	487.21	497.62	493.50	500.32	508.26	500.98	503.01	505.90	508.30	514.28	517.10	512.83	512.66
Blast furnaces and basic steel products	547.86	572.54	560.73	575.17	569.73	580.03	589.45	575.88	577.58	581.92	593.74	598.92	605.75	602.04	593.21
Fabricated metal products	400.61	408.46	403.60	411.01	408.04	413.50	422.84	414.17	413.59	414.59	408.18	412.76	417.00	406.37	411.68
Machinery, except electrical	427.04	440.54	436.31	442.44	439.07	444.98	456.68	446.88	449.63	452.38	445.12	449.40	455.15	447.86	448.51
Electrical and electronic equipment	384.08	395.65	394.28	400.61	396.47	402.82	413.42	404.42	402.46	402.46	395.75	399.10	404.42	399.56	403.51
Transportation equipment	541.45	541.86	528.32	542.29	537.16	546.11	562.46	549.53	546.11	547.84	536.32	542.27	539.67	527.31	530.60
Motor vehicles and equipment	582.47	572.97	550.21	570.35	562.30	568.51	595.28	585.30	577.37	582.77	566.82	571.69	567.09	547.35	550.63
Instruments and related products	375.97	388.27	383.54	389.23	389.09	398.68	407.23	397.17	399.37	401.31	394.54	399.23	402.55	398.37	404.35
Miscellaneous manufacturing	287.62	298.58	294.39	299.41	301.29	305.56	309.14	303.76	301.06	301.04	297.60	302.62	304.18	297.61	301.04
Nondurable goods	344.92	356.71	358.49	359.30	358.40	363.51	368.24	362.69	362.29	363.60	361.03	366.11	367.13	366.40	367.94
Food and kindred products	342.80	349.60	351.60	349.46	347.60	353.36	357.86	354.22	351.05	352.74	351.74	359.30	357.29	354.31	359.38
Tobacco manufactures	444.91	480.59	490.51	470.71	473.46	481.46	483.58	481.19	486.53	525.78	536.93	571.03	624.36	525.34	505.85
Textile mill products	265.99	284.82	288.56	293.44	292.03	294.69	299.62	293.94	295.78	299.04	291.21	298.75	303.16	297.74	301.26
Apparel and other textile products	208.57	214.33	213.96	217.49	216.60	218.36	220.66	218.59	220.00	219.41	212.65	219.11	221.03	217.93	219.32
Paper and allied products	466.77	482.98	483.41	485.14	484.88	489.12	500.09	488.68	484.18	483.48	486.64	493.62	494.05	496.80	493.93
Printing and publishing	367.04	379.62	381.76	387.60	384.43	387.21	392.81	381.26	384.05	386.46	381.26	384.16	384.16	387.07	391.67
Chemicals and allied products	484.36	501.96	499.98	502.85	504.94	516.01	519.72	514.00	514.04	515.30	519.06	518.25	516.57	517.88	518.70
Petroleum and coal products	604.58	621.08	624.26	625.34	622.94	630.08	628.28	645.45	629.73	636.55	635.10	637.43	624.82	646.36	649.25
Rubber and miscellaneous plastics products	350.99	360.55	361.32	362.75	362.30	365.71	373.09	367.33	364.79	365.20	360.74	366.86	370.77	367.43	369.35
Leather and leather products	216.88	218.45	217.86	218.37	218.96	221.86	227.84	225.29	223.57	227.25	224.60	233.53	237.37	229.25	232.32
TRANSPORTATION AND PUBLIC UTILITIES	450.30	458.64	459.80	461.38	460.21	467.67	465.29	457.77	465.27	462.91	463.27	466.05	465.68	472.41	474.35
WHOLESALE TRADE	351.74	359.04	358.82	358.87	359.42	363.65	363.65	361.57	361.95	361.19	363.09	366.53	367.49	366.53	370.76
RETAIL TRADE	174.64	176.08	178.50	176.35	175.74	176.32	178.46	172.35	174.78	175.71	177.83	178.44	179.97	182.10	183.62
FINANCE, INSURANCE, AND REAL ESTATE	289.02	303.94	304.41	303.72	305.40	312.81	309.52	312.18	318.50	316.54	316.17	316.54	315.95	312.63	321.71
SERVICES	256.75	265.20	263.71	265.36	266.65	269.89	269.57	269.51	273.13	272.48	271.32	271.51	272.21	273.22	277.20

– Data not available.
[p] = preliminary

NOTE: See "Notes on the data" for a description of the most recent benchmark revision.

17. The Hourly Earnings Index for production or nonsupervisory workers on private nonagricultural payrolls by industry

Industry	Not seasonally adjusted				Seasonally adjusted					
	Aug. 1986	June 1987	July 1987[p]	Aug. 1987[p]	Aug. 1986	Apr. 1987	May 1987	June 1987	July 1987[p]	Aug. 1987[p]
PRIVATE SECTOR (in current dollars)	168.6	172.6	172.7	173.0	169.5	172.6	172.9	172.9	173.2	173.9
Mining[1]	181.9	182.1	182.5	182.0	–	–	–	–	–	–
Construction	152.0	154.1	153.6	153.9	152.0	153.7	154.1	155.0	154.3	153.9
Manufacturing	171.9	174.7	175.0	174.4	172.7	175.0	174.4	174.7	174.8	175.3
Transportation and public utilities	170.3	174.7	175.2	175.7	171.2	175.2	176.2	175.6	176.2	176.6
Wholesale trade[1]	172.0	176.4	176.5	177.5	–	–	–	–	–	–
Retail trade	157.5	160.3	160.3	160.7	158.6	159.8	160.2	160.3	160.9	161.8
Finance, insurance, and real estate[1]	179.5	186.5	186.4	187.8	–	–	–	–	–	–
Services	172.7	179.2	179.0	179.7	174.6	179.4	179.9	179.9	180.5	181.7
PRIVATE SECTOR [in constant (1977) dollars]	94.6	93.6	93.4	–	95.2	94.2	94.0	93.8	93.7	–

[1] This series is not seasonally adjusted because the seasonal component is small relative to the trend-cycle, irregular components, or both, and consequently cannot be separated with sufficient precision.
– Data not available.

[p] = preliminary.
NOTE: See "Notes on the data" for a description of the most recent benchmark revision.

18. Indexes of diffusion: industries in which employment increased, data seasonally adjusted

(In percent)

Time span and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Over 1-month span:												
1985	55.9	47.0	52.4	47.3	53.2	46.8	53.8	53.8	47.8	53.2	54.3	57.3
1986	53.2	48.1	48.1	53.5	52.4	46.8	52.4	56.2	55.1	53.2	59.7	59.7
1987	53.5	56.8	58.6	58.4	58.6	55.7	69.5	54.9	–	–	–	–
Over 3-month span:												
1985	51.1	48.4	42.4	46.5	44.3	49.7	47.0	48.6	45.9	47.6	55.1	56.5
1986	49.7	44.9	45.7	48.4	47.6	45.4	48.4	55.1	55.9	58.1	58.6	60.3
1987	58.6	59.5	61.1	61.6	61.4	68.4	65.1	–	–	–	–	–
Over 6-month span:												
1985	46.5	46.5	43.2	44.3	44.3	45.1	43.0	44.3	49.2	49.2	47.3	45.9
1986	47.6	47.6	43.0	43.2	45.4	48.4	47.3	53.0	59.2	58.9	57.8	58.9
1987	61.9	62.7	58.9	68.1	65.9	–	–	–	–	–	–	–
Over 12-month span:												
1985	44.6	44.1	43.8	40.8	41.6	41.6	42.2	42.4	43.8	44.3	44.1	42.4
1986	43.2	44.1	46.2	45.7	47.8	49.5	49.5	51.6	54.9	52.2	55.1	56.5
1987	62.2	64.6	–	–	–	–	–	–	–	–	–	–

– Data not available.

NOTE: Figures are the percent of industries with employment rising. (Half of the unchanged components are counted as rising.) Data are centered within the spans. Data for the 2 most recent months shown in each span are preliminary. See the "Definitions" in this section. See "Notes on the data" for a description of the most recent benchmark revision.

19. Annual data: Employment status of the noninstitutional population

(Numbers in thousands)

Employment status	1978	1979	1980	1981	1982	1983	1984	1985	1986
Noninstitutional population	163,541	166,460	169,349	171,775	173,939	175,891	178,080	179,912	182,293
Labor force:									
Total (number)	103,882	106,559	108,544	110,315	111,872	113,226	115,241	117,167	119,540
Percent of population	63.5	64.0	64.1	64.2	64.3	64.4	64.7	65.1	65.6
Employed:									
Total (number)	97,679	100,421	100,907	102,042	101,194	102,510	106,702	108,856	111,303
Percent of population	59.7	60.3	59.6	59.4	58.2	58.3	59.9	60.5	61.1
Resident Armed Forces	1,631	1,597	1,604	1,645	1,668	1,676	1,697	1,706	1,706
Civilian									
Total	96,048	98,824	99,303	100,397	99,526	100,834	105,005	107,150	109,597
Agriculture	3,387	3,347	3,364	3,368	3,401	3,383	3,321	3,179	3,163
Nonagricultural industries	92,661	95,477	95,938	97,030	96,125	97,450	101,685	103,971	106,434
Unemployed:									
Total (number)	6,202	6,137	7,637	8,273	10,678	10,717	8,539	8,312	8,237
Percent of labor force	6.0	5.8	7.0	7.5	9.5	9.5	7.4	7.1	6.9
Not in labor force (number)	59,659	59,900	60,806	61,460	62,067	62,665	62,839	62,744	62,752

20. Annual data: Employment levels by industry

(Numbers in thousands)

Industry	1978	1979	1980	1981	1982	1983	1984	1985	1986
Total employment	86,697	89,823	90,406	91,156	89,566	90,200	94,496	97,519	99,610
Private sector	71,026	73,876	74,166	75,126	73,729	74,330	78,472	81,125	82,900
Goods-producing	25,585	26,461	25,658	25,497	23,813	23,334	24,727	24,859	24,681
Mining	851	958	1,027	1,139	1,128	952	966	927	783
Construction	4,229	4,463	4,346	4,188	3,905	3,948	4,383	4,673	4,904
Manufacturing	20,505	21,040	20,285	20,170	18,781	18,434	19,378	19,260	18,994
Service-producing	61,113	63,363	64,748	65,659	65,753	66,866	69,769	72,660	74,930
Transportation and public utilities	4,923	5,136	5,146	5,165	5,082	4,954	5,159	5,238	5,244
Wholesale trade	4,969	5,204	5,275	5,358	5,278	5,268	5,555	5,717	5,735
Retail trade	14,573	14,989	15,035	15,189	15,179	15,613	16,545	17,356	17,845
Finance, insurance, and real estate	4,724	4,975	5,160	5,298	5,341	5,468	5,689	5,955	6,297
Services	16,252	17,112	17,890	18,619	19,036	19,694	20,797	22,000	23,099
Government	15,672	15,947	16,241	16,031	15,837	15,869	16,024	16,394	16,711
Federal	2,753	2,773	2,866	2,772	2,739	2,774	2,807	2,875	2,899
State	3,474	3,541	3,610	3,640	3,640	3,662	3,734	3,832	3,888
Local	9,446	9,633	9,765	9,619	9,458	9,434	9,482	9,687	9,923

NOTE: See "Notes on the data" for a description of the most recent benchmark revision.

21. Annual data: Average hours and earnings of production or nonsupervisory workers on nonagricultural payrolls, by industry

Industry	1978	1979	1980	1981	1982	1983	1984	1985	1986
Private sector									
Average weekly hours	35.8	35.7	35.3	35.2	34.8	35.0	35.2	34.9	34.8
Average hourly earnings (in dollars)	5.69	6.16	6.66	7.25	7.68	8.02	8.32	8.57	8.76
Average weekly earnings (in dollars)	203.70	219.91	235.10	255.20	267.26	280.70	292.86	299.09	304.85
Mining									
Average weekly hours	43.4	43.0	43.3	43.7	42.7	42.5	43.3	43.4	42.2
Average hourly earnings (in dollars)	7.67	8.49	9.17	10.04	10.77	11.28	11.63	11.98	12.44
Average weekly earnings (in dollars)	332.88	365.07	397.06	438.75	459.88	479.40	503.58	519.93	524.97
Construction									
Average weekly hours	36.8	37.0	37.0	36.9	36.7	37.1	37.8	37.7	37.4
Average hourly earnings (in dollars)	8.66	9.27	9.94	10.82	11.63	11.94	12.13	12.32	12.47
Average weekly earnings (in dollars)	318.69	342.99	367.78	399.26	426.82	442.97	458.51	464.46	466.38
Manufacturing									
Average weekly hours	40.4	40.2	39.7	39.8	38.9	40.1	40.7	40.5	40.7
Average hourly earnings (in dollars)	6.17	6.70	7.27	7.99	8.49	8.83	9.19	9.54	9.73
Average weekly earnings (in dollars)	249.27	269.34	288.62	318.00	330.26	354.08	374.03	386.37	396.01
Transportation and public utilities									
Average weekly hours	40.0	39.9	39.6	39.4	39.0	39.0	39.4	39.5	39.2
Average hourly earnings (in dollars)	7.57	8.16	8.87	9.70	10.32	10.79	11.12	11.40	11.70
Average weekly earnings (in dollars)	302.80	325.58	351.25	382.18	402.48	420.81	438.13	450.30	458.64
Wholesale trade									
Average weekly hours	38.8	38.8	38.5	38.5	38.3	38.5	38.5	38.4	38.4
Average hourly earnings (in dollars)	5.88	6.39	6.96	7.56	8.09	8.55	8.89	9.16	9.35
Average weekly earnings (in dollars)	228.14	247.93	267.96	291.06	309.85	329.18	342.27	351.74	359.04
Retail trade									
Average weekly hours	31.0	30.6	30.2	30.1	29.9	29.8	29.8	29.4	29.2
Average hourly earnings (in dollars)	4.20	4.53	4.88	5.25	5.48	5.74	5.85	5.94	6.03
Average weekly earnings (in dollars)	130.20	138.62	147.38	158.03	163.85	171.05	174.33	174.64	176.08
Finance, insurance, and real estate									
Average weekly hours	36.4	36.2	36.2	36.3	36.2	36.2	36.5	36.4	36.4
Average hourly earnings (in dollars)	4.89	5.27	5.79	6.31	6.78	7.29	7.63	7.94	8.35
Average weekly earnings (in dollars)	178.00	190.77	209.60	229.05	245.44	263.90	278.50	289.02	303.94
Services									
Average weekly hours	32.8	32.7	32.6	32.6	32.6	32.7	32.6	32.5	32.5
Average hourly earnings (in dollars)	4.99	5.36	5.85	6.41	6.92	7.31	7.59	7.90	8.16
Average weekly earnings (in dollars)	163.67	175.27	190.71	208.97	225.59	239.04	247.43	256.75	265.20

22. Employment Cost Index, compensation,[1] by occupation and industry group

(June 1981 = 100)

Series	1985			1986				1987		Percent change	
	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	3 months ended	12 months ended
										June 1987	
Civilian workers [2]	126.4	128.4	129.2	130.6	131.5	133.0	133.8	135.0	135.9	0.7	3.3
Workers, by occupational group:											
White-collar workers	128.3	130.7	131.6	133.1	134.2	136.0	136.9	138.5	139.3	.6	3.8
Blue-collar workers	123.1	124.4	124.9	126.2	126.8	127.8	128.4	129.1	130.1	.8	2.6
Service occupations	128.0	130.9	131.8	133.1	133.7	135.4	136.6	138.0	138.5	.4	3.6
Workers, by industry division:											
Goods-producing	123.9	124.9	125.5	126.9	128.1	128.8	129.5	130.2	131.1	.7	2.3
Manufacturing	124.6	125.5	126.0	127.7	128.7	129.3	130.1	130.7	131.5	.6	2.2
Service-producing	127.9	130.7	131.5	132.9	133.7	135.6	136.5	138.1	138.9	.6	3.9
Services	132.6	136.4	137.1	138.8	139.4	142.4	143.6	145.2	145.8	.4	4.6
Health services	–	–	–	–	–	–	–	–	–	.6	4.7
Hospitals	–	–	–	–	–	–	–	–	–	.8	4.5
Public administration [3]	130.3	134.2	134.8	136.8	138.0	140.6	141.6	144.1	144.7	.4	4.9
Nonmanufacturing	127.2	129.7	130.6	131.9	132.8	134.6	135.4	136.9	137.8	.7	3.8
Private industry workers	125.2	126.8	127.5	128.9	129.9	130.8	131.6	132.9	133.8	.7	3.0
Workers, by occupational group:											
White-collar workers	127.1	128.8	129.8	131.3	132.5	133.5	134.3	136.1	137.0	.7	3.4
Professional specialty and technical occupations	–	–	–	–	–	–	–	–	–	.6	3.5
Executive, administrative, and managerial occupations	–	–	–	–	–	–	–	–	–	.7	3.9
Sales occupations	–	–	–	–	–	–	–	–	–	.5	2.1
Administrative support occupations, including clerical	–	–	–	–	–	–	–	–	–	1.0	3.5
Blue-collar workers	122.8	124.0	124.4	125.7	126.3	127.2	127.8	128.4	129.5	.9	2.5
Precision production, craft, and repair occupation	–	–	–	–	–	–	–	–	–	.8	2.4
Machine operators, assemblers, and inspectors	–	–	–	–	–	–	–	–	–	1.0	2.7
Transportation and material moving occupations	–	–	–	–	–	–	–	–	–	1.1	3.0
Handlers, equipment cleaners, helpers, and laborers	–	–	–	–	–	–	–	–	–	.5	2.0
Service occupations	126.5	128.8	129.5	130.9	131.1	132.3	133.5	134.7	135.2	.4	3.1
Workers, by industry division:											
Goods-producing	123.8	124.6	125.3	126.7	127.8	128.6	129.2	129.9	130.8	.7	2.3
Construction	–	–	–	–	–	–	–	–	–	1.3	3.1
Manufacturing	124.6	125.5	126.0	127.7	128.7	129.3	130.1	130.7	131.5	.6	2.2
Durables	–	–	–	–	–	–	–	–	–	.7	2.0
Nondurables	–	–	–	–	–	–	–	–	–	.5	2.6
Service-producing	126.4	128.7	129.4	130.8	131.6	132.7	133.5	135.3	136.3	.7	3.6
Transportation and public utilities	–	–	–	–	–	–	–	–	–	1.1	2.8
Transportation	–	–	–	–	–	–	–	–	–	1.4	2.8
Public utilities	–	–	–	–	–	–	–	–	–	.9	2.9
Wholesale and retail trade	–	–	–	–	–	–	–	–	–	1.5	3.4
Wholesale trade	–	–	–	–	–	–	–	–	–	1.5	4.3
Retail trade	–	–	–	–	–	–	–	–	–	1.4	3.0
Finance, insurance, and real estate	–	–	–	–	–	–	–	–	–	–1.0	3.0
Service	–	–	–	–	–	–	–	–	–	.6	4.3
Health services	–	–	–	–	–	–	–	–	–	.7	5.0
Hospitals	–	–	–	–	–	–	–	–	–	.7	4.6
Nonmanufacturing	125.6	127.6	128.4	129.7	130.6	131.7	132.4	134.1	135.1	.7	3.4
State and local government workers	132.0	136.5	137.5	138.9	139.7	143.6	144.7	145.9	146.3	.3	4.7
Workers, by occupational group:											
White-collar workers	132.9	137.6	138.6	140.0	140.5	145.0	146.0	147.2	147.5	.2	5.0
Blue-collar workers	128.5	131.9	132.7	134.7	136.3	138.5	139.5	140.8	141.3	.4	3.7
Workers, by industry division:											
Services	133.2	137.9	139.1	140.4	140.8	145.5	146.6	147.3	147.6	.2	4.8
Hospitals and other services[4]	131.5	134.1	135.2	136.8	137.9	139.4	141.1	142.5	143.3	.6	3.9
Health services	–	–	–	–	–	–	–	–	–	.6	3.8
Schools	133.7	139.1	140.3	141.5	141.7	147.6	148.4	148.9	149.1	.1	5.2
Elementary and secondary	134.6	140.9	142.0	143.0	143.2	149.4	150.3	150.5	150.7	.1	5.2
Public administration[3]	130.3	134.2	134.8	136.8	138.0	140.6	141.6	144.1	144.7	.4	4.9

[1] Cost (cents per hour worked) measured in the Employment Cost Index consists of wages, salaries, and employer cost of employee benefits.

[2] Consist of private industry workers (excluding farm and household workers) and State and local government (excluding Federal Government) workers.

[3] Consist of legislative, judicial, administrative, and regulatory activities.

[4] Includes, for example, library, social, and health services.

– Data not available.

23. Employment Cost Index, wages and salaries, by occupation and industry group

(June 1981 = 100)

Series	1985			1986				1987		Percent change	
	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	3 months ended	12 months ended
										June 1987	
Civilian workers [1]	124.2	126.3	127.0	128.3	129.3	130.7	131.5	132.8	133.5	0.5	3.2
Workers, by occupational group:											
White-collar workers	126.4	128.8	129.8	131.2	132.4	134.1	135.0	136.6	137.3	.5	3.7
Blue-collar workers	120.5	122.0	122.3	123.4	124.1	125.0	125.6	126.2	127.1	.7	2.4
Service occupations	125.3	128.0	128.6	129.8	130.0	131.7	132.8	134.2	134.7	.4	3.6
Workers, by industry division											
Goods-producing	121.5	122.5	123.1	124.4	125.6	126.3	127.0	127.8	128.5	.5	2.3
Manufacturing	122.3	123.2	123.8	125.3	126.5	127.2	127.9	128.7	129.5	.6	2.4
Service-producing	125.8	128.6	129.4	130.7	131.5	133.4	134.2	135.8	136.5	.5	3.8
Services	130.5	134.2	134.8	136.4	137.0	139.9	141.1	142.7	143.4	.5	4.7
Health services	–	–	–	–	–	–	–	–	–	.6	5.0
Hospitals	–	–	–	–	–	–	–	–	–	.7	4.7
Public administration [2]	127.2	131.4	132.0	133.8	134.6	137.5	138.1	140.5	141.0	.4	4.8
Nonmanufacturing	125.0	127.6	128.4	129.6	130.4	132.2	133.0	134.5	135.2	.5	3.7
Private industry workers	123.3	124.9	125.6	126.8	127.9	128.8	129.5	130.8	131.7	.7	3.0
Workers, by occupational group:											
White-collar workers	125.5	127.3	128.3	129.6	131.1	132.0	132.7	134.6	135.4	.6	3.3
Professional specialty and technical occupations	128.7	131.2	131.5	132.7	134.0	135.4	136.4	138.4	139.1	.5	3.8
Executive, administrative, and managerial occupations	126.5	127.7	128.4	130.5	132.1	132.4	133.5	135.6	136.4	.6	3.3
Sales occupations	117.4	119.3	122.5	122.4	124.3	125.2	124.9	126.7	127.1	.3	2.3
Administrative support occupations, including clerical	125.6	127.1	127.9	129.6	130.8	131.7	132.7	134.3	135.5	.9	3.6
Blue-collar workers	120.3	121.7	122.0	123.1	123.7	124.5	125.1	125.6	126.6	.8	2.3
Precision production, craft, and repair occupations	122.0	123.7	123.8	125.3	125.7	126.7	127.4	127.9	128.8	.7	2.5
Machine operators, assemblers, and inspectors	120.1	121.1	121.6	122.6	123.6	124.1	124.9	125.5	126.7	1.0	2.5
Transportation and material moving occupations	115.7	117.7	117.8	118.0	118.9	119.8	120.1	120.5	121.5	.8	2.2
Handlers, equipment cleaners, helpers, and laborers	118.5	118.6	119.8	120.0	120.3	120.9	121.4	121.9	122.6	.6	1.9
Service occupations	124.4	126.3	126.6	128.0	128.0	128.9	130.1	131.4	131.9	.4	3.0
Workers, by industry division:											
Goods-producing	121.4	122.3	122.9	124.2	125.4	126.1	126.8	127.5	128.3	.6	2.3
Construction	116.6	117.3	117.9	118.3	119.8	120.5	120.8	121.7	122.7	.8	2.4
Manufacturing	122.3	123.2	123.8	125.3	126.5	127.2	127.9	128.7	129.5	.6	2.4
Durables	122.0	122.7	123.4	124.8	125.8	126.4	127.2	127.7	128.7	.8	2.3
Nondurables	122.6	124.0	124.6	126.1	127.9	128.5	129.3	130.5	131.0	.4	2.4
Service-producing	124.8	127.0	127.8	129.0	129.9	130.9	131.6	133.4	134.3	.7	3.4
Transportation and public utilities	122.8	124.8	125.2	126.3	126.6	127.3	127.5	128.1	129.3	.9	2.1
Transportation	–	–	–	–	–	–	–	–	–	1.3	1.8
Public utilities	–	–	–	–	–	–	–	–	–	.7	2.6
Wholesale and retail trade	121.1	122.7	123.7	124.5	125.8	126.5	126.9	127.9	129.9	1.6	3.3
Wholesale trade	126.8	127.7	128.3	129.7	131.2	131.8	133.1	134.8	137.2	1.8	4.6
Retail trade	118.9	120.8	121.9	122.5	123.7	124.4	124.5	125.2	127.1	1.5	2.7
Finance, insurance, and real estate	121.7	124.1	126.5	126.6	128.0	129.0	130.0	133.5	131.5	–1.5	2.7
Services	131.0	133.9	134.1	136.2	136.9	138.2	139.5	141.8	142.8	.7	4.3
Health services	–	–	–	–	–	–	–	–	–	.7	5.1
Hospitals	–	–	–	–	–	–	–	–	–	.7	4.8
Nonmanufacturing	123.9	125.9	126.6	127.7	128.7	129.7	130.4	131.9	132.8	.7	3.2
State and local government workers	128.7	133.2	134.2	135.5	136.0	140.4	141.4	142.5	142.8	.2	5.0
Workers, by occupational group											
White-collar workers	129.6	134.3	135.3	136.6	137.0	141.8	142.8	143.9	144.1	.1	5.2
Blue-collar workers	124.5	127.9	128.4	130.4	131.9	134.5	135.1	136.3	136.9	.4	3.8
Workers, by industry division											
Services	129.7	134.5	135.6	136.8	137.1	142.1	143.3	143.9	144.2	.2	5.2
Hospitals and other services [3]	128.0	130.2	130.9	132.4	133.3	135.8	137.3	138.6	139.4	.6	4.6
Health services	–	–	–	–	–	–	–	–	–	.6	4.1
Schools	130.2	135.8	137.0	138.0	138.2	144.1	145.1	145.5	145.6	.1	5.4
Elementary and secondary	131.1	137.5	138.5	139.4	139.4	145.7	146.4	146.5	146.6	.1	5.2
Public administration [2]	127.2	131.4	132.0	133.8	134.6	137.5	138.1	140.5	141.0	.4	4.8

[1] Consists of private industry workers (excluding farm and household workers) and State and local government (excluding Federal Government) workers.

[2] Consists of legislative, judicial, administrative, and regulatory activities.

[3] Includes, for example, library, social and health services.

– Data not available.

24. Employment Cost Index, private nonfarm workers, by bargaining status, region, and area size

(June 1981 = 100)

Series	1985			1986				1987		Percent change	
	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	3 months ended	12 months ended
										June 1987	
COMPENSATION											
Workers, by bargaining status[1]											
Union	125.5	126.5	127.1	128.4	128.7	129.4	129.8	130.5	131.2	0.5	1.9
Goods-producing	123.9	124.6	125.2	126.4	126.7	127.3	127.5	128.0	128.7	.5	1.6
Service-producing	128.0	129.5	130.2	131.6	131.9	132.8	133.4	134.4	135.2	.6	2.5
Manufacturing	124.2	125.0	125.5	127.0	126.9	127.5	127.9	128.0	128.7	.5	1.4
Nonmanufacturing	126.6	127.8	128.6	129.7	130.4	131.2	131.5	132.6	133.5	.7	2.4
Nonunion	125.0	126.8	127.5	129.0	130.2	131.2	132.1	133.6	134.6	.7	3.4
Goods-producing	123.5	124.4	125.1	126.7	128.2	129.1	130.0	130.8	131.8	.8	2.8
Service-producing	125.8	128.3	129.0	130.4	131.4	132.5	133.4	135.3	136.4	.8	3.8
Manufacturing	124.8	125.7	126.3	128.1	129.7	130.4	131.4	132.2	133.2	.8	2.7
Nonmanufacturing	125.1	127.3	128.1	129.5	130.4	131.6	132.5	134.3	135.3	.7	3.8
Workers, by region [1]											
Northeast	126.4	128.8	129.9	131.6	133.3	134.2	135.2	137.4	138.6	.9	4.0
South	125.2	126.5	127.2	128.7	129.6	130.7	131.4	132.1	133.2	.8	2.8
Midwest (formerly North Central)	122.7	124.2	124.6	125.9	126.2	127.3	128.1	129.1	130.2	.9	3.2
West	127.9	129.1	129.8	130.8	131.6	132.1	132.8	134.1	134.2	.1	2.0
Workers, by area size [1]											
Metropolitan areas	125.7	127.3	128.1	129.5	130.5	131.4	132.2	133.5	134.4	.7	3.0
Other areas	122.5	123.9	123.9	125.5	126.4	127.2	127.9	129.0	130.2	.9	3.0
WAGES AND SALARIES											
Workers, by bargaining status [1]											
Union	123.0	124.1	124.7	125.6	126.1	126.9	127.2	127.7	128.3	.5	1.7
Goods-producing	121.3	122.2	122.7	123.4	124.1	124.5	124.8	125.0	125.8	.6	1.4
Service-producing	125.7	127.1	127.8	129.0	129.3	130.5	130.9	131.7	132.2	.4	2.2
Manufacturing	121.7	122.8	123.3	124.2	124.6	125.0	125.5	125.6	126.2	.5	1.3
Nonmanufacturing	124.1	125.3	125.9	126.9	127.4	128.5	128.7	129.5	130.1	.5	2.1
Nonunion	123.4	125.2	125.9	127.3	128.5	129.4	130.3	131.8	132.8	.8	3.3
Goods-producing	121.4	122.3	123.0	124.5	126.1	127.0	127.8	128.8	129.6	.6	2.8
Service-producing	124.4	126.9	127.7	128.9	129.9	130.8	131.7	133.6	134.6	.7	3.6
Manufacturing	122.8	123.7	124.4	126.1	127.7	128.5	129.5	130.6	131.5	.7	3.0
Nonmanufacturing	123.6	125.9	126.6	127.8	128.9	129.8	130.6	132.4	133.4	.8	3.5
Workers, by region [1]											
Northeast	124.6	126.8	128.1	129.2	131.3	132.3	133.1	135.4	136.6	.9	4.0
South	123.4	124.8	125.4	126.8	127.8	128.8	129.4	130.1	131.1	.8	2.6
Midwest (formerly North Central)	121.1	122.5	122.9	124.2	124.4	125.3	126.2	127.4	128.5	.9	3.3
West	125.1	126.6	127.1	128.1	128.9	129.3	130.1	131.2	131.1	-.1	1.7
Workers, by area size[1]											
Metropolitan areas	123.8	125.5	126.3	127.4	128.5	129.4	130.2	131.6	132.4	.6	3.0
Other areas	120.6	121.9	122.0	123.6	124.5	125.0	125.6	126.6	127.8	.9	2.7

[1] The indexes are calculated differently from those for the occupation and industry groups. For a detailed description of the index calculation, see the *Monthly Labor Review* Technical Note, "Estimation procedures for the Employment Cost Index," May 1982.

25. Specified compensation and wage adjustments from contract settlements, and effective wage adjustments, private industry collective bargaining situations covering 1,000 workers or more (in percent)

Measure	Annual average		Quarterly average							
	1985	1986	1985		1986				1987	
			III	IV	I	II	III	IV[p]	I[p]	II[p]
Specified adjustments:										
Total compensation [1] adjustments, [2] settlements covering 5,000 workers or more:										
First year of contract	2.6	1.1	2.0	2.0	0.6	0.7	0.7	2.7	1.7	4.2
Annual rate over life of contract	2.7	1.6	3.0	1.4	1.2	1.6	1.2	2.4	2.4	3.9
Wage adjustments, settlements covering 1,000 workers or more:										
First year of contract	2.3	1.2	2.0	2.1	.8	1.3	.8	2.0	1.2	2.6
Annual rate over life of contract	2.7	1.8	3.1	1.9	1.5	2.0	1.5	2.1	1.8	2.9
Effective adjustments:										
Total effective wage adjustment [3]	3.3	2.3	1.2	.5	.6	.7	.5	.5	.4	1.0
From settlements reached in period	.7	.5	.2	.1	.0	.2	.1	.2	.0	.1
Deferred from settlements reached in earlier periods	1.8	1.7	.5	.2	.4	.6	.5	.2	.3	.7
From cost-of-living-adjustments clauses	.7	.2	.4	.1	.2	.0	.0	.1	.1	.2

[1] Compensation includes wages, salaries, and employers' cost of employee benefits when contract is negotiated.

[2] Adjustments are the net result of increases, decreases, and no changes in compensation or wages.

[3] Because of rounding, total may not equal sum of parts.

[p] = preliminary.

26. Average specified compensation and wage adjustments, major collective bargaining settlements in private industry situations covering 1,000 workers or more during 4-quarter periods (in percent)

Measure	Average for four quarters ending--							
	1985		1986				1987	
	III	IV	I	II	III	IV[p]	I[p]	II[p]
Specified total compensation adjustments, settlements covering 5,000 workers or more, all industries:								
First year of contract	3.1	2.6	2.3	1.4	0.9	1.1	1.2	1.9
Annual rate over life of contract	2.7	2.7	2.5	2.0	1.4	1.6	1.7	2.1
Specified wage adjustments, settlements covering 1,000 workers or more:								
All industries								
First year of contract	2.4	2.3	2.0	1.6	1.2	1.2	1.2	1.5
Contracts with COLA clauses	1.9	1.6	1.6	1.8	2.2	1.9	2.0	1.8
Contracts without COLA clauses	2.7	2.7	2.2	1.5	.8	.9	.9	1.4
Annual rate over life of contract	2.5	2.7	2.5	2.2	1.7	1.8	1.8	2.0
Contracts with COLA clauses	1.8	2.5	2.5	2.5	2.0	1.7	1.8	1.7
Contracts without COLA clauses	3.0	2.8	2.5	2.1	1.6	1.8	1.8	2.2
Manufacturing								
First year of contract	1.5	.8	.8	.1	-1.0	-1.2	-1.6	-.8
Contracts with COLA clauses	1.5	.8	.8	.7	1.1	1.3	1.3	1.4
Contracts without COLA clauses	1.5	.9	.9	-.4	-2.0	-2.8	-3.5	-2.9
Annual rate over life of contract	1.6	1.8	1.8	1.4	.3	.2	.0	.2
Contracts with COLA clauses	1.4	2.1	2.1	2.0	1.1	.9	.8	.8
Contracts without COLA clauses	2.4	1.6	1.5	.9	-.1	-.2	-.6	-.3
Nonmanufacturing								
First year of contract	3.2	3.3	2.8	2.6	2.1	2.0	2.2	2.3
Contracts with COLA clauses	4.0	3.6	3.5	3.4	2.7	2.1	2.2	2.1
Contracts without COLA clauses	3.0	3.3	2.7	2.4	1.9	2.0	2.2	2.4
Annual rate over life of contract	3.3	3.3	3.0	2.8	2.3	2.3	2.4	2.6
Contracts with COLA clauses	3.9	3.6	3.6	3.3	2.5	2.1	2.2	2.2
Contracts without COLA clauses	3.2	3.3	2.8	2.6	2.2	2.4	2.5	2.8
Construction								
First year of contract	1.0	1.5	1.6	2.3	2.3	2.2	2.4	2.6
Contracts with COLA clauses	[1]	[1]	[1]	1.1	1.4	1.4	1.6	[1]
Contracts without COLA clauses	[1]	[1]	[1]	2.4	2.4	2.3	2.4	[1]
Annual rate over life of contract	1.7	2.1	2.2	2.5	2.6	2.5	2.5	2.8
Contracts with COLA clauses	[1]	[1]	[1]	1.2	1.6	1.6	1.4	[1]
Contracts without COLA clauses	[1]	[1]	[1]	2.6	2.6	2.5	2.6	[1]

[1] Data do not meet publication standards.

[p] = preliminary.

27. Average effective wage adjustments, private industry collective bargaining situations covering 1,000 workers or more during 4-quarter periods (in percent)

Effective wage adjustment	Average for four quarters ending--						
	1985	1986				1987	
	IV	I	II	III	IV[p]	I[p]	II[p]
For all workers:[1]							
Total	3.3	3.1	2.9	2.3	2.3	2.0	2.2
From settlements reached in period	.7	.6	.5	.5	.5	.4	.3
Deferred from settlements reached in earlier period	1.8	1.7	1.8	1.6	1.7	1.5	1.6
From cost-of-living-adjustments clauses	.7	.8	.7	.2	.2	.1	.3
For workers receiving changes:							
Total	4.1	4.0	3.8	3.1	2.8	2.4	2.8
From settlements reached in period	3.4	2.9	2.5	1.7	1.6	1.2	1.1
Deferred from settlements reached in earlier period	3.7	3.5	3.4	3.8	3.9	3.7	3.5
From cost-of-living-adjustments clauses	2.2	2.5	2.0	1.0	1.0	.6	1.8

[1] Because of rounding, total may not equal sum of parts.

[p] = preliminary.

28. Specified compensation and wage adjustments from contract settlements, and effective wage adjustments, State and local government collective bargaining situations covering 1,000 workers or more (in percent)

Measure	Annual average		First 6 months 1987
	1985	1986	
Specified adjustments:			
Total compensation [1] adjustments, [2] settlements covering 5,000 workers or more:			
First year of contract	4.2	6.2	5.7
Annual rate over life of contract	5.1	6.0	4.9
Wage adjustments, settlements covering 1,000 workers or more:			
First year of contract	4.6	5.7	5.2
Annual rate over life of contract	5.4	5.7	5.4
Effective adjustments:			
Total effective wage adjustment [3]	5.7	5.5	1.6
From settlements reached in period	4.1	2.4	.4
Deferred from settlements reached in earlier periods	1.6	3.0	1.2
From cost-of-living-adjustment clauses	([4])	([4])	([4])

[1] Compensation includes wages, salaries, and employers' cost of employee benefits when contract is negotiated.

[2] Adjustments are the net result of increases, decreases, and no changes in compensation or wages.

[3] Because of rounding, total may not equal sum of parts.

[4] Less than 0.05 percent.

– Data not available.

29. Work stoppages involving 1,000 workers or more

Measure	Annual totals		1986					1987[p]							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Number of stoppages:															
Beginning in period	54	69	10	8	5	2	1	2	5	3	2	3	8	5	2
In effect during period	61	72	22	18	18	9	6	7	7	5	5	7	12	13	11
Workers involved:															
Beginning in period (in thousands)	323.9	533.1	113.3	39.4	44.3	8.7	3.0	7.3	37.6	12.2	2.7	7.8	16.1	8.4	17.4
In effect during period (in thousands)	584.1	899.5	153.0	87.4	109.9	67.8	49.4	47.6	41.6	16.2	8.9	14.7	26.6	26.2	38.0
Days idle:															
Number (in thousands)	7,079.0	1,200.1	1371.6	1,225.6	1,423.7	940.4	933.2	828.6	194.1	104.4	151.3	223.7	295.7	483.0	403.2
Percent of estimated working time[1]	.03	.05	.08	.06	.06	.05	.04	.04	.01	.01	.01	.01	.01	.02	.02

[1] Agricultural and government employees are included in the total employed and total working time: private household, forestry, and fishery employees are excluded. An explanation of the measurement of idleness as a percentage of the total time worked is found in "'Total economy' measure of strike idleness," *Monthly Labor Review,* October 1968, pp. 54-56.

– Data not available.

[p] = preliminary

30. Consumer Price Index for All Urban Consumers: U.S. city average, by expenditure category and commodity or service group; and CPI for Urban Wage Earners and Clerical Workers, all items

(1967=100, unless otherwise indicated)

Series	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
CONSUMER PRICE INDEX FOR ALL URBAN CONSUMERS:															
All items	322.2	328.4	328.6	330.2	330.5	330.8	331.1	333.1	334.4	335.9	337.7	338.7	340.1	340.8	342.7
All items (1957-59=100)	374.7	381.9	382.1	384.1	384.4	384.7	385.1	387.4	388.9	390.7	392.7	393.9	395.6	396.3	398.5
Food and beverages	302.0	311.8	314.6	315.1	315.6	316.4	317.0	320.5	321.6	321.6	322.5	324.0	325.4	325.1	325.4
Food	309.8	319.7	322.7	323.2	323.7	324.6	325.2	328.9	330.1	330.0	331.0	332.5	334.1	333.6	333.8
Food at home	296.8	305.3	308.9	309.0	309.5	309.9	310.2	315.2	316.6	315.8	316.9	318.8	320.4	319.1	319.0
Cereals and bakery products	317.0	325.8	328.2	328.5	328.4	328.5	329.5	331.5	332.7	333.2	335.6	336.5	337.0	338.4	338.8
Meats, poultry, fish, and eggs	263.4	275.1	283.0	284.7	284.9	286.3	287.3	289.2	286.4	286.5	285.9	288.5	290.7	293.1	294.6
Dairy products	258.0	258.4	258.3	258.5	260.0	261.2	262.2	263.3	264.7	263.7	263.2	264.3	263.7	263.2	264.2
Fruits and vegetables	325.7	328.7	332.1	329.1	328.6	327.8	328.5	344.3	355.2	352.5	360.6	365.7	372.8	359.3	352.5
Other foods at home	361.1	373.6	374.0	373.7	374.4	373.9	372.2	378.7	380.0	378.6	377.6	377.5	376.4	375.9	377.0
Sugar and sweets	398.8	411.1	413.1	413.7	413.4	412.4	411.8	415.8	415.8	417.2	417.4	417.7	419.3	418.8	419.6
Fats and oils	294.4	287.8	287.8	285.6	284.6	285.4	286.0	293.2	290.3	294.6	291.8	293.3	291.4	292.9	292.6
Nonalcoholic beverages	451.7	478.2	476.9	475.7	477.5	476.9	470.2	482.6	481.9	475.4	469.8	467.9	462.6	458.5	458.8
Other prepared foods	294.2	301.9	303.2	303.8	304.7	303.9	305.2	308.4	312.1	311.3	313.2	313.5	314.5	315.4	317.5
Food away from home	346.6	360.1	361.8	363.3	364.0	365.8	367.1	368.6	369.6	370.9	371.5	372.3	373.8	374.9	375.9
Alcoholic beverages	229.5	239.7	240.1	240.4	240.6	240.5	240.8	242.5	243.2	243.6	244.3	245.0	245.9	246.7	247.3
Housing	349.9	360.2	362.4	363.7	363.0	361.7	362.1	363.9	365.1	366.4	367.7	368.9	371.3	372.5	374.9
Shelter	382.0	402.9	405.2	407.6	409.5	410.2	410.4	412.3	414.0	415.9	418.0	419.2	420.2	422.1	425.1
Renters' costs (12/82=100)	115.4	121.9	122.9	123.6	124.0	124.3	124.2	125.3	125.8	126.4	127.1	127.3	127.9	129.3	130.1
Rent, residential	264.6	280.0	281.7	283.2	284.6	285.6	286.0	287.1	288.0	288.3	288.8	289.4	289.6	291.2	293.1
Other renters' costs	398.4	416.2	425.7	429.1	427.3	425.5	418.2	428.3	430.8	438.7	446.1	446.1	453.1	465.9	467.7
Homeowners' costs (12/82=100)	113.1	119.4	119.9	120.7	121.3	121.5	121.6	122.0	122.5	123.0	123.6	124.0	124.2	124.4	125.4
Owners' equivalent rent (12/82=100)	113.2	119.4	119.9	120.7	121.3	121.5	121.6	122.0	122.5	123.0	123.6	124.1	124.2	124.4	125.4
Household insurance (12/82=100)	112.4	119.2	119.9	120.2	120.6	121.1	121.6	121.8	122.0	122.2	122.4	123.0	123.6	124.5	125.1
Maintenance and repairs	368.9	373.8	376.4	376.2	379.0	377.1	380.0	382.1	381.9	383.4	382.4	381.9	385.0	392.4	391.3
Maintenance and repair services	421.1	430.9	434.2	437.0	437.5	433.7	433.1	437.7	436.1	439.4	437.1	435.3	440.5	452.8	451.5
Maintenance and repair commodities	269.6	269.7	271.3	268.7	273.0	272.9	278.3	277.7	278.8	278.5	278.7	279.6	280.2	281.9	281.3
Fuel and other utilities	393.6	384.7	389.5	388.3	379.1	371.1	371.0	373.7	374.8	374.9	374.2	377.5	387.6	388.1	391.1
Fuels	488.1	463.1	469.0	467.2	450.3	437.8	438.1	443.7	445.1	444.6	442.0	448.7	470.8	468.9	473.6
Fuel oil, coal, and bottled gas	619.5	501.5	447.3	453.5	451.9	452.0	460.6	487.9	503.2	500.6	500.5	497.7	498.6	497.9	502.3
Gas (piped) and electricity	452.7	446.7	464.5	461.1	441.4	426.7	425.3	428.8	428.9	428.7	425.9	433.3	456.8	454.8	459.4
Other utilities and public services	240.7	253.1	255.9	255.6	257.1	255.4	254.9	254.9	255.6	256.2	257.0	257.2	256.4	258.6	259.9
Household furnishings and operations	247.2	250.4	250.5	251.5	251.6	251.2	252.4	253.1	253.5	254.3	255.2	254.9	254.9	255.1	255.4
Housefurnishings	200.1	201.1	200.9	202.2	202.2	201.4	202.5	203.0	203.2	203.8	204.7	203.7	203.6	203.9	204.2
Housekeeping supplies	313.6	319.5	319.8	320.1	319.8	320.4	322.9	324.6	325.3	327.7	328.2	330.1	330.5	330.1	329.5
Housekeeping services	338.9	346.6	347.4	347.8	348.5	348.5	349.3	349.8	350.6	351.0	352.2	353.1	353.0	353.8	354.3
Apparel and upkeep	206.0	207.8	207.0	212.1	213.2	213.1	210.9	207.1	208.4	215.2	218.7	218.0	214.5	210.5	214.7
Apparel commodities	191.6	192.0	191.2	196.6	197.6	197.4	194.9	190.9	192.1	199.1	202.6	201.8	198.1	194.0	198.3
Men's and boys' apparel	197.9	200.0	197.8	203.2	204.3	205.3	202.3	199.2	199.9	203.5	205.6	207.1	205.3	203.0	204.1
Women's and girls' apparel	169.5	168.0	167.2	175.7	176.4	175.0	171.7	166.6	167.8	177.0	182.2	179.6	173.7	168.3	175.0
Infants' and toddlers' apparel	299.7	312.7	310.6	309.7	312.0	307.0	312.7	301.8	304.5	319.6	319.1	316.4	308.0	301.2	304.8
Footwear	212.1	211.2	209.6	212.0	215.1	215.1	214.0	209.9	211.0	216.5	219.2	220.8	218.8	214.3	215.9
Other apparel commodities	215.5	217.9	221.6	221.1	219.8	221.1	220.0	223.2	226.0	227.4	227.0	226.7	230.6	231.9	234.2
Apparel services	320.9	334.6	334.7	336.7	338.3	339.0	339.5	342.5	343.2	344.7	344.7	346.8	347.4	348.7	348.2
Transportation	319.9	307.5	301.3	302.2	302.6	304.3	304.8	308.5	310.0	310.6	313.3	314.6	316.7	318.5	320.2
Private transportation	314.2	299.5	292.8	293.7	294.1	295.8	295.9	299.8	301.3	301.9	304.8	306.3	308.6	310.5	312.0
New vehicles	214.9	224.1	224.5	224.2	226.7	230.2	231.7	232.3	229.9	229.2	229.9	230.6	231.2	231.8	231.0
New cars	215.2	224.4	224.7	224.5	227.1	230.7	232.2	233.0	230.2	229.4	230.4	231.3	232.0	232.7	232.1
Used cars	379.7	363.2	358.0	359.5	360.6	361.0	356.6	354.6	356.9	363.0	371.6	378.6	383.0	385.5	385.7
Motor fuel	373.8	292.1	265.9	271.1	263.2	260.9	261.9	275.8	288.1	290.0	297.2	299.7	306.0	311.2	319.5
Gasoline	373.3	291.4	265.3	270.6	262.6	260.2	261.2	275.1	287.5	289.4	296.7	299.3	305.5	310.8	319.1
Maintenance and repair	351.4	363.1	364.3	365.0	365.7	368.4	370.7	371.3	373.0	373.0	376.1	376.1	376.3	376.8	378.6
Other private transportation	287.6	303.9	304.5	302.3	307.6	311.6	312.0	314.9	314.0	314.4	315.1	315.9	317.6	318.8	318.6
Other private transportation commodities	202.6	201.6	201.8	200.3	198.9	200.0	200.4	202.2	201.8	202.3	200.8	202.3	202.3	201.6	202.6
Other private transportation services	312.8	333.9	334.6	332.3	339.3	344.1	344.5	347.7	346.7	347.0	348.6	349.1	351.3	353.2	352.6
Public transportation	402.8	426.4	428.0	428.5	428.7	431.7	437.5	438.9	439.8	441.4	440.8	439.6	438.1	438.3	442.8
Medical care	403.1	433.5	437.5	439.7	442.3	444.6	446.8	449.6	452.4	455.0	457.3	458.9	461.3	464.1	466.1
Medical care commodities	256.7	273.6	276.0	276.7	277.5	278.2	280.8	282.4	283.9	286.3	287.5	289.6	291.5	293.4	294.6
Medical care services	435.1	468.6	473.0	475.7	478.8	481.5	483.4	486.5	489.6	492.1	494.7	496.0	498.4	501.5	503.6
Professional services	367.3	390.9	393.3	396.1	398.0	399.8	401.0	403.7	406.8	409.6	412.5	413.9	416.7	418.9	420.6
Hospital and related services	224.0	237.4	239.5	240.1	242.3	243.8	245.0	246.7	248.1	249.0	250.1	251.0	251.8	254.6	256.4
Entertainment	265.0	274.1	274.7	275.3	276.5	277.4	277.4	278.3	278.7	279.8	281.3	282.0	282.3	283.5	283.9
Entertainment commodities	260.6	265.9	266.1	265.9	266.7	267.6	267.4	268.1	268.1	269.9	270.8	271.7	271.8	272.8	272.5
Entertainment services	271.8	286.3	287.3	289.2	290.8	291.8	292.2	293.3	294.1	294.5	296.6	297.2	297.6	299.1	300.1
Other goods and services	326.6	346.4	346.4	353.3	354.6	354.9	355.2	358.1	359.7	360.3	361.1	362.0	362.9	365.1	366.6
Tobacco products	328.5	351.0	356.2	356.8	357.2	357.3	357.6	364.9	368.3	369.6	370.4	370.9	372.7	379.9	380.8
Personal care	281.9	291.3	292.3	292.0	293.1	293.4	293.6	295.7	296.4	296.4	297.3	299.0	299.2	300.2	300.8
Toilet goods and personal care appliances	278.5	287.9	289.1	288.2	289.9	289.6	289.6	291.3	292.1	292.0	292.9	294.2	294.2	295.8	295.7
Personal care services	286.0	295.4	296.2	296.5	297.1	297.9	298.2	300.8	301.3	301.5	302.3	304.6	304.9	305.3	306.7
Personal and educational expenses	397.1	428.8	422.9	445.2	447.6	448.2	448.8	450.6	452.0	452.8	453.8	454.4	455.5	456.5	459.0
School books and supplies	350.8	380.3	376.9	389.4	392.3	392.5	392.6	400.7	403.4	403.9	404.4	404.9	405.1	405.2	405.7
Personal and educational services	407.7	440.1	433.7	457.8	460.2	460.8	461.6	462.8	464.2	465.0	466.0	466.6	467.9	469.0	471.6

See footnotes at end of table.

30. Continued— Consumer Price Index for All Urban Consumers: U.S. city average, by expenditure category and commodity or service group; and CPI for Urban Wage Earners and Clerical Workers, all items

(1967=100, unless otherwise indicated)

Series	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
All items	322.2	328.4	328.6	330.2	330.5	330.8	331.1	333.1	334.4	335.9	337.7	338.7	340.1	340.8	342.7
Commodities	286.7	283.9	281.9	283.5	283.6	284.0	284.2	286.3	287.7	289.5	291.4	292.3	292.8	292.8	294.2
Food and beverages	302.0	311.8	314.6	315.1	315.6	316.4	317.0	320.5	321.6	321.6	322.5	324.0	325.4	325.1	325.4
Commodities less food and beverages	274.6	264.7	260.1	262.3	262.1	262.4	262.4	263.7	265.2	267.9	270.4	270.9	270.9	271.0	273.0
Nondurables less food and beverages	282.1	265.2	258.1	261.5	260.4	260.0	260.0	261.8	265.4	269.7	273.2	273.5	273.2	272.8	276.6
Apparel commodities	191.6	192.0	191.2	196.6	197.6	197.4	194.9	190.9	192.1	199.1	202.6	201.8	198.1	194.0	198.3
Nondurables less food, beverages, and apparel	333.3	307.3	296.9	299.5	297.2	296.7	298.0	304.8	310.3	311.9	315.0	316.4	319.1	322.0	325.2
Durables	270.7	270.2	269.0	269.3	270.5	271.8	271.7	272.4	271.2	271.7	273.0	273.6	274.2	274.9	274.6
Services	381.5	400.5	403.7	405.5	406.1	406.1	406.6	408.6	409.9	411.2	412.8	414.2	416.7	418.3	420.7
Rent of shelter (12/82=100)	113.9	120.2	120.9	121.7	122.2	122.4	122.5	123.1	123.6	124.1	124.8	125.1	125.4	126.0	126.9
Household services less rent of' shelter (12/82=100)	111.2	112.8	115.3	114.9	112.9	111.0	110.8	111.3	111.5	111.5	111.4	112.3	114.8	115.1	115.8
Transportation services	337.0	356.3	357.3	356.2	360.5	364.4	366.2	368.5	368.5	369.0	370.5	370.5	371.6	372.9	373.8
Medical care services	435.1	468.6	473.0	475.7	478.8	481.5	483.4	486.5	489.6	492.1	494.7	496.0	498.4	501.5	503.6
Other services	314.1	331.8	330.8	337.9	339.5	340.3	340.8	342.2	343.1	343.7	345.0	345.9	346.6	347.7	349.2
Special indexes:															
All items less food	323.3	328.6	328.1	330.0	330.2	330.4	330.6	332.2	333.6	335.4	337.3	338.3	339.6	340.5	342.7
All items less shelter	303.9	306.7	306.4	307.9	307.8	308.0	308.3	310.3	311.5	312.9	314.6	315.6	317.1	317.4	319.0
All items less homeowners' costs (12/82=100)	109.7	111.2	111.2	111.7	111.7	111.8	111.9	112.7	113.1	113.6	114.2	114.6	115.1	115.3	115.9
All items less medical care	317.7	322.6	322.6	324.2	324.4	324.5	324.8	326.7	328.0	329.4	331.1	332.2	333.5	334.1	336.0
Commodities less food	272.5	263.4	259.0	261.1	260.9	261.2	261.2	262.5	264.0	266.5	268.9	269.4	269.5	269.6	271.6
Nondurables less food	277.2	262.2	255.6	258.9	257.8	257.4	257.5	259.2	262.6	266.4	269.6	270.0	269.8	269.5	273.1
Nondurables less food and apparel	319.2	297.1	287.9	290.2	288.1	287.7	288.9	294.9	299.6	301.0	303.7	305.0	307.4	309.9	312.7
Nondurables	293.2	289.6	287.4	289.4	289.0	289.2	289.5	292.1	294.6	296.8	299.1	300.0	300.5	300.1	302.3
Services less rent of shelter (12/82=100)	113.5	118.7	119.8	120.2	120.1	120.0	120.2	120.8	121.1	121.3	121.6	122.1	123.2	123.7	124.2
Services less medical care	373.3	390.6	393.6	395.4	395.7	395.4	395.8	397.6	398.8	400.0	401.5	402.9	405.4	406.8	409.3
Energy	426.5	370.3	358.6	360.6	348.6	341.7	342.4	352.2	359.2	360.0	362.4	366.9	380.6	382.4	388.9
All items less energy	314.8	327.0	328.3	330.0	331.4	332.3	332.6	334.0	334.9	336.5	338.2	339.0	339.5	340.1	341.6
All items less food and energy	314.4	327.1	327.9	329.9	331.6	332.5	332.8	333.6	334.5	336.4	338.3	338.9	339.1	339.9	341.7
Commodities less food and energy	259.7	263.2	262.9	264.5	265.5	266.1	265.8	265.5	265.7	268.4	270.3	270.7	270.1	269.6	270.9
Energy commodities	409.9	322.4	292.4	297.7	290.6	288.5	290.5	306.1	319.2	320.9	328.0	330.2	336.4	341.4	349.9
Services less energy	375.9	397.1	399.0	401.4	403.7	405.0	405.7	407.5	408.9	410.4	412.3	413.2	414.1	416.0	418.3
Purchasing power of the consumer dollar:															
1967=$1.00	31.0	30.5	30.4	30.3	30.3	30.2	30.2	30.0	29.9	29.8	29.6	29.5	29.4	29.3	29.2
1957-59=$1.00	26.7	26.2	26.2	26.0	26.0	26.0	26.0	25.8	25.7	25.6	25.5	25.4	25.3	25.2	25.1
CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS AND CLERICAL WORKERS:															
All items	318.5	323.4	323.4	324.9	325.0	325.4	325.7	327.7	329.0	330.5	332.3	333.4	334.9	335.6	337.4
All items (1957-59=100)	370.4	376.1	376.1	377.8	378.0	378.4	378.8	381.1	382.6	384.4	386.5	387.8	389.5	390.3	392.4
Food and beverages	301.8	311.6	314.5	315.0	315.4	316.2	316.8	320.3	321.3	321.2	322.1	323.5	325.0	324.8	325.1
Food	309.3	319.2	322.3	322.8	323.3	324.2	324.8	328.4	329.5	329.4	330.2	331.8	333.4	333.1	333.4
Food at home	295.3	303.7	307.3	307.5	307.9	308.4	308.7	313.4	314.6	313.8	314.9	316.8	318.5	317.5	317.4
Cereals and bakery products	315.4	324.2	326.7	326.8	326.8	327.0	328.0	330.0	331.2	331.6	334.1	334.8	335.4	336.8	337.1
Meats, poultry, fish, and eggs	262.7	274.4	282.2	284.0	284.4	285.8	286.6	288.5	285.8	285.6	285.2	287.9	290.0	292.5	293.9
Dairy products	256.9	257.1	256.9	257.1	258.6	259.9	260.9	262.0	263.6	262.4	262.0	263.1	262.5	261.9	262.9
Fruits and vegetables	320.3	323.8	327.2	324.2	322.9	322.2	323.4	338.2	348.2	346.0	353.6	358.5	366.7	354.1	347.1
Other foods at home	361.5	373.5	373.9	373.5	374.4	373.9	372.2	378.9	380.0	378.8	377.8	377.9	376.8	376.3	377.5
Sugar and sweets	398.3	410.5	412.6	413.0	412.8	411.9	411.2	414.9	414.8	416.5	416.5	417.1	418.7	418.3	419.3
Fats and oils	293.9	287.2	287.1	285.1	284.1	284.5	285.5	292.6	289.9	293.9	291.3	292.6	290.7	292.2	291.9
Nonalcoholic beverages	453.2	478.1	476.9	475.5	477.7	477.1	470.3	483.7	482.5	476.9	471.3	470.0	464.5	460.5	461.0
Other prepared foods	295.7	303.2	304.5	305.2	305.9	305.3	306.6	309.7	313.3	312.6	314.5	314.9	315.8	316.7	318.7
Food away from home	349.7	363.4	365.2	366.6	367.3	369.2	370.5	372.2	373.2	374.3	374.8	375.6	377.1	378.2	379.2
Alcoholic beverages	232.6	242.5	243.0	243.4	243.5	243.4	243.9	245.4	246.2	246.5	247.2	247.8	248.6	249.2	249.8
Housing	343.3	353.2	355.4	356.6	355.6	354.3	354.8	356.3	357.5	358.8	360.0	361.1	363.5	364.6	367.0
Shelter	370.4	390.7	392.9	395.2	397.1	397.8	398.1	399.6	401.2	403.2	405.1	406.3	406.9	408.7	411.7
Renters' costs (12/84=100)	103.6	109.5	110.3	110.9	111.4	111.7	111.6	112.3	112.7	113.3	113.8	114.0	114.2	115.3	116.0
Rent, residential	263.7	279.1	280.8	282.2	283.6	284.6	285.1	286.1	287.0	287.3	287.8	288.3	288.5	290.0	291.9
Other renters' costs	397.9	416.0	426.1	428.9	426.7	424.8	417.3	424.9	427.6	439.0	448.1	449.2	453.1	467.0	468.8
Homeowners' costs (12/84=100)	103.1	108.8	109.3	110.0	110.5	110.7	110.8	111.1	111.6	112.1	112.7	113.1	113.2	113.4	114.3
Owners' equivalent rent (12/84=100)	103.0	108.8	109.2	110.0	110.5	110.7	110.8	111.1	111.5	112.1	112.7	113.1	113.2	113.4	114.3
Household insurance (12/84=100)	103.2	109.4	110.1	110.4	110.8	111.3	111.7	111.9	112.1	112.4	112.5	113.1	113.8	114.6	115.1
Maintenance and repairs	364.1	369.4	371.5	370.6	373.1	372.4	374.6	377.3	376.9	378.5	378.0	378.0	380.9	386.4	385.7
Maintenance and repair services	415.0	425.3	428.6	430.7	431.1	428.2	428.1	434.5	432.5	436.8	435.7	433.2	438.3	449.8	448.7
Maintenance and repair commodities	261.1	262.5	263.5	261.1	264.3	265.0	268.0	267.6	268.4	267.9	267.9	269.7	270.5	270.7	270.4
Fuel and other utilities	394.7	385.4	390.6	389.1	379.3	371.3	371.1	373.9	374.9	375.1	374.3	377.5	388.0	388.3	391.5
Fuels	487.5	462.7	469.3	467.1	449.2	437.1	437.3	442.7	443.7	443.2	440.7	446.9	470.0	467.6	472.6
Fuel oil, coal, and bottled gas	622.0	504.5	450.7	456.6	454.8	455.0	463.5	489.3	503.9	501.4	501.1	498.2	499.4	498.4	502.7
Gas (piped) and electricity	451.6	445.6	464.1	460.3	439.6	425.3	423.8	427.4	427.3	427.0	424.4	431.2	455.4	453.0	457.8
Other utilities and public services	241.6	253.8	256.6	256.2	257.8	255.8	255.3	255.6	256.5	257.1	257.8	258.1	257.4	259.5	260.8
Household furnishings and operations	243.4	246.5	246.6	247.5	247.5	247.2	248.5	248.9	249.4	250.1	250.8	250.5	250.4	250.7	251.0
Housefurnishings	197.6	198.4	198.3	199.4	199.3	198.5	199.7	200.0	200.2	200.7	201.4	200.5	200.5	200.8	201.2
Housekeeping supplies	310.7	317.1	317.3	317.9	317.8	318.4	320.6	322.0	323.1	325.2	325.7	327.2	327.5	327.6	327.0
Housekeeping services	340.2	348.2	349.1	349.5	350.1	350.1	350.8	351.2	352.0	352.3	353.3	354.0	354.0	354.4	354.8
Apparel and upkeep	205.0	206.5	205.9	211.0	211.9	211.5	209.6	205.8	206.9	213.7	217.4	216.6	213.0	209.1	212.9

See footnotes at end of table.

30. Continued— Consumer Price Index for All Urban Consumers: U.S. city average, by expenditure category and commodity or service group; and CPI for Urban Wage Earners and Clerical Workers, all items

(1967=100, unless otherwise indicated)

Series	Annual average		1986					1987							
	1985	1986	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Apparel commodities	191.3	191.5	190.8	196.2	197.1	196.6	194.5	190.5	191.5	198.3	202.1	201.2	197.5	193.6	197.4
Men's and boys' apparel	198.2	199.7	197.1	202.3	203.6	204.6	202.1	198.6	198.9	201.9	204.3	205.7	204.0	201.7	203.1
Women's and girls' apparel	171.3	169.4	169.3	178.1	178.1	176.2	173.1	168.2	169.2	178.6	184.4	181.8	175.8	170.4	176.6
Infants' and toddlers' apparel	311.7	329.4	328.6	326.2	329.2	323.8	329.3	319.1	322.2	337.3	336.3	334.7	324.2	318.3	320.9
Footwear	212.5	211.8	209.9	212.0	215.3	215.6	214.9	211.1	212.4	217.7	220.0	221.3	219.4	215.5	217.2
Other apparel commodities	203.1	206.1	209.5	209.0	207.9	208.9	207.8	210.1	212.1	214.1	213.9	213.1	217.0	217.6	219.4
Apparel services	318.5	332.0	332.3	334.2	335.6	336.2	336.6	339.7	340.5	341.8	341.6	343.3	343.8	344.8	344.2
Transportation	321.6	307.6	300.9	301.8	302.2	304.0	304.2	308.2	309.9	310.8	313.9	315.5	317.9	319.7	321.4
Private transportation	317.4	301.5	294.4	295.3	295.7	297.5	297.5	301.6	303.4	304.2	307.4	309.1	311.7	313.6	315.2
New vehicles	214.2	223.3	223.6	223.3	225.7	229.4	230.7	231.2	228.9	228.2	229.0	229.5	229.9	230.3	229.5
New cars	214.5	223.6	223.9	223.7	226.3	230.0	231.4	232.0	229.3	228.5	229.5	230.3	230.9	231.6	230.9
Used cars	379.7	363.2	358.0	359.5	360.6	361.0	356.6	354.7	357.0	363.1	371.7	378.7	383.0	385.4	385.6
Motor fuel	375.4	293.1	266.7	271.9	264.0	262.0	263.2	277.7	289.5	291.3	298.7	301.2	307.6	313.0	321.4
Gasoline	375.0	292.5	266.1	271.4	263.4	261.3	262.5	277.1	288.9	290.7	298.3	300.7	307.2	312.6	321.0
Maintenance and repair	352.6	364.7	365.7	366.6	367.2	369.7	372.3	373.4	375.1	374.9	377.9	378.1	378.3	378.8	380.6
Other private transportation	287.7	302.2	302.2	299.7	305.2	309.5	309.9	312.6	311.5	311.7	312.1	312.9	314.7	315.8	315.4
Other private transportation commodities	204.7	203.9	204.0	202.7	201.1	202.3	202.8	204.3	204.0	204.3	202.6	204.0	204.4	203.8	204.7
Other private transportation services	312.3	330.9	330.9	328.1	335.4	340.7	341.0	344.0	342.6	342.9	344.1	344.6	346.9	348.7	347.7
Public transportation	391.7	416.3	418.4	418.8	418.9	421.1	425.8	426.7	427.2	428.7	428.9	428.9	426.9	426.9	430.7
Medical care	401.2	431.0	435.0	437.1	439.7	441.7	443.9	446.7	449.7	452.3	454.9	456.6	459.3	462.1	464.2
Medical care commodities	256.3	272.8	275.2	275.8	276.6	277.0	279.8	281.4	282.9	285.1	286.2	288.2	290.5	292.1	293.2
Medical care services	432.7	465.7	470.1	472.6	475.6	478.2	480.1	483.2	486.5	489.2	492.1	493.6	496.2	499.4	501.7
Professional services	367.7	391.4	394.0	396.6	398.4	400.2	401.5	404.2	407.4	410.2	413.3	414.7	417.5	419.7	421.5
Hospital and related services	221.2	234.2	236.3	236.8	239.1	240.4	241.6	243.2	244.6	245.4	246.5	247.4	248.2	250.9	252.8
Entertainment	260.1	268.7	269.2	270.0	271.1	272.1	272.3	272.9	273.4	274.4	276.0	276.9	277.0	278.2	278.5
Entertainment commodities	254.2	259.5	259.8	259.8	260.6	261.7	261.7	262.2	262.3	263.7	264.7	265.9	265.9	266.8	266.8
Entertainment services	271.6	286.0	286.7	288.9	290.7	291.6	292.0	292.7	293.9	294.2	296.6	297.2	297.4	299.0	299.9
Other goods and services	322.7	341.7	342.6	347.5	348.8	349.2	349.5	352.8	354.6	355.1	356.0	356.9	357.8	360.5	361.9
Tobacco products	328.1	350.7	355.9	356.5	356.8	356.9	357.2	364.7	368.0	369.2	370.0	370.5	372.3	379.7	380.5
Personal care	279.6	289.0	289.9	289.5	290.8	291.2	291.3	293.2	294.1	293.9	294.7	296.4	296.4	297.3	298.2
Toilet goods and personal care appliances	279.0	288.6	289.7	288.7	290.5	290.5	290.3	292.0	293.2	292.7	293.6	294.9	294.8	296.1	296.6
Personal care services	280.5	289.8	290.5	290.8	291.6	292.4	292.7	294.9	295.4	295.5	296.2	298.4	298.8	299.1	300.4
Personal and educational expenses	399.3	430.7	425.1	446.1	448.7	449.4	450.0	452.0	453.7	454.3	455.5	456.1	457.3	458.4	460.6
School books and supplies	355.7	384.8	381.4	393.9	396.7	396.9	397.1	406.5	409.3	409.6	410.1	410.5	410.6	410.7	411.4
Personal and educational services	410.1	442.0	436.0	458.7	461.3	462.1	462.8	464.3	465.9	466.6	467.8	468.5	469.8	471.0	473.4
All items	318.5	323.4	323.4	324.9	325.0	325.4	325.7	327.7	329.0	330.5	332.3	333.4	334.9	335.6	337.4
Commodities	286.5	283.1	281.1	282.6	282.6	283.1	283.3	285.5	287.0	288.6	290.7	291.6	292.4	292.5	293.9
Food and beverages	301.8	311.6	314.5	315.0	315.4	316.2	316.8	320.3	321.3	321.2	322.1	323.5	325.0	324.8	325.1
Commodities less food and beverages	274.9	264.2	259.4	261.5	261.1	261.5	261.5	262.9	264.6	267.2	269.9	270.6	270.9	271.2	273.3
Nondurables less food and beverages	283.8	265.6	258.1	261.5	260.2	259.7	259.9	262.3	266.0	270.0	273.7	274.2	274.1	274.1	277.9
Apparel commodities	191.3	191.5	190.8	196.2	197.1	196.6	194.5	190.5	191.5	198.3	202.1	201.2	197.5	193.6	197.4
Nondurables less food, beverages, and apparel	334.2	306.7	295.9	298.4	296.0	295.6	296.9	304.4	310.2	311.5	315.0	316.5	319.5	322.8	326.2
Durables	265.2	264.0	262.6	263.0	264.0	265.3	265.0	265.4	264.5	265.3	266.8	267.8	268.5	269.1	269.0
Services	377.3	395.7	399.0	400.4	401.0	401.0	401.5	403.3	404.5	405.9	407.3	408.8	411.4	412.8	415.3
Rent of shelter (12/84=100)	103.2	109.0	109.6	110.3	110.8	111.0	111.1	111.5	111.9	112.5	113.0	113.4	113.5	114.0	114.9
Household services less rent of shelter (12/84=100)	102.6	103.9	106.4	106.0	103.8	102.0	101.8	102.3	102.5	102.5	102.4	103.2	105.7	105.9	106.6
Transportation services	332.2	350.1	350.7	349.2	353.8	357.9	359.5	361.7	361.3	361.6	363.2	363.5	364.7	365.9	366.3
Medical care services	432.7	465.7	470.1	472.6	475.6	478.2	480.1	483.2	486.5	489.2	492.1	493.6	496.2	499.4	501.7
Other services	310.1	326.9	326.0	332.2	333.8	334.7	335.1	336.4	337.5	338.0	339.4	340.3	340.9	342.0	343.3
Special indexes:															
All items less food	319.4	323.0	322.2	323.9	324.0	324.2	324.4	326.0	327.4	329.3	331.3	332.3	333.7	334.6	336.8
All items less shelter	303.4	305.1	304.6	305.9	305.7	305.9	306.3	308.4	309.6	311.0	312.8	313.9	315.6	315.9	317.4
All items less homeowners' costs (12/84=100)	101.8	102.8	102.7	103.2	103.2	103.2	103.4	104.0	104.5	104.9	105.5	105.9	106.4	106.6	107.1
All items less medical care	314.3	318.0	317.8	319.3	319.3	319.6	319.8	321.8	323.0	324.5	326.2	327.3	328.8	329.3	331.1
Commodities less food	272.8	262.9	258.3	260.3	260.0	260.3	260.4	261.8	263.5	265.9	268.5	269.2	269.5	269.8	271.8
Nondurables less food	279.0	262.7	255.8	259.1	257.8	257.4	257.6	259.9	263.3	266.9	270.4	270.8	270.9	270.9	274.4
Nondurables less food and apparel	320.3	296.9	287.3	289.6	287.4	287.0	288.2	294.8	299.7	300.9	303.9	305.3	307.9	310.8	313.8
Nondurables	293.9	289.8	287.5	289.5	289.0	289.2	289.6	292.5	294.9	296.9	299.2	300.1	300.9	300.8	302.9
Services less rent of shelter (12/84=100)	102.6	107.1	108.1	108.3	108.2	108.1	108.3	108.8	109.0	109.2	109.5	109.9	111.1	111.5	112.0
Services less medical care	369.0	385.9	389.0	390.3	390.6	390.4	390.7	392.5	393.5	394.7	396.1	397.5	400.1	401.4	403.8
Energy	426.3	367.5	354.8	356.9	344.8	338.5	339.2	349.8	356.9	357.7	360.8	364.9	378.6	380.6	387.5
All items less energy	309.9	321.2	322.4	323.9	325.3	326.3	326.5	327.8	328.7	330.2	331.9	332.8	333.2	333.8	335.2
All items less food and energy	308.7	320.3	321.0	322.7	324.4	325.4	325.6	326.3	327.1	329.0	330.9	331.6	331.8	332.6	334.2
Commodities less food and energy	256.8	259.8	259.3	260.9	261.7	262.4	262.1	261.7	262.0	264.6	266.6	267.1	266.7	266.3	267.5
Energy commodities	410.9	322.9	292.9	298.2	290.9	289.1	291.1	307.2	319.9	321.5	328.9	331.2	337.7	343.1	351.8
Services less energy	371.1	391.9	393.7	395.7	398.2	399.6	400.2	401.9	403.2	404.7	406.5	407.5	408.2	410.1	412.3
Purchasing power of the consumer dollar:															
1967=$1.00	31.4	30.9	30.9	30.8	30.8	30.7	30.7	30.5	30.4	30.3	30.1	30.0	29.9	29.8	29.6
1957-59=$1.00	27.0	26.6	26.6	26.5	26.5	26.4	26.4	26.2	26.1	26.0	25.9	25.8	25.7	25.6	25.5

31. Consumer Price Index: U.S. city average and available local area data: all items

(1967=100, unless otherwise indicated)

Area[1]	Pricing schedule[2]	Other index base	All Urban Consumers							Urban Wage Earners						
			1986		1987					1986		1987				
			Aug.	Sept.	Apr.	May	June	July	Aug.	Aug.	Sept.	Apr.	May	June	July	Aug.
U.S. city average	M	-	328.6	330.2	337.7	338.7	340.1	340.8	342.7	323.4	324.9	332.3	333.4	334.9	335.6	337.4
Region and area size[3]																
Northeast urban	M	12/77	175.0	-	181.0	181.7	182.4	182.7	184.1	172.2	-	178.2	178.9	179.5	179.9	181.2
Size A - More than 1,200,000	M	12/77	173.1	-	178.8	179.5	180.5	180.7	182.1	168.8	-	174.4	175.2	176.1	176.3	177.7
Size B - 500,000 to 1,200,000	M	12/77	174.7	-	182.3	182.8	182.0	182.5	183.3	171.8	-	179.3	179.7	179.0	179.5	180.3
Size C - 50,000 to 500,000	M	12/77	182.8	-	188.9	189.0	189.7	190.9	192.5	187.2	-	193.1	193.5	194.1	195.1	196.6
North Central urban	M	12/77	176.2	-	180.4	180.8	182.4	182.6	184.0	172.2	-	176.2	176.7	178.3	178.6	179.8
Size A - More than 1,200,000	M	12/77	180.7	-	184.0	184.5	186.6	186.9	188.2	175.0	-	178.3	178.8	180.7	181.0	182.3
Size B - 360,000 to 1,200,000	M	12/77	172.5	-	179.5	179.5	180.2	180.2	182.0	168.1	-	174.6	174.8	175.5	175.6	177.4
Size C - 50,000 to 360,000	M	12/77	171.2	-	176.1	176.9	177.8	178.2	179.6	167.7	-	172.2	173.0	174.0	174.3	175.5
Size D - Nonmetropolitan (less than 50,0000	M	12/77	171.4	-	174.6	174.9	176.1	176.7	177.1	172.4	-	175.7	176.2	177.4	178.2	178.5
South urban	M	12/77	176.4	-	180.9	181.4	182.1	182.6	183.2	175.3	-	179.7	180.3	181.0	181.6	182.1
Size A - More than 1,200,000	M	12/77	176.7	-	181.5	182.0	182.6	183.3	184.0	176.1	-	180.7	181.4	182.1	182.7	183.3
Size B - 450,000 to 1,200,000	M	12/77	178.6	-	183.0	183.2	183.7	184.1	184.8	174.6	-	178.7	179.1	179.6	180.0	180.6
Size C - 50,000 to 450,000	M	12/77	174.8	-	179.2	179.8	180.8	181.4	181.7	175.3	-	179.8	180.4	181.6	182.2	182.5
Size D - Nonmetropolitan (less than 50,000)	M	12/77	174.3	-	178.0	178.9	179.1	179.9	180.0	175.0	-	178.6	179.5	179.7	180.6	180.9
West urban	M	12/77	179.0	-	183.8	184.4	184.5	184.7	185.6	176.4	-	181.1	181.7	181.9	182.1	183.0
Size A - More than 1,250,000	M	12/77	182.0	-	187.2	188.1	187.9	188.1	189.2	176.9	-	182.1	182.9	182.8	182.9	183.9
Size B - 330,000 to 1,250,000	M	12/77	178.1	-	182.7	183.2	183.9	184.0	184.3	178.3	-	182.8	183.5	184.0	184.2	184.6
Size C - 50,000 to 330,000	M	12/77	173.0	-	175.8	175.2	176.4	176.6	177.1	171.1	-	173.8	173.2	174.2	174.6	175.2
Size classes:																
A	M	12/77	-	-	102.2	102.5	103.0	103.2	103.8	-	-	102.2	102.6	103.1	103.3	103.9
B	M	12/77	176.6	-	182.1	182.4	182.7	183.0	183.9	173.5	-	178.9	179.3	179.6	179.9	180.8
C	M	12/77	175.0	-	179.6	180.0	181.0	181.5	182.4	174.8	-	179.4	179.8	180.8	181.4	182.2
D	M	12/77	173.8	-	177.4	178.2	178.8	179.5	179.7	174.5	-	178.1	178.9	179.6	180.3	180.7
Selected local areas																
Chicago, IL-Northwestern IN	M	-	331.4	333.9	337.1	338.4	345.0	346.1	348.8	316.2	318.3	321.6	322.7	328.9	330.0	332.5
Los Angeles-Long Beach, Anaheim, CA	M	-	330.9	334.6	342.8	345.1	344.2	344.1	346.7	323.5	326.8	334.8	337.1	336.3	336.2	338.8
New York, NY-Northeastern NJ	M	-	325.9	326.6	337.0	339.0	340.6	340.7	343.7	317.2	317.5	328.2	330.2	331.7	331.6	334.4
Philadelphia, PA-NJ	M	-	323.1	325.8	333.8	336.2	339.0	339.1	342.2	324.4	326.7	334.9	337.5	340.4	340.7	343.9
San Francisco-Oakland, CA	M	-	345.5	-	353.0	353.5	353.5	356.0	356.9	339.0	-	346.9	347.0	347.3	349.3	349.9
Baltimore, MD	1	-	-	334.0	-	340.1	-	343.8	-	-	330.9	-	337.4	-	341.9	-
Boston, MA	1	-	-	328.2	-	335.1	-	338.0	-	-	325.2	-	332.9	-	336.3	-
Cleveland, OH	1	-	352.7	-	-	357.5	-	361.4	-	329.9	-	-	334.2	-	337.9	-
Miami, FL	1	11/77	-	174.3	-	179.1	-	180.5	-	-	174.5	-	179.2	-	180.9	-
St. Louis, MO-IL	1	-	-	325.7	-	330.5	-	334.7	-	-	320.7	-	326.3	-	331.0	-
Washington, DC-MD-VA	1	-	-	332.3	-	340.5	-	343.1	-	-	334.6	-	343.2	-	345.4	-
Dallas-Ft. Worth, TX	2	-	346.2	-	351.8	-	354.1	-	356.0	339.1	-	344.4	-	347.4	-	349.5
Detroit, MI	2	-	323.2	321.1	330.5	-	330.2	-	333.5	312.8	310.5	319.9	-	319.7	-	322.7
Houston, TX	2	-	332.9	-	341.1	-	341.5	-	344.0	330.5	-	338.5	-	339.7	-	341.7
Pittsburgh, PA	2	-	330.1	-	338.2	-	338.9	-	341.7	309.2	-	316.6	-	317.8	-	320.3

[1] Area is the Consolidated Metropolitan Statistical Area (CMSA), exclusive of farms and military. Area definitions are those established by the Office of Management and Budget in 1983, except for Boston-Lawrence-Salem, MA-NH Area (excludes Monroe County); and Milwaukee, WI Area (includes only the Milwaukee MSA). Definitions do not include revisions made since 1983.

[2] Foods, fuels, and several other items priced every month in all areas; most other goods and services priced as indicated:.
M - Every month.
1 - January, March, May, July, September, and November.
2 - February, April, June, August, October, and December.

[3] Regions are defined as the four Census regions.

- Data not available.

NOTE: Local area CPI indexes are byproducts of the national CPI program. Because each local index is a small subset of the national index, it has a smaller sample size and is, therefore, subject to substantially more sampling and other measurement error than the national index. As a result, local area indexes show greater volatility than the national index, although their long-term trends are quite similar. Therefore, the Bureau of Labor Statistics strongly urges users to consider adopting the national average CPI for use in escalator clauses.

32. Annual data: Consumer Price Index all items and major groups

Series	1978	1979	1980	1981	1982	1983	1984	1985	1986
Consumer Price Index for All Urban Consumers:									
All items:									
Index	195.4	217.4	246.8	272.4	289.1	298.4	311.1	322.2	328.4
Percent change	7.7	11.3	13.5	10.4	6.1	3.2	4.3	3.6	1.9
Food and beverages:									
Index	206.3	228.5	248.0	267.3	278.2	284.4	295.1	302.0	311.8
Percent change	9.7	10.8	8.5	7.8	4.1	2.2	3.8	2.3	3.2
Housing:									
Index	202.8	227.6	263.3	293.5	314.7	323.1	336.5	349.9	360.2
Percent change	8.7	12.2	15.7	11.5	7.2	2.7	4.1	4.0	2.9
Apparel and upkeep:									
Index	159.6	166.6	178.4	186.9	191.8	196.5	200.2	206.0	207.8
Percent change	3.5	4.4	7.1	4.8	2.6	2.5	1.9	2.9	.9
Transportation:									
Index	185.5	212.0	249.7	280.0	291.5	298.4	311.7	319.9	307.5
Percent change	4.7	14.3	17.8	12.1	4.1	2.4	4.5	2.6	-3.9
Medical care:									
Index	219.4	239.7	265.9	294.5	328.7	357.3	379.5	403.1	433.5
Percent change	8.4	9.3	10.9	10.8	11.6	8.7	6.2	6.2	7.5
Entertainment:									
Index	176.6	188.5	205.3	221.4	235.8	246.0	255.1	265.0	274.1
Percent change	5.3	6.7	8.9	7.8	6.5	4.3	3.7	3.9	3.4
Other goods and services:									
Index	183.3	196.7	214.5	235.7	259.9	288.3	307.7	326.6	346.4
Percent change	6.4	7.3	9.0	9.9	10.3	10.9	6.7	6.1	6.1
Consumer Price Index for Urban Wage Earners and Clerical Workers:									
All items:									
Index	195.3	217.7	247.0	272.3	288.6	297.4	307.6	318.5	323.4
Percent change	7.6	11.5	13.5	10.2	6.0	3.0	3.4	3.5	1.5

33. Producer Price Indexes, by stage of processing

(1967 = 100)

Grouping	Annual average		1986				1987							
	1985	1986	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Finished goods	293.7	289.7	287.3	290.7	290.7	290.4	291.8	292.3	292.6	294.9	296.3	296.8	297.8	297.2
Finished consumer goods	291.8	284.9	282.5	285.2	285.1	284.8	286.2	287.1	287.5	290.1	292.0	292.7	293.8	293.0
Finished consumer foods	271.2	278.1	282.9	283.6	283.1	282.9	280.1	280.8	280.3	283.2	286.7	287.7	287.6	283.6
Finished consumer goods excluding foods	297.3	283.5	277.4	281.0	281.2	280.8	284.4	285.3	286.3	288.6	289.6	290.1	292.0	292.9
Nondurable goods less food	339.3	311.2	304.5	301.9	302.2	302.1	307.7	310.5	312.2	314.7	316.5	317.4	320.2	322.2
Durable goods	241.5	246.8	241.7	253.5	253.5	252.8	253.2	250.7	250.6	252.5	252.0	251.9	252.3	251.3
Capital equipment	300.5	306.4	303.9	309.9	310.4	310.1	311.2	310.7	310.5	311.8	311.9	311.6	312.1	312.1
Intermediate materials, supplies, and components	318.7	307.6	306.1	304.8	304.8	305.0	307.0	308.9	309.3	311.0	312.7	314.8	317.1	318.2
Materials and components for manufacturing	299.5	296.1	296.2	296.4	296.4	296.4	297.8	298.7	299.5	301.4	303.2	304.6	306.4	306.6
Materials for food manufacturing	258.8	251.0	254.3	253.9	253.2	253.2	251.1	251.6	250.4	255.3	261.5	261.2	262.0	258.5
Materials for nondurable manufacturing	285.9	279.1	277.0	277.5	278.0	278.3	281.3	283.1	283.9	286.9	287.9	291.6	293.1	292.3
Materials for durable manufacturing	320.2	313.8	314.9	315.3	314.9	313.9	315.8	316.2	317.8	320.3	323.9	325.3	329.7	332.5
Components for manufacturing	291.5	294.4	295.0	294.9	294.9	295.2	295.8	296.1	297.0	297.0	297.3	297.2	298.0	298.3
Materials and components for construction	315.2	317.4	317.6	317.3	317.5	316.9	317.1	317.9	318.7	319.3	319.9	320.2	321.8	323.8
Processed fuels and lubricants	548.9	430.2	409.1	394.9	392.8	395.5	406.7	418.5	416.0	421.3	425.0	437.5	449.5	457.4
Containers	311.2	314.9	317.4	318.1	319.0	319.2	320.7	323.6	324.9	325.4	325.0	326.1	326.1	326.8
Supplies	284.2	287.3	288.0	287.5	288.0	288.2	289.0	289.5	289.6	290.5	292.1	292.7	293.2	293.3
Crude materials for further processing	306.1	280.3	275.4	277.2	279.2	277.0	284.2	287.2	288.6	295.3	304.7	304.9	307.8	307.7
Foodstuffs and feedstuffs	235.0	231.0	233.5	235.0	236.8	233.5	227.6	229.9	229.6	240.1	251.3	246.5	243.1	240.1
Crude nonfood materials	459.2	386.8	365.6	367.9	370.3	370.6	394.2	398.5	402.0	405.3	414.0	420.1	431.0	434.1
Special groupings														
Finished goods, excluding foods	299.0	291.1	286.1	290.4	290.7	290.4	293.2	293.6	294.3	296.3	296.9	297.2	298.6	299.3
Finished energy goods	720.9	518.5	471.7	452.1	453.7	454.6	477.4	489.6	495.5	507.4	516.5	520.7	527.5	534.0
Finished goods less energy	269.2	275.6	275.5	280.0	280.0	279.6	279.7	279.5	279.5	281.2	282.2	282.5	283.1	282.0
Finished consumer goods less energy	261.3	267.9	268.5	272.6	272.4	272.0	271.8	271.7	271.8	273.6	274.9	275.3	276.0	274.6
Finished goods less food and energy	268.7	274.9	272.9	278.9	279.1	278.7	279.8	279.3	279.5	280.7	280.7	280.7	281.6	281.8
Finished consumer goods less food and energy	252.1	258.4	256.7	262.6	262.6	262.2	263.4	262.9	263.3	264.4	264.4	264.5	265.7	265.9
Consumer nondurable goods less food and energy	246.2	253.0	254.2	254.8	254.9	254.7	256.4	257.2	257.9	258.4	258.7	258.9	260.7	261.6
Intermediate materials less foods and feeds	325.0	313.3	311.5	310.4	310.3	310.5	312.8	314.7	315.3	316.9	318.1	320.3	322.8	324.2
Intermediate foods and feeds	232.8	230.3	233.2	230.3	231.0	231.5	229.5	230.0	227.6	231.9	240.2	241.3	241.1	237.7
Intermediate energy goods	528.3	414.4	393.8	380.3	378.3	380.7	391.3	402.6	400.3	405.3	408.1	420.1	431.7	439.3
Intermediate goods less energy	304.0	303.5	304.0	303.9	304.1	304.1	305.2	306.1	306.8	308.2	309.8	310.8	312.2	312.6
Intermediate materials less foods and energy	305.2	304.4	304.6	304.8	304.9	304.8	306.2	307.2	308.1	309.3	310.5	311.6	313.2	314.0
Crude energy materials	748.1	575.8	533.9	534.4	537.0	533.2	578.0	584.4	590.1	594.1	606.9	612.2	629.5	632.6
Crude materials less energy	233.2	229.2	229.7	231.6	233.3	231.5	228.1	230.4	230.6	238.9	248.4	247.1	246.0	244.8
Crude nonfood materials less energy	249.7	245.6	239.1	242.3	244.4	247.1	250.3	252.8	254.4	257.4	263.1	271.1	276.4	280.0

34. Producer Price indexes, by durability of product

(1967=100)

Grouping	Annual average		1986				1987							
	1985	1986	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Total durable goods	297.3	300.0	298.8	302.2	302.4	302.1	302.9	302.8	303.4	304.3	304.9	305.2	306.2	306.9
Total nondurable goods	317.2	298.8	295.6	294.4	294.8	294.7	298.2	300.7	301.1	304.4	308.0	309.8	312.0	312.0
Total manufactures	304.3	297.6	296.0	297.0	297.1	297.2	299.5	300.7	300.8	303.0	304.4	305.4	306.8	307.5
Durable	298.1	300.8	299.6	303.1	303.3	302.9	303.7	303.5	304.1	305.0	305.5	305.4	306.3	306.9
Nondurable	310.5	294.0	292.1	290.4	290.5	291.0	294.7	297.4	297.0	300.5	302.9	304.9	306.8	307.7
Total raw or slightly processed goods	327.9	305.6	299.0	299.2	300.6	298.6	301.6	303.6	305.9	308.4	315.2	316.9	320.0	318.3
Durable	252.2	252.0	252.8	252.0	254.4	255.4	258.8	260.9	261.1	262.1	268.4	279.0	286.3	292.5
Nondurable	332.4	308.6	301.6	301.8	303.1	300.9	303.9	305.8	308.3	310.9	317.7	318.8	321.7	319.5

35. Annual data: Producer Price Indexes, by stage of processing

(1967=100)

Index	1978	1979	1980	1981	1982	1983	1984	1985	1986
Finished goods:									
Total	195.9	217.7	247.0	269.8	280.7	285.2	291.1	293.7	289.7
Consumer goods	194.9	217.9	248.9	271.3	281.0	284.6	290.3	291.8	284.9
Capital equipment	199.2	216.5	239.8	264.3	279.4	287.2	294.0	300.5	306.4
Intermediate materials, supplies, and components:									
Total	215.6	243.2	280.3	306.0	310.4	312.3	320.0	318.7	307.6
Materials and components for manufacturing	208.7	234.4	265.7	286.1	289.8	293.4	301.8	299.5	296.1
Materials and components for construction	224.7	247.4	268.3	287.6	293.7	301.8	310.3	315.2	317.4
Processed fuels and lubricants	295.3	364.8	503.0	595.4	591.7	564.8	566.2	548.9	430.2
Containers	202.8	226.8	254.5	276.1	285.6	286.6	302.3	311.2	314.9
Supplies	198.5	218.2	244.5	263.8	272.1	277.1	283.4	284.2	287.3
Crude materials for further processing:									
Total	234.4	274.3	304.6	329.0	319.5	323.6	330.8	306.1	280.3
Foodstuffs and feedstuffs	216.2	247.9	259.2	257.4	247.8	252.2	259.5	235.0	231.0
Nonfood materials except fuel	272.3	330.0	401.0	482.3	473.9	477.4	484.5	459.2	386.8
Fuel	426.8	507.6	615.0	751.2	886.1	931.5	931.3	909.6	817.2

36. U.S. export price indexes by Standard International Trade Classification

(June 1977 = 100, unless otherwise indicated)

Category	1974 SITC	1984	1985				1986				1987	
		Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June
ALL COMMODITIES (9/83 = 100)		98.1	97.5	97.5	96.5	96.7	97.0	96.7	95.1	96.2	97.2	99.9
Food (3/83 = 100)	0	96.5	95.8	94.0	90.2	93.6	90.5	89.5	77.2	81.2	79.8	83.4
Meat (3/83 = 100)	01	104.4	103.9	104.7	106.1	112.2	111.5	114.7	122.0	122.6	123.4	129.0
Fish (3/83 = 100)	03	98.7	101.0	103.6	102.6	101.8	102.2	106.2	111.2	116.9	118.5	122.9
Grain and grain preparations (3/80 = 100)	04	92.9	92.4	90.3	82.6	87.1	82.1	79.1	59.0	64.8	62.9	66.5
Vegetables and fruit (3/83 = 100)	05	114.7	119.5	120.2	126.9	118.9	115.3	125.8	131.4	131.9	130.8	130.8
Feedstuffs for animals (3/83 = 100)	08	82.4	72.8	68.6	75.7	83.4	88.5	85.5	90.2	87.4	85.7	93.7
Misc. food products (3/83 = 100)	09	108.4	110.6	109.2	108.1	107.7	106.0	104.7	106.6	108.2	108.6	110.0
Beverages and tobacco (6/83 = 100)	1	101.3	99.9	100.1	99.7	98.6	95.6	96.5	96.3	101.6	101.7	104.0
Beverages (9/83 = 100)	11	103.7	104.0	105.3	101.8	100.9	101.9	103.0	102.2	102.9	104.7	104.8
Tobacco and tobacco products (6/83 = 100)	12	101.1	99.5	99.6	99.5	98.4	95.1	95.9	95.8	101.4	101.4	104.0
Crude materials (6/83 = 100)	2	101.4	97.5	96.8	93.3	92.5	95.8	95.6	92.3	94.8	97.3	106.4
Raw hides and skins (6/80 = 100)	21	133.6	121.0	126.2	129.0	139.9	138.9	148.9	138.0	148.3	168.8	191.2
Oilseeds and oleaginous fruit (9/77 = 100)	22	74.8	71.0	71.2	64.2	63.9	66.9	65.8	64.5	62.9	60.4	68.6
Crude rubber (including synthetic and reclaimed) (9/83 = 100)	23	104.0	106.4	106.3	107.1	106.0	106.0	106.1	105.3	104.4	–	111.8
Wood	24	125.4	128.7	125.7	124.5	128.1	128.7	128.7	129.7	135.5	139.0	146.2
Pulp and waste paper (6/83 = 100)	25	114.2	100.5	96.1	93.8	92.7	98.8	109.7	119.8	121.2	133.0	138.7
Textile fibers	26	106.7	102.4	105.8	103.6	97.7	101.6	98.6	74.7	92.2	99.7	115.0
Crude fertilizers and minerals	27	163.2	165.6	167.9	169.4	165.5	168.0	166.1	164.3	162.8	155.6	155.1
Metalliferous ores and metal scrap	28	92.4	89.2	82.0	80.1	78.7	83.4	80.5	84.6	80.7	82.2	90.7
Mineral fuels	3	99.7	100.1	99.2	97.6	96.6	91.9	86.7	85.7	84.7	85.6	84.4
Animal and vegetables oils, fats, and waxes	4	147.9	142.0	144.5	114.5	101.4	90.8	84.4	76.5	86.8	88.9	94.5
Fixed vegetable oils and fats (6/83 = 100)	42	156.7	152.9	164.8	128.8	108.7	95.4	95.3	80.8	87.0	89.1	94.7
Chemicals (3/83 = 100)	5	97.7	97.0	96.8	97.1	96.6	96.5	95.4	93.1	92.2	96.6	103.1
Organic chemicals (12/83 = 100)	51	94.7	93.8	96.5	97.1	95.4	93.5	89.3	88.0	89.4	99.5	114.3
Fertilizers, manufactured (3/83 = 100)	56	94.8	92.5	87.9	89.8	90.0	88.6	84.0	77.4	68.7	75.4	80.4
Intermediate manufactured products (9/81 = 100)	6	100.4	99.4	99.2	99.2	99.1	100.3	101.2	102.2	102.7	104.4	106.8
Leather and furskins (9/79 = 100)	61	79.0	82.5	79.2	75.9	78.5	77.8	82.5	84.2	88.0	96.3	101.1
Rubber manufactures	62	148.5	150.2	149.0	148.3	148.7	151.0	150.0	150.4	151.3	152.1	153.9
Paper and paperboard products (6/78 = 100)	64	159.5	155.0	151.6	149.6	148.2	152.2	158.7	165.3	167.9	174.4	177.7
Iron and steel (3/82 = 100)	67	96.5	95.5	95.3	95.9	98.2	98.4	99.4	100.2	100.1	101.5	101.5
Nonferrous metals (9/81 = 100)	68	82.5	79.7	79.6	79.8	78.2	80.2	79.1	79.4	78.8	80.3	90.2
Metal manufactures, n.e.s. (3/82 = 100)	69	105.0	105.4	105.2	105.4	104.4	105.3	105.5	105.6	105.7	105.7	105.6
Machinery and transport equipment, excluding military and commercial aircraft (12/78 = 100)	7	141.5	142.3	142.9	143.1	143.3	144.0	144.2	144.6	145.5	146.2	146.8
Power generating machinery and equipment (12/78 = 100)	71	167.5	165.3	167.4	167.1	167.5	169.1	169.2	169.5	171.4	173.0	172.8
Machinery specialized for particular industries (9/78 = 100)	72	153.4	155.0	155.7	156.0	156.2	155.5	154.7	155.0	155.7	154.7	156.0
Metalworking machinery (6/78 = 100)	73	151.9	153.4	155.1	156.3	158.4	159.0	158.9	160.4	161.8	165.0	165.8
General industrial machines and parts n.e.s. 9/78 = 100)	74	150.2	152.4	152.0	152.4	152.2	152.3	153.3	154.4	155.3	157.7	157.8
Office machines and automatic data processing equipment	75	101.4	100.9	100.0	99.9	99.4	99.9	99.2	98.9	98.1	96.1	96.0
Telecommunications, sound recording and reproducing equipment	76	134.3	133.3	133.3	134.1	134.5	136.5	137.0	137.8	139.7	141.3	140.8
Electrical machinery and equipment	77	114.6	114.9	116.1	115.3	113.8	115.1	114.2	114.4	114.9	117.0	117.3
Road vehicles and parts (3/80 = 100)	78	131.8	133.1	133.9	133.8	135.0	135.5	136.4	136.5	137.9	138.0	138.5
Other transport equipment, excl. military and commercial aviation	79	191.7	195.5	196.6	199.3	200.7	203.3	206.8	207.4	209.7	211.4	214.7
Other manufactured articles	8	99.3	99.5	100.4	100.3	100.3	102.6	103.4	104.1	104.3	105.3	107.3
Apparel (9/83 = 100)	84	103.4	104.7	104.7	105.0	105.3	–	–	–	110.0	–	–
Professional, scientific, and controlling instruments and apparatus	87	171.7	175.5	178.3	178.7	178.8	182.1	183.8	183.8	184.8	186.4	188.5
Photographic apparatus and supplies, optical goods, watches and clocks (12/77 = 100)	88	130.3	128.0	129.1	127.5	128.5	131.6	132.9	132.7	132.0	133.4	133.1
Miscellaneous manufactured articles, n.e.s.	89	94.1	92.4	93.1	93.1	92.4	95.6	95.6	97.6	97.7	98.1	102.1
Gold, non-monetary (6/83 = 100)	971	79.5	69.1	75.4	77.4	77.5	81.8	82.2	97.5	94.5	98.2	108.4

– Data not available.

37. U.S. import price indexes by Standard International Trade Classification

(June 1977=100, unless otherwise indicated)

Category	1974 SITC	1985			1986				1987	
		June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June
ALL COMMODITIES (9/82=100)		93.0	92.9	94.2	88.5	83.2	83.9	86.0	91.6	95.3
Food (9/77=100)	0	96.8	94.9	102.8	113.4	104.7	109.1	105.3	100.2	102.0
Meat	01	118.2	120.6	131.2	122.7	118.5	126.9	134.4	132.1	135.9
Dairy products and eggs (6/81=100)	02	97.9	99.1	100.5	106.7	107.1	109.4	111.5	116.8	119.6
Fish	03	129.4	129.7	132.7	139.3	144.8	149.6	157.1	161.6	167.4
Bakery goods, pasta products, grain and grain preparations (9/77=100)	04	132.3	136.3	141.9	146.9	149.2	154.0	155.3	161.0	165.2
Fruits and vegetables	05	129.4	120.2	131.3	119.4	119.4	127.1	125.5	120.5	125.4
Sugar, sugar preparations, and honey (3/82=100)	06	122.6	123.1	111.9	124.6	121.6	123.9	124.3	126.0	128.6
Coffee, tea, cocoa	07	56.0	54.4	64.6	85.9	69.2	71.8	61.0	50.9	49.3
Beverages and tobacco	1	157.1	158.0	162.1	163.2	165.5	165.8	168.0	170.8	174.1
Beverages	11	154.3	156.0	159.1	161.8	163.9	165.5	168.2	171.5	174.6
Crude materials	2	93.6	91.5	91.2	94.2	95.3	98.1	98.5	103.1	105.6
Crude rubber (inc. synthetic & reclaimed) (3/84=100)	23	76.4	68.9	73.2	78.8	75.5	76.9	78.5	79.1	84.5
Wood (9/81=100)	24	106.9	101.6	99.4	104.3	106.3	109.4	107.2	115.0	112.0
Pulp and waste paper (12/81=100)	25	80.4	76.8	75.8	74.9	79.9	86.0	92.8	100.5	104.6
Crude fertilizers and crude minerals (12/83=100)	27	101.7	102.7	102.1	101.5	100.0	100.4	100.2	99.5	98.4
Metalliferous ores and metal scrap (3/84=100)	28	87.6	89.5	90.1	94.5	95.6	98.2	95.4	98.0	100.0
Crude vegetable and animal materials, n.e.s.	29	104.9	102.5	102.5	103.6	104.4	104.8	104.7	113.4	120.3
Fuels and related products (6/82=100)	3	80.9	79.8	79.1	55.3	37.5	33.6	38.4	49.7	54.8
Petroleum and petroleum products (6/82=100)	33	81.6	80.3	80.1	54.7	36.1	32.1	37.9	49.9	55.2
Fats and oils (9/83=100)	4	76.7	57.6	50.6	41.4	39.3	35.5	51.6	50.8	54.5
Vegetable oils (9/83=100)	42	75.9	56.2	48.9	39.3	37.4	33.5	50.0	49.2	52.6
Chemicals (9/82=100)	5	94.9	94.5	94.2	94.6	93.3	93.4	93.2	95.9	98.8
Medicinal and pharmaceutical products (3/84=100)	54	95.1	95.3	96.7	102.9	104.9	110.0	110.1	116.2	120.3
Manufactured fertilizers (3/84=100)	56	82.0	80.8	78.5	79.2	79.7	77.4	79.7	81.8	83.6
Chemical materials and products, n.e.s. (9/84=100)	59	95.6	96.9	97.8	99.9	100.3	101.0	102.8	104.3	105.0
Intermediate manufactured products (12/77=100)	6	132.4	133.6	133.4	134.0	135.6	138.8	139.4	142.2	147.4
Leather and furskins	61	133.3	137.0	141.3	141.6	143.0	147.4	143.3	149.5	156.6
Rubber manufactures, n.e.s.	62	138.6	137.3	138.1	136.5	137.7	138.1	138.1	140.8	140.5
Cork and wood manufactures	63	121.2	123.4	124.0	130.8	134.3	137.4	142.7	144.3	151.6
Paper and paperboard products	64	157.2	157.8	156.5	157.1	157.1	157.5	164.8	165.2	165.0
Textiles	65	127.5	126.5	128.1	131.2	132.9	135.1	135.3	138.8	140.4
Nonmetallic mineral manufactures, n.e.s.	66	151.7	157.6	162.2	164.2	169.6	178.2	180.2	183.1	190.3
Iron and steel (9/78=100)	67	120.1	119.1	118.3	117.3	118.1	119.0	118.5	122.3	127.1
Nonferrous metals (12/81=100)	68	82.3	83.7	80.4	79.4	78.9	83.5	81.6	82.4	90.9
Metal manufactures, n.e.s.	69	117.8	119.5	121.6	124.4	127.8	129.1	129.1	133.4	134.5
Machinery and transport equipment (6/81=100)	7	102.6	103.5	107.2	111.5	115.3	118.1	120.2	123.9	126.1
Machinery specialized for particular industries (9/78=100)	72	97.0	101.4	104.9	112.1	115.4	120.1	121.0	127.5	129.5
Metalworking machinery (3/80=100)	73	90.5	94.2	98.1	105.0	107.7	110.7	115.7	122.4	126.1
General industrial machinery and parts, n.e.s. (6/81=100)	74	91.1	94.3	98.0	103.8	109.0	112.8	113.9	120.5	123.0
Office machines and automatic data processing equipment (3/80=100)	75	89.4	90.3	93.7	96.9	101.3	102.5	102.4	103.2	106.4
Telecommunications, sound recording and reproducing apparatus (3/80=100)	76	88.8	88.3	88.6	89.4	91.6	93.7	93.9	94.6	95.5
Electrical machinery and equipment (12/81=100)	77	83.9	81.4	83.1	84.5	87.5	89.5	91.7	93.6	94.8
Road vehicles and parts (6/81=100)	78	112.1	112.7	117.8	123.4	127.1	129.8	133.2	137.0	139.2
Misc. manufactured articles (3/80=100)	8	98.0	99.6	100.8	103.3	104.8	109.5	109.6	114.3	118.1
Plumbing, heating, and lighting fixtures (6/80=100)	81	114.1	117.8	115.0	120.1	123.5	125.5	125.5	125.5	130.6
Furniture and parts (6/80=100)	82	136.7	142.1	142.7	147.0	142.2	145.8	146.9	148.9	153.3
Clothing (9/77=100)	84	133.9	134.5	134.5	133.4	135.3	137.8	139.1	145.5	150.9
Footwear	85	136.7	142.1	142.7	147.0	142.2	145.8	146.9	148.9	153.3
Professional, scientific, and controlling instruments and apparatus (12/79=100)	87	92.3	98.8	102.4	106.4	112.5	118.3	118.0	125.6	129.5
Photographic apparatus and supplies, optical goods, watches, and clocks (3/80=100)	88	89.5	91.1	94.5	99.3	103.2	106.9	107.6	111.8	114.4
Misc. manufactured articles, n.e.s. (6/82=100)	89	95.2	96.4	97.9	102.1	103.4	112.3	111.0	116.9	121.8
Gold, non-monetary (6/82=100)	971	98.3	101.1	101.0	106.7	107.3	126.9	123.3	128.0	141.5

38. U.S. export price indexes by end-use category

(September 1983 = 100 unless otherwise indicated)

Category	Percentage of 1980 trade value	1985			1986				1987	
		June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June
Foods, feeds, and beverages	16.294	80.9	76.2	77.5	75.5	74.7	66.0	68.4	67.1	71.3
Raw materials	30.696	97.2	96.5	95.9	96.0	94.9	93.3	94.8	98.2	103.1
Raw materials, nondurable	21.327	99.5	98.7	97.9	97.5	96.1	93.7	95.4	99.5	104.7
Raw materials, durable	9.368	91.6	91.1	91.0	92.5	91.9	92.5	93.2	95.1	99.2
Capital goods (12/82=100)	30.186	106.6	106.6	106.6	107.4	107.5	107.7	108.3	108.9	109.5
Automotive vehicles, parts and engines (12/82=100)	7.483	108.0	108.1	109.2	109.5	110.4	110.8	111.8	111.9	112.1
Consumer goods	7.467	101.1	101.9	101.4	103.7	104.5	104.5	105.7	106.9	107.1
Durables	3.965	99.2	100.4	99.5	101.8	101.8	102.1	102.7	103.9	103.6
Nondurables	3.501	103.0	103.3	103.3	105.5	107.2	106.9	108.5	109.8	110.5

39. U.S. import price indexes by end-use category

(December 1982=100)

Category	Percentage of 1980 trade value	1985			1986				1987	
		June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June
Foods, feeds, and beverages	7.477	100.4	99.0	106.0	115.8	108.2	112.3	109.2	104.7	106.6
Petroleum and petroleum products, excl. natural gas	31.108	82.1	80.9	80.5	55.4	36.8	32.6	38.3	50.5	55.8
Raw materials, excluding petroleum	19.205	95.8	95.4	93.9	94.5	94.0	95.3	94.9	96.9	100.5
Raw materials, nondurable	9.391	93.9	93.5	91.8	91.1	89.7	89.5	89.7	91.8	94.5
Raw materials, durable	9.814	97.8	97.4	96.2	98.1	98.7	101.4	100.3	102.3	106.8
Capital goods	13.164	96.3	97.6	100.0	102.8	106.7	109.4	110.7	115.3	117.8
Automotive vehicles, parts and engines	11.750	105.9	106.4	111.4	115.6	119.0	121.0	123.9	126.2	128.0
Consumer goods	14.250	99.4	101.0	102.4	104.5	106.5	110.1	110.6	114.3	117.5
Durable	5.507	97.0	98.9	100.7	103.4	106.5	111.2	111.6	114.8	117.5
Nondurable	8.743	102.5	103.9	104.7	106.0	106.6	108.6	109.2	113.7	117.6

40. U.S. export price indexes by Standard Industrial Classification [1]

Industry group	1985			1986				1987	
	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June
Manufacturing:									
Food and kindred products (6/83=100)	99.5	96.7	98.1	97.0	95.0	95.2	97.6	99.0	104.1
Lumber and wood products, except furniture (6/83=100)	99.5	98.3	101.2	101.5	101.2	102.1	105.7	109.8	113.0
Furniture and fixtures (9/83=100)	106.5	107.1	108.4	109.2	109.7	110.1	110.4	113.4	114.0
Paper and allied products (3/81=100)	94.7	93.2	92.1	95.7	101.5	106.1	108.7	113.7	116.7
Chemicals and allied products (12/84=100)	99.6	99.7	99.2	98.9	98.3	96.2	95.9	100.3	106.5
Petroleum and coal products (12/83=100)	102.7	102.0	99.1	93.5	83.1	83.1	82.2	83.5	86.8
Primary metal products (3/82=100)	87.5	88.1	87.9	89.8	89.8	90.7	89.9	91.7	97.4
Machinery, except electrical (9/78=100)	140.5	140.6	140.5	140.6	140.3	140.5	140.7	141.0	141.4
Electrical machinery (12/80=100)	112.4	111.9	111.2	112.6	112.3	112.6	113.6	115.2	115.3
Transportation equipment (12/78=100)	161.8	162.6	164.1	165.1	167.1	167.4	169.4	170.0	171.2
Scientific instruments; optical goods; clocks (6/77=100)	156.6	156.2	156.7	159.7	161.2	161.5	162.3	163.3	164.6

[1] SIC - based classification.

41. U.S. import price indexes by Standard Industrial Classification [1]

Industry group	1985			1986				1987	
	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June
Manufacturing:									
Food and kindred products (6/77=100)	115.0	114.2	115.1	117.7	115.6	118.0	122.4	122.7	125.9
Textile mill products (9/82=100)	101.0	100.4	101.8	104.7	106.4	107.1	108.0	111.7	113.6
Apparel and related products (6/77=100)	133.0	133.9	134.4	133.4	135.1	137.8	139.3	146.0	150.9
Lumber and wood products, except furniture (6/77=100)	120.6	117.5	115.8	122.1	124.8	127.9	127.9	134.5	135.0
Furniture and fixtures (6/80=100)	96.1	97.7	98.2	101.2	103.5	105.4	105.6	109.6	110.2
Paper and allied products (6/77=100)	139.8	138.7	137.4	137.6	139.4	142.2	150.3	154.0	155.7
Chemicals and allied products (9/82=100)	93.9	93.3	95.8	98.6	102.1	103.8	102.4	104.7	105.7
Rubber and miscellaneous plastic products (12/80=100)	96.7	96.6	97.5	100.9	100.6	101.9	102.1	104.4	105.8
Leather and leather products	138.9	142.3	144.0	145.8	144.6	147.7	148.7	151.8	156.2
Primary metal products (6/81=100)	84.1	84.3	82.6	82.0	82.4	84.9	84.0	85.4	91.3
Fabricated metal products (12/84=100)	99.1	101.0	102.6	104.9	108.5	110.3	111.1	115.5	116.2
Machinery, except electrical (3/80=100)	93.4	96.6	100.0	105.5	109.0	112.5	114.2	119.1	121.9
Electrical machinery (9/84=100)	95.8	94.5	95.8	97.0	100.2	102.6	104.0	105.7	106.9
Transportation equipment (6/81=100)	114.2	114.8	119.6	123.9	128.0	130.4	133.2	136.5	138.4
Scientific instruments; optical goods; clocks (12/79=100)	91.7	94.6	98.8	103.9	109.1	113.7	113.7	119.1	122.1
Miscellaneous manufactured commodities (9/82=100)	95.1	96.6	98.7	99.9	101.7	106.9	108.1	110.3	113.8

[1] SIC - based classification.

42. Indexes of productivity, hourly compensation, and unit costs, quarterly data seasonally adjusted

(1977=100)

Item	Quarterly Indexes										
	1984	1985				1986				1987	
	IV	I	II	III	IV	I	II	III	IV	I	II
Business:											
Output per hour of all persons	105.9	106.5	107.2	108.2	107.9	109.5	109.7	109.6	109.6	109.7	110.0
Compensation per hour	170.3	172.4	174.6	177.0	179.3	180.7	182.2	183.6	185.2	185.8	187.3
Real compensation per hour	98.1	98.5	98.6	99.4	99.7	100.1	101.3	101.4	101.6	100.7	100.3
Unit labor costs	160.8	161.9	162.8	163.6	166.1	165.0	166.2	167.5	169.0	169.4	170.2
Unit nonlabor payments	157.9	158.7	160.4	161.8	160.2	163.1	163.9	165.7	162.4	166.0	169.1
Implicit price deflator	159.8	160.8	162.0	163.0	164.0	164.3	165.4	166.9	166.7	168.2	169.8
Nonfarm business:											
Output per hour of all persons	104.8	105.2	105.7	106.4	105.9	107.7	107.7	107.5	107.5	107.6	107.9
Compensation per hour	170.2	172.2	174.1	176.2	178.3	180.0	181.3	182.6	184.4	184.9	186.3
Real compensation per hour	98.0	98.4	98.3	98.9	99.2	99.7	100.8	100.9	101.2	100.2	99.7
Unit labor costs	162.4	163.6	164.7	165.7	168.3	167.2	168.4	169.8	171.5	171.8	172.6
Unit nonlabor payments	158.5	159.5	161.5	163.4	160.8	164.7	165.2	167.0	163.9	167.4	169.3
Implicit price deflator	161.0	162.2	163.6	164.9	165.7	166.4	167.3	168.8	168.8	170.3	171.4
Nonfinancial corporations:											
Output per hour of all employees	106.4	107.0	107.7	109.2	108.9	109.8	109.7	109.9	110.5	109.7	110.0
Compensation per hour	168.1	169.9	171.8	173.8	175.7	177.2	178.4	179.5	181.0	180.8	182.0
Real compensation per hour	96.8	97.0	97.0	97.6	97.7	98.2	99.1	99.2	99.3	98.0	97.4
Total unit costs	162.8	163.6	164.3	163.7	166.0	166.3	167.2	168.5	168.7	169.7	170.7
Unit labor costs	158.0	158.9	159.5	159.1	161.4	161.5	162.6	163.2	163.8	164.8	165.4
Unit nonlabor costs	176.8	177.5	178.7	177.5	179.4	180.7	180.6	184.2	183.2	184.1	186.4
Unit profits	134.2	132.0	132.2	142.5	128.7	129.7	129.5	130.6	127.7	132.2	131.8
Unit nonlabor payments	161.9	161.6	162.5	165.2	161.6	162.8	162.7	165.4	163.7	165.9	167.3
Implicit price deflator	159.4	159.8	160.5	161.2	161.5	161.9	162.7	164.0	163.8	165.2	166.0
Manufacturing:											
Output per hour of all persons	120.0	121.5	124.0	125.2	126.0	127.6	128.3	129.4	129.9	131.0	132.6
Compensation per hour	171.1	173.3	176.1	178.0	180.2	181.0	182.1	183.1	184.3	183.9	184.7
Real compensation per hour	98.5	99.0	99.5	99.9	100.2	100.3	101.2	101.2	101.2	99.6	98.9
Unit labor costs	142.5	142.7	142.0	142.1	143.0	141.9	142.0	141.5	141.9	140.4	139.3

43. Annual indexes of multifactor productivity and related measures, selected years

(1977=100)

Item	1960	1970	1973	1975	1977	1979	1980	1981	1982	1983	1984	1985
Private business												
Productivity:												
Output per hour of all persons	67.3	88.4	95.9	95.7	100.0	99.5	99.2	100.6	100.3	103.0	105.4	106.5
Output per unit of capital services	102.4	102.0	105.3	93.8	100.0	99.8	94.2	92.4	86.6	88.3	92.4	91.5
Multifactor productivity	78.2	92.9	99.1	95.0	100.0	99.7	97.4	97.7	95.2	97.6	100.6	101.0
Output	55.3	80.2	93.0	89.3	100.0	107.9	106.6	108.9	105.4	109.9	118.9	122.8
Inputs:												
Hours of all persons	82.2	90.8	96.9	93.2	100.0	108.4	107.5	108.2	105.2	106.7	112.8	115.3
Capital services	54.0	78.7	88.3	95.1	100.0	108.0	113.1	117.8	121.7	124.4	128.7	134.1
Combined units of labor and capital input	70.7	86.3	93.8	93.9	100.0	108.2	109.4	111.5	110.7	112.6	118.1	121.6
Capital per hour of all persons	65.7	86.7	91.1	102.0	100.0	99.7	105.3	108.8	115.7	116.7	114.1	116.3
Private nonfarm business												
Productivity:												
Output per hour of all persons	70.7	89.2	96.4	96.0	100.0	99.2	98.7	99.6	99.1	102.4	104.3	104.8
Output per unit of capital services	103.7	102.8	106.0	93.8	100.0	99.0	93.4	91.1	85.1	87.3	90.9	89.7
Multifactor productivity	80.9	93.7	99.6	95.3	100.0	99.1	96.9	96.7	94.1	97.0	99.6	99.4
Output	54.4	79.9	92.9	88.9	100.0	107.9	106.6	108.4	104.8	110.0	118.9	122.5
Inputs:												
Hours of all persons	77.0	89.6	96.3	92.6	100.0	108.8	108.0	108.8	105.7	107.4	114.0	116.9
Capital services	52.5	77.7	87.6	94.8	100.0	109.0	114.1	119.0	123.2	126.1	130.8	136.6
Combined units of labor and capital input	67.3	85.3	93.3	93.4	100.0	108.9	110.0	112.2	111.4	113.5	119.4	123.3
Capital per hour of all persons	68.2	86.8	91.0	102.3	100.0	100.1	105.6	109.4	116.5	117.4	114.7	116.8
Manufacturing												
Productivity:												
Output per hour of all persons	62.2	80.8	93.4	92.9	100.0	101.4	101.4	103.6	105.9	112.0	116.6	121.7
Output per unit of capital services	102.5	98.6	111.4	90.1	100.0	99.7	91.2	89.2	81.8	86.9	94.4	96.0
Multifactor productivity	71.9	85.2	97.9	92.0	100.0	101.0	98.7	99.8	99.2	105.1	110.7	114.7
Output	52.5	78.6	96.3	84.9	100.0	108.1	103.2	104.8	98.4	104.7	116.0	120.4
Inputs:												
Hours of all persons	84.4	97.3	103.1	91.4	100.0	106.5	101.7	101.1	92.9	93.5	99.5	98.9
Capital services	51.2	79.7	86.4	94.2	100.0	108.4	113.1	117.5	120.3	120.6	122.9	125.4
Combined units of labor and capital inputs	73.0	92.2	98.4	92.2	100.0	107.0	104.5	105.0	99.2	99.7	104.8	105.0
Capital per hour of all persons	60.7	82.0	83.8	103.1	100.0	101.7	111.2	116.2	129.4	129.0	123.6	126.7

44. Annual indexes of productivity, hourly compensation, unit costs, and prices, selected years

(1977=100)

Item	1960	1970	1973	1975	1977	1979	1980	1981	1982	1983	1984	1985	1986
Business:													
Output per hour of all persons	67.6	88.4	95.9	95.7	100.0	99.6	99.3	100.7	100.3	103.0	105.6	107.5	109.5
Compensation per hour	33.6	57.8	70.9	85.2	100.0	119.1	131.5	143.7	154.9	161.5	168.0	175.9	182.8
Real compensation per hour	68.9	90.2	96.7	95.9	100.0	99.4	96.7	95.7	97.3	98.2	98.0	99.1	101.0
Unit labor costs	49.7	65.4	73.9	89.0	100.0	119.5	132.5	142.7	154.5	156.7	159.1	163.6	166.9
Unit nonlabor payments	46.4	59.4	72.5	88.2	100.0	112.5	118.7	134.6	136.6	146.4	156.5	160.3	163.8
Implicit price deflator	48.5	63.2	73.4	88.7	100.0	117.0	127.6	139.8	148.1	153.0	158.2	162.4	165.8
Nonfarm business:													
Output per hour of all persons	71.0	89.3	96.4	96.0	100.0	99.3	98.8	99.8	99.2	102.5	104.6	105.8	107.5
Compensation per hour	35.3	58.2	71.2	85.6	100.0	118.9	131.3	143.6	154.8	161.5	167.8	175.2	182.0
Real compensation per hour	72.3	90.8	97.1	96.4	100.0	99.2	96.6	95.7	97.2	98.2	97.9	98.7	100.6
Unit labor costs	49.7	65.2	73.9	89.2	100.0	119.7	132.9	144.0	156.0	157.6	160.4	165.6	169.3
Unit nonlabor payments	46.3	60.0	69.3	86.7	100.0	110.5	118.5	133.5	136.5	148.3	156.4	161.3	165.2
Implicit price deflator	48.5	63.4	72.3	88.3	100.0	116.5	127.8	140.3	149.2	154.3	159.0	164.1	167.8
Nonfinancial corporations:													
Output per hour of all employees	73.4	91.1	97.5	96.7	100.0	99.8	99.1	99.6	100.4	103.5	106.0	108.2	109.9
Compensation per hour	36.9	59.2	71.6	85.9	100.0	118.7	131.1	143.3	154.3	159.9	165.8	172.8	178.9
Real compensation per hour	75.5	92.4	97.6	96.7	100.0	99.1	96.4	95.5	96.9	97.3	96.7	97.4	98.9
Total unit costs	49.4	64.8	72.7	90.3	100.0	118.2	133.4	147.7	159.5	159.5	160.8	164.4	167.7
Unit labor costs	50.2	65.0	73.4	88.8	100.0	119.0	132.3	143.8	153.8	154.5	156.5	159.7	162.8
Unit nonlabor costs	47.0	64.2	70.7	94.9	100.0	115.8	136.7	159.1	176.4	174.3	173.6	178.3	182.2
Unit profits	59.8	52.3	65.6	77.0	100.0	94.5	85.2	98.1	78.5	110.9	136.5	133.9	129.3
Unit nonlabor payments	51.5	60.1	68.9	88.6	100.0	108.4	118.6	137.8	142.1	152.1	160.6	162.7	163.7
Implicit price deflator	50.7	63.3	71.9	88.7	100.0	115.4	127.6	141.7	149.8	153.7	157.9	160.7	163.1
Manufacturing:													
Output per hour of all persons	62.2	80.8	93.4	92.9	100.0	101.4	101.4	103.6	105.9	112.0	118.1	124.2	128.8
Compensation per hour	36.5	57.4	68.8	85.1	100.0	118.6	132.4	145.2	157.5	162.4	168.0	176.9	182.7
Real compensation per hour	74.8	89.5	93.8	95.9	100.0	99.1	97.4	96.7	98.9	98.8	98.0	99.6	100.9
Unit labor costs	58.7	71.0	73.7	91.7	100.0	117.0	130.6	140.1	148.7	145.0	142.2	142.4	141.8
Unit nonlabor payments	60.0	64.1	70.7	87.5	100.0	98.9	97.8	111.8	114.0	128.5	138.6	134.7	137.9
Implicit price deflator	59.1	69.0	72.8	90.5	100.0	111.7	121.0	131.8	138.6	140.2	141.2	140.2	140.7

45. Unemployment rates, approximating U.S. concepts, in nine countries, quarterly data seasonally adjusted

Country	Annual average		1985	1986				1987	
	1985	1986	IV	I	II	III	IV	I	II
Total labor force basis									
United States	7.1	6.9	7.0	7.0	7.0	6.8	6.8	6.6	6.1
Canada	10.4	9.5	10.1	9.7	9.5	9.6	9.4	9.6	9.0
Australia	8.2	8.0	7.8	7.9	7.7	8.2	8.3	8.3	8.1
Japan	2.6	2.8	2.8	2.7	2.8	2.9	2.9	3.0	3.1
France	10.2	10.4	10.2	10.2	10.4	10.6	10.6	11.0	11.0
Germany	7.7	7.4	7.7	7.6	7.5	7.4	7.2	7.3	7.4
Italy [1, 2]	5.9	6.2	6.1	6.1	6.2	5.9	6.5	6.6	–
Sweden	2.8	2.6	2.7	2.7	2.6	2.6	2.6	2.0	1.9
United Kingdom	11.2	11.1	11.0	11.1	11.2	11.1	10.9	10.6	10.2
Civilian labor force basis									
United States	7.2	7.0	7.1	7.1	7.1	6.9	6.9	6.7	6.2
Canada	10.5	9.6	10.1	9.7	9.6	9.7	9.4	9.6	9.1
Australia	8.3	8.1	7.9	8.0	7.8	8.3	8.4	8.3	8.2
Japan	2.6	2.8	2.8	2.7	2.8	2.9	2.9	3.0	3.1
France	10.4	10.7	10.4	10.5	10.7	10.8	10.8	11.2	11.3
Germany	7.9	7.6	7.8	7.8	7.7	7.5	7.4	7.4	7.6
Italy[1, 2]	6.0	6.3	6.2	6.2	6.3	6.0	6.6	6.7	–
Sweden	2.8	2.7	2.7	2.8	2.6	2.6	2.6	2.0	1.9
United Kingdom	11.2	11.1	11.1	11.2	11.2	11.2	10.9	10.7	10.3

[1] Quarterly rates are for the first month of the quarter.

[2] Major changes in the Italian labor force survey, introduced in 1977, resulted in a large increase in persons enumerated as unemployed. However, many persons reported that they had not actively sought work in the past 30 days, and they have been provisionally excluded for comparability with U.S. concepts. Inclusion of such persons would about double the Italian unemployment rate shown.

– Data not available.

NOTE: Quarterly figures for France, Germany, and the United Kingdom are calculated by applying annual adjustment factors to current published data and therefore should be viewed as less precise indicators of unemployment under U.S. concepts than the annual figures.

46. Annual data: Employment status of the civilian working-age population, approximating U.S. concepts, 10 countries

(Numbers in thousands)

Employment status and country	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Labor force										
United States	99,009	102,251	104,962	106,940	108,670	110,204	111,550	113,544	115,461	117,834
Canada	10,500	10,895	11,231	11,573	11,904	11,958	12,183	12,399	12,639	12,870
Australia	6,358	6,443	6,519	6,693	6,810	6,910	6,997	7,133	7,272	7,562
Japan	53,820	54,610	55,210	55,740	56,320	56,980	58,110	58,480	58,820	59,410
France	22,300	22,460	22,670	22,800	22,930	23,160	23,130	23,290	23,340	23,480
Germany	25,870	26,000	26,250	26,520	26,650	26,710	26,740	26,890	27,090	27,280
Italy	20,510	20,570	20,850	21,120	21,320	21,410	21,590	21,670	21,800	21,990
Netherlands	4,950	5,010	5,100	5,310	5,520	5,570	5,600	5,620	5,710	–
Sweden	4,168	4,203	4,262	4,312	4,327	4,350	4,369	4,385	4,418	4,437
United Kingdom	26,050	26,260	26,350	26,520	26,590	26,740	26,790	27,180	27,370	27,460
Participation rate[1]										
United States	62.3	63.2	63.7	63.8	63.9	64.0	64.0	64.4	64.8	65.3
Canada	61.6	62.7	63.4	64.1	64.8	64.1	64.4	64.8	65.2	65.7
Australia	62.7	61.9	61.6	62.1	61.9	61.7	61.4	61.5	61.8	63.0
Japan	62.5	62.8	62.7	62.6	62.6	62.7	63.1	62.7	62.3	62.1
France	57.6	57.5	57.5	57.2	57.1	57.1	56.6	56.6	56.2	56.2
Germany	53.4	53.3	53.3	53.2	52.9	52.7	52.5	52.6	52.8	53.2
Italy	48.2	47.8	48.0	48.2	48.3	47.7	47.5	47.3	47.2	47.5
Netherlands	49.0	48.8	49.0	50.2	51.4	51.2	50.9	50.5	50.7	–
Sweden	65.9	66.1	66.6	66.9	66.8	66.8	66.7	66.6	66.9	67.2
United Kingdom	62.7	62.8	62.6	62.5	62.2	62.3	62.1	62.6	62.7	62.5
Employed										
United States	92,017	96,048	98,824	99,303	100,397	99,526	100,834	105,005	107,150	109,597
Canada	9,651	9,987	10,395	10,708	11,006	10,644	10,734	11,000	11,311	11,634
Australia	6,000	6,038	6,111	6,284	6,416	6,415	6,300	6,490	6,670	6,952
Japan	52,720	53,370	54,040	54,600	55,060	55,620	56,550	56,870	57,260	57,740
France	21,180	21,250	21,300	21,330	21,200	21,240	21,170	20,980	20,900	20,970
Germany	24,970	25,130	25,470	25,750	25,560	25,130	24,750	24,800	24,960	25,210
Italy	19,670	19,720	19,930	20,200	20,280	20,250	20,320	20,390	20,490	20,610
Netherlands	4,700	4,750	4,830	4,980	5,010	4,980	4,890	4,930	5,110	–
Sweden	4,093	4,109	4,174	4,226	4,219	4,213	4,218	4,249	4,293	4,319
United Kingdom	24,400	24,610	24,940	24,670	23,800	23,710	23,600	24,000	24,300	24,400
Employment-population ratio[2]										
United States	57.9	59.3	59.9	59.2	59.0	57.8	57.9	59.5	60.1	60.7
Canada	56.6	57.5	58.7	59.3	59.9	57.0	56.7	57.4	58.4	59.4
Australia	59.2	58.0	57.8	58.3	58.4	57.3	55.3	56.0	56.6	57.9
Japan	61.2	61.3	61.4	61.3	61.2	61.2	61.4	61.0	60.6	60.4
France	54.7	54.4	54.0	53.5	52.8	52.3	51.8	51.0	50.4	50.2
Germany	51.6	51.5	51.7	51.7	50.8	49.6	48.6	48.5	48.7	49.1
Italy	46.3	45.9	45.9	46.1	45.9	45.2	44.7	44.5	44.4	44.6
Netherlands	46.5	46.3	46.4	47.0	46.6	45.8	44.5	44.3	45.7	–
Sweden	64.8	64.6	65.3	65.6	65.1	64.7	64.4	64.5	65.0	65.4
United Kingdom	58.7	58.8	59.2	58.1	55.7	55.3	54.7	55.3	55.7	55.6
Unemployed										
United States	6,991	6,202	6,137	7,637	8,273	10,678	10,717	8,539	8,312	8,237
Canada	849	908	836	865	898	1,314	1,448	1,399	1,328	1,236
Australia	358	405	408	409	394	495	697	642	602	610
Japan	1,100	1,240	1,170	1,140	1,260	1,360	1,560	1,610	1,560	1,670
France	1,120	1,210	1,370	1,470	1,730	1,920	1,960	2,310	2,440	2,510
Germany	900	870	780	770	1,090	1,580	1,990	2,090	2,130	2,070
Italy	840	850	920	920	1,040	1,160	1,270	1,280	1,310	1,380
Netherlands	250	260	270	330	510	590	710	690	600	–
Sweden	75	94	88	86	108	137	151	136	125	118
United Kingdom	1,660	1,650	1,420	1,850	2,790	3,030	3,190	3,180	3,070	3,060
Unemployment rate										
United States	7.1	6.1	5.8	7.1	7.6	9.7	9.6	7.5	7.2	7.0
Canada	8.1	8.3	7.4	7.5	7.5	11.0	11.9	11.3	10.5	9.6
Australia	5.6	6.3	6.3	6.1	5.8	7.2	10.0	9.0	8.3	8.1
Japan	2.0	2.3	2.1	2.0	2.2	2.4	2.7	2.8	2.6	2.8
France	5.0	5.4	6.0	6.4	7.5	8.3	8.5	9.9	10.4	10.7
Germany	3.5	3.3	3.0	2.9	4.1	5.9	7.4	7.8	7.9	7.6
Italy	4.1	4.1	4.4	4.4	4.9	5.4	5.9	5.9	6.0	6.3
Netherlands	5.1	5.2	5.3	6.2	9.2	10.6	12.7	12.3	10.5	–
Sweden	1.8	2.2	2.1	2.0	2.5	3.1	3.5	3.1	2.8	2.7
United Kingdom	6.4	6.3	5.4	7.0	10.5	11.3	11.9	11.7	11.2	11.1

[1] Labor force as a percent of the civilian working-age population.
[2] Employment as a percent of the civilian working-age population.
– Data not available.

47. Annual indexes of manufacturing productivity and related measures, 12 countries

(1977=100)

Item and country	1960	1970	1973	1974	1975	1976	1978	1979	1980	1981	1982	1983	1984	1985	1986
Output per hour															
United States	62.2	80.8	93.4	90.6	92.9	97.1	101.5	101.4	101.4	103.6	105.9	112.0	116.6	121.7	126.0
Canada	50.7	75.6	90.3	91.7	88.6	94.8	101.1	102.0	98.2	102.9	100.4	106.9	110.2	112.7	112.1
Japan	23.2	64.8	83.1	86.5	87.7	94.3	108.0	114.8	122.7	127.2	135.0	142.3	152.5	163.7	168.2
Belgium	32.8	59.9	78.2	82.6	85.9	95.1	106.3	112.3	119.7	128.1	135.7	144.7	149.8	153.3	–
Denmark	37.2	65.5	83.2	86.0	94.6	98.2	101.5	106.5	112.3	114.2	114.6	120.2	118.9	117.2	116.6
France	36.4	69.6	82.2	85.2	88.5	95.0	105.7	110.3	112.0	116.4	123.5	128.8	133.8	138.3	140.9
Germany	40.3	71.2	84.0	87.4	90.1	96.5	103.1	108.2	108.6	111.0	112.6	119.1	123.5	128.9	131.4
Italy	36.5	72.7	90.9	95.3	91.1	98.9	103.0	110.5	116.9	121.0	123.4	126.6	134.7	136.8	138.4
Netherlands	32.4	64.3	81.5	88.1	86.2	95.8	106.4	112.3	113.9	116.9	119.4	127.5	141.2	145.6	–
Norway	54.6	81.7	94.6	97.7	96.8	99.7	101.8	107.1	106.7	107.0	109.8	117.2	123.9	125.2	122.1
Sweden	42.3	80.7	94.8	98.8	100.2	101.7	102.8	110.9	112.7	113.2	116.5	125.5	131.0	134.5	136.4
United Kingdom	55.5	79.7	95.6	97.4	95.2	99.5	101.5	102.4	101.7	107.0	113.6	123.0	129.5	134.2	138.2
Output															
United States	52.5	78.6	96.3	91.7	84.9	93.1	106.0	108.1	103.2	104.8	98.4	104.7	116.0	120.4	124.4
Canada	41.3	73.5	93.5	96.3	89.9	96.5	104.6	108.5	103.6	107.4	95.6	101.0	108.4	113.6	115.4
Japan	19.2	69.9	91.9	91.7	86.2	94.8	106.7	113.9	124.1	129.8	137.3	148.2	165.4	179.3	182.1
Belgium	41.6	78.0	95.7	99.5	92.0	99.4	101.6	104.4	107.3	106.0	110.5	112.1	114.1	115.1	–
Denmark	49.2	82.0	95.9	97.4	95.0	99.6	99.7	105.4	110.1	106.6	108.3	115.6	120.0	123.6	127.0
France	35.4	73.3	88.6	91.8	90.0	96.1	103.4	106.1	106.6	105.9	106.0	107.4	108.4	108.6	108.1
Germany	50.0	86.6	96.1	95.4	91.0	98.0	101.8	106.6	106.6	104.9	102.4	103.6	106.4	111.7	114.5
Italy	37.4	78.0	90.5	96.3	86.9	97.9	101.8	108.6	115.4	114.3	111.6	109.2	113.7	115.5	119.3
Netherlands	44.8	84.4	95.8	100.0	92.7	99.0	102.8	106.1	106.6	106.7	105.0	107.0	112.9	115.3	–
Norway	55.1	86.9	99.5	104.0	101.0	101.4	98.2	100.3	98.8	97.7	97.4	97.2	102.6	105.2	107.0
Sweden	52.6	92.5	100.3	105.7	106.1	106.1	97.3	103.6	104.0	100.6	100.1	105.2	111.5	113.8	114.4
United Kingdom	71.2	95.0	104.8	103.5	96.3	98.2	100.6	100.5	91.7	86.2	86.4	88.9	92.4	95.2	96.0
Total hours															
United States	84.4	97.3	103.1	101.2	91.4	95.9	104.4	106.5	101.7	101.1	92.9	93.5	99.5	98.9	98.7
Canada	81.4	97.2	103.6	105.0	101.5	101.8	103.4	106.3	105.5	104.3	95.1	94.5	98.3	100.8	103.0
Japan	82.7	107.9	110.7	106.1	98.2	100.6	98.8	99.3	101.2	102.0	101.7	104.2	108.5	109.6	108.3
Belgium	127.1	130.2	122.3	120.4	107.1	104.6	95.5	93.0	89.6	82.8	81.4	77.5	76.2	75.1	–
Denmark	132.4	125.1	115.2	113.2	100.4	101.4	98.3	99.0	98.1	93.4	94.5	96.2	101.0	105.5	108.9
France	97.2	105.3	107.8	107.8	101.7	101.2	97.8	96.2	95.2	91.0	85.8	83.4	81.0	78.5	76.7
Germany	123.8	121.7	114.4	109.2	101.0	101.6	98.7	98.5	98.1	94.6	91.0	87.0	86.2	86.7	87.2
Italy	102.3	107.4	99.6	101.0	95.4	99.0	98.8	98.2	98.7	94.5	90.4	86.2	84.4	84.4	86.2
Netherlands	138.4	131.2	117.6	113.5	107.6	103.3	96.6	94.4	93.6	91.2	88.0	83.9	79.9	79.2	–
Norway	101.0	106.4	105.1	106.5	104.3	101.7	96.5	93.6	92.6	91.3	88.6	82.9	82.8	84.0	87.6
Sweden	124.4	114.6	105.7	107.0	105.9	104.3	94.6	93.4	92.3	88.9	85.9	83.9	85.1	84.6	83.9
United Kingdom	128.3	119.1	109.5	106.3	101.2	98.7	99.1	98.1	90.2	80.6	76.1	72.3	71.3	71.0	69.5
Compensation per hour															
United States	36.5	57.4	68.8	76.2	85.1	92.1	108.2	118.6	132.4	145.2	157.5	162.4	168.2	176.7	181.9
Canada	27.5	47.9	60.3	69.1	78.9	90.3	107.6	118.6	131.3	151.1	167.3	177.4	188.0	195.9	202.2
Japan	8.9	33.9	55.1	72.3	84.2	90.7	106.6	113.4	120.7	129.8	136.6	140.7	144.9	152.0	157.3
Belgium	13.8	34.9	53.5	65.2	79.0	89.5	107.8	117.5	130.4	144.5	150.7	159.8	173.1	183.7	–
Denmark	12.6	36.3	56.1	67.9	81.0	90.4	110.2	123.1	135.9	149.6	162.9	174.2	184.3	194.4	202.6
France	15.1	36.6	52.3	62.0	76.7	88.9	113.5	129.3	148.2	171.5	202.3	227.0	246.9	262.5	274.0
Germany	18.8	48.0	67.5	76.9	84.5	91.3	107.8	116.1	125.6	134.5	141.0	148.4	155.5	162.8	171.0
Italy	8.3	26.1	43.7	54.5	70.2	84.2	114.5	134.7	160.2	197.1	237.3	276.4	307.4	339.5	353.9
Netherlands	12.5	39.0	60.5	71.9	82.2	91.9	108.4	117.0	123.6	129.1	137.5	144.0	151.0	159.0	–
Norway	15.8	37.9	54.5	63.6	77.2	88.8	110.0	116.0	128.0	142.8	156.0	173.5	188.3	204.8	220.5
Sweden	14.7	38.5	54.2	63.8	77.3	91.5	111.4	120.1	133.6	148.1	158.9	173.3	189.7	208.9	223.1
United Kingdom	15.2	31.5	48.3	57.7	77.3	89.3	116.4	138.8	168.3	192.5	212.3	227.7	243.9	261.3	282.4
Unit labor costs: National currency basis															
United States	58.7	71.0	73.7	84.1	91.7	94.9	106.6	117.0	130.6	140.1	148.7	145.0	144.2	145.1	144.3
Canada	54.2	63.4	66.8	75.3	89.1	95.3	106.5	116.2	133.7	146.7	166.5	166.0	170.6	173.8	180.4
Japan	38.4	52.3	66.4	83.6	96.0	96.2	98.7	98.8	98.4	102.0	101.2	98.9	95.0	92.9	93.5
Belgium	42.0	58.2	68.4	78.9	91.9	94.2	101.4	104.7	109.0	112.8	111.1	110.5	115.6	119.8	–
Denmark	33.8	55.4	67.4	79.0	85.6	92.1	108.6	115.7	121.0	131.1	142.2	144.9	155.1	166.0	173.8
France	41.6	52.6	63.6	72.8	86.7	93.6	107.4	117.3	132.3	147.4	163.8	176.2	184.5	189.8	194.4
Germany	46.6	67.4	80.3	88.0	93.8	94.6	104.5	107.3	115.7	121.2	125.2	124.6	125.9	126.3	130.2
Italy	22.8	36.0	48.1	57.2	77.1	85.1	111.2	121.9	137.0	162.9	192.4	218.3	228.2	248.2	255.7
Netherlands	38.5	60.7	74.3	81.6	95.4	96.0	101.8	104.1	108.5	110.4	115.2	113.0	106.9	109.2	–
Norway	29.0	46.4	57.6	65.2	79.7	89.1	108.1	108.2	120.0	133.4	142.1	148.0	152.0	163.5	180.5
Sweden	34.8	47.7	57.2	64.6	77.1	90.0	108.4	108.3	118.6	130.9	136.3	138.1	144.8	155.3	163.6
United Kingdom	27.4	39.5	50.5	59.3	81.2	89.8	114.7	135.5	165.4	179.9	186.9	185.1	188.4	194.7	204.4
Unit labor costs: U.S. dollar basis															
United States	58.7	71.0	73.7	84.1	91.7	94.9	106.6	117.0	130.6	140.1	148.7	145.0	144.2	145.1	144.3
Canada	59.4	64.5	71.0	81.8	93.1	102.7	99.3	105.4	121.5	130.0	143.4	143.1	139.9	135.2	137.9
Japan	28.5	39.1	65.6	76.8	86.7	86.9	126.8	121.3	116.8	123.8	108.8	111.5	107.2	104.3	148.7
Belgium	30.2	42.0	63.1	72.7	89.7	87.5	115.6	127.9	133.7	109.2	86.9	77.4	71.7	72.3	–
Denmark	29.5	44.4	67.2	77.9	89.6	91.5	118.4	132.0	129.0	110.3	102.3	95.1	89.9	94.0	128.9
France	41.7	46.8	70.4	74.5	99.5	96.3	117.3	135.5	154.1	133.2	122.4	113.7	103.8	103.9	138.0
Germany	25.9	42.9	70.4	79.1	88.7	87.3	121.0	135.9	147.9	124.9	119.7	113.3	102.7	99.6	139.2
Italy	32.5	50.6	73.1	77.6	104.3	90.5	115.6	129.5	141.4	126.3	125.4	126.8	114.7	114.8	151.4
Netherlands	25.1	41.2	65.6	74.6	92.8	89.1	115.7	127.4	134.2	108.9	105.8	97.1	81.8	80.7	–
Norway	21.7	34.5	53.4	62.8	81.4	86.9	109.7	113.8	129.3	123.6	117.1	107.9	99.1	101.3	129.8
Sweden	30.1	41.1	58.7	65.1	83.2	92.3	107.2	112.9	125.3	115.4	96.9	80.4	78.2	80.6	102.5
United Kingdom	44.2	54.2	70.9	79.5	103.4	92.9	126.1	164.9	220.5	208.8	187.2	160.8	144.3	144.8	171.9

– Data not available.

48. Occupational injury and illness incidence rates by industry, United States

Industry and type of case[1]	Incidence rates per 100 full-time workers[2]								
	1977	1978	1979	1980	1981	1982	1983	1984	1985
PRIVATE SECTOR[3]									
Total cases	9.3	9.4	9.5	8.7	8.3	7.7	7.6	8.0	7.9
Lost workday cases	3.8	4.1	4.3	4.0	3.8	3.5	3.4	3.7	3.6
Lost workdays	61.6	63.5	67.7	65.2	61.7	58.7	58.5	63.4	64.9
Agriculture, forestry, and fishing[3]									
Total cases	11.5	11.6	11.7	11.9	12.3	11.8	11.9	12.0	11.4
Lost workday cases	5.1	5.4	5.7	5.8	5.9	5.9	6.1	6.1	5.7
Lost workdays	81.1	80.7	83.7	82.7	82.8	86.0	90.8	90.7	91.3
Mining									
Total cases	10.9	11.5	11.4	11.2	11.6	10.5	8.4	9.7	8.4
Lost workday cases	6.0	6.4	6.8	6.5	6.2	5.4	4.5	5.3	4.8
Lost workdays	128.8	143.2	150.5	163.6	146.4	137.3	125.1	160.2	145.3
Construction									
Total cases	15.5	16.0	16.2	15.7	15.1	14.6	14.8	15.5	15.2
Lost workday cases	5.9	6.4	6.8	6.5	6.3	6.0	6.3	6.9	6.8
Lost workdays	111.5	109.4	120.4	117.0	113.1	115.7	118.2	128.1	128.9
General building contractors:									
Total cases	15.0	15.9	16.3	15.5	15.1	14.1	14.4	15.4	15.2
Lost workday cases	5.7	6.3	6.8	6.5	6.1	5.9	6.2	6.9	6.8
Lost workdays	100.2	105.3	111.2	113.0	107.1	112.0	113.0	121.3	120.4
Heavy construction contractors:									
Total cases	16.0	16.6	16.6	16.3	14.9	15.1	15.4	14.9	14.5
Lost workday cases	5.7	6.2	6.7	6.3	6.0	5.8	6.2	6.4	6.3
Lost workdays	116.7	110.9	123.1	117.6	106.0	113.1	122.4	131.7	127.3
Special trade contractors:									
Total cases	15.6	15.8	16.0	15.5	15.2	14.7	14.8	15.8	15.4
Lost workday cases	6.1	6.6	6.9	6.7	6.6	6.2	6.4	7.1	7.0
Lost workdays	115.5	111.0	124.3	118.9	119.3	118.6	119.0	130.1	133.3
Manufacturing									
Total cases	13.1	13.2	13.3	12.2	11.5	10.2	10.0	10.6	10.4
Lost workday cases	5.1	5.6	5.9	5.4	5.1	4.4	4.3	4.7	4.6
Lost workdays	82.3	84.9	90.2	86.7	82.0	75.0	73.5	77.9	80.2
Durable goods									
Lumber and wood products:									
Total cases	22.3	22.6	20.7	18.6	17.6	16.9	18.3	19.6	18.5
Lost workday cases	10.4	11.1	10.8	9.5	9.0	8.3	9.2	9.9	9.3
Lost workdays	178.0	178.8	175.9	171.8	158.4	153.3	163.5	172.0	171.4
Furniture and fixtures:									
Total cases	17.2	17.5	17.6	16.0	15.1	13.9	14.1	15.3	15.0
Lost workday cases	6.0	6.9	7.1	6.6	6.2	5.5	5.7	6.4	6.3
Lost workdays	92.0	95.9	99.6	97.6	91.9	85.6	83.0	101.5	100.4
Stone, clay, and glass products:									
Total cases	16.9	16.8	16.8	15.0	14.1	13.0	13.1	13.6	13.9
Lost workday cases	6.9	7.8	8.0	7.1	6.9	6.1	6.0	6.6	6.7
Lost workdays	120.4	126.3	133.7	128.1	122.2	112.2	112.0	120.8	127.8
Primary metal industries:									
Total cases	16.2	17.0	17.3	15.2	14.4	12.4	12.4	13.3	12.6
Lost workday cases	6.8	7.5	8.1	7.1	6.7	5.4	5.4	6.1	5.7
Lost workdays	119.4	123.6	134.7	128.3	121.3	101.6	103.4	115.3	113.8
Fabricated metal products:									
Total cases	19.1	19.3	19.9	18.5	17.5	15.3	15.1	16.1	16.3
Lost workday cases	7.2	8.0	8.7	8.0	7.5	6.4	6.1	6.7	6.9
Lost workdays	109.0	112.4	124.2	118.4	109.9	102.5	96.5	104.9	110.1
Machinery, except electrical:									
Total cases	14.0	14.4	14.7	13.7	12.9	10.7	9.8	10.7	10.8
Lost workday cases	4.7	5.4	5.9	5.5	5.1	4.2	3.6	4.1	4.2
Lost workdays	69.9	75.1	83.6	81.3	74.9	66.0	58.1	65.8	69.3
Electric and electronic equipment:									
Total cases	8.6	8.7	8.6	8.0	7.4	6.5	6.3	6.8	6.4
Lost workday cases	3.0	3.3	3.4	3.3	3.1	2.7	2.6	2.8	2.7
Lost workdays	46.7	50.3	51.9	51.8	48.4	42.2	41.4	45.0	45.7
Transportation equipment:									
Total cases	11.8	11.5	11.6	10.6	9.8	9.2	8.4	9.3	9.0
Lost workday cases	5.0	5.1	5.5	4.9	4.6	4.0	3.6	4.2	3.9
Lost workdays	79.3	78.0	85.9	82.4	78.1	72.2	64.5	68.8	71.6
Instruments and related products:									
Total cases	7.0	6.9	7.2	6.8	6.5	5.6	5.2	5.4	5.2
Lost workday cases	2.4	2.6	2.8	2.7	2.7	2.3	2.1	2.2	2.2
Lost workdays	37.4	37.0	40.0	41.8	39.2	37.0	35.6	37.5	37.9
Miscellaneous manufacturing industries:									
Total cases	11.5	11.8	11.7	10.9	10.7	9.9	9.9	10.5	9.7
Lost workday cases	4.0	4.5	4.7	4.4	4.4	4.1	4.0	4.3	4.2
Lost workdays	58.7	66.4	67.7	67.9	68.3	69.9	66.3	70.2	73.2

See footnotes at end of table.

48. Continued— Occupational injury and illness incidence rates by industry, United States

Industry and type of case[1]	Incidence rates per 100 full-time workers[2]								
	1977	1978	1979	1980	1981	1982	1983	1984	1985
Nondurable goods									
Food and kindred products:									
Total cases	19.5	19.4	19.9	18.7	17.8	16.7	16.5	16.7	16.7
Lost workday cases	8.5	8.9	9.5	9.0	8.6	8.0	7.9	8.1	8.1
Lost workdays	130.1	132.2	141.8	136.8	130.7	129.3	131.2	131.6	138.0
Tobacco manufacturing:									
Total cases	9.1	8.7	9.3	8.1	8.2	7.2	6.5	7.7	7.3
Lost workday cases	3.8	4.0	4.2	3.8	3.9	3.2	3.0	3.2	3.0
Lost workdays	66.7	58.6	64.8	45.8	56.8	44.6	42.8	51.7	51.7
Textile mill products:									
Total cases	10.2	10.2	9.7	9.1	8.8	7.6	7.4	8.0	7.5
Lost workday cases	2.9	3.4	3.4	3.3	3.2	2.8	2.8	3.0	3.0
Lost workdays	57.4	61.5	61.3	62.8	59.2	53.8	51.4	54.0	57.4
Apparel and other textile products:									
Total cases	6.7	6.5	6.5	6.4	6.3	6.0	6.4	6.7	6.7
Lost workday cases	2.0	2.2	2.2	2.2	2.2	2.1	2.4	2.5	2.6
Lost workdays	31.7	32.4	34.1	34.9	35.0	36.4	40.6	40.9	44.1
Paper and allied products:									
Total cases	13.6	13.5	13.5	12.7	11.6	10.6	10.0	10.4	10.2
Lost workday cases	5.0	5.7	6.0	5.8	5.4	4.9	4.5	4.7	4.7
Lost workdays	101.6	103.3	108.4	112.3	103.6	99.1	90.3	93.8	94.6
Printing and publishing:									
Total cases	6.8	7.0	7.1	6.9	6.7	6.6	6.6	6.5	6.3
Lost workday cases	2.7	2.9	3.1	3.1	3.0	2.8	2.9	2.9	2.9
Lost workdays	41.7	43.8	45.1	46.5	47.4	45.7	44.6	46.0	49.2
Chemicals and allied products:									
Total cases	8.0	7.8	7.7	6.8	6.6	5.7	5.5	5.3	5.1
Lost workday cases	3.1	3.3	3.5	3.1	3.0	2.5	2.5	2.4	2.3
Lost workdays	51.4	50.9	54.9	50.3	48.1	39.4	42.3	40.8	38.8
Petroleum and coal products:									
Total cases	8.1	7.9	7.7	7.2	6.7	5.3	5.5	5.1	5.1
Lost workday cases	3.3	3.4	3.6	3.5	2.9	2.5	2.4	2.4	2.4
Lost workdays	59.2	58.3	62.0	59.1	51.2	46.4	46.8	53.5	49.9
Rubber and miscellaneous plastics products:									
Total cases	16.8	17.1	17.1	15.5	14.6	12.7	13.0	13.6	13.4
Lost workday cases	7.6	8.1	8.2	7.4	7.2	6.0	6.2	6.4	6.3
Lost workdays	118.1	125.5	127.1	118.6	117.4	100.9	101.4	104.3	107.4
Leather and leather products:									
Total cases	11.5	11.7	11.5	11.7	11.5	9.9	10.0	10.5	10.3
Lost workday cases	4.4	4.7	4.9	5.0	5.1	4.5	4.4	4.7	4.6
Lost workdays	68.9	72.5	76.2	82.7	82.6	86.5	87.3	94.4	88.3
Transportation and public utilities									
Total cases	9.7	10.1	10.0	9.4	9.0	8.5	8.2	8.8	8.6
Lost workday cases	5.3	5.7	5.9	5.5	5.3	4.9	4.7	5.2	5.0
Lost workdays	95.9	102.3	107.0	104.5	100.6	96.7	94.9	105.1	107.1
Wholesale and retail trade									
Total cases	7.7	7.9	8.0	7.4	7.3	7.2	7.2	7.4	7.4
Lost workday cases	2.9	3.2	3.4	3.2	3.1	3.1	3.1	3.3	3.2
Lost workdays	44.0	44.9	49.0	48.7	45.3	45.5	47.8	50.5	50.7
Wholesale trade:									
Total cases	8.5	8.9	8.8	8.2	7.7	7.1	7.0	7.2	7.2
Lost workday cases	3.6	3.9	4.1	3.9	3.6	3.4	3.2	3.5	3.5
Lost workdays	52.5	57.5	59.1	58.2	54.7	52.1	50.6	55.5	59.8
Retail trade:									
Total cases	7.4	7.5	7.7	7.1	7.1	7.2	7.3	7.5	7.5
Lost workday cases	2.7	2.8	3.1	2.9	2.9	2.9	3.0	3.2	3.1
Lost workdays	40.5	39.7	44.7	44.5	41.1	42.6	46.7	48.4	47.0
Finance, insurance, and real estate									
Total cases	2.0	2.1	2.1	2.0	1.9	2.0	2.0	1.9	2.0
Lost workday cases	.8	.8	.9	.8	.8	.9	.9	.9	.9
Lost workdays	10.4	12.5	13.3	12.2	11.6	13.2	12.8	13.6	15.4
Services									
Total cases	5.5	5.5	5.5	5.2	5.0	4.9	5.1	5.2	5.4
Lost workday cases	2.2	2.4	2.5	2.3	2.3	2.3	2.4	2.5	2.6
Lost workdays	35.4	36.2	38.1	35.8	35.9	35.8	37.0	41.1	45.4

[1] Total cases include fatalities.

[2] The incidence rates represent the number of injuries and illnesses or lost workdays per 100 full-time workers and were calculated as:
(N/EH) X 200,000, where:
N = number of injuries and illnesses or lost workdays.
EH = total hours worked by all employees during calendar year.
200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year.)

[3] Excludes farms with fewer than 11 employees since 1976.

NEW FROM BLS

SALES PUBLICATIONS

BLS Bulletins

Employee Benefits in Medium and Large Firms, 1986. Bulletin 2281, 100 pp. (GPO Stock No. 029-001-02927-6) $5. Presents results of a 1986 survey of the incidence and provisions of employee benefits in medium and large firms. This survey—the eighth in an annual series—provides representative data for 21.3 million full-time employees in a cross-section of the Nation's private industries.

Geographic Profile of Employment and Unemployment, 1986. Bulletin 2279, 200 pp. (GPO Stock No. 029-001-02924-1) $9.50. Includes data from the Current Population Survey for regions, States, and selected large metropolitan areas and central cities. Annual averages for 1986 by selected demographic and economic characteristics.

Occupational Injuries and Illnesses in the United States by Industry, 1985. Bulletin 2278, 81 pp. (GPO Stock No. 029-001-02925-0) $4.25. Contains 1984 and 1985 data by industry on occupational injuries, illnesses, and fatalities in private sector establishments.

Relative Importance of Components in the Consumer Price Indexes, 1986. Bulletin 2280, 37 pp. (GPO Stock No. 029-001-02923-3) $2.25. Presents data on the relative importance (value weights) of components in the Consumer Price Indexes. The data can be used in conjunction with the CPI Detailed Report.

Area Wage Surveys. These bulletins cover office, professional, technical, maintenance, custodial, and material movement jobs in major metropolitan areas. The annual series is available by subscription for $71 per year. Individual area bulletins are also available separately.

Atlanta, Georgia, Metropolitan Area, May 1987. Bulletin 3040-18, 51 pp. (GPO Stock No. 829-001-00161-2) $2.75.

Bradenton, Florida, Metropolitan Area, June 1987. Bulletin 3040-20, 37 pp. (GPO Stock No. 829-001-00163-9) $2.25.

Milwaukee, Wisconsin, Metropolitan Area, May 1987. Bulletin 3040-17, 54 pp. (GPO Stock No. 829-001-00160-4) $2.75.

Phoenix, Arizona, Metropolitan Area, June 1987. Bulletin 3040-22, 49 pp. (GPO Stock No. 829-001-00165-5) $2.75.

Portland, Oregon-Washington, Metropolitan Area, June 1987. Bulletin 3040-21, 33 pp. (GPO Stock No. 829-001-00164-7) $2.

Richmond, Virginia, Metropolitan Area, June 1987. Bulletin 3040-1, 29 pp. (GPO Stock No. 829-001-00162-19) $1.75.

Selected Metropolitan Areas, 1986. Bulletin 3035-72, 148 pp. (GPO Stock No. 029-001-02939-2) $7.50.

Industry Wage Surveys. These studies include results from the latest BLS survey of wages and employee benefits, with detailed occupational data for the Nation, regions, and selected areas. Data are useful for wage and salary administration, union contract negotiation, arbitration, and Government policy considerations.

Wood Household Furniture, June 1986. Bulletin 2283, 112 pp. (GPO Stock No. 029-001-02931-4) $5.50.

Periodicals

CPI Detailed Report. This monthly publication provides a comprehensive report on price movements for the month, as well as statistical tables, charts, and technical notes. $6 ($16 per year).

Current Wage Developments. Each issue of this monthly periodical includes data on selected compensation changes, work stoppages, and major agreements expiring the following month. $2.75 ($12 per year).

Employment and Earnings. This monthly report highlights employment and unemployment developments and includes statistical tables on national, State, and area employment, hours, and earnings. $8.50 ($22 per year).

Supplement to Employment and Earnings, July 1987. 266 pp. (GPO Stock No. 729-004-00034-1) $14. This supplement presents revised detailed industry statistics on the Nation's nonagricultural workers adjusted to March 1986 benchmarks including monthly and average annual employment data, average weekly hours, and average hourly and weekly earnings.

Occupational Outlook Quarterly. Each issue helps guidance counselors, people planning careers, and others keep informed of changing career opportunities. $2 ($5 per year).

Producer Price Indexes. This monthly report includes a comprehensive report on price movements for the month, as well as regular tables and technical notes. $8.50 ($21 per year).

Supplement to Producer Price Indexes Data for 1986. 345 pp. (GPO Stock No. 029-009-00029) $13. Presents monthly indexes and annual averages for 1986; also provides information on the relative importance of index components at the end of the year. Features an article on update of the Producer Price Index weight structure.

OTHER PUBLICATIONS

(Single copies available upon request while supplies last.)

Area Wage Summaries

Alaska, July 1987. 5 pp.
Alpena-Standish-Tawas City, MI, July 1987. 4 pp.
Baton Rouge, LA, June 1987. 4 pp.
Battle Creek, MI, July 1987. 6 pp.
Brunswick, GA, June 1987. 4 pp.
Cedar Rapids, IA, June 1987. 7 pp.
Charleston-North Charleston-Walterboro, SC, July 1987. 4 pp.
Columbus, MS, June 1987. 4 pp.
Fort Wayne, IN, June 1987. 4 pp.
Goldsboro, NC, July 1987. 4 pp.
Greenville-Spartanburg, SC, June 1987. 4 pp.
LaCrosse-Sparta, WI, July 1987. 7 pp.
Little Rock-North Little Rock, AR, July 1987. 4 pp.
Norfolk-Virginia Beach-Newport News, VA, June 1987. 7 pp.
Northern New York, June 1987. 4 pp.
Peoria, IL, July 1987. 7 pp.
Portsmouth-Chillicothe-Gallipolis, OH, June 1987. 4 pp.
Providence, RI, June 1987. 6 pp.
Santa Barbara-Santa Maria-Lompoc, CA, July 1987. 5 pp.
Selma, AL, July 1987. 4 pp.
South Dakota, June 1987. 4 pp.
Tulsa, OK, June 1987. 4 pp.
Waco and Killeen-Temple, TX, July 1987. 4 pp.
Waterloo-Cedar Falls, IA, June 1987. 7 pp.
West Virginia, July 1987. 5 pp.
Yakima-Richland-Kennewick-Pasco-Walla Walla-Pendleton, WA-OR, July 1987. 7 pp.

To Order:

Sales Publications. Order bulletins by title, bulletin number, and GPO stock number from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, or from the Bureau of Labor Statistics, Publications Sales Center, P.O. Box 2145, Chicago, IL 60690. Subscriptions, including microfiche subscriptions, are available only from the Superintendent of Documents. All checks—including those that go to the Chicago Regional Office—should be made payable to the Superintendent of Documents.

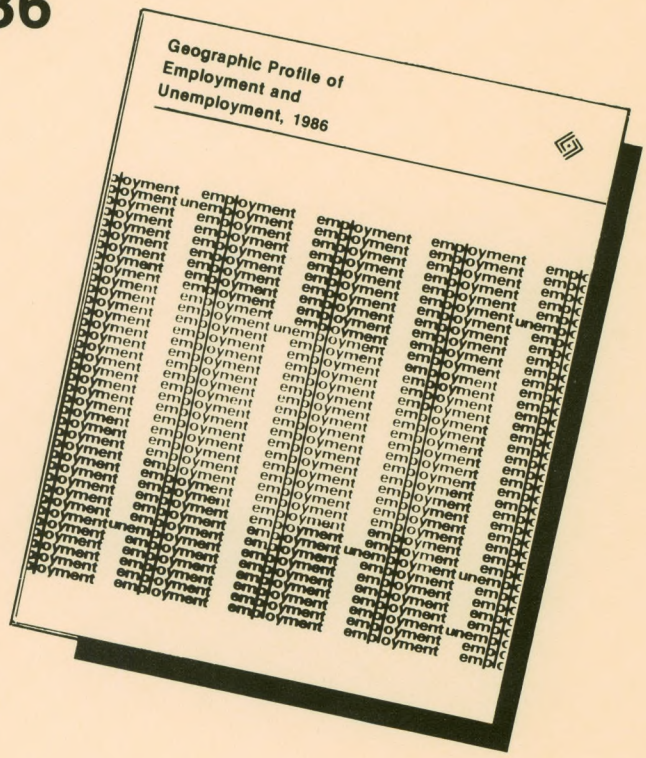
Other Publications. Request from the Bureau of Labor Statistics, U.S. Department of Labor, Room 2831A, 441 G Street, NW, Washington, DC 20212, or from the Bureau of Labor Statistics, Chicago Regional Office, P.O. Box 2145, Chicago, IL 60690.

☆ U. S. GOVERNMENT PRINTING OFFICE : 1987 181-512/40020

Geographic Profile of Employment and Unemployment, 1986

Bulletin 2279

Here, in a single volume, is a complete picture of the labor force in four Census regions and nine divisions, each of the 50 States and the District of Columbia, 50 metropolitan areas, and 17 central cities. It is the only current source of information on demographic and economic characteristics for metropolitan areas and cities. The data report on labor force status by sex, race, age, Hispanic origin, marital status, occupation, industry, full- and part-time status, reasons for and duration of unemployment, and reasons for part-time work. The volume includes nearly 30 tables, geographic boundary definitions, a description of sampling and estimation procedures, and tables of sampling errors.



Please send your order to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

or

Bureau of Labor Statistics
Publications Sales Center
P.O. Box 2145
Chicago, Ill. 60690

Order form

Please send _____ **copies of** *Geographic Profile of Employment and Unemployment, 1986,* Bulletin 2279, Stock No. 029-001-02924-1 at $9.50 each.

☐ Enclosed is a check or money order payable to the Superintendent of Documents.

☐ Charge to GPO Deposit Account No. _____

☐ Charge to my ☐ MasterCard * Account No. _____ Expiration date _____

☐ VISA* * Account No. _____ Expiration date _____

*Acceptable only on orders sent to the Superintendent of Documents.

Name _____

Organization (if applicable) _____

Address _____

City, State, Zip Code _____

U.S. Department of Labor
Bureau of Labor Statistics
Washington D.C. 20212

Official Business
Penalty for private use, $300
RETURN POSTAGE GUARANTEED

Second Class Mail
Postage and Fees Paid
U.S. Department of Labor
ISSN 0098-1818