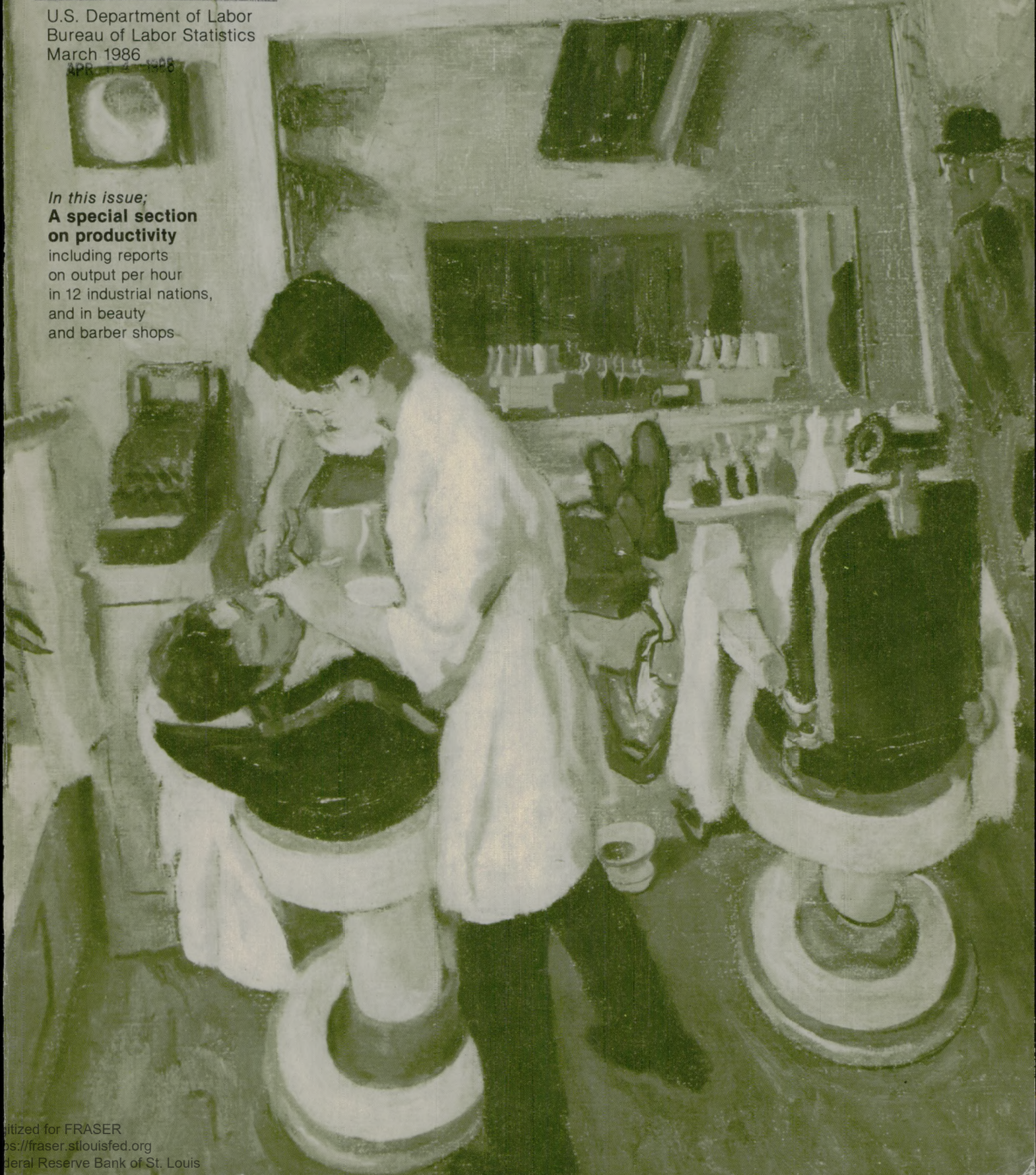


FRASER  
Federal Reserve Bank  
of St. Louis  
MONTHLY LABOR REVIEW

U.S. Department of Labor  
Bureau of Labor Statistics  
March 1986

APR 24 1986

*In this issue;*  
**A special section  
on productivity**  
including reports  
on output per hour  
in 12 industrial nations,  
and in beauty  
and barber shops



VRR



**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—\$24 domestic; \$30 foreign. Single copy—\$4, domestic; \$5 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  
 U.S. 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. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through April 30, 1987. Second-class postage paid at Washington, DC and at additional mailing addresses.



**March cover:**

A detail from  
 "In a barber shop,"  
 an oil painting by Elias Bolotowsky,  
 photograph courtesy  
 National Museum of American Art,  
 Washington, D.C.

Cover design by Richard L. Mathews

**Regional Commissioners  
 for Bureau of Labor Statistics**

**Region I—Boston:** *Anthony J. Ferrara*  
 1603 John F. Kennedy Federal Building, Government Center  
 Boston, MA 02203  
 Phone: (617) 223-6761  
 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:** *Kenneth Lee (Acting)*  
 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

MARCH 1986

VOLUME 109, NUMBER 3

Henry Lowenstern, Editor-in-Chief

Robert W. Fisher, Executive Editor

---

### A SPECIAL SECTION ON PRODUCTIVITY

- Edwin Dean and others 3 **Productivity and labor cost trends in manufacturing, 12 countries**  
Output per hour in manufacturing increased in the U.S and 11 other nations in 1984; U.S. unit labor costs also rose relative to foreign costs on a dollar-adjusted basis
- Arthur S. Herman 11 **Productivity continued to increase in many industries during 1984**  
Among industries with large increases in output per employee hour were steel, coal and iron mining, transportation, and utilities; changes were mixed in trade and services
- Leo Sveikauskas 16 **The contribution of R&D to productivity growth**  
A BLS study suggests that R&D directly contributed between 0.1 and 0.2 percent annually to the postwar growth of productivity in the nonfarm business sector
- Horst Brand, Ziaul Z. Ahmed 21 **Beauty and barber shops: the trend of labor productivity**  
Output per hour rose at an annual rate of 0.8 percent between 1972 and 1984, in line with the productivity trend for other personal service industries
- E. S. Persigehl, J. G. Olsen 27 **Productivity in the metal doors, sash, and trim industry**  
The overall rate of output per hour increased slowly between 1967 and 1983, reflecting a rise in employee hours; moderate advancement is expected to continue

### REPORTS

- Steven Deutsch 35 International experiences with technological change

### DEPARTMENTS

- 2 Labor month in review  
32 Research summaries  
35 Foreign labor developments  
41 Major agreements expiring next month  
43 Developments in industrial relations  
45 Book reviews  
49 Current labor statistics

# Labor Month In Review



**IMMIGRATION EFFECTS.** In its report for 1986, the President's Council of Economic Advisers, drawing on various studies, reported on the impact of immigration on the labor market. Here are excerpts:

**No displacement.** Studies that take a broad view of the labor market have found no significant evidence of unemployment among native-born workers attributable to immigration. Any direct effects of immigration on domestic employment have either been too small to measure or have been quickly dissipated.

Although existing studies may not be conclusive, the evidence currently available does not suggest that native-born American workers experience significant labor market difficulties in areas that have attracted immigrants. Several studies, moreover, have shown that the presence of immigrants in labor markets is associated with increased job opportunities overall, including job opportunities for native-born minority groups.

Some studies of the effects of immigration on wage levels have revealed evidence of adverse wage effects. For example, one study concluded that real wages were 8 to 10 percent lower on average in cities near the Mexican border. Several studies found a reduction in the wages of unskilled workers in areas with high concentrations of unskilled immigrant workers.

Other studies, however, have shown that greater concentrations of aliens in labor markets are associated with higher earnings of native-born workers. Increased wages have been found both for broad groups of workers and also for native-born minority groups with whom immigrants might compete directly for jobs.

The experience of the Los Angeles

labor market in adjusting to a growing concentration of unskilled immigrant labor is instructive. One study estimated that more than a million foreign-born persons settled in Los Angeles County between 1970 and 1983. During the early 1980's, the foreign-born in Los Angeles County represented close to a third of the total population. Job growth in the area was strong, and the new immigrants were quickly absorbed into the labor market. New immigrant workers accounted for some 70 percent of the new growth in employment in the 1970s. This study also showed that the unemployment rate in Los Angeles, which had exceeded the national average in 1970, fell below the average by the early 1980s. These results were not, of course, the consequence of international migration alone, but they suggest a smooth labor market adjustment to the inflow of migrants.

**Illegal aliens.** Although aliens who are eligible to hold jobs in the United States are clearly distinct from those who are not, researchers have not been able to isolate separate economic effects of illegal alien workers.

Illegal aliens have a higher proportion of males than legal aliens, are younger, and are less likely to bring family members with them. Illegal migrants are likely to remain in the United States for shorter periods of time than legal migrants. Illegal migrants also tend to have lower levels of education and to work in jobs requiring lower skill levels. Illegal aliens may have less incentive to invest in schooling or other activities that are specifically useful in the U.S. labor market.

Nevertheless, a recent study of apprehended illegal aliens in Chicago showed that they use market opportunities to improve their economic status. The subjects of the study were

able to benefit from a competitive labor market, with opportunities for skill improvement and upward job mobility. These illegal aliens were apparently able to work their way up from entry-level jobs. Only 16 percent of those in the Chicago study had wage rates below the Federal minimum of \$3.35 per hour, and some of these were in sectors not covered by the minimum wage. The average hourly wage of these illegal aliens at the time of their apprehension, in 1983, was \$4.50.

**Entrepreneurs.** Many immigrants are entrepreneurs. One study found that foreign-born males are significantly more likely to be self-employed than native-born males with similar skills. Self-employed workers, both foreign- and native-born, had higher annual incomes than salaried workers. Returns on capital owned by self-employed workers may partially explain these differences in incomes. Self-employment also provides greater potential for high work effort. The self-employed work more hours per week than do wage-and-salary workers.

One reason for the successful absorption of immigrants into the U.S. labor market is that overall migrant inflows have been low relative to the size of the population, to labor force growth, and to domestic migration. International migrant flows, moreover, historically respond to labor market demands. Before legal restrictions were imposed, immigration increased when the demand for labor was relatively high and decreased when labor demand was relatively low.

The full report of the Council of Economic Advisers appears in the *Economic Report of the President*, available from the Superintendent of Documents, Washington 20402. Price: \$8.50. □

# Productivity and labor costs trends in manufacturing, 12 countries

*Output and output per hour in manufacturing rose in the United States and 11 other countries in 1984; U.S. unit labor costs increased 7 percent, relative to the costs of foreign competitors, after adjustment for the dollar's appreciation*

EDWIN DEAN, HARRY BOISSEVAIN,  
AND JAMES THOMAS

Manufacturing productivity, as measured by output per hour, rose in 1984 in the United States and 11 other industrial countries studied. The United States had a substantial increase of 5 percent, but this was exceeded by five of the other countries—Japan, France, Italy, the Netherlands, and Sweden. Belgium, West Germany,<sup>1</sup> and the United Kingdom about matched the U.S. gain; Canada, Denmark, and Norway had smaller increases.

Manufacturing output grew in all 12 countries in 1984, for the first time since 1973. The U.S. and Japanese output growth rates of more than 11 percent were the largest, and the French increase of 2 percent was the lowest. Productivity rose in the United States, Canada, Japan, Denmark, Norway and Sweden because output rose at a greater rate

than hours.<sup>2</sup> The productivity increases for the other countries resulted from a combination of output gains coupled with decreased hours.

Unit labor costs, which reflect changes in productivity and hourly compensation, fell in the United States, Canada, Japan, Germany, and the Netherlands; and rose in the other European countries. However, unit labor costs measured in U.S. dollars were again significantly influenced by changes in currency exchange rates, as they have been since 1980. The dollar remained stable with the Japanese yen, but appreciated 5 percent against the Canadian dollar and 7 to 14 percent against the European currencies. Consequently, unit labor costs fell in each of the 11 foreign countries when measured in U.S. dollars, with the falloffs ranging from 3 to 15 percent—compared with a 1-percent decline in the United States.

Since 1980, U.S. manufacturing unit labor costs have risen at a 7-percent average annual rate relative to a trade-weighted average for the 11 rival industrial countries, re-

---

Edwin Dean, formerly an economist in the Division of Foreign Labor Statistics, Bureau of Labor Statistics, is now chief of the Bureau's Division of Productivity Research. Harry Boissevain and James Thomas are economists in the Division of Foreign Labor Statistics.

versing the gains in comparative unit labor costs that U.S. manufacturers experienced during most of the 1970's. All of the 1980-84 relative increase, however, resulted from the appreciation of the U.S. dollar. Measured on a national currency basis, U.S. unit labor costs decreased at a 1-percent average annual rate relative to the trade-weighted average for the other 11 countries. Along with the rapid rise in U.S. relative unit labor costs in this period, the U.S. merchandise trade deficit increased fourfold.

This article examines 1984 developments in manufacturing labor productivity, hourly compensation, and unit labor costs in the United States and 11 countries, and compares unit labor cost trends measured in U.S. dollars prior to 1980 with the trends of the last 4 years. The indexes for 1984 are preliminary, while those for other recent years reflect some revised underlying statistics for most countries.<sup>3</sup>

The U.S. figures reflect the recent comprehensive benchmark revision of the U.S. national accounts, including the shift in the base period for the calculation of constant dollar estimates from 1972 to 1982. The effect is to reduce U.S. manufacturing output growth, and productivity, by about two-tenths of a percentage point in the pre-1973 period, but to have virtually no overall effect on the post-1973 period. Japan also rebenchmarked its national accounts, from 1975 to 1980, resulting in about a 1.5-percentage point reduction in output and productivity growth rates since 1973. In addition, a new average hours series has been introduced for Germany,<sup>4</sup> as well as new output series for the Netherlands<sup>5</sup> and the United Kingdom<sup>6</sup> since the previous *Monthly Labor Review* article in 1984.<sup>7</sup> The new series for Germany affects the year-to-year movements in output per hour and hourly compensation, but has no effect on the unit labor cost measures.

### Productivity trends

As noted earlier, 1984 manufacturing productivity<sup>8</sup> increased for all the countries studied. (See table 1.) The Netherlands had the largest gain—more than 10 percent—followed by Japan, France, Italy, and Sweden, with gains of about 6 to 7 percent. Output per hour rose about 5 percent

in the United States, Belgium, Germany, and the United Kingdom, and 1 to 4 percent in Canada, Denmark, and Norway.

Productivity researchers have found that a marked slowdown in manufacturing productivity growth occurred in most developed countries beginning about 1973. All 12 countries studied here had slower productivity gains in the 1973-84 period than in the 1960-73 period.

Another study reports that this slowdown in total manufacturing productivity was reflected in specific manufacturing industries in the United States, France, Germany, and the United Kingdom—after 1973, productivity growth declined in each of 13 manufacturing industry groups, in these four countries, with only one exception.<sup>9</sup>

For all but three of the 12 countries—Belgium, Denmark, and Norway—the 1984 increases in total manufacturing productivity were much larger than the average trend for the 1973-84 period. Moreover, the United States, the Netherlands, and the United Kingdom had 1984 gains that exceeded their average rates of increase over the 1960-73 period.

**Output.** In all 12 countries, output gains influenced the 1984 productivity increases. (See table 2.) Output (gross product originating in manufacturing at constant prices) rose most rapidly in the three non-European countries, with growth between 8 and 12 percent. The percentage increases were the largest since 1973 for Canada and Japan, and since the 1950's for the United States.

The European countries output increases exceeded their performance of the previous year. Denmark, the Netherlands, and Sweden had strong gains of between 5 and 7 percent; Germany, Italy, and the United Kingdom grew by 4 percent; and Belgium, France, and Norway had more modest expansions of less than 3 percent. Output gains were the largest since 1976 for the Netherlands, and since 1973 or 1974 for Norway, Sweden, and the United Kingdom. Although the British output increase was larger than in recent years, the level of output was still 12 percent below that of 1973. Canada, Italy, and Norway were the only other

**Table 1. Annual percent changes in manufacturing productivity, 12 countries, 1960-84**

Year	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Norway	Sweden	Eleven foreign countries (weighted) <sup>1</sup>
Output per hour:													
1960-84	2.4	3.4	8.3	5.7	4.9	5.5	3.5	7.1	5.6	6.6	3.6	4.7	5.5
1960-73	2.8	4.5	10.6	6.7	5.9	6.9	4.4	7.0	6.4	7.6	4.5	6.6	6.9
1973-84	2.1	1.6	5.9	4.6	3.4	3.8	2.3	6.2	3.5	4.6	2.3	2.8	3.8
1973-80	1.7	2.0	5.9	4.9	3.9	3.5	1.2	6.4	4.5	5.2	2.0	2.2	3.9
1981	2.2	2.0	3.7	3.9	2.1	3.5	6.2	6.9	1.6	2.7	4	.4	3.4
1982	2.2	-2.8	6.1	6.1	1.6	2.0	4.5	4.7	-7	2.4	2.7	3.0	2.8
1983	6.6	6.4	5.4	4.2	6.1	2.4	7.3	6.8	3.5	5.3	5.6	7.7	5.7
1984	4.9	3.7	7.0	5.7	4.6	6.6	4.7	4.6	.8	10.5	2.0	5.7	5.5

<sup>1</sup>A trade-weighted average of the 11 foreign countries. See description of weights in text.

NOTE: Rates of change computed from the least squares trend of the logarithms of the index numbers. Index numbers for the underlying data series are available from the authors.

**Table 2. Annual percent changes in manufacturing output, 12 countries, 1960-84**

Year	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Norway	Sweden
Output:												
1960-84 .....	3.0	4.1	8.9	5.0	3.3	4.8	1.1	4.5	3.7	4.0	2.7	2.8
1960-73 .....	4.4	6.3	12.9	7.3	5.2	6.8	3.0	6.5	5.2	6.4	4.8	5.0
1973-84 .....	1.8	1.1	5.9	2.0	1.2	2.3	-1.5	1.6	2.1	1.2	-1	.3
1973-80 .....	2.5	2.3	4.7	3.0	2.0	3.4	-1.1	1.6	2.2	1.6	-2	-2
1981 .....	1.6	1.0	4.5	-7	-1.5	-9	-6.0	-1.2	-3.2	.1	-1.1	-3.3
1982 .....	-6.1	-11.4	5.8	.1	-2.4	-2.4	.2	3.0	1.6	-1.5	-2	-5
1983 .....	7.3	5.5	8.0	1.3	1.0	-2.4	2.9	1.5	3.6	.3	-1.2	5.1
1984 .....	11.7	8.2	11.4	2.1	3.9	3.8	3.9	1.8	5.7	5.2	2.5	6.8

NOTE: Rates of change computed from the least squares trend of the logarithms of the index numbers. Index numbers for the underlying data series are available from the authors.

countries in which manufacturing output had not yet recovered to previous peak levels.

### Employment and hours

In the three non-European countries and Denmark, total hours of input in manufacturing rose between 4 and 7 percent in 1984, with the United States recording the largest gain. (See table 3.) Total hours rose modestly in Norway and Sweden and fell in the remaining 6 countries; except for France, the declines in total hours were smaller than in the previous year.

All of the European countries have experienced long-term declines in aggregate hours over the 1973-84 period, ranging from an annual average rate of about 1.5 percent in Denmark and Italy to around 4 percent in Belgium and the United Kingdom. In Japan, Canada, and the United States, there has been little overall change in total hours over the 1973-84 period.

The 1984 expansions in aggregate hours in the United States and Japan were the result of substantial increases in employment and small percentage increases in average hours. In Canada, a large increase in employment was accompanied by a slight drop in average hours. The 1984 employment increases in the United States, Canada, and Japan were the largest since 1973. Nonetheless, the levels of manufacturing employment in the United States and Canada in 1984 were between 5 and 8 percent below the peaks of the late 1970's, while in Japan, 1984 was about 1 percent below the previous peak reached in 1974.

Among the European countries, Belgium, Germany, the Netherlands, the United Kingdom, and the three Scandinavian countries all recorded either a rise or a lower rate of decrease in 1984 employment, compared with 1983. These countries also had higher rates of employment growth or smaller rates of decline in 1984 than they experienced, on average, during the 1973-84 period. In contrast, employment in France and Italy declined at a more rapid rate in 1984 than the average for the 1973-84 period.

The long-term trend in manufacturing employment has been downward in the European countries. Most countries had employment peaks in the 1960's or 1970's that were

more than 15 percent above 1984 levels. The contrast, in this respect, to the three non-European countries is marked, and essentially unaltered by the favorable employment developments in 1984 in seven of the nine European countries.

In most of the European countries, the 1984 changes in aggregate hours took place mainly as a result of changes in employment rather than in average hours per employee. Changes in average hours had substantial effects on aggregate hours only in Belgium and the Netherlands, where average hours declined by 2 to 3 percent.

The declines in Belgium and the Netherlands occurred as employers, unions, and government took measures, beginning in 1982 and continuing through 1984, to reduce average hours worked, hoping that this would retard the rapid rate of decline in employment. A key element in these efforts has been a reduction in average hours through reorganization of work time negotiated at the company, industry, and sectoral levels. The negotiations in both countries produced a variety of reorganization schemes, but the most common provided for reduced annual hours by granting additional days of vacation or free shifts. The Netherlands Central Bureau of Statistics reported that by the end of 1984, hours reductions had affected 63 percent of firms and 86 percent of employees in Dutch manufacturing. In both countries—despite the concerted efforts of government and collective bargaining agents—employment continued to fall in 1984, but the rate of decline was substantially less than in the preceding 2 years.<sup>10</sup>

Over the 1973-84 period, average hours per employee declined in nine of the countries studied. In the remaining three countries—the United States, Japan, and Denmark—average hours were essentially unchanged. Only two countries, Belgium and the Netherlands, had 1984 reductions in average hours that exceeded the long-term trend.

### Hourly compensation

For all countries, hourly compensation costs—which include wages and salaries, supplements, and employer payments for social security and other employee benefit programs—rose at a lower rate in 1984 than the average for the years since 1973. (See table 4.) Canada had the lowest rise,

less than 2 percent, followed by Japan, the United States, and Germany, each with less than 4 percent increases. Belgium, Denmark, France, the Netherlands, Norway, and the United Kingdom recorded increases of 5 to 9 percent. Italy and Sweden had the highest rates, about 10 to 11 percent.

The Netherlands and Sweden were the only countries to show a markedly more rapid rise in hourly compensation in 1984 than in 1983. For Sweden, 1984 was the second consecutive year of progressively larger increases. In Denmark, the 1984 compensation increase was the lowest since the 1950's, which may be attributed, in part, to the fact that in late 1982 the government imposed a 2-year freeze on pay indexation and restricted local-level collective bargaining.<sup>11</sup>

### Unit labor costs

Productivity increases in 1984 more than offset the rises in hourly compensation costs in the United States, Canada, Japan, Germany, and the Netherlands; consequently, unit labor costs fell 1 to 4 percent. This marked the third consecutive year in which unit labor costs fell in Japan and the second consecutive year of declines for the United States, Germany, and the Netherlands. Unit labor costs rose between 2 and 5 percent in the other countries. Italy had one of the largest increases (4 percent), but this represented a sharp deceleration from Italy's 1983 increase (14 percent).

As noted earlier, the 1984 increases in hourly compensation were below the 1973-84 trend rates in all 12 countries, and the 1984 increases in output per hour were well above

the 1973-84 trend in 9 countries. Therefore, it is not surprising that the 1984 performance in unit labor costs was favorable, compared to 1973-84 trends, because unit labor costs represent the ratio of hourly compensation to output per hour.

*In U.S. dollars.* Because labor costs are a principal component of the costs of manufactured goods, unit labor costs play a major role in conjunction with the exchange rates among currencies in determining the relative prices of goods offered for sale on the world market.

During 1984, changes in currency exchange rates had a significant effect on relative changes in unit labor costs measured in U.S. dollars. The U.S. dollar appreciated relative to the currencies of 10 of the countries studied and remained unchanged relative to the Japanese yen. In each year of the 1980-84 period, the dollar appreciated strongly relative to each of the European countries' currencies. It appreciated much more moderately relative to the Canadian dollar in 3 of the years. The dollar rose relative to the yen only in 1982. However, as of 1984, the yen had not regained its 1980 currency exchange value.

In 1984, unit labor costs measured in U.S. dollars fell in the 11 foreign countries. The decreases were 15 percent for the Netherlands; 10 to 11 percent for Belgium, France, Germany, Italy, and the United Kingdom; 6 to 8 percent for Canada, Denmark, and Norway; and less than 4 percent for Japan and Sweden. The 1984 changes were more damaging

**Table 3. Annual percent changes in manufacturing employment and hours, 12 countries, 1960-84**

Year	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Norway	Sweden
<b>Aggregate hours:</b>												
1960-84	0.6	0.7	0.5	-0.6	-1.5	-0.6	-2.4	-2.5	-1.8	-2.4	-0.8	-1.8
1960-73	1.6	1.7	2.1	.6	-.6	-.1	-1.3	-.5	-1.1	-1.1	.2	-1.5
1973-84	-.2	-.5	.0	-2.5	-2.1	-1.4	-3.8	-4.4	-1.3	-3.2	-2.3	-2.5
1973-80	.7	.3	-1.1	-1.8	-1.9	-.1	-2.3	-4.5	-2.2	-3.4	-2.1	-2.4
1981	-.6	-1.0	.8	-4.4	-3.6	-4.3	-11.5	-7.6	-4.7	-2.6	-1.5	-3.7
1982	-8.1	-8.8	-.3	-5.6	-4.0	-4.3	-4.1	-1.6	2.4	-3.9	-2.9	-3.4
1983	.6	-.8	2.5	-2.8	-4.8	-4.7	-4.1	-4.9	.0	-4.8	-6.4	-2.3
1984	6.5	4.4	4.1	-3.4	-.7	-2.7	-.7	-2.6	4.8	-4.7	.5	1.1
<b>Employment:</b>												
1960-84	.6	1.0	1.2	.2	-.6	.7	-1.6	-1.2	-.7	-1.4	.3	-.5
1960-73	1.5	1.9	3.0	1.1	.3	1.4	-.6	.5	.2	.0	1.2	-.2
1973-84	-.1	-.2	-.2	-1.5	-1.5	-.7	-3.3	-3.5	-1.2	-2.7	-1.3	-1.5
1973-80	.8	.6	-1.2	-1.1	-1.2	.1	-1.7	-3.6	-1.7	-2.4	-.4	-.9
1981	-.5	.2	1.4	-3.3	-2.4	-1.9	-10.4	-5.4	-3.5	-3.2	-1.4	-3.1
1982	-6.7	-7.8	-.1	-1.4	-3.7	-2.2	-5.2	-3.8	-.2	-4.5	-2.8	-4.1
1983	-1.7	-1.8	1.9	-2.2	-4.1	-3.2	-5.0	-2.7	-.2	-4.8	-6.4	-2.6
1984	5.1	4.4	2.9	-3.0	-1.0	-4.0	-1.6	-.9	5.1	-2.0	-.6	.2
<b>Average hours:</b>												
1960-84	-.1	-.3	-.7	-.8	-.9	-1.4	-.7	-1.3	-1.1	-1.1	-1.1	-1.3
1960-73	.1	-.2	-.9	-.5	-.9	-1.5	-.7	-1.0	-1.4	-1.1	-1.0	-1.3
1973-84	-.1	-.4	.2	-1.0	-.7	-.6	-.4	-.8	-.2	-.5	-1.0	-1.0
1973-80	-.1	-.3	.1	-.8	-.7	-.2	-.6	-.9	-.6	-1.0	-1.7	-1.5
1981	.0	-1.1	-.6	-1.2	-1.2	-2.4	-1.2	-2.3	-1.2	.6	-.1	-.6
1982	-1.5	-1.1	-.2	-4.3	-.3	-2.1	1.2	2.3	2.6	.6	-.1	.7
1983	2.4	1.0	.6	-.6	-.8	-1.5	.9	-2.3	-.2	0.0	.0	.3
1984	1.3	-.1	1.2	-.5	.3	1.4	.9	-1.7	-.3	-2.8	1.1	.9

NOTE: Rates of change computed from the least squares trend of the logarithms of the index numbers. Index numbers for the underlying data series are available from the authors.



**Table 4. Annual percent changes in hourly compensation and unit labor costs in manufacturing, 12 countries, 1960-84**

Year	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Norway	Sweden	Eleven foreign countries (weighted) <sup>1</sup>
<b>Hourly compensation:</b>													
1960-84	7.2	9.2	13.6	12.7	9.7	16.8	13.6	12.3	12.8	12.0	11.6	11.8	12.1
1960-73	5.0	6.4	14.5	9.5	9.8	12.3	8.6	10.7	11.8	12.6	9.8	10.3	10.5
1973-84	8.9	11.0	8.2	14.9	7.7	19.3	16.0	10.7	11.0	8.2	11.3	11.5	11.1
1973-80	9.5	11.7	10.7	15.7	8.9	19.9	19.4	12.9	12.9	10.4	12.8	13.5	12.8
1981	9.6	16.0	7.6	15.4	7.0	23.1	13.5	11.1	10.1	4.5	11.6	10.9	11.6
1982	8.5	10.3	5.2	17.9	5.0	20.4	9.3	5.0	7.7	6.9	9.3	7.3	8.8
1983	3.6	7.3	3.0	12.1	5.7	16.7	7.5	8.1	8.2	4.9	11.1	9.1	6.8
1984	3.7	1.4	2.9	8.4	3.7	10.8	7.2	6.4	5.5	5.6	7.0	10.1	4.6
<b>Unit labor costs:</b>													
1960-84	4.7	5.6	4.9	6.7	4.6	10.7	9.8	4.8	6.8	5.0	7.7	6.8	6.2
1960-73	2.2	1.8	3.6	2.6	3.7	5.1	4.1	3.4	5.1	4.7	5.1	3.5	3.3
1973-84	6.6	9.2	2.2	9.8	4.2	15.0	13.4	4.3	7.3	3.4	8.8	8.5	7.0
1973-80	7.6	9.5	4.5	10.2	4.8	15.9	17.9	6.2	8.0	5.0	10.7	11.1	8.6
1981	7.3	13.7	3.7	11.1	4.8	18.9	6.9	3.9	8.3	1.8	11.2	10.4	7.9
1982	6.2	13.5	-8	11.2	3.3	18.1	4.6	.3	8.5	4.3	6.4	4.2	5.8
1983	-2.8	.8	-2.3	7.6	-4	14.0	.2	1.2	4.5	-4	5.2	1.3	1.0
1984	-1.2	-2.2	-3.9	2.6	-8	3.9	2.4	1.7	4.6	-4.4	5.0	4.1	-8
<b>Unit labor costs in U.S. dollars:</b>													
1960-84	4.7	4.9	7.5	5.7	8.1	7.0	7.0	6.1	6.6	7.3	8.8	6.4	6.7
1960-73	2.2	1.9	5.0	2.4	6.1	5.4	2.6	4.5	5.0	6.0	6.0	4.3	4.0
1973-84	6.6	6.3	4.5	4.3	4.4	4.8	9.2	1.6	2.6	2.9	5.9	2.8	5.3
1973-80	7.6	6.4	9.5	11.3	11.3	9.5	16.1	11.3	9.7	10.6	12.7	11.2	10.3
1981	7.3	10.9	6.1	-13.8	-15.6	-10.7	-6.9	-18.0	-14.5	-18.8	-4.4	-7.9	-3.3
1982	6.2	10.2	-12.1	-8.1	-4.1	-7	-9.7	-18.9	-7.3	-2.9	-5.4	-16.0	-5.4
1983	-2.8	1.0	2.5	-7.1	-5.3	1.6	-13.1	-9.3	-4.7	6.8	-7.0	-17.0	-3.3
1984	-1.2	-7.0	-3.8	-10.5	-11.0	-10.1	-9.7	-9.9	-7.6	-15.0	-6.1	-3.4	-7.9

<sup>1</sup>A trade-weighted average of the 11 foreign countries. See description of weights in text.  
 NOTE: Rates of change computed from the least squares trend of the logarithms of the index numbers. Index numbers for the underlying data series are available from the authors.

to the competitive position of the United States than the shifts of the previous year. In 1983, when U.S. unit labor costs decreased by about 3 percent, they decreased by larger proportions in eight countries, but increased in three countries, including Canada and Japan, two of the most important trading partners of the United States.

The appreciation of the dollar after 1980 has had a dramatic effect on U.S. unit labor costs relative to other countries. The following tabulation shows the average annual percentage change between 1980 and 1984 in unit labor costs measured in national currencies and in U.S. dollars:

	<i>National currency</i>	<i>U.S. dollars</i>
United States	2.1	2.1
Canada	6.4	3.9
Japan	-1.0	-2.7
Italy	14.0	-4.1
Norway	6.7	-5.8
Denmark	6.5	-8.1
Germany	1.7	-8.2
France	8.3	-9.5
Netherlands	.6	-9.9
United Kingdom	3.3	-10.2
Sweden	4.5	-12.3
Belgium	1.6	-14.2

Expressed in national currencies, seven countries had greater increases in unit labor costs than the United States.

Taking into account the appreciation of the dollar after 1980, only one country, Canada, experienced a greater increase.

### Relative productivity and labor cost trends

Following is a discussion of changes in the trends of each country's manufacturing productivity and labor costs relative to a trade-weighted average for its major international competitors.<sup>12</sup> The indexes were constructed by taking ratios of each country's indexes to weighted geometric averages of the corresponding indexes for the other 11 countries. The weights used to combine the other 11 countries' indexes into an average "competitors" index reflect the relative importance of each country as a manufacturing trade competitor as of 1980. Prior to this article, 1975 trade weights were used. The most significant change affecting U.S. "competitors" indexes was an increase in the relative weight given to Japan, from 17 to more than 27 percent. The weights for Canada and the United Kingdom rose about 1 percent each; the weights for all other countries fell.

Annual percent changes in the ratio of each country's productivity and labor cost indexes to the trade-weighted averages of the 11 rival nations' indexes were calculated for 1960 to 1984. (See table 5.) These percent changes indicate the annual movements in each country's productivity and labor costs relative to its competitors' productivity and costs.

*Relative productivity changes.* The United States has experienced a long-term relative decline in productivity, compared with the trade-weighted average of the other countries—amounting to 4.0 percent per year in the 1960–73 period and 1.7 percent per year in the 1973–84 period. Norway and the United Kingdom were the only other countries to experience significant relative declines. Japan had by far the most rapid increases in relative productivity growth in both periods—6.0 percent in the 1960–73 period and 3 percent per year since 1973—followed by the Netherlands in the earlier period (1.5 percent) and by Belgium in the latter (2.5 percent). The relatively poor performance of the U.S. manufacturing sector reflects, in part, a “catching-up” by other countries.

While the United States has had a long-term relative decline in productivity, U.S. productivity growth since 1981 has equalled the trade-weighted average of the 11 foreign countries. This reflects the large U.S. productivity increase of 1983 followed by the further substantial increase of 1984.

*Relative compensation.* The largest 1984 relative increases in manufacturing hourly compensation, relative to changes in competitor countries, took place in France, Italy,

and Sweden. The largest relative decreases were in the three non-European countries and Germany. In the years since 1973, the largest decreases occurred in Germany, at an annual rate of more than 3 percent, and in the United States, Japan and the Netherlands, at 2- to 3-percent annual rates. Italy (at 8 percent), the United Kingdom (at 5 percent), and France (at 3 percent) recorded the largest increases.

*Relative unit labor costs.* In 1984, the largest increases in relative unit labor costs, measured in national currencies, were recorded by Denmark, France, Italy, Norway, Sweden, and the United Kingdom. The largest relative decreases were in Japan and the Netherlands. The United States, with a relative decrease of 0.4 percent, occupied an intermediate position. The 1984 decrease in relative U.S. unit labor costs, matched the trend for the period since 1973.

After adjustment for relative changes in foreign exchange rates, U.S. unit labor costs rose 7 percent in 1984 relative to competitors, far exceeding the 0.4-percent rise of the previous year. The 1984 U.S. increase also far exceeded the increases recorded by Japan and the three Scandinavian countries, the only other countries to have increases in relative unit labor costs in U.S. dollars. The Netherlands and

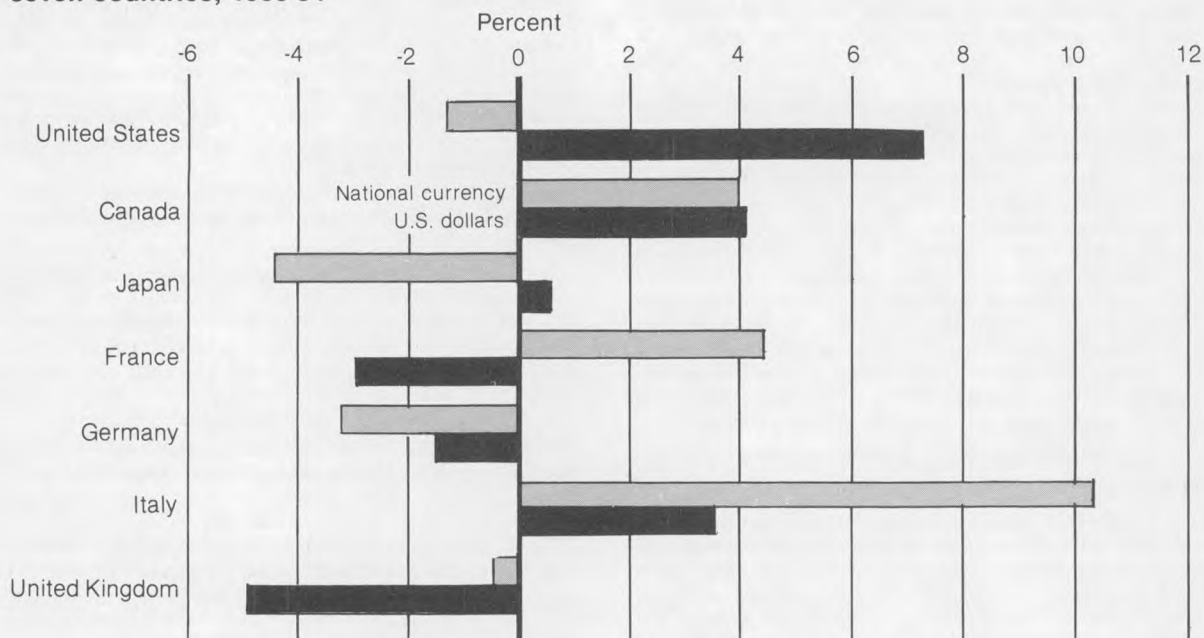
**Table 5. Relative annual percent changes in output per hour, hourly compensation, and unit labor costs in manufacturing, 12 countries, 1960–84**

	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Norway	Sweden
<b>Output per hour:</b>												
1960–84	-3.0	0.1	4.5	0.6	-0.4	0.5	-1.4	2.0	0.8	1.5	-1.3	-0.1
1960–73	-3.9	.6	5.9	.7	-.3	.9	-1.5	.9	.5	1.5	-1.5	.7
1973–84	-1.7	-.9	3.0	1.0	-.5	.0	-1.3	2.5	.1	.8	-1.1	-.7
<b>1973–80</b>												
1981	-2.1	-.3	3.2	1.3	.1	-.3	-2.5	2.5	1.2	1.4	-1.3	-1.2
1982	-1.2	-.5	.9	.5	-1.5	.2	3.2	3.7	-1.1	-.8	-2.5	-2.6
1983	-.6	-5.4	3.5	3.3	-2.1	-1.5	1.5	1.3	-3.7	-.7	-.3	.1
1984	.8	-.1	-.7	-1.4	.8	-3.2	1.6	1.2	-2.4	-.5	-.4	1.9
1984	-.5	-1.4	1.9	.2	-1.2	1.3	-.8	-1.0	-4.2	5.2	-3.1	.8
<b>Hourly compensation:</b>												
1960–84	-4.4	.6	3.6	.9	-2.4	5.2	2.4	.6	1.3	.5	-.1	.3
1960–73	-4.9	-.2	6.5	-.4	-.2	2.6	-.8	.8	1.9	2.7	-.1	.6
1973–84	-2.0	1.4	-2.2	3.4	-4.4	7.7	5.0	-.6	.0	-2.7	.1	.4
<b>1973–80</b>												
1981	-3.0	1.2	-.9	2.6	-4.7	6.9	6.8	.1	.2	-2.0	-.1	.8
1982	-1.8	5.6	-3.0	3.8	-5.0	11.5	2.5	.1	-.4	-6.0	.9	.1
1983	-.3	1.6	-3.7	8.6	-5.6	10.4	.1	-4.7	-.7	-1.8	.9	-1.4
1984	-3.1	2.8	-3.0	4.2	-2.6	9.0	.4	.2	.6	-2.5	3.5	1.6
1984	-.9	-2.6	-2.0	2.5	-2.8	5.0	1.7	.4	-.6	-.2	.7	4.3
<b>Unit labor costs in national currency:</b>												
1960–84	-1.4	.5	-.8	.3	-2.1	4.7	3.8	-1.3	.4	-1.0	1.3	.5
1960–73	-1.1	-.8	.6	-1.1	.1	1.7	.7	-.1	1.4	1.2	1.4	-.2
1973–84	-.3	2.4	-5.0	2.4	-4.0	7.7	6.4	-3.0	-.2	-3.5	1.2	1.1
<b>1973–80</b>												
1981	-.9	1.5	-3.9	1.4	-4.8	7.2	9.5	-2.4	-1.0	-3.3	1.2	2.0
1982	-.6	6.2	-3.8	3.3	-3.6	11.3	-.6	-3.4	.7	-5.2	3.4	2.8
1983	.4	7.4	-6.9	5.1	-3.6	12.1	-1.4	-5.9	3.1	-1.1	1.1	-1.5
1984	-3.8	2.7	-2.3	5.8	-3.3	12.6	-1.2	-1.0	3.1	-2.1	4.0	-.2
1984	-.4	-1.3	-3.8	2.3	-1.6	3.7	2.5	1.5	3.7	-5.1	4.0	3.5
<b>Unit labor costs in U.S. dollars:</b>												
1960–84	-1.9	-.4	1.6	-1.2	1.6	.3	-.5	-.6	-.3	.4	2.0	-.5
1960–73	-1.7	-.8	1.6	-2.2	2.3	1.3	-1.5	.3	.5	1.6	1.7	-.1
1973–84	1.3	.1	-1.3	-.6	-.5	-.1	4.4	-3.3	-2.3	-1.9	1.1	-2.3
<b>1973–80</b>												
1981	-2.4	-1.9	-.2	.5	.5	-1.4	5.6	.2	-1.4	-.5	1.4	.1
1982	10.9	7.0	9.4	-4.8	-8.4	-.9	.3	-8.1	-6.0	-9.4	4.3	.7
1983	12.2	7.8	-11.9	-3.0	2.3	5.6	-5.8	-14.7	-.4	4.0	2.5	-11.5
1984	.4	4.5	7.8	-2.2	.4	8.3	-9.1	-3.7	3.1	-.7	1.0	-12.2
1984	7.2	-4.1	2.2	-1.9	-3.0	-1.4	-2.3	-.4	.6	-6.7	1.6	5.5

NOTE: Rates of change computed from the least squares trend of the logarithms of a ratio of 2 index numbers.

The ratio is the index of the reference country divided by a trade-weighted average index for the other 11 countries.

**Chart 1. Average annual percentage changes in relative unit labor costs in manufacturing, seven countries, 1980-84**



NOTE: Average annual percentages changes are computed from the least squares trend of the logarithms of a ratio of two index numbers. The ratio is the index of the reference country divided by a trade-weighted average index for the other 11 countries.

Canada recorded the largest decreases in relative unit labor costs in U.S. dollars, at 7 and 4 percent.

During the 1980-84 period of rapid appreciation of the U.S. dollar relative to most foreign currencies, the United States experienced a 1-percent per year decrease in relative unit labor costs in national currency terms, but a 7-percent per year increase after adjustment for the relative change in the foreign exchange value of the dollar.

Chart 1 shows the effect of adjusting relative unit labor cost changes for relative changes in foreign exchange rates over the 1980-84 period for the seven largest countries (United States, Canada, Japan, France, Germany, Italy, and the United Kingdom). Japan was the only country other than the United States to experience a much larger increase in relative unit labor costs after adjustment for changes in the exchange rate—a 4-percent per year decrease in relative unit costs before adjustment and a 1-percent per year increase after. Japan and the United States were the only two countries to record large average annual appreciations of their currencies relative to trade-weighted averages of the currencies of their competitors. (Canada, Germany, and the Netherlands registered small increases.) The relative appreciations were 9 percent for the United States and 5 percent for Japan.

The difference between the United States' annual average

increase of 7 percent in relative unit labor costs in U.S. dollars and the 1-percent increase for Japan was due partly to the greater currency appreciation experienced by the United States over the 1980-84 period. It was also due partly to the greater decrease in relative unit labor costs in national currency recorded for Japan, about 4 percent annually, compared with 1 percent for the United States. The average Japanese decrease of about 4 percent per year in relative unit labor costs in national currency units was due to a 1.4-percent increase in productivity and a 3-percent decrease in hourly compensation. The U.S. decrease of 1 percent per year in relative unit labor costs was the net result of a 1.5-percent decrease in compensation and a small decrease in relative productivity.

The effect of relative exchange rate changes on relative U.S. unit labor costs in 1980-84 contrasts sharply with the U.S. experience in 1973-80. In the earlier period, a gradual relative depreciation of the dollar converted a 1-percent average annual decline in relative unit labor costs, in national currency units, into an average annual decrease of 2.5 percent.

As the dollar appreciated from 1980 to 1984, the U.S. merchandise trade deficit steadily increased, from \$25 billion in 1980 to \$36 billion in 1982 and \$108 billion in 1984. This deficit is computed for all U.S. trading partners, not just the 11 partners examined in this study. □

## — FOOTNOTES —

<sup>1</sup> The Federal Republic, including West Berlin.

<sup>2</sup> The data relate to all employed persons, including the self-employed, in the United States and Canada, and to all wage and salary employees in the other countries. Hours refer to hours paid in the United States; hours worked in the other countries.

Compensation comprises all payments made by employers directly to their employees (before deductions) and employer contributions to legally required insurance programs and to contractual and private welfare plans for the benefit of employees. Labor costs include, in addition to compensation, employer expenditures for recruitment and training; the cost of cafeterias, medical facilities, and other plant facilities and services; and taxes (other than social security taxes, which are part of compensation) levied on payrolls or employment rolls. Annual data are not available for total labor costs. Labor costs, as measured in the data series used for this article, approximate more closely the concept of compensation. However, compensation has been adjusted to include all significant changes in taxes that are regarded as labor costs. For the United States and Canada, compensation of self-employed workers is measured by assuming that their hourly compensation is equal to the average for wage and salary employees.

<sup>3</sup> This article includes revised statistics which have not yet been incorporated in table 47, "Current Labor Statistics," this issue.

<sup>4</sup> The new average hours series for Germany, 1960–83, is computed by the German Institut fuer Arbeitsmarkt-und Berufsforschung (Nuremberg) and refers to average hours worked by all manufacturing wage and salary employees. It is consistent with and used with the national accounts figures on the number of manufacturing employees to derive aggregate hours. The previous hours series was the product of the number of employees, from the national accounts, and average annual hours per wage worker only, from a monthly industrial survey conducted by the German Federal Statistical Office. The industrial survey data were used for the preliminary 1984 figure.

<sup>5</sup> The new output series for the years beginning with 1969 is value added from the Netherlands national accounts. The figures include petroleum refining from 1977, but exclude petroleum refining over the 1969–77 period. The series previously used for these years was the index of industrial production for manufacturing prepared by the Central Bureau of Statistics. This measure was used because the previous national accounts figures for manufacturing included natural gas and petroleum extraction.

<sup>6</sup> The new output series for the United Kingdom, for the years beginning with 1976, is the index of output in manufacturing at constant factor cost, with separate manufacturing industries combined using weights proportional to the distribution of net output in 1980, that is published with the

national accounts. The series previously used for these years was the 1975-based index of manufacturing production; this series is still used for the years before 1976. The 1980-based series, unlike the earlier one, excludes the refining of oil and the processing of other energy-related materials from the definition of manufacturing and includes extraction of non-fuel minerals. This corresponds with the European Community definition of manufacturing. The employment and compensation series beginning 1976 have also been replaced with series consistent with this revised definition of manufacturing.

<sup>7</sup> Donato Alvarez and Brian Cooper, "Productivity trends in manufacturing in the U.S. and 11 other countries," *Monthly Labor Review*, January 1984, pp. 52–58.

<sup>8</sup> Although the labor productivity measure relates output to the hours of persons employed in manufacturing, it does not measure the specific contributions of labor as a single factor of production. Rather, it reflects the joint effects of many influences, including new technology, capital investment, the level of output, capacity utilization, energy use, and managerial effectiveness, as well as the skills and efforts of the work force.

<sup>9</sup> The exception was the paper and printing industry in France. Arthur Neef and Edwin Dean, "Comparative Changes in Labor Productivity and Unit Labor Costs by Manufacturing Industry: United States and Western Europe," presented at a conference on Interindustry Differences in Productivity Growth, American Enterprise Institute, Washington, D.C., October 1984. This paper also examines the possible role of industry-specific events in determining the post-1973 slowdown. See also Irving Kravis and Robert Lipsey, "The Diffusion of Economic Growth in the World Economy, 1950–80," in John W. Kendrick, ed., *International Comparisons of Productivity and Causes of the Slowdown* (Cambridge, MA, Ballinger, 1984).

<sup>10</sup> Incomes Data Services Ltd., *IDS International Report* (London), May 1983, June 1983, March 1984, October 1984, and July 23, 1985.

<sup>11</sup> Incomes Data Services Ltd., *IDS International Report* (London), October 1984.

<sup>12</sup> The trade weights were adapted from weights developed by the International Monetary Fund (IMF). The original IMF weights cover 17 countries; the 11 foreign countries covered by this article account for 94 percent of the U.S. competitors' total trade weight. For more information about the relative indexes of manufacturing productivity and costs, see Patricia Capdevielle, Donato Alvarez, and Brian Cooper, "International trends in productivity and labor costs," *Monthly Labor Review*, December 1982, pp. 3–14. The weights are available from the authors, as are the relative indexes for each country and the underlying "own country" and "competitor countries" indexes used to compute the relative indexes. Indexes of trade-weighted exchange rates are also available from the authors.

---

### Publications Awards

The *Monthly Labor Review* was one of five Bureau of Labor Statistics publications honored in the annual competition sponsored by the Washington chapter of the Society for Technical Communication. The competition was open to publications produced in 1985 by trade associations, private research and educational institutions, corporations, and government agencies. Contest criteria included audience definition, writing, editing, and graphics.

In addition to the *Review*, BLS publications honored were *The First Hundred Years of the Bureau of Labor Statistics, Trends in Manufacturing: A Chartbook, New from BLS*, and the *Occupational Outlook Quarterly*.

---

# Productivity continued to increase in many industries during 1984

*Among industries with large increases in output per employee hour were steel, coal and iron mining, and several transportation and utilities industries; changes were mixed in trade and service*

ARTHUR S. HERMAN

Productivity, as measured by output per employee hour, grew in 1984 in about three quarters of the industries for which the Bureau of Labor Statistics regularly publishes data. Productivity increases were large in many industries. In a significant number, these gains followed major productivity growth in 1983. The expansion in industry productivity is consistent with the situation in the nonfarm business sector of the economy in which output per hour increased 1.6 percent between 1983 and 1984, after gaining 3.4 percent in 1982-83. Table 1 shows productivity trends in industries measured by the Bureau and includes new measures introduced for additional industries: barber and beauty shops; metal doors, sash and trim; metal stampings; and oilfield machinery.<sup>1</sup>

## **Changes in manufacturing**

Among important manufacturing industries, productivity in the steel industry grew 13.0 percent in 1984. This large gain was in addition to the record productivity advance of 28.5 percent in 1983. Steel output increased more than 13 percent in 1984, due in part to continued demand from

such key markets as motor vehicles, appliances, and construction. Employee hours rose only slightly and employment continued to decline, as the industry continued restructuring and the closing of inefficient facilities. The motor vehicles industry had an above average productivity gain of 4.6 percent, in addition to an unusually large gain in the previous year (13.1 percent). Output in this industry was up more than 21 percent in 1984, as demand for all types of motor vehicles expanded, while hours increased almost 16 percent.

Other important manufacturing industries with large gains included steel foundries with a productivity increase of more than 11 percent, while gray iron foundries attained an increase of more than 9 percent in 1984. Output in these industries rose in 1984 as demand from the automobile, construction, and railroad industries expanded. The tire industry posted an 11.3-percent productivity gain in 1984, following a 6.2-percent gain in 1983. Output grew by 14.3 percent in 1984 as demand was up for both original equipment and replacement tires, while hours rose only slightly. In petroleum refining, productivity moved up 10.9 percent in 1984, after gaining 3.0 percent in 1983. Refinery output increased for the first time since 1978, while hours declined, as small refineries continued to close.

---

Arthur S. Herman is an economist in the Office of Productivity and Technology, Bureau of Labor Statistics.

Other significant manufacturing industries with large productivity gains included malt beverages (10.5 percent), metal cans and primary aluminum (both 10.1 percent), and household cooking equipment (9.7 percent).

A few manufacturing industries registered productivity declines in 1984. These included pharmaceutical preparations (-5.2 percent), hardwood veneer and plywood (-4.8 percent), structural clay products (-3.9 percent), and folding paperboard boxes (-2.6 percent). Although output was up in all of these industries, except for pharmaceuticals where it fell slightly, employee hours rose even more, resulting in the productivity falloff.

### **Mining**

All of the mining industries experienced productivity gains in 1984. Coal mining, the largest mining industry, posted a gain of 10.1 percent in 1984, on top of a 14.2-percent rise in 1983. Coal output was up 14.4 percent in 1984 in anticipation of a strike which did not occur, while hours rose 3.9 percent. Productivity in iron mining (usable ore) increased 25.3 percent, compared with a 41.1-percent gain the previous year. Output was up 36.9 percent in 1984 as demand increased from the steel industry, while hours rose 9.3 percent. Copper mining (recoverable metal) had a productivity gain of 17.6 percent, after a 12.7-percent increase in 1983. Output was up only 5.1 percent in 1984, because of low copper prices, while hours dropped 10.6 percent, as only the most efficient mines were operating. The nonmetallic minerals industry registered a productivity gain of 1.9 percent. Output grew 8.7 percent in this industry, owing to the expansion of construction activity, while hours were up 6.6 percent.

### **Transportation and utilities**

Most transportation and utility industries also recorded 1984 productivity gains. In railroads (revenue traffic), productivity was up 7.5 percent following a 22.5-percent rise in 1983. Railroad output grew 9.2 percent in 1984 as shipments of coal, motor vehicles, construction materials, and chemicals were up significantly, while hours increased 1.5 percent. Productivity grew 3.3 percent in air transportation, compared with a 9.9-percent gain in the previous year. Air traffic increased significantly in 1984, resulting in a 7.9-percent gain in output. In petroleum pipelines, productivity grew 11.1 percent, as output rose and hours continued to fall. Electric utility productivity was up 3.5 percent, as output increased 5.3 percent, and hours were up 1.8 percent. The gas utilities industry registered its first productivity gain since 1979 (3.2 percent), with output increasing 2.5 percent, and hours dropping 0.7 percent.

### **Trade and services**

Productivity changes were mixed among trade and service industries. The hotel and motel industry registered the highest gain, at 7.7 percent. Output was up 15.2 percent in

this industry owing to the continuation of the business recovery, as well as a strong summer vacation period, while employee hours grew 7.0 percent. Apparel and accessory stores also registered a good productivity increase, up 6.0 percent. Output increased 9.6 percent in 1984, as favorable economic and credit conditions aided clothing sales, while hours rose 3.4 percent. In laundries and cleaning services, productivity grew 3.3 percent, based on a gain in output of 8.2 percent and an increase in hours of 4.8 percent. Productivity gains were recorded in drugstores (1.8 percent) and gasoline stations (0.4 percent). However, there were productivity declines in several of the service industries. The beauty and barber shop industry had a substantial 8.4-percent decline. Productivity also fell 2.1 percent in eating and drinking places. While output in the restaurant industry was up 3.8 percent in 1984, hours increased even more, resulting in the productivity falloff. Productivity dropped 1.0 percent in retail food stores. New car dealers had a small productivity decline of 0.1 percent. Output was up significantly at 10.8 percent. However, hours rose slightly more, resulting in the productivity decline.

### **Trends among industries**

Almost all of the industries studied recorded average annual gains in productivity over the long term (1947-84 for many of the industries). A few industries experienced long-term declines, however. These included metal stampings, metal forming machine tools, farm machinery, and bus carriers.

Over the most recent 5-year period (1979-84), most of the industries registered a growth in productivity. Slightly more than one-fourth had productivity declines. In addition, almost two-thirds of the industries recorded lower rates of productivity growth from 1979-84 than in the preceding long-term period. The falloff in productivity growth in a majority of the industries is in line with the trend in the nonfarm business sector of the economy, where productivity grew at an annual rate of 1.0 percent from 1979 to 1984, compared with a 2.2-percent rate for 1947-79.

*Gains, 1979-84.* The highest rate of productivity increase over the 5-year period was recorded by the radio and television sets industry (14.5 percent per year). Productivity growth in this highly competitive industry was aided by widespread use of automatic production techniques and equipment and the closing of less efficient plants. Copper mining (recoverable metal) had the second highest rate of productivity gain, at 10.5 percent. However, this reflected both an output decline and a very sharp decline in hours. More advanced mining methods were introduced and less efficient mines were shut down in an effort to compete with low-priced foreign ore, resulting in the productivity gain. The wet corn milling industry had the third highest rate of gain at 9.7 percent. Here output rose, while employee hours

**Table 1. Indexes of output per employee hour in selected industries, 1979-84, and percent changes, 1983-84 and 1979-84**

[1977 = 100]

sic Code <sup>1</sup>	Industry	1979	1980	1981	1982	1983	1984 <sup>2</sup>	Percent change, 1983-84	Average annual percent change, 1979-84
<b>Mining</b>									
1011	Iron mining, crude ore	122.7	124.7	132.8	100.9	139.0	175.2	26.0	5.4
1011	Iron mining, usable ore	122.8	123.2	130.6	98.2	138.6	173.6	25.3	5.3
1021	Copper mining, crude ore	109.1	99.5	102.0	106.4	129.9	140.3	8.0	6.2
1021	Copper mining, recoverable metal	98.2	91.6	97.7	116.2	130.9	153.9	17.6	10.5
111,21	Coal mining	99.4	112.5	122.2	119.2	136.1	149.9	10.1	7.7
121	Bituminous coal and lignite mining	99.6	112.6	122.7	120.0	136.9	151.1	10.4	7.9
14	Nonmetallic minerals, except fuels	102.7	96.5	94.7	89.3	98.1	100.0	1.9	-0.4
142	Crushed and broken stone	106.9	101.3	96.7	94.1	103.9	106.6	2.6	0.1
<b>Manufacturing</b>									
2011,13	Red meat products	101.7	107.0	107.9	112.3	116.2	115.1	-0.9	2.6
2011	Meatpacking plants	104.6	108.9	113.9	119.5	124.0	123.4	-0.5	3.7
2013	Sausages and other prepared meats	95.0	102.3	95.0	96.5	99.8	98.3	-1.5	0.3
2026	Fluid milk	117.3	126.5	131.6	140.0	147.1	(3)	(3)	4 5.7
203	Preserved fruits and vegetables	98.9	100.8	99.2	107.9	110.4	(3)	(3)	4 2.9
2033	Canned fruits and vegetables	101.9	101.4	100.7	108.6	112.2	(3)	(3)	4 2.6
204	Grain mill products	101.0	105.3	110.9	121.0	125.3	(3)	(3)	4 5.9
2041,45	Flour, including flour mixes and other grains	95.1	98.1	99.1	112.3	118.8	(3)	(3)	4 6.0
2041	Flour and other grain mill products	97.3	94.8	96.7	104.1	111.5	112.5	0.9	3.7
2043	Cereal breakfast foods	107.3	105.9	109.3	115.0	118.7	(3)	(3)	4 2.9
2044	Rice milling	96.3	111.8	117.9	104.5	101.5	(3)	(3)	4 0.4
2046	Wet corn milling	105.7	121.0	137.5	138.8	156.6	(3)	(3)	4 9.7
2047,48	Prepared feeds for animals and fowls	101.2	105.0	110.7	124.9	126.9	(3)	(3)	4 6.5
205	Bakery products	95.0	93.7	96.2	103.2	106.6	(3)	(3)	4 3.3
2061,62,63	Sugar	103.1	100.1	98.8	90.4	98.6	105.2	6.7	-0.1
2061,62	Raw and refined cane sugar	101.5	99.3	98.8	87.6	100.0	99.1	-0.9	-0.6
2063	Beet sugar	104.6	102.1	98.7	94.8	94.6	117.4	24.1	0.9
2082	Malt beverages	109.9	116.0	118.3	122.6	131.3	145.1	10.5	5.3
2086	Bottled and canned soft drinks	105.6	109.8	114.3	118.3	127.0	138.0	8.7	5.3
2111,21,31	Total, tobacco	102.1	102.1	100.5	100.7	105.1	106.1	1.0	0.8
2111,31	Cigarettes, chewing and smoking tobacco	102.4	101.8	99.6	99.5	104.1	105.1	1.0	0.6
2121	Cigars	101.4	106.4	107.3	111.4	112.3	114.8	2.2	2.4
2251,52	Hosiery	107.9	107.4	122.0	114.2	118.0	123.4	4.6	2.6
2281	Nonwool yarn mills	103.8	99.7	103.1	118.2	127.9	134.6	5.2	6.4
2421	Sawmills and planing mills, general	98.3	104.2	107.9	115.1	125.0	125.6	0.5	5.4
2431	Millwork	92.2	93.6	96.4	86.1	86.3	(3)	(3)	4 -2.1
2434	Wood kitchen cabinets	92.1	98.2	94.8	96.1	93.5	(3)	(3)	4 0.1
2435,36	Veneer and plywood	94.5	102.8	106.9	114.4	120.3	120.3	5	5.1
2435	Hardwood, veneer and plywood	97.8	104.1	100.3	101.4	107.2	102.1	-4.8	0.9
2436	Softwood, veneer and plywood	93.4	102.7	111.8	122.1	127.9	131.3	2.7	7.2
251	Household furniture	101.5	99.9	103.0	104.7	109.9	115.2	4.8	2.7
2511,17	Wood household furniture	101.7	97.3	97.4	98.3	104.1	(3)	(3)	4 0.6
2512	Upholstered household furniture	105.1	102.3	110.5	115.9	121.4	(3)	(3)	4 4.2
2514	Metal household furniture	90.2	93.6	98.7	107.5	108.4	(3)	(3)	4 5.2
2515	Mattresses and bedsprings	102.8	112.1	114.0	104.3	108.3	(3)	(3)	4 0.3
252	Office furniture	107.2	112.1	108.8	107.4	110.6	(3)	(3)	4 0.2
2521	Wood office furniture	110.8	109.2	92.9	90.3	92.9	(3)	(3)	4 -5.3
2522	Metal office furniture	104.5	113.9	114.0	116.6	120.2	(3)	(3)	4 3.1
2611,21,31,61	Paper, paperboard and pulp mills	105.4	105.2	104.4	111.3	120.0	123.9	3.2	3.7
2643	Paper and plastic bags	98.0	94.6	92.3	95.3	102.2	(3)	(3)	4 0.9
2651	Folding paperboard boxes	104.3	101.3	104.4	104.2	105.1	102.4	-2.6	(5)
2653	Corrugated and solid fiber board boxes	106.9	111.0	109.8	111.9	114.0	116.9	2.5	1.6
2823,24	Synthetic fibers	115.0	115.7	120.9	103.6	125.7	125.4	-0.2	1.5
2834	Pharmaceutical preparations	105.3	106.0	104.2	107.0	114.4	108.4	-5.2	1.2
2841	Soaps and detergents	104.8	109.6	107.4	100.9	98.2	(3)	(3)	4 -2.1
2844	Cosmetics and other toiletries	94.0	83.6	76.1	84.0	86.0	(3)	(3)	4 -1.7
2851	Paints and allied products	104.8	100.8	99.8	106.5	116.5	126.6	8.7	4.2
2911	Petroleum refining	94.9	94.2	83.7	79.4	81.8	90.7	10.9	-2.0
301	Tires and inner tubes	107.3	102.4	118.1	128.2	136.1	151.5	11.3	7.9
3079	Miscellaneous plastics products	94.8	95.7	98.5	110.1	107.1	(3)	(3)	4 3.9
314	Footwear	100.2	99.1	95.6	106.3	103.9	101.8	-2.0	0.9
3221	Glass containers	102.4	105.2	110.1	105.8	108.5	115.6	6.5	1.9
3241	Hydraulic cement	96.0	87.0	91.1	94.0	108.4	123.2	13.7	5.7
325	Structural clay products	95.9	97.6	100.7	102.6	104.0	99.9	-3.9	1.2
3251,53,59	Clay construction products	91.6	94.0	97.3	103.3	100.4	97.1	-3.3	1.6

**Table 1. Continued—Indexes of output per employee hour in selected industries, 1979–84, and percent changes, 1983–84 and 1979–84**

[1977 = 100]

sic Code <sup>1</sup>	Industry	1979	1980	1981	1982	1983	1984 <sup>2</sup>	Percent change, 1983–84	Average annual percent change, 1979–84
3251	Brick and structural clay tile	85.4	84.9	84.3	88.6	84.9	82.4	-2.9	-0.4
3253	Ceramic wall and floor tile	111.6	119.8	125.9	128.1	125.5	(3)	(3)	4 3.1
3255	Clay refractories	110.2	109.6	111.1	100.0	119.9	110.2	-8.1	0.5
3271,72	Concrete products	92.7	90.4	88.5	92.4	96.7	(3)	(3)	4 1.1
3273	Ready-mixed concrete	99.9	93.1	95.4	90.6	95.7	(3)	(3)	4 -1.1
331	Steel	106.9	102.9	112.0	90.9	116.8	132.0	13.0	3.6
3321	Gray iron foundries	96.8	90.8	92.7	93.7	98.9	108.0	9.2	2.4
3324,25	Steel foundries	100.6	99.8	91.6	89.0	90.6	100.9	11.4	-0.9
3331,32,33	Primary copper, lead, and zinc	106.5	103.7	118.6	128.0	141.8	152.6	7.6	8.4
3331	Primary copper	113.3	105.3	124.4	128.5	138.3	156.9	13.4	7.3
3334	Primary aluminum	99.7	100.0	103.8	103.0	111.5	122.8	10.1	4.0
3351	Copper rolling and drawing	98.1	94.1	97.9	106.0	121.1	127.5	5.3	6.3
3353,54,55	Aluminum rolling and drawing	100.3	100.0	96.8	99.2	110.4	110.6	0.2	2.3
3411	Metal cans	103.6	102.6	108.1	112.2	121.2	133.5	10.1	5.3
3423	Hand and edge tools	103.9	98.4	95.2	92.8	90.5	(3)	(3)	4 -3.3
3441	Fabricated structural metal	102.1	102.1	98.5	98.4	103.3	(3)	(3)	4 -0.1
3442	Metal doors, sash, and trim	92.8	90.6	90.4	96.0	98.9	(3)	(3)	4 1.9
3465,66,69	Metal stampings	102.3	99.9	101.4	98.1	104.0	(3)	(3)	4 0.1
3465	Automotive stampings	102.9	101.6	105.0	106.7	121.5	(3)	(3)	4 3.9
3469	Metal stampings, n.e.c.	101.5	98.1	98.0	89.3	88.6	(3)	(3)	4 -3.6
3494	Valves and pipe fittings	105.3	102.8	105.4	101.3	104.6	(3)	(3)	4 -0.3
3598	Fabricated pipe and fittings	90.2	90.1	93.5	89.5	89.6	(3)	(3)	4 -0.2
3519	Internal combustion engines, n.e.c.	98.2	94.3	93.2	82.0	89.0	(3)	(3)	4 -3.3
352	Farm and garden machinery	100.5	93.3	95.1	94.9	95.0	98.7	3.9	-0.1
3523	Farm machinery	98.3	91.3	94.1	92.6	92.1	95.4	3.6	-0.4
3524	Lawn and garden equipment	113.5	106.5	101.0	106.9	108.7	115.0	5.8	0.5
3531	Construction machinery and equipment	100.3	97.4	96.1	88.9	95.3	103.0	8.1	(5)
3533	Oilfield machinery and equipment	105.6	104.0	104.7	98.4	100.7	(3)	(3)	4 -1.5
3541,42	Machine tools	102.0	98.8	96.5	88.1	86.8	86.9	0.1	-3.6
3541	Metal-cutting machine tools	103.0	100.6	98.9	89.4	85.0	85.9	1.1	-4.2
3542	Metal-forming machine tools	99.2	93.5	89.4	85.0	91.6	89.7	-2.1	-1.7
3545	Machine tool accessories	100.8	99.2	102.0	89.1	85.4	(3)	(3)	4 -4.3
3561,63	Pumps and compressors	102.9	100.2	102.4	95.5	101.8	(3)	(3)	4 -0.7
3561	Pumps and pumping equipment	101.2	97.7	101.7	92.7	99.6	(3)	(3)	4 -0.8
3562	Ball and roller bearings	105.8	95.4	94.3	83.3	87.2	89.0	2.1	-3.5
3563	Air and gas compressors	106.0	105.5	106.8	101.7	106.1	(3)	(3)	4 -0.3
3585	Refrigeration and heating equipment	101.4	93.8	99.4	100.1	101.2	(3)	(3)	4 0.6
3612	Transformers	108.4	110.6	106.9	99.6	100.7	101.4	0.7	-1.9
3613	Switchgear and switchboard apparatus	102.8	103.2	99.5	101.3	105.0	(3)	(3)	4 -0.2
3621	Motors and generators	99.6	100.1	102.3	109.3	107.5	107.4	-0.1	1.9
3631,32,33,39	Major household appliances	108.7	105.8	107.6	108.6	116.2	122.2	5.2	2.5
3631	Household cooking equipment	108.9	103.9	105.7	112.6	115.6	126.8	9.7	3.3
3632	Household refrigerators and freezers	112.3	114.4	117.4	116.1	128.4	135.9	5.8	3.8
3633	Household laundry equipment	108.1	102.1	103.9	105.4	112.0	111.6	-0.4	1.3
3639	Household appliances, n.e.c.	102.6	99.1	100.4	94.7	103.2	105.9	2.6	0.6
3641	Electric lamps	105.2	103.2	106.9	108.4	124.7	132.0	5.9	5.0
3645,46,47,48	Lighting fixtures	94.6	93.3	88.7	91.0	94.7	97.6	3.1	0.6
3651	Radio and television receiving sets	118.5	116.9	133.6	163.9	196.7	(3)	(3)	4 14.5
371	Motor vehicles and equipment	97.8	90.8	93.1	96.9	109.6	114.6	4.6	4.1
3825	Instruments to measure electricity	100.2	108.4	111.9	118.8	120.2	(3)	(3)	4 4.7
	<b>Other</b>								
401	Railroad transportation-revenue traffic	104.7	107.3	111.5	115.8	141.9	152.6	7.5	8.2
401	Railroad transportation-car miles	102.9	107.9	107.6	110.1	128.9	137.7	6.8	5.9
4111,31,414	Class I bus carriers	98.3	100.8	90.9	90.0	84.8	(3)	(3)	4 -4.0
4213 PT	Intercity trucking <sup>6</sup>	98.6	94.3	98.7	93.3	101.0	(3)	(3)	4 0.4
4213 PT	Intercity trucking-general freight <sup>6</sup>	96.6	87.9	92.5	86.8	92.5	(3)	(3)	4 -1.0
4511,4521 PT	Air transportation <sup>6</sup>	113.1	106.2	104.9	114.7	126.0	130.1	3.3	3.8
4612,13	Petroleum pipelines	101.7	93.0	86.0	89.2	93.9	104.3	11.1	0.5
4811	Telephone communications	110.8	118.1	124.4	129.1	146.0	(3)	(3)	4 6.6
491,92,93	Gas and electric utilities	97.6	96.2	94.4	89.3	88.1	91.2	3.5	-1.9
491,493 PT	Electric utilities	95.4	94.0	93.0	89.5	90.9	94.1	3.5	-0.6
492,493 PT	Gas utilities	103.4	102.1	98.1	89.0	81.1	83.7	3.2	-5.1
54	Retail food stores <sup>7</sup>	97.3	99.7	96.8	95.2	96.9	95.9	-1.0	-0.5
5511	Franchised new car dealers	94.6	99.5	96.6	97.4	106.2	106.1	-0.1	2.2
5541	Gasoline service stations <sup>7</sup>	106.9	104.3	105.8	110.7	118.5	119.0	0.4	2.8
56	Apparel and accessory stores <sup>7</sup>	114.4	120.1	127.1	130.9	138.1	146.4	6.0	4.9



**Table 1. Continued—Indexes of output per employee hour in selected industries, 1979–84, and percent changes, 1983–84 and 1979–84**

sic Code <sup>1</sup>	Industry	1979	1980	1981	1982	1983	1984 <sup>2</sup>	Percent change, 1983–84	Average annual percent change, 1979–84
5611	Men's and boys' clothing stores <sup>7</sup> .....	108.2	106.4	115.6	115.7	120.2	127.0	5.7	3.4
5621	Women's ready-to-wear stores <sup>7</sup> .....	120.7	125.5	139.0	158.2	169.0	184.1	8.9	9.4
5651	Family clothing stores <sup>7</sup> .....	107.7	122.6	131.4	139.6	149.3	155.0	3.8	7.3
5661	Shoe stores <sup>7</sup> .....	112.2	109.3	113.0	108.9	109.9	116.3	5.8	0.5
58	Eating and drinking places <sup>7</sup> .....	99.1	99.2	96.5	95.9	96.4	94.4	-2.1	-1.0
5912	Drug and proprietary stores <sup>7</sup> .....	103.1	106.0	106.2	106.1	107.9	109.8	1.8	1.1
602	Commercial banking .....	99.3	92.7	90.5	93.2	102.7	( <sup>3</sup> )	( <sup>3</sup> )	4.0
7011	Hotels, motels, and tourist courts <sup>7</sup> .....	102.4	98.6	96.2	94.5	95.5	102.9	7.7	-0.3
721	Laundry and cleaning services <sup>7</sup> .....	97.6	90.7	88.2	90.4	90.3	93.3	3.3	-0.6
723,724	Beauty and barber shops <sup>7</sup> .....	107.4	102.9	109.2	108.3	114.1	104.5	-8.4	0.5
723	Beauty shops <sup>7</sup> .....	108.0	106.2	114.7	113.1	120.0	111.7	-6.9	1.5

<sup>1</sup> As defined in the *Standard Industrial Classification Manual*, 1972, published by the Office of Management and Budget.

<sup>2</sup> Preliminary data.

<sup>3</sup> Not available.

<sup>4</sup> Percent change, 1979–83.

<sup>5</sup> Rate of change is less than 0.05 percent.

<sup>6</sup> Output per employee.

<sup>7</sup> Output per hour of all persons.

NOTE: Although the output per employee-hour measures relate output to the hours of all employees engaged in each industry, they do not measure the specific contribution of labor, capital, or any other single factor of production. Rather, they reflect the joint effects of many influences, including new technology, capital investment, the level of output, capacity utilization, energy use, and managerial skills, as well as the skills and efforts of the work force. Some of these measures use a labor input series that is based on hours paid, and some use a labor input series that is based on plant hours.

n.e.c. = not elsewhere classified.

fell. Demand continued strong for high fructose corn syrup, a key product of this industry, which is used as a sweetener, especially by soft drink manufacturers. The industry has made substantial capital investment in highly automated plants, allowing for output expansion at the same time as employment was being reduced. Other industries with high rates of gain from 1979 to 1984 include: women's clothing stores (9.4 percent), primary copper, lead and zinc (8.4 percent), railroad transportation (revenue traffic) (8.2 percent), tires (7.9 percent), coal mining (7.7 percent), family clothing stores (7.3 percent), and softwood veneer and plywood (7.2 percent).

*Declines, 1979–84.* Among the industries with declines, the wood office furniture industry had the greatest falloff in output per hour, dropping at a rate of 5.3 percent from 1979 to 1983. (The 1984 data are not as yet available.) Output decreased at a 4.1-percent rate, while employee hours grew at a 1.3-percent rate. This industry was severely affected by the two recessions which occurred within this period and suffered sharp drops in output and associated declines in

productivity. The industry with the second largest falloff was gas utilities, registering an average annual decline of 5.1 percent from 1979 to 1984. Output fell at a rate of 3.8 percent owing to a drop in average use per customer, while the number of customers increased, leading to growth in employee hours at a rate of 1.4 percent. Among other industries with substantial declines were: Machine tool accessories (-4.3 percent, 1979–83), bus carriers (-4.0 percent), machine tools (-3.6 percent), metal stampings (-3.6 percent, 1979–83), ball and roller bearings (-3.5 percent), as well as internal combustion engines and hand and edge tools (both -3.3 percent, 1979–83). □

— FOOTNOTE —

<sup>1</sup> For a detailed report on these industries, see Brian L. Friedman and Arthur S. Herman, "Productivity growth low in the oilfield machinery industry," *Monthly Labor Review*, December 1985, pp. 34–38; Horst Brand and Ziaul Z. Ahmed, "Beauty and barber shops: the trend of labor productivity," pp. 21–26, this issue; and Elmer S. Persigehl and John G. Olsen, "Productivity in the metal doors, sash, and trim industry," pp. 27–31, this issue. An article on the metal stampings industry will appear in a forthcoming issue of the *Review*.

# The contribution of R&D to productivity growth

*Results of a BLS study suggest that the direct contribution of research and development to postwar productivity growth was between 0.1 and 0.2 percent annually in the nonfarm business sector; R&D had no substantial effect on the post-1973 productivity slowdown*

LEO SVEIKAUSKAS

Many observers believe that research and development (R&D) conducted in U.S. industry is an important ingredient in the Nation's productivity improvement.<sup>1</sup> The Bureau of Labor Statistics has recently conducted work aimed at establishing the contribution of R&D to productivity growth.<sup>2</sup> The study proceeded along much the same lines as prior BLS analysis of the contribution of the physical capital stock to productivity.<sup>3</sup> This work calculated real annual investment in research and development and estimated the R&D stock to determine the annual and long-term productivity effects of research spending in the private nonfarm business sector. This article summarizes the main conclusions which have emerged from that analysis.

Between 1948 and 1982, U.S. multifactor productivity growth—the increase in output beyond the contribution of labor and capital inputs—was 1.2 percent per year. However, the long-term productivity trend for the postwar period reflects very different developments during two distinct sub-periods. Multifactor productivity increased at an annual rate of 1.7 percent from 1948 to 1973, but then decreased by 0.2 percent per year through 1982. The results reported below indicate that the R&D stock contributed 0.1–0.2 per-

cent annually to 1948–82 productivity growth, but had no substantial effect on the 1973–82 productivity slowdown.

Research and development provides both *direct* productivity benefits to industries conducting research, such as computer or aircraft manufacturers, and *indirect* benefits to industries further along the chain of production, as occurs when banks take advantage of new computer technology or commercial airlines realize gains from the purchase of better aircraft. This study deals only with the direct productivity benefits accruing to industries actually conducting the research. The reader should realize that, on balance, the indirect benefits gained as new technology spreads to other parts of the economy are likely to be greater than the direct contribution of research. Future Bureau work will attempt to determine the magnitude of these indirect effects.

## Main elements of the analysis

At least eight distinct issues have to be considered in developing an estimate of the R&D stock and determining its influence on productivity growth. The following discussion summarizes the decisions that the Bureau reached on each of these matters. In several instances, economic understanding is at present not sufficient to support a definite judgment concerning the proper treatment of an issue. In these cases, an assumption which appears reasonable in light of prior

---

Leo Sveikauskas is an economist in the Division of Productivity Research, Bureau of Labor Statistics.

analysis was selected for use in the "preferred" model. However, sensitivity analyses also examined the effect of other plausible assumptions on conclusions about the relationship between R&D and productivity growth.

*Defining the R&D stock.* The first and main issue is determination of the components of research that should be included in the R&D stock, which establishes the central framework for the study. BLS measures of productivity in the major economic sectors rely upon data published in the national income accounts. Therefore, the components of research that should properly be included in the R&D stock are those that *directly* affect productivity growth as measured within the context of the national income accounts. Most analyses of R&D indicate that only privately financed research directly affects typical measures of productivity.<sup>4</sup> However, there is also some evidence that government-financed research conducted in industry affects measured productivity, although less strongly.<sup>5</sup>

In view of this information, the preferred measure of the R&D stock selected for this study includes only privately financed research conducted in industry and the relatively small, privately financed projects conducted in colleges and universities or nonprofit institutions, which are assumed to be similar in nature. However, the sensitivity analyses discussed below also consider an alternative measure that includes government-financed research conducted in industry, weighted at 20 cents on the dollar.

The Bureau's definition of the R&D stock includes both product and process research, and both basic and applied research, although separate accounts are kept for the latter two categories to permit differential treatment of lag and depreciation issues. The R&D stock is here limited to research conducted by U.S. industry. Detailed specification of the influence of foreign research on the U.S. economy remains an important topic for future empirical investigation.

*Locating appropriate data.* Once the relevant definition of R&D was decided, it was necessary to obtain data on annual expenditures for the categories of research included. Annual publications of the National Science Foundation provide the necessary information from 1953 onwards.<sup>6</sup> Nestor Terleckyj has prepared similar consistent annual data on private R&D expenditures for the years 1921-52.<sup>7</sup> The alternative measure of the research stock, which includes government-financed research conducted in industry, relies on data developed by David Blank and George Stigler.<sup>8</sup>

*Converting to constant dollars.* The third step in the analysis requires selection of an appropriate R&D deflator to convert annual research spending into constant-dollar terms. The National Science Foundation uses the GNP deflator for this purpose, although it is widely recognized that this series provides only a very rough approximation. Zvi Griliches has suggested an alternative deflator that weights the output

price deflator for nonfinancial corporations at 0.51 and the unit compensation index for the same sector at 0.49.<sup>9</sup> The BLS study adopts the Griliches deflator, suitably modified to adjust research expenditures occurring before 1958, the first year for which nonfinancial corporations data are available.

*Determining the appropriate lag time.* Once real annual research expenditures are estimated, the lag between the time research is conducted and the time it affects productivity must be considered. On the basis of a review of the relevant literature, a 2-year lag was selected for applied research and a 5-year lag was chosen for basic research. One-year and 3-year lags for applied research were examined in the sensitivity analyses.

*Treating depreciation.* A fifth crucial issue is whether the R&D stock depreciates over time, in the sense of contributing less to output. If so, what is the time path and pattern of this depreciation? The literature contains a broad range of conclusions on this topic, from some which suggest that R&D investments do not depreciate at all to others which indicate rapid depreciation of research expenditures.<sup>10</sup>

For this study, a depreciation pattern known as 0.1 geometric decay, which implies that 10 percent of the research stock depreciates each year, was selected as the preferred choice for applied research. Basic research was assumed not to depreciate. The sensitivity analyses also examine the effects of alternatively assuming zero or 0.2 geometric decay for applied research. As the discussion of the findings shows, the choice of a rate of depreciation has a substantial impact on conclusions concerning the effect of R&D on productivity growth. Unfortunately, not much is definitively known about depreciation of the R&D stock.

*Calculating the R&D stock.* The research stock was calculated using standard perpetual inventory methods which determine each year's net change in the stock by allowing for new investment and for depreciation.

*Deciding on a rate of return.* The seventh matter to be considered is the appropriate rate of return to apply to the research stock to determine its contribution to productivity growth. On the basis of a broad range of empirical studies, a 30-percent real rate of return was selected for use in the preferred measure.<sup>11</sup> On the basis of a review of the relevant literature, it was assumed that there has been no decline in the rate of return over time.<sup>12</sup> However, the sensitivity analyses also examined the impact on productivity growth if there has been a substantial decline in the rate of return to R&D over time.

*Determining the impact of R&D.* In the final step, information on the R&D stock and its assumed rate of return was combined to estimate the impact of research on productivity. This was determined by calculating the research share of

output in the private nonfarm business sector and multiplying this share by the growth rate of the research stock. Such a procedure is standard in analyzing the contribution of inputs to economic growth.

In these calculations, the research stock is first multiplied by the assumed real rate of return (.30) to determine annual-real research income. Research income is then divided by real output in the private nonfarm business sector to obtain the research share in the sector. Finally, the research share is multiplied by the annual percentage increase in the R&D stock to determine the contribution to productivity growth.<sup>13</sup>

### Empirical results

Table 1 presents the preferred estimates of the impact of R&D on productivity growth. All results are for the private nonfarm business sector for the 1948–82 period.

Column 1 shows the R&D stock of the sector in 1972 dollars. Over the 1948–82 period, the research stock grew at an average annual rate of 6.8 percent. From 1948 to 1973, growth was 7.8 percent a year, but the pace slowed considerably—to 4.3 percent—during the 1973–82 period.

Estimates of year-to-year change in column 2 also indicate that the growth of the R&D stock slowed substantially in the 1970's. By that time, however, the research share of sector income (column 5) was considerably greater than it had been in the immediate postwar years because of the consistent substantial growth in the R&D stock. The weight of research in the economy was therefore greater in recent years, and each percentage-point increase in the R&D stock made more of a contribution to output growth. Consequently, the overall contribution of R&D held up better in the 1970's than the slowing growth rate of the research stock itself would suggest.

Estimates for the subperiods 1948–73 and 1973–82 indicate that R&D had no substantial impact on the post-1973 productivity slowdown. From 1948 to 1982, R&D contributed 0.14 percent a year to multifactor productivity growth. Subperiod rates were essentially the same: 0.14 percent from 1948 to 1973, and 0.13 percent from 1973 to 1982.<sup>14</sup>

The annual productivity contributions shown in column 6 provide a more detailed view of the impact of R&D on productivity. The annual productivity contribution ranged between 0.16 and 0.18 in the 1960's, but declined to about 0.11 to 0.12 in the late 1970's. However, by the early 1980's, the productivity contribution of R&D had essentially returned to the magnitudes reached in the 1960's.

*Other major sectors.* The analysis so far has concentrated on the impact of the research stock in the nonfarm business sector. It is difficult to obtain a reliable time series for direct private research investment in the farm sector, and that sector is therefore not examined here. The heavy expenditures by Federal and State governments on agriculture can probably best be viewed as indirect research provided to the farm sector by other industries, and therefore are also not

**Table 1. Central variables and results from analysis of the effects of research and development on productivity growth, private nonfarm business sector, 1948–82**

[In billions of 1972 dollars, unless otherwise indicated]

Year	R&D stock		Output of private nonfarm business <sup>1</sup>	Real R&D income <sup>2</sup>	R&D share of total output <sup>3</sup> (in percent)	R&D contribution to productivity growth <sup>4</sup> (in percent)
	Level	Annual growth rate (in percent)				
	(1)	(2)	(3)	(4)	(5)	(6)
1948 ...	\$13.5	—	\$364.5	\$4.0	—	—
1949 ...	14.6	8.8	357.5	4.4	1.2	0.10
1950 ...	15.8	8.0	392.2	4.7	1.2	.09
1951 ...	16.5	4.6	418.0	5.0	1.2	.05
1952 ...	17.5	6.1	432.2	5.3	1.2	.07
1953 ...	18.5	5.7	451.0	5.6	1.2	.07
1954 ...	20.1	8.3	442.0	6.0	1.3	.10
1955 ...	22.4	11.4	479.1	6.7	1.4	.15
1956 ...	24.6	9.9	492.7	7.4	1.4	.14
1957 ...	26.7	8.9	498.6	8.0	1.6	.13
1958 ...	29.9	11.8	488.9	9.0	1.7	.19
1959 ...	32.8	9.6	528.2	9.8	1.8	.17
1960 ...	35.6	8.4	535.5	10.7	1.9	.16
1961 ...	38.6	8.5	545.2	11.6	2.1	.17
1962 ...	41.9	8.5	577.3	12.6	2.1	.17
1963 ...	45.1	7.7	602.8	13.5	2.2	.16
1964 ...	48.4	7.3	641.2	14.5	2.3	.16
1965 ...	51.9	7.1	685.8	15.6	2.3	.16
1966 ...	55.5	6.9	726.5	16.6	2.3	.15
1967 ...	59.5	7.3	741.9	17.9	2.3	.17
1968 ...	63.9	7.4	782.2	19.2	2.4	.17
1969 ...	68.7	7.4	805.0	20.6	2.5	.18
1970 ...	73.6	7.1	796.6	22.1	2.7	.18
1971 ...	78.7	7.0	819.9	23.6	2.8	.19
1972 ...	83.3	5.8	877.7	25.0	2.9	.16
1973 ...	87.4	4.9	938.1	26.2	2.8	.13
1974 ...	91.5	4.7	917.9	27.5	2.9	.13
1975 ...	96.2	5.0	896.3	28.8	3.1	.15
1976 ...	100.6	4.6	957.9	30.2	3.2	.14
1977 ...	104.1	3.5	1023.3	31.2	3.1	.11
1978 ...	108.0	3.8	1081.7	32.4	3.0	.11
1979 ...	112.1	3.8	1105.0	33.6	3.0	.11
1980 ...	116.7	4.1	1088.7	35.0	3.1	.12
1981 ...	121.8	4.4	1112.3	36.5	3.3	.14
1982 ...	127.7	4.8	1083.4	38.3	3.4	.16

<sup>1</sup> Constant-dollar output of the sector. All calculations were conducted prior to the January 1985 GNP revisions.

<sup>2</sup> Column (1) × 0.30, under the assumption of a 30-percent rate of return on the research stock.

<sup>3</sup> Column (4) divided by column (3).

<sup>4</sup> To illustrate the methodology adopted to generate these estimates, the 1948–49 growth in the research stock, .088 (or 8.8 percent), is multiplied by the research share, .012 (or 1.2 percent), to determine the productivity contribution, which is .0010, or 0.10 percentage points. Text footnote 13 describes the actual method used, which tends to result in slightly lower contributions.

considered in this report.

In addition, it is difficult to establish a reliable basis on which to divide nonfarm business research between its manufacturing and nonmanufacturing components. Tentative estimates suggest that research and development may have contributed as much as 0.41 percent per year to 1948–82 productivity growth in manufacturing, but only 0.01 percent to direct productivity growth in the nonmanufacturing sector. These very different effects of the direct impact of research arise because an extremely large proportion of direct research spending takes place in manufacturing.

## Sensitivity analyses

The preferred results summarized above are based on a 2-year lag between applied research and its effect on productivity, 0.1 geometric depreciation, use of the Griliches deflator to convert research expenditures into real terms, inclusion of only privately financed research, and a constant rate of return to the research stock over time. But, as indicated earlier, these assumptions are subject to some uncertainty because much remains to be known about the economics of R&D. Therefore, a sensitivity analysis was conducted to determine how other plausible assumptions affect the central conclusions concerning the influence of R&D. The first line of table 2 lists the productivity impacts with the preferred assumptions. These figures provide the base-case framework, which is used as the standard of reference for examining the effects of using alternative assumptions in the model.

Changes in the lag before applied research influences production have little effect on long-term productivity growth. If a 1-year lag is adopted, the R&D impact is slightly greater (line 2), essentially because the research stock is then somewhat larger. However, there is no substantial change in the effect of R&D on productivity. If a 3-year lag is assumed instead (line 3), there is no change at all in the implied influence of R&D on productivity growth.

In contrast, changes in the assumed rate of depreciation have a major impact on the implied influence of R&D. If there is zero depreciation, the research stock increases more rapidly and is larger at every given time, both of which suggest that R&D contributes more to productivity. With zero depreciation (line 4), research contributes 0.33 percent to 1948–82 productivity growth; the 1948–73 contribution of 0.31 percent increases to 0.40 percent in 1973–82 as the R&D stock continues to grow.

Conversely, if 0.2 geometric decay is assumed for applied research (line 5), the R&D stock grows more slowly and is smaller, so that R&D contributes only 0.09 percent to 1948–82 productivity growth, 0.10 percent in 1948–73 and 0.08 percent in 1973–82. These amounts are moderately less than in the preferred case. Because the depreciation of R&D has important implications for the role of the research stock in productivity growth, further study of this issue would be highly useful.

If the GNP deflator is used instead of the Griliches deflator (line 6), the original results are not greatly changed. However, if two-tenths of the Federal expenditures for research conducted in industry are included (line 7), the 1948–82 productivity contribution is 0.16 percent, reflecting the greater research stock. In addition, R&D plays a greater role in the productivity slowdown, with its contribution declining from 0.17 percent in 1948–73 to 0.13 percent in 1973–82. This reflects the fact that the growth of Federally financed research conducted in industry slowed more during the 1970's than did privately financed research spending. Nevertheless, even if the Federal funds are included, the implied R&D effects on productivity growth (and the productivity slowdown) are not very great.

Finally, line 8 presents the case in which the rate of return declines linearly from 30 percent in 1967 to 20 percent in 1982. The productivity contribution of R&D is slightly lower for 1948–82 as well as for 1973–82. However, once again the contribution to the productivity slowdown is less than one-tenth of a percentage point.

In summary, the preferred estimates of the impact of R&D on productivity growth are fairly robust with respect to changes in the central assumptions used in constructing them. The exception is the rate of depreciation: under the zero depreciation assumption, the effect of R&D on productivity is substantially greater.<sup>15</sup>

**Table 2. The effect of alternative assumptions on the implied influence of the research and development stock on productivity growth, 1948–82 and two subperiods**

Alternative assumption	R&D contribution to productivity growth <sup>1</sup> (in percent)		
	1948–82	1948–73	1973–82
1) Preferred estimate .....	0.14	0.14	0.13
2) 1-year lag for applied research .....	.15	.15	.14
3) 3-year lag for applied research .....	.14	.14	.13
4) Zero depreciation of applied research .....	.33	.31	.40
5) 0.2 geometric depreciation of applied research ..	.09	.10	.08
6) GNP deflator used to deflate research expenditures .....	.14	.14	.14
7) Two-tenths of Federally funded research conducted in industry counted in the research stock .....	.16	.17	.13
8) The real rate of return to research declines over time <sup>2</sup> .....	.13	.14	.10

<sup>1</sup> See footnote 4, table 1.

<sup>2</sup> Assumes a linear decline from 30 percent in 1967 to 20 percent in 1982.

THE CONCLUSIONS drawn here must be qualified because they deal only with the *direct* return to research and development. The indirect effects of research are likely to be greater, but because they take longer to appear, the slowdown in research spending in the late 1960's and the 1970's is probably not yet fully reflected in productivity measures. The Bureau of Labor Statistics plans further study of the indirect effects of R&D.

More generally, although R&D has received much attention, it represents only a portion of the many social and individual activities relevant to technical progress. Managerial and organizational quality, the integration of the industrial relations system with effective technological change, and technological achievements by individual inventors or entrepreneurs all are important facets of technical change. These aspects of innovation are also likely to have had a substantial impact on productivity growth but are, regrettably, extremely difficult to quantify on a comprehensive national basis. □

## —FOOTNOTES—

<sup>1</sup> A National Academy of Sciences report which suggested improvements in the Nation's productivity statistics paid substantial attention to the role of research and development in productivity growth. See *Measurement and Interpretation of Productivity* (Washington, National Academy of Sciences, 1979). John W. Kendrick and Elliot S. Grossman find research and development to be the most important factor affecting interindustry differences in productivity growth. See *Productivity in the United States: Trends and Cycles* (Baltimore, MD, The Johns Hopkins Press, 1980). See also Zvi Griliches, "Issues in Assessing the Contribution of Research and Development to Productivity Growth," *Bell Journal of Economics*, Spring 1979, pp. 92–116.

<sup>2</sup> Recent BLS work on this topic is summarized in *Research and Development and Productivity Growth* (Bureau of Labor Statistics, forthcoming).

<sup>3</sup> The Bureau's work on the influence of physical capital on productivity is summarized in Jerome A. Mark and William H. Waldorf, "Multifactor productivity: a new BLS measure," *Monthly Labor Review*, December 1983, pp. 3–15. A detailed discussion of the effect of capital on productivity is contained in *Trends in Multifactor Productivity, 1948–1981*, Bulletin 2178 (Bureau of Labor Statistics, September 1983).

<sup>4</sup> William N. Leonard, "Research and Development in Industrial Growth," *Journal of Political Economy*, March 1971, pp. 232–56; and Nestor E. Terleckyj, "Research and Development and U.S. Industrial Productivity in the 1970's," in Devendra Sahel, ed., *The Transfer and Utilization of Technical Knowledge* (Lexington, MA, Lexington Books, 1982), pp. 63–99.

<sup>5</sup> David M. Levy, and Nestor E. Terleckyj, "Effects of Government Research and Development on Private R and D Investment and Productivity: A Macroeconomic Analysis," *Bell Journal of Economics*, August 1983, pp. 551–61; Zvi Griliches, "Returns to Research and Development Expenditures in the Private Sector," in John W. Kendrick and Beatrice N. Vaccara, eds., *New Developments in Productivity Measurement and Analysis* (Cambridge, MA, National Bureau of Economic Research, 1980), pp. 419–54; and Zvi Griliches, "Productivity, R and D and Basic Research at the Firm Level in the 1970's," Discussion Paper 1124 (Cambridge, MA, Harvard Institute of Economic Research, 1985).

<sup>6</sup> National Science Foundation, *Research and Development in Industry*, various issues; and National Science Foundation, *National Patterns of Science and Technology Resources*, various issues.

<sup>7</sup> Nestor E. Terleckyj, "R and D as a Source of Growth of Productivity and Income," Working Paper (Washington, National Planning Association, May 18, 1982).

<sup>8</sup> David B. Blank and George J. Stigler, *The Demand and Supply of Scientific Personnel* (New York, National Bureau of Economic Research, 1967).

<sup>9</sup> Zvi Griliches, "Comment (on Mansfield)," in Zvi Griliches, ed., *R and D, Patents and Productivity* (Chicago, University of Chicago Press, 1984), pp. 148–49.

<sup>10</sup> Ariel Pakes and Mark Schankerman, "The Rate of Obsolescence of Patents, Research Gestation Lags and the Private Rate of Return to Research Resources," in Griliches, ed., *R and D, Patents and Productivity*, pp. 73–88; Terleckyj, "Research and Development and U.S. Industrial Productivity in the 1970's"; and Zvi Griliches and Frank Lichtenberg, "Research and Development and Productivity at the Industry Level: Is There Still a Relationship?" in Griliches, ed., *R and D, Patents and Productivity*, pp. 465–96.

<sup>11</sup> There are two types of studies which provide evidence on the rate of return to research and development: regression studies of industry or firm productivity growth and studies of returns to specific representative R&D projects. Regression evidence is subject to many well-known qualifications, such as omission of relevant variables. Therefore, it is important to emphasize that the studies of the returns to specific research projects suggest conclusions broadly comparable with the evidence from the regression analysis of productivity. The consistency between these two different strands of evidence greatly increases the confidence which can be placed in the implied relationship between R&D and productivity growth.

Important regression studies include Zvi Griliches, "Research Expenditures and Growth Accounting," in B.R. Williams, ed., *Science and Technology in Economic Growth* (New York, Macmillan Co., 1973), pp. 59–95; Nestor E. Terleckyj, *Effect of Research and Development on the Productivity Growth of Industries: An Exploratory Study* (Washington, National Planning Association, 1976); Zvi Griliches, "Returns to Research and Development Expenditures in the Private Sector"; Leo A. Sveikauskas, "Technology Inputs and Multifactor Productivity Growth," *Review of Economics and Statistics*, May 1981, pp. 275–82; Frederic M. Scherer, "Interindustry Technology Flows and Productivity Growth," *Review of Economics and Statistics*, November 1982, pp. 627–34; and Zvi Griliches and Frank Lichtenberg, "Interindustry Technology Flows and Productivity Growth: A Reexamination," *Review of Economics and Statistics*, May 1984, pp. 324–29.

The most important studies of the returns to representative projects are Edwin Mansfield, John Rapoport and others, "Social and Private Rates of Return from Industrial Innovations," *Quarterly Journal of Economics*, May 1977, pp. 221–40; and J. G. Tewksbury and others, "Measuring the Societal Impact of Innovations," *Science*, Aug. 8, 1980, pp. 658–62, including the further references cited there.

Many regression studies of the impact of research and development on productivity growth measure the increase in the research stock as observed research spending. If research investments depreciate, these regression studies may substantially underestimate the true return to research. In this context, the Mansfield case-study evidence was especially helpful in ensuring that the return to research selected for the present study is realistic.

<sup>12</sup> Studies which find no substantial change in the rate of return to R&D over time includes Zvi Griliches and Frank Lichtenberg, "Interindustry Technology Flows"; Kim Clark and Zvi Griliches, "Productivity Growth and R and D at the Business Level: Results from the PIMS Data Base," in Griliches, ed., *R and D, Patents and Productivity*, pp. 393–416; and Griliches, "Productivity, R and D and Basic Research at the Firm Level in the 1970's."

A somewhat earlier study presents evidence indicating the rate of return to research may have declined and considers some of the reasons why such a declining return is plausible. See Edwin Mansfield, "How Research Pays Off in Productivity," *EPRI Journal*, October 1979, pp. 25–28.

<sup>13</sup> The share of research and development in any year can be calculated by multiplying the research stock times the assumed real rate of return (.30) to obtain implied real research income, and dividing the result by real output.

The research share indicated for each year in table 1 is obtained by calculating  $S_{t-1}$ , the research share for the first year of any binary comparison, and  $S_t$ , the corresponding research share in the second year. The share used,  $S_t^*$ , is then calculated as  $S_{t-1} + S_t/2.0$ , or the average share for the two years in question. The contribution to productivity growth is then obtained from  $S_t^* (\log R_t - \log R_{t-1})$ , where  $R_t$  and  $R_{t-1}$  are the values of the research stock in the two years under consideration. The logarithmic form here indicates that growth rates are measured in continuous rather than discrete terms. Appendix A of the forthcoming BLS Bulletin *Research and Development and Productivity Growth* provides more complete information on the procedures used here.

The bulletin also includes a more detailed discussion of the various ways in which economists have examined the impact of R&D and the many complex issues which must be addressed in developing quantitative measures. Current understanding in this area leaves several important matters unresolved. In particular, the possibility of quality improvement in the R&D sector and the interactions between basic and applied research deserve further attention.

<sup>14</sup> The average annual productivity contribution for each of the periods considered was calculated as the geometric mean of the relevant annual contributions listed in column 6 of table 1.

<sup>15</sup> However, with the zero depreciation assumption, the contribution of R&D increases about one-tenth of a percentage point from 1948–73 to 1973–82; R&D not only does not contribute to the productivity slowdown, but is a positive force which tends to offset some of the slowdown occurring for other reasons.

# Beauty and barber shops: the trend of labor productivity

*Output per hour of persons employed in these shops rose at an annual rate of 0.8 percent between 1972 and 1984, in line with the productivity trend for other personal service industries*

HORST BRAND AND ZIAUL Z. AHMED

Output per hour of persons employed in the beauty and barber shop industries rose at an average annual rate of 0.8 percent between 1972 and 1984.<sup>1</sup> Other industries with a high personal service component show roughly comparable trend rates, including the hotel and motel industry.

Output of beauty and barber shops remained virtually unchanged between 1972 and 1984, while hours dipped 0.6 percent a year. (See table 1.) The comparative weakness in output and hours was linked to sharp contractions in the number of barber shops. Beauty shops recorded some gains in output and a small long-term rise in hours.<sup>2</sup>

The output-per-hour trend rates for the two industries combined, as well as for beauty shops separately, mask pronounced year-to-year fluctuations. These, in part, reflected short-term volatility in the productivity mainly of beauty shops. Such volatility has probably been linked with lags in the adjustment of labor inputs to output changes—accounting for a relatively tight supply of labor in relation to output in “good” years, and for excess supply in “off” years. In beauty shops, productivity fluctuated between a rise of 8 percent (in 1984) and a drop of 6 percent (in 1976). The gains were associated with output rising more than

hours (or with hours declining)—except in 1981 when productivity increased because of a decline in output that was less than a decline in hours. Losses were all linked with a decrease in output accompanied by additional hours.

A change in the productivity trend in the two industries occurred after 1976. Between 1972 and 1976, output per hour fell in both industries; in beauty shops, it decreased at an average annual rate of nearly 4 percent. Subsequently, it rose 2.4 percent a year. The productivity drop during the 1972–76 period was to some extent associated with a strong increase in the service capacity of beauty shops, as indicated by expanding self-employment—accompanied by a change in hair styling fashions that *reduced* certain styling service requirements. The productivity rise after 1976 was linked with declining self-employment, and with fashion changes that called for more styling services.

## **Demand and output**

Beauty shops render up to 12 distinct types of services; barber shops up to eight. Workers in both industries mainly cut hair; many establishments confine their service to hair cutting. In addition to haircuts, full-service beauty shops offer permanents, coloring, conditioning, and manicures; a few offer pedicures. A limited number of shops also perform facials and other cosmetical skin treatments. They also fit

---

Horst Brand And Ziaul Z. Ahmed are economists in the Division of Industry Productivity and Technology Studies, Bureau of Labor Statistics.

and service wigs. Their patrons often include men. The range of barber shop services is generally narrower, although styling and shampooing of men's hair have increased somewhat in importance. Women are also served.

Service output of beauty shops did not display a notably strong long-term trend, rising at an average annual rate of 1.4 percent between 1972 and 1984. Service output of barber shops declined at a rate of 4.8 percent a year during that period. The decline in barber shop output was somewhat erratic. The long-term uptrend in beauty shop service output obscures a rather sharp falloff between 1972 and 1976 that was subsequently reversed. Until 1976, beauty shop service output dipped 3.3 percent a year; thereafter it rose 2.6 percent a year. Neither the output of total consumer services nor of the consumer service industries for which the Bureau of Labor Statistics computes pertinent measures so strongly reversed trend during the decade (average annual rates, in percent):<sup>3</sup>

	1972-84	1972-76	1976-84
All services, except government .....	4.7	3.7	5.2
All consumer services .....	3.6	3.5	3.3
Beauty shops .....	1.4	-3.3	2.6
Barber shops .....	-4.8	-4.5	-5.6
Hotels, motels .....	3.9	3.0	3.5
Eating and drinking .....	2.7	3.1	2.2
Laundry and drycleaning .....	-2.8	-6.6	-1.9

Among reasons is that beauty shops are subject to changes in hair styling fashions, and these were quite far-reaching during the 1970's. Such changes have often shifted some elements of hair care from beauty and barber shops to the home (do-it-yourself), and vice versa.

Trade publications data and interviews with industry representatives confirm that the mix of services offered by beauty shops changed significantly between 1972 and 1984, as styles changed. In the late 1960's and early 1970's, long hair became popular and required more attention by hair stylists than the fashions that followed. Bouffant hairdos, which entail much back-combing ("teasing") and setting, hence additional labor, were still popular.<sup>4</sup> After about 1972, shorter hair and the "natural look," requiring less styling and setting, came to be preferred, somewhat diminishing the need for professional styling.<sup>5</sup> Women now tended to visit beauty shops chiefly for trimming of their hair, often washing it themselves. This reduced the time needed for such services as shampooing and setting of the hair.<sup>6</sup> Hair coloring, which had been popular during the early 1970's, declined in relative importance as the "natural look" gained favor. The demand for "wash and wear" permanenting rose strongly throughout the 1970's, because it permitted minimum maintenance of hair style and lessened visits to beauty shops.<sup>7</sup>

Moreover, longer hair among men came into fashion, and men who preferred to have their hair professionally

**Table 1. Productivity and related variables in the beauty and barber shop industries 1972-84**

[1977=100]

Year	Beauty shops <sup>1</sup>			Beauty and barber shops <sup>2</sup>		
	Productivity	Output	All person hours	Productivity	Output	All person hours
1972 .....	110.1	103.9	94.4	105.0	108.6	103.4
1973 .....	106.2	102.1	96.1	100.7	106.8	106.0
1974 .....	106.2	99.6	93.8	101.4	101.5	100.1
1975 .....	100.1	94.5	94.4	98.7	97.6	98.9
1976 .....	94.3	91.3	96.8	95.0	94.4	99.4
1977 .....	100.0	100.0	100.0	100.0	100.0	100.0
1978 .....	104.7	106.2	101.4	103.6	105.3	101.6
1979 .....	108.0	108.4	100.4	107.4	105.6	98.3
1980 .....	106.2	107.2	100.9	102.9	103.6	100.7
1981 .....	114.7	105.1	91.6	109.2	99.9	91.5
1982 .....	113.1	103.6	91.9	108.3	97.8	90.3
1983 .....	120.0	119.4	99.5	114.1	109.8	96.2
1984 .....	111.7	119.7	107.2	104.5	108.5	103.8
Average annual percent change:						
1972-84 .....	0.9	1.4	0.5	0.8	0.2	-0.6
1979-84 .....	1.5	2.3	0.8	0.5	0.8	0.3

<sup>1</sup> Standard Industrial Code 723.

<sup>2</sup> SIC 723 and 724 combined.

groomed increasingly visited beauty shops.<sup>8</sup> "Unisex" salons, usually featuring limited services common to the hair styling needs of both sexes (hair cut, permanent wave, and shampoo), spread. The expansion of unisex salons, with their emphasis on walk-in, no-wait service (no appointments), represented a basic marketing shift; and has been a factor in the persistent decline in the number of barber shops.<sup>9</sup>

The change in fashions and the resultant shift in the services performed by beauty and barber shops apparently did not much affect labor requirements. The proportion of labor costs in beauty salons' total operating costs averaged around 60 percent throughout the period. While permanenting gained and hair coloring lost in relative importance, the two together have evidently accounted for roughly one half of the work performed in beauty shops. The relative importance of shampooing, conditioning, and trimming of hair seems to have changed little over the period.<sup>10</sup> The range of barber shop services generally remained narrow, with haircuts outranking their other services. However, hair styling has increasingly added to the quality of barbers' hair cutting service.<sup>11</sup>

The fashion changes that occurred in the early 1970's loosened the traditional relation between beauty shop services, household incomes, and changes in the age composition of the female population.<sup>12</sup> The age distribution of employed women age 35 to 54 changed little, and this group, according to an industry survey, has the greatest probability of visiting beauty shops and the highest frequency in doing so. The proportion of employed women in this age group declined from 38 percent in 1972 to 34 percent in 1977, then rose to 37 percent in 1984.<sup>13</sup> Overall, employment of women rose at an average annual rate of



3.3 percent between 1972 and 1984, and median income (in current dollars) of women working full time increased at an estimated rate of 8 percent a year. The rise in women's employment and income proved paradoxical. It often meant that less time was available for visits to beauty shops, and more hair care was performed at home. Moreover, many women apparently preferred unisex salons, offering no-frills service. However, women could afford to patronize full-service salons more frequently.<sup>14</sup> In general, according to the survey, the frequency of beauty salon visits rises with income. Yet, pressure of time may reduce the services requested or desired by the client.

Despite the increase in the output of beauty shops since the mid-1970's, constant-dollar receipts of both beauty and barber shops declined steadily as a proportion of total personal consumption expenditures for services, falling from 1.2 percent in 1972 to 0.7 percent in 1982.

### Employment and industry structure

Employment in beauty and barber shops, including payroll as well as self-employment, totaled 692,000 persons in 1984. It did not, on balance, change significantly over the 1972-84 span. Hours declined at an average annual rate of 0.6 percent, partly reflecting a continual shift to part-time schedules.

Annual employment and hours data for barbershops are of but limited validity.<sup>15</sup> However, pertinent data collected by the Bureau of the Census for census years show that the number of barber shops declined 25 percent between 1972 and 1977. The number of paid employees dropped 17 percent over that period, with a further 25-percent decrease indicated for the 1977-83 span. Self-employment, as indicated by the number of proprietorships and partnerships, dropped by just over one-third between 1972 and 1983.<sup>16</sup>

Census data show that the great majority of barber shops do not employ wage or salary workers. The one-sixth which do account for close to one-half of receipts. Of barber shops with payrolls, one-fifth employs half of the payroll employees in the industry. Most of the others engage one or two paid workers, with the owner or owners also working.

Employment in beauty shops, which totaled about 591,400 persons in 1984, rose at a rate of 1.1 percent a year over the 12-year period. It increased even in years of declining service output, except in 1981 when it dropped sharply, and in 1974 when it remained unchanged from the previous year. Hours responded somewhat more closely to movements in output, rising at a rate of 0.5 percent between 1972 and 1984. For 1982, the BLS estimates that nonsupervisory beauty shop workers averaged 29.6 hours per week, reflecting a high part-time component, and that part-time schedules accounted for 39 percent of employed workers.<sup>17</sup> This represents a far higher proportion than for employed workers generally, of whom only 13 percent were on voluntary part time (in 1984); or for service workers (other than in private households), of whom 18 percent worked part time.

While two-fifths of all beauty shops employ wage or salary workers, they account for four-fifths of the industry's total receipts. On average, beauty shops with payrolls employ four workers. However, 60 percent of the payroll employees work in only 30 percent of all beauty shops, averaging eight workers per shop. In addition, the owner or owners also perform beauty services (industry sources believe 90 percent do so).

Self-employment in barber shops dropped much more sharply over the 1972-83 period (35 percent) than payroll employment (25 percent); and it rose a bit more in beauty shops (15 percent) than payroll employment (14 percent). It was mainly the small beauty shop with one or two paid employees whose numbers dwindled. It is of interest to note that *self-employment* in beauty shops attained a peak in 1980 that was 19 percent above the previous high, reached in 1972. But in 1983, self-employment was 4 percent below the 1980 mark. The leveling off in beauty shops' *payroll employment* was much more moderate.

While total employment (all persons) in beauty and barber shops combined did not change significantly between 1972 and 1984, employment in industries with a large personal service component generally rose rapidly. In general, in industries that may be defined as consumer-oriented services with a high personal-service component, employment increased at an average annual rate of 3.8 percent between 1972 and 1984, or by 53 percent.<sup>18</sup>

Both barbers and hair stylists—often referred to as cosmetologists—are skilled workers, and are required to obtain up to 1,800 hours of training in most States, as well as to be licensed. While hourly earnings do not compare favorably with the average for private nonfarm industries or for service industries generally, comparisons are not entirely valid because beauty and barber shop workers receive tips, and are generally paid on a commission basis.<sup>19</sup> However, there is a large reserve pool of licensed but inactive hair stylists, estimated by industry observers at several times the number actually working. The potential competition tends to constrain pay increases.<sup>20</sup>

### Efficiency and tools of the trade

No official data on the capital expenditures of the beauty and barber shop industries are available. However, the Bureau of the Census reports the value of shipments by manufacturers of barber and beauty chairs, other furniture, and equipment (including hair clippers) for the two industries. The value of such shipments amounted to \$47.5 million in 1982; this represented a decline from both 1977 and 1972 when the pertinent figures are adjusted for price changes. Beauty and barber shop personnel, of course, use many kinds of tools manufactured in a broad variety of industries, so that the above figure for the heavier types of equipment understates the two industries' total equipment outlays. Trade sources indicate beauty shop expenditures of \$46.4 million in 1982 for appliances, such as hand dryers,

and for such durable sundries as shears and scissors.<sup>21</sup> That would suggest total equipment expenditures of close to \$100 million in 1982 by the two industries. (No reliable estimate for outlays for structures and structural fixtures can be offered.)

Barbers and hair stylists use a variety of powered and unpowered handtools, often in conjunction with small electrical appliances (such as heat lamps), as well as shampoos, tints, and conditioning solutions in performing their work. There have been and continue to be improvements in both the equipment they use and the solutions they apply. These improvements, however, are designed primarily to facilitate adaptation to changing hair styles, rather than to reduce labor requirements per patron served for the same hair style or category of service.

The use of cordless, rechargeable clippers and trimmers allows the operator greater freedom of movement. It is debatable whether these devices have lessened unit labor requirements. Industry observers in the barbering trade, where the electric clipper was introduced long ago, doubt that this device has significantly reduced the time needed for men's or boys' haircuts, although it is much less laborious to use than the unpowered clipper, which it replaced. Similarly, shampoo machines, introduced in barber shops 15 to 20 years ago with the expectation that they would save time, do not significantly lessen the time needed for the average haircut, although the machines may make the service more agreeable to the customer.<sup>22</sup>

Electric blowers have tended to replace dryers. They are easier to manipulate in conjunction with blow drying or styling. Blowing is thought to be less quick than heat drying but conforms more readily with so-called "wash-and-wear" hair styling and the "casual" hair styles in fashion among both women and men. More than a decade ago, formalized hair-setting practices required operators to use setting lotion, pins or rollers, and dryers. The practice, and the fashion that gave rise to it, are no longer popular, thereby reducing labor requirements. However, some establishments (and patrons) continue to prefer the more formalized hair styling practices and dryers.<sup>23</sup>

Combs made of better plastics are now more pliable and run more easily through the hair, and last longer. Brushes are now easier on the scalp, more specialized to type of hairdo, and also last longer. Shears are shorter to give the operator greater control in trimming hair; they also are made of better metals, require less frequent sharpening, and produce a cleaner cut. Easier to use curling irons have also been introduced.<sup>24</sup> Industry observers generally agree that these developments have not significantly reduced unit labor requirements, although operator effort has been eased by them.<sup>25</sup>

This also holds generally for the solutions applied in washing, setting, conditioning, and tinting of hair. Thus, shampoos clean the hair, but they also tend to dry it out. Additives have been developed which inhibit this drying

process. Permanent wave solutions and tints are more gentle and do less damage to the hair's molecular structure.<sup>26</sup> Tints are now manufactured in the form of creams rather than liquids, which tends to improve the hair's appearance. But the hair stylist must still divide the hair every 16th of an inch for proper tinting to reach the roots. The improved tint has not materially shortened the time required for the work.<sup>27</sup>

Permanent-wave solutions have been developed that time permanents automatically and permit the hair stylist to remove the curling rods without testing the curl for proper setting. In principle, this shortens labor requirements for this particular service. However, because of the variance in hair texture, the stylist may be reluctant to follow the manufacturer's instructions to the letter. She or he may be guided by, but not entirely rely upon, the automatic setting prescribed by the manufacturer. The stylist will generally be less concerned with saving time than with the quality of the service rendered to the patron, although in busy beauty shops there may be conflicting pressures.

Technological changes occurred during the decades prior to the period studied here that led to the expansion of the beauty shop industry and the contraction of barber shops.<sup>28</sup> Thus, the advent of the permanent-wave machine in the 1920's shifted women's hairstyling from the home to the market. The "cold wave," a chemical means of curling hair in conjunction with curlers, accelerated the shift in the late 1940's and 1950's. By contrast, the invention of the safety razor, and its diffusion when its price dropped after the patent had expired, shifted shaving from the barber shop to the home; the electric razor, widely marketed first during the 1930's, completed the shift. Thereafter, the work of barber shops was by and large confined to hair cutting. Beauty shops have almost always been under competitive pressure from hairstyling products for home use, but generally they have been able to overcome this pressure by improving quality of service and of the service environment.

## Outlook

It appears likely that the basic skills of hair stylists and barbers will continue to resist, as they have in the past, the kinds of technological change that incorporate them in mechanical devices. Industry observers do not foresee technological innovations on the scale of the permanenting machine, discussed earlier, which fed the expansion of the beauty shop industry prior to the 1972-84 period. Industry observers also believe that hair styling and barbering, being highly personalized services, should not be surrounded by impersonal technologies and "gadgetry." Hand-held tools of the beauty and barber trades will probably continue to become better adapted to hair styling and trimming tasks, and the chemical applications required for setting, conditioning, and coloring of hair should continue to become more serviceable.<sup>29</sup> But it is not clear that they will be more labor-saving than tools currently in use.

Certain organizational (or structural) changes in both industries have occurred (and should continue to occur), which tend to standardize operational practices and set models of managerial efficiency. Thus, as of 1983, 19 firms listed by the U.S. Department of Commerce franchised (or operated) more than 2,000 beauty and barber shops. In addition, training services were offered as part of exclusive product-sales franchises to more than 5,000 shops.<sup>30</sup>

Consulting services are now available to assist in setting up and equipping salons. They offer a variety of services, such as architectural and interior design, advertising pro-

grams, and managerial and financial advice.<sup>31</sup> Salon management systems have been widely accepted by the larger shops. Their originators provide computer software and advice in its use. The business and financial side of salon management may thus increasingly come to be handled by outside firms under contract with the salon owner. In turn, performance standards of employees more in line with operating costs may be more readily formulated and may improve operational efficiency in both industries, as the standards diffuse.<sup>32</sup> □

—FOOTNOTES—

<sup>1</sup> The two industries for which productivity is discussed here have been designated as SIC 723 (beauty shops) and SIC 724 (barber shops) in the Office of Management and Budget's *Standard Industrial Classification Manual, 1972*. Beauty shops are primarily engaged in beauty services; barber shops are primarily engaged in furnishing barber and men's hair styling services. Combination beauty and barber shops are classified as SIC 723. Beauty schools and barber schools are included in the respective industries.

A separate productivity measure for barber shops has not been published because of the limited reliability of employment data.

Average annual rates of change are based on the linear least squares trends of the logarithms of the index numbers. The measures of productivity will be updated and included in the annual BLS bulletin, *Productivity Measures for Selected Industries*.

<sup>2</sup> For an earlier study of productivity in beauty and barber shops, see Jean Alexander Wilburn, "A Contrast in Productivity Trends Within Personal Services: The Beauty and Barber Shop Industries," in Victor R. Fuchs and Jean Alexander Wilburn, *Productivity Differences Within the Service Sector* (New York, National Bureau of Economic Research, 1967). pp. 55-109. The study covered the 1939-63 period, but used census-year rather than annual data. The Wilburn study and BLS findings compare average annual rates of change, in percent, for 1939-63 and 1972-82 as follows:

	Barber Shops		Beauty Shops	
	1939-63	1972-84	1939-63	1972-84
Current dollar receipts . . .	5.7	1.5	7.8	9.3
Price . . . . .	5.2	7.0	3.8	7.5
Real output . . . . .	0.5	-4.8	4.0	1.4
Employment . . . . .	-0.1	-3.5	2.5	1.1
Real output per person . . .	0.6	-1.3	1.5	0.2

<sup>3</sup> The rates of change are derived from constant-dollar personal consumption expenditures for services published by the Office of Business Economics, U.S. Department of Commerce. The figures for consumer services are derived from constant-dollar personal consumption expenditures for services, Office of Business Economics, U.S. Department of Commerce. Also see footnote 18.

<sup>4</sup> *Modern Beauty Shop*, February 1972, p. 45

<sup>5</sup> *Modern Beauty Shop*, January 1973, p. 40 ff.

<sup>6</sup> Industry information. According to an advertisement by the Wella Corporation (*Modern Beauty Shop*, February 1974, p. 84), "no fuss, wash and wear" hair styling was becoming popular. There was also a demand for changeable styling and associated paraphernalia, such as hot combs and hot rollers. Because of a greater chance of hair becoming damaged, a trend toward conditioning of hair developed to regain and retain its normal appearance and protect it from damage.

<sup>7</sup> Information from National Hairdressers and Cosmetologists Association, St. Louis, MO.

<sup>8</sup> Information from the Beauty and Barber Supply Institutes, Englewood, NJ. See also *The Wall Street Journal*, May 1978, p. 40.

<sup>9</sup> Beauty and Barber Supply Institute.

<sup>10</sup> See the annual surveys of the professional salon market in *Modern Salon* and its predecessor publication, *Modern Beauty Shop Magazine*. The

market surveys show beauty shop suppliers' purchases from manufacturers, by product classification. The publisher confirms that the surveys are indicative of the volume of beauty shop services to which the product classification pertains. The proportions (in percent) of distributor purchases of key products (here excluding cosmetics, of which a large part is sold at retail by beauty shops, as well as furniture and equipment) changed as follows over the 1972-82 period:

	1972	1976	1982
Total . . . . .	100	100	100
Permanents . . . . .	17	20	34
Hair color . . . . .	35	28	22
Shampoo . . . . .	15	18	18
Conditioners . . . . .	13	16	17
Hair goods and accessories . . . . .	11	3	1
Held-held electrical appliances . . . . .	10	15	9

<sup>11</sup> In a recent pricing sample of the Consumer Price Index, styling figured in one-third of all haircuts performed in barber shops.

<sup>12</sup> See Amelia Bassin, "The Consumer Revolt—What's In It For You?" *Modern Beauty Shop*, January 1973, p. 40 ff.

<sup>13</sup> *1983 Salon Client Survey*, conducted by Vance Research Services, Lincolnshire, IL. Data are from the Bureau of Labor Statistics.

<sup>14</sup> See the "1983 Salon Client Survey," *Modern Salon*, September 1983, p. 92.

<sup>15</sup> See footnote 1.

<sup>16</sup> Internal Revenue Service, *Statistics of Income, Partnership Returns and Sole Proprietorship Returns*, various years.

<sup>17</sup> *Occupational Projections and Training Data*, Bulletin 2206 (Bureau of Labor Statistics, 1984), pp. 52-53.

<sup>18</sup> Consumer-oriented service industries with a high personal service component (other than government services) are here defined as including the following industries: hotels and motels (SIC 70); personal services (SIC 72); motion pictures (SIC 78); amusement and recreation services (SIC 79); health services (SIC 80); educational services (SIC 82); social services (SIC 83); and membership organizations (SIC 86).

<sup>19</sup> For the salon owner profile, published annually in *Modern Salon*, see August 1984 issue, p. 82 ff.

<sup>20</sup> Licensing surveys by *American Hairdresser* estimated the number of licensed hair stylists to exceed the number actually working by a factor of 5 in 1973-74 and 1975-76.

<sup>21</sup> *Facts and Figures*, 23rd Annual Survey of the Professional Salon Market, 1982.

<sup>22</sup> Information from Beauty and Barber Supply Institute. See also the advertisement for Oster Corp., and Wahl Clipper Corp., in various issues of *Modern Beauty Shop* and *Modern Salon*.

<sup>23</sup> Information from National Beauty and Barber Manufacturers Association. See also advertisements of Styling Research Co. in *Modern Salon*, November 1982, and Duhl, Duck Inc., *Modern Salon*, April 1984.

<sup>24</sup> *Ibid*. See also advertisements for shears, switch blades, and razors, for example, by Jatai International, Los Angeles, CA, in *Modern Salon*, September 1984.

<sup>25</sup> Apparently none of the pertinent advertisements have claimed that labor time savings would result from the use of the products advertised. Industry observers, however, say that the use of better service-adapted styling tools is considerably less tiring than the use of more conventional tools—considering that the stylist stands behind the chair a good part of the day and moves her or his arms in a distal position.

<sup>26</sup> Industry sources. See also footnote 7. “Permanenting, coloring, bleaching and tinting can all take their toll on the quality of hair,” advertisements by the Wella Corp., *Modern Beauty Shop*, February 1974, p. 84.

<sup>27</sup> National Beauty and Barber Manufacturers Association.

<sup>28</sup> See Wilburn, “A Contrast in Productivity Trends,” p. 61 ff.

<sup>29</sup> Information from National Beauty and Barber Manufacturing Association, National Hair Dressers and Cosmetologists Association, and People-Media, Reading, PA.

<sup>30</sup> Andrew Kostecka, *Franchise Opportunities Handbook* (U.S. Department of Commerce, September 1983), pp. 32–37.

<sup>31</sup> See, for example, *The Raylon Resource* (Reading, PA, Raylon Showrooms). See also *Salon Today*, various issues. Information from Cutco Industries, Jericho, NY., and other industry sources.

<sup>32</sup> See, for example, *The Computerized Salon Management System* (Cincinnati, OH, The Mikal Corp., 1985). The annual “Facts and Figures” articles in *Modern Salon* also tend to standardize business operations in the industry.

## APPENDIX: Measurement techniques and limitations

Indexes of output per hour of all persons measure the change in the relation between the output of an industry and the hours expended on that output. An index of output per hour is derived by dividing an index of output by an index of hours.

The preferred output index for personal service industries would be obtained from data on the quantities of services provided by the industry. The quantity of each type of service provided would be weighted (multiplied) by the time required to provide one unit of each type of service in some specified base period. Thus, services that require more labor time would be given more importance in the output index than services that require less.

Such data, however, are not available for the beauty and barber shop industries. Real output of these industries was estimated by removing the effects of changing prices from the current-dollar value of industry receipts. Because an adjustment for price changes usually lowers the dollar value, such a series is referred to as a deflated value measure. The deflator used here is the Consumer Price Index for beauty shops and for barber shops. These two CPI's price a total of 25 types of service and 51 specific services, as well

as certain additional pricing factors. The more important the service, the greater the probability of its being priced.

The index of hours for beauty and barber shops is for all persons—that is, the index represents hours for paid employees, as well as for partners and proprietors. As in all of the output-per-hour measures published by the Bureau of Labor Statistics, hours and employment are considered homogeneous and additive. Adequate information for weighting the various types of labor separately are not available.

The indexes of output per hour do not measure the specific contribution of labor, capital, or any other single factor. Rather, they reflect many interrelated influences such as changes in technology, capital investment, design and layout of workplaces, skill and effort of the work force, and managerial ability.

The output measure is derived from data on annual receipts published by the Bureau of the Census. The all-persons-hour measures are derived from data on employment and hours originated by the Bureau of Labor Statistics and supplemented by data reported by the Internal Revenue Service, and from special tabulations compiled for the Bureau of Labor Statistics by the Bureau of the Census.

# Productivity in the metal doors, sash, and trim industry

*The overall rate of output per hour increased slowly from 1967 to 1983, reflecting low output growth and an increase in employee hours; moderate advancement is expected to continue*

ELMER S. PERSIGHEHL AND JOHN G. OLSEN

From 1967 to 1983, output per hour in the metal doors, sash, and trim industry<sup>1</sup> increased at an average annual rate of 0.9 percent. In comparison, the rate of productivity growth for all manufacturing industries during this period was 2.4 percent. The slow productivity rise reflected a relatively low output growth of 1.5 percent per year and an increase in employee hours of 0.6 percent per year. (See table 1.) The industry's demand is dependent upon residential and nonresidential building construction, where wide seasonal and cyclical fluctuations have been common. The productivity growth experienced in this industry has been aided by gradual improvements in equipment design and the increased application of easier-to-use aluminum materials.

Year-to-year changes in industry output and productivity have generally shown similar movements. Large increases in output have been associated with above average gains in productivity. For example, in 1971, output increased 11.3 percent and productivity jumped 11.3 percent. Similarly, output advanced 11.4 and 24.7 percent in 1976 and 1977, while productivity gained 4.0 and 7.6 percent. In 4 of the 6 years that output declined, productivity also fell. Despite declines in output during 1975 and 1982, productivity advanced as manufacturers were able to adjust their work force hours to meet demand changes.

---

Elmer S. Persigehl and John G. Olsen are economists in the Division of Industry Productivity and Technology Studies, Bureau of Labor Statistics.

## Subperiod productivity trends

In the metal doors, sash, and trim industry, productivity growth can be divided into two distinct periods: 1967–72 and 1972–83. From 1967 to 1972, productivity grew at a rate of 2.4 percent per year based on a gain in output at a 3.8-percent rate and an increase in hours at a 1.4-percent rate. This growth, however, reflected a slight decrease during 1967–70, with a substantial growth in 1970–72 of 6.5 percent per year. Following the economic recession of 1970, industry output grew strongly in 1971 and 1972.

Between 1972 and 1983, productivity increased at the low rate of 0.5 percent per year, reflecting an annual output growth of 1.2 percent and an increase in hours of 0.7 percent per year. This slow growth resulted from a balancing off of diverse movements. From 1972 to 1974, productivity fell at an average annual rate of 3.2 percent, but from 1975 to 1977 it rose to a rate of 5.8 percent as a result of an average increase in output of almost 18 percent per year. From 1977 to 1981, productivity again declined at a rate of 2.4 percent per year, largely as a result of the economic recession in 1980. But it rebounded in 1982 and 1983, increasing at an annual rate of 4.6 percent.

## Output

Establishments in this industry manufacture metal and metal covered doors and sash, window and door frames, screens, molding, and trim. In 1983, more than two-fifths of the industry's output consisted of doors, including garage

doors, and around one-third of window units and related items. The industry's output depends closely on building construction markets. More than four-fifths of the output was used in building construction.<sup>2</sup> Approximately two-fifths of output was used in new residential housing, including additions and alterations. One-sixth was used in new nonresidential buildings, which include educational and commercial buildings. Additionally, almost one-quarter of output was used in maintenance and repair construction on existing buildings.

In spite of several economic downturns, overall output of the metal doors, sash, and trim industry increased an average of 1.5 percent per year between 1967 and 1983. In comparison, over the same period, all manufacturing output increased an average of 2.3 percent per year.

The industry's output generally paralleled the trend for new building construction.<sup>3</sup> Between 1967 and 1972, for example, the industry's output grew at an average annual rate of 3.8 percent. In comparison, the deflated value of new building construction put in place increased 3.6 percent annually over this period. From 1972 to 1975, the industry's output fell 10.6 percent per year as the market for new buildings experienced an 11.0-percent annual decline.

Since the mid-1970's, this pattern has changed somewhat. To offset market fluctuations in new building construction, manufacturers have produced more of their output for the replacement market. In 1973, new construction accounted for about 52 percent of the value of total industry revenues.<sup>4</sup> By 1983, this market had fallen to about 40 percent of revenues. The replacement market comprised about 59 percent of revenues in 1983, rising from 46 percent in 1973. This trend is expected to continue.

**Metal doors.** One factor affecting the demand for industry output has been the wider use of metal doors. In single family housing construction, homebuilders are installing more metal than wooden doors in projects costing less than \$100,000.<sup>5</sup> According to the Architectural Aluminum Manufacturers Association (AAMA), aluminum doors accounted for more than three-fourths of all residential patio doors used in 1982. The introduction of more energy efficient metal door units along with increased consumer demand for security and fire safety, also has contributed to a shift in the type of entry door in new construction from wood to metal.

Demand for garage doors, particularly by the metal buildings industry, has grown substantially in the past 20 years. Before 1966, only 5 percent of all overhead garage doors were manufactured out of metal.<sup>6</sup> Technological advances such as the development of pre-painted doors, which have eliminated the need for on-site painting, and new insulating core materials, along with improved economies of scale, which have lowered average unit costs, have led to increased demand for metal doors. By 1980, about 90 percent of the doors installed on steel buildings were made of galvanized steel.

**Aluminum windows.** Another factor contributing to the growth of industry output has been the increasing penetration of the new housing market by manufacturers of aluminum windows. In 1967, aluminum and, to a small extent, steel windows accounted for about 55 percent of all new residential window installations, with wood making up the other 45 percent.<sup>7</sup> Except for 2 years in the mid-1970's when aluminum window prices rose relative to wooden ones, the industry's share of the window market has grown steadily to approximately 70 percent of the total in 1980.

Demand for metal windows varies from region to region and by type of building. Aluminum windows are more popular in the South and parts of the West, while wood windows are more popular in the Northeast and North Central parts of the United States. Among residential units, the use of aluminum windows is more prevalent in attached single family houses and apartments than in detached single family homes. Between 1977 and 1983, about 71 percent of new private housing starts occurred in the South and West regions. During this period, townhouses and apartments also increased their share of the new housing market. As a result, manufacturers of aluminum windows increased their share of new residential construction.

**Storm windows and doors.** The vast majority of storm windows and doors are made of aluminum. According to AAMA statistics, aluminum units comprised almost 95 percent of all storm windows and doors shipped from 1970 to 1983. Beginning in the mid-1970's, shipments increased substantially because of rising heating and cooling costs and energy tax credit incentives. Several years of high installation rates reduced the number of homes containing only single glazed windows that were available for storm window

**Table 1. Productivity and related indexes for metal doors, sash, and trim, 1967-83**

[1977 = 100]

Year	Output per employee-hour	Output	All employee hours	Employees
1967 .....	81.7	81.0	99.1	97.1
1968 .....	85.6	81.7	95.4	94.8
1969 .....	83.7	81.9	97.9	96.4
1970 .....	82.1	79.5	96.8	94.7
1971 .....	91.4	88.5	96.8	95.7
1972 .....	93.1	100.9	108.4	107.4
1973 .....	92.0	98.2	106.7	105.8
1974 .....	87.2	88.6	101.6	101.2
1975 .....	89.3	72.0	80.6	81.6
1976 .....	92.9	80.2	86.3	85.7
1977 .....	100.0	100.0	100.0	100.0
1978 .....	94.8	102.9	108.6	108.5
1979 .....	92.8	103.4	111.4	111.4
1980 .....	90.6	96.3	106.3	107.0
1981 .....	90.4	100.1	110.7	109.1
1982 .....	96.0	96.6	100.6	100.8
1983 .....	98.9	104.1	105.3	107.1
<b>Average annual rates of change (in percent)</b>				
1967-83 .....	0.9	1.5	0.6	0.7
1978-83 .....	0.9	-0.3	-1.2	-1.0

and door applications. This temporary market saturation along with a fall in new housing starts contributed to a total decline in product shipments of 53 percent from 1978 to 1982.

*Insulated doors and windows.* Since the mid-1970's, much progress has been made in the energy efficiency of door, window, and wall design. According to the Insulated Steel Door Institute, advancements in weatherstrip systems and improvements in insulating technologies for door sections has led to a reduction in heat loss of more than 40 percent. In glass areas of buildings, the best improvement has been achieved by using double glazed insulating glass. In many cases, heat loss through glass areas has been cut in half. The use of better seals and coated glass also has improved the energy efficiency of windows. These product improvements along with home energy conservation incentive programs contributed to an increase in the replacement and retrofitting of existing doors and windows with more energy efficient units. Replacement and remodeling activity has helped to sustain the industry's output by offsetting the impact of declining new building construction.

### **Employment**

Total employment in the metal doors, sash, and trim industry grew at a rate of 0.7 percent per year between 1967 and 1983. In comparison, all manufacturing industries showed no average annual change in employment over the same period. Employment growth for the industry was uneven, however, rising from 63,900 in 1967 to 70,700 in 1972, declining to 53,700 in 1975, again rising to a peak of 73,300 in 1979, and then declining again to 66,300 in 1982. The proportion of production workers fell from 75.0 percent in 1967 to 73.8 percent in 1983.

The majority of jobs in the metal doors, sash, and trim industry consisted of stamping, blanking, and forming of metals. Almost 50 percent of the production workers were engaged in these three operations.<sup>8</sup> Other main types of work in this industry consist of galvanizing iron and steel, painting, lacquering, or enameling. About 15 percent of the employees worked in these finishing occupations. About 11 percent worked in a tool and die shop. Eleven percent worked in plate or structural fabrication. About 9 percent worked in a machine shop. The remaining 8.5 percent of production workers were engaged in electroplating, heat treating, or worked in the pattern shop.

Female employees constitute an increasing proportion of the workers in the metal doors, sash, and trim industry, rising from an 18-percent share of the work force in 1967 to almost 27 percent of all industry employees in 1983.<sup>9</sup> During the period, average weekly hours of production workers declined 1 hour, from 40.6 hours in 1967 to 39.6 in 1983.

### **Capital expenditures**

Increases in capital expenditures are important and frequently contribute to advances in output per hour. During

the 1967-83 period, the annual rate of growth in new capital expenditures per employee averaged 9.2 percent in the metal doors, sash, and trim industry. In comparison, the average for all manufacturing establishments was 10.0 percent. Although the growth rate was close to the average, the level of capital expenditures per employee in this industry was less than half the level for all manufacturing industries. In 1983, the industry spent about \$1,350 per employee for new capital expenditures, compared with more than \$3,500 for all manufacturing. During 1983, the metal doors, sash, and trim industry allocated around 70 percent of capital expenditures to the purchase of new machinery and equipment. In comparison, the average for all manufacturing during 1981 (most recent year for which data is available) was more than 80 percent. The remainder was expended on new structures and plant additions.

### **Size of establishments**

In 1982, the Bureau of the Census reported a total of 1,738 establishments in the metal doors, sash, and trim industry. A small percentage of these accounted for the majority of industry shipments. Nearly 10 percent of the industry's establishments averaged more than 100 employees and generated approximately 57 percent of the industry's value of shipments. In contrast, more than one-quarter of the establishments reported four or fewer employees and accounted for only 1 percent of shipments.

The number of metal window manufacturers has increased substantially during the past 20 years. Currently, about 750 companies make prime metal windows, and 175 firms manufacture metal storm windows.<sup>10</sup> Although some large firms manufacture metal windows and doors in several establishments, most producers are small, one-plant companies that serve local or regional markets.

Metal windows usually are manufactured in a variety of custom-ordered sizes. To be responsive to special orders, manufacturers of windows generally are located near their market outlets. In 1977, the majority of metal window frames and sash produced was shipped less than 200 miles from the manufacturers' plants to their customers.

### **Technology**

Technological change in this industry during recent years has primarily consisted of modifications and improvements in existing methods and equipment.

The manufacture of aluminum framing members for window and curtain walls essentially consists of the remelting, extruding, anodizing, and fabricating of aluminum to specified dimensions. Aluminum scrap is remelted in an aluminum cast house to produce aluminum billets. To produce extruded shapes, a hydraulically operated ram forces a hot (but not molten) aluminum billet through openings in a precision-made die. The result is a fine grained extrusion conforming to the configurations and dimensions of the die. In this process, it is possible to form an infinite variety of uniform products.

Anodizing is a protective treatment used to improve the corrosive and abrasive resistance of aluminum. This treatment does not apply a coating but converts a thin layer of aluminum on the surface to an oxide that is extremely hard. In recent years, anodizing processes have been developed that result in anodic films in amber shades, ranging from light to dark. In many cases, amber colored finishes have been used in architectural work in place of clear anodizing. Anodic films developed with these processes are much harder, denser, and longer lasting than former clear anodizing finishes. Another recent modification at one plant replaced a one-step, 19 bath anodizing process with a two-step, 18–20 bath process. The two-step process which uses better controls has improved the quality of the aluminum oxide coating, and reduced energy and labor requirements for this operation.

The anodized aluminum extrusions are fitted and assembled in the factory to modular or custom sizes. The joints in aluminum windows and frames are either welded or fastened mechanically. Mortise and tenon joints, that is, joints between members at right angles to each other, are commonly used. The clip, epoxy, and stake (CES) method is often used when joints are fastened together mechanically. The clip, a type of corner fastener, is placed into the joint with epoxy. Then a machine mechanically drives the extruded sections together.

Although not widely diffused in the industry, the computer-aided design and computer-aided manufacture (CAD/CAM) system have been introduced into the operations of some plants. This technology uses computers to assist in developing designs for products to be manufactured. It is most feasible for large plants which have a sizable volume of fabricating work, generally destined for the commercial building sector. The CAD/CAM system has improved design

analysis and cut unit labor requirements for skilled drafters through its greater sophistication, accuracy, and operation speed.

A recent equipment improvement has been the introduction of programmable controllers into new machines that perform complex operations. These electrical testing devices that replace limit switches allow the source of electrical problems to be more easily located, thereby reducing machine downtime. Another equipment improvement has been the development of drilling machines that drill holes of different configurations. Compared with previously used equipment, these machines reduce set up time, and thus, lower unit labor requirements.

### Outlook

As indicated earlier, short-term changes in productivity generally reflect changes in output and output in this industry is directly related to trends in residential and nonresidential building construction. According to macroeconomic projections by the U.S. Department of Commerce, building construction should continue to grow during the next 5 years. Private nonresidential construction is expected to increase in quantity and value put in place. The number of residential units built is expected to level off. Because of increases in the average size per unit, however, the value of residential construction put in place is expected to grow slightly. Based on these projections, the demand for the metal doors, sash, and trim industry's products should also rise during the next 5 years. This projection, along with the experience over the 1967–83 period, suggests that productivity should continue to advance moderately. Wider adoption of recent innovations, particularly among large manufacturers, should also contribute to the growth of labor productivity. □

### FOOTNOTES

<sup>1</sup> The metal doors, sash, and trim industry is classified as SIC 3442 in the *Standard Industrial Classification Manual 1972* and its 1977 supplement, issued by the U.S. Office of Management and Budget. This industry includes establishments primarily engaged in manufacturing ferrous and nonferrous metal and metal covered doors and sash, window and door frames, and screens, molding, and trim.

<sup>2</sup> *The Detailed Input-Output Structure of the U.S. Economy 1977, Volume 1, The Use and Make of Commodities by Industries 1977* (U.S. Department of Commerce, 1984), pp. 17–35.

<sup>3</sup> This output measure includes the value of new private residential buildings, new private nonresidential buildings, and new public buildings put in place, in constant 1977 dollars. See *Construction Review*, International Trade Administration, July–August, 1983, pp. 9–15.

<sup>4</sup> "Prospects Good for Metal Doors, Windows, Study Says," *Metal Building News*, May 1984, p. 41.

<sup>5</sup> "Sales Power of Doors and Windows," *Professional Builder*, June 1980, p. 122.

<sup>6</sup> "Metal Builders and the Overhead Door Industry," *Metal Building Review*, October 1984, pp. 24, 64, and 65.

<sup>7</sup> See Architectural Aluminum Manufacturers Association, *Architectural Aluminum Industry Statistical Review 1980, 1981*, p. 20.

<sup>8</sup> Computed from survey material in the *1977 Census of Manufactures*, Vol. I, Table 3, "Selected Metal Working Operations by Industry," pp. 10–27.

<sup>9</sup> See *Employment and Earnings, United States, 1909–79*, Bulletin 1312–11 (Bureau of Labor Statistics, July 1979); and *Supplement to Employment and Earnings, United States, 1909–78* (Bureau of Labor Statistics, July 1985).

<sup>10</sup> "Market Trends in the U.S. Window Industry," *Construction Review*, International Trade Administration, January–February 1984, p. 3.



## APPENDIX: Measurement techniques and limitations

The productivity indexes in this study measure the change over time in industry output per unit of labor input. They do not measure the specific contribution of labor, but reflect the influence of many factors such as technology, capital investment, and managerial skills, as well as the skill and effort of the work force.

The output index is based on value of shipments data adjusted for inventory change, published by the Bureau of the Census. Detailed data from the Census of Manufactures for 1967, 1972, 1977, and 1982 were used to derive benchmark indexes, to which the annual indexes for intervening years, based on the Annual Survey of Manufactures, were adjusted. The value of shipments of the various product classes were adjusted for price changes by appropriate Producer Price Indexes to derive a real output measure. These, in turn, were combined with employee hour weights to derive the overall output measure. Employment and employee hour indexes were derived from census data. Employees and employee hours are considered homogeneous and additive, and thus do not reflect changes in the qualitative aspects of labor, such as skill and experience of persons constituting the aggregate.

Data on the quantities of goods produced by the metal doors, sash, and trim industry are not complete. Real out-

put, therefore, was estimated on the basis of a deflated value technique. That is, changes in the price levels of the current dollar value of production were removed by means of appropriate price indexes. Because an adjustment for changing price levels usually lowers the dollar value, such a series is referred to as a deflated value measure. In an industry such as the metal doors, sash, and trim industry, where the raw material may differ from one product to the next, this technique may result in some bias in the measure. However, the bias is minimal.

To combine segments of the output measure, employee hour weights relating to the individual segments were used. This technique was used at various levels of subaggregation for the variety of products manufactured by this industry. These procedures result in a final output index that is conceptually close to the preferred output measure.

Indexes of output per employee-hour relate total output to one input of labor time. The indexes do not measure the specific contribution of labor, capital, and any other single factor. Rather, they reflect the joint effects of such factors as changes in technology, capital investment, capacity utilization, shop design and layout, skill and effort of the work force, managerial ability, and labor-management relations.

---

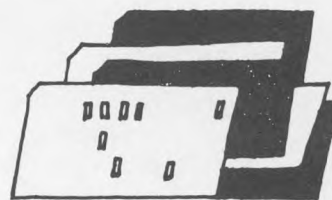
### Verifying basic skills

Employers report in survey after survey that what they are seeking in young employees is, first, the basic skills needed to learn on the job, and, second, the dependability and world-of-work skills to show up on time and follow instructions. Vocational skills are less frequently required, although important for some jobs such as secretarial work. Employers do not usually give academic or other tests, and have little basis for judging the dependability of those with limited work experience, so they judge on the basis of academic credentials and other considerations such as vouching by acquaintances or relatives, best bets based on previous experiences with similar individuals, or prejudice. Employment and training programs recruit and serve those unable to secure jobs in the private sector. Unless these enrollees attain academic credentials recognized by employers, or are sorted so that those who prove to be dependable and trainable are identified, participants who are disadvantaged at entry will be equally disadvantaged at exit.

—NATIONAL COUNCIL ON EMPLOYMENT POLICY  
*Investing in America's Future: A Policy Statement*  
by the National Council on Employment Policy  
(Washington, National Council  
on Employment Policy, 1984), pp. 24–25.

# Research Summaries

---



## Minimum wage stability affects shirt and nightwear industry pay

Absence of change in the Federal minimum wage during the May 1981–84 survey period helps to explain the relatively modest wage gains of production and related workers in the men's and boy's shirts and nightwear manufacturing industry. Straight-time earnings averaged \$4.68 an hour in May 1984, according to the latest Bureau of Labor Statistics survey.<sup>1</sup> This was 11 percent above the \$4.23 recorded in a similar survey conducted in May 1981—an increase averaging 3.4 percent a year.<sup>2</sup> By comparison, wages and salaries in all nondurable goods manufacturing as reported by the Bureau's Employment Cost Index rose 17.1 percent, or 5.4 percent a year, during the 3 years ending in the second quarter of 1984.

In establishments employing about half of the industry's production workers in May 1984, pay was linked to the minimum wage by a policy of adjusting wage rates for all jobs to reflect changes in the statutory minimum. (See table 1.)

A more moderate rate of inflation between May 1981 and May 1984 also helps to explain the shirt industry's pace of wage increases. The Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) rose 13.5 percent, or 4.3 percent a year, at a time when one-fifth of the shirt workers were under collective bargaining agreements providing for cost-of-living wage adjustments.

Workers in the Southeast, who accounted for seven-tenths of the production work force, averaged \$4.62 an hour in May 1984. Among the other five regions studied separately,<sup>3</sup> average hourly earnings were highest in New England (\$5.43) and lowest in the Southwest (\$4.17).

Hourly earnings of more than 64,000 workers covered by the study ranged from the minimum wage of \$3.35 to \$9 and over. The middle 50 percent of the workers earned between \$3.68 and \$5.42 an hour. About 14 percent of the workers earned within 5 cents of the Federal minimum wage, down from 22 percent in 1981.

Among the 23 occupational classifications selected to represent the shirtmaking process, average hourly earnings ranged from \$7.49 for sewing-machine adjusters to \$4.03 for thread trimmers. Machine cutters (\$6.18) and markers

(\$5.57) were the only other jobs studied separately with hourly averages over \$5.50. Sewing-machine operators, by far the largest occupational group studied, with nearly 37,000 workers, averaged \$4.59 an hour. Averages for the other jobs with more than 2,000 workers were \$4.66 for combination final inspectors and thread trimmers, \$4.62 for garment folders, and \$4.48 for finish pressers.

Occupational pay levels varied widely by region. While pay levels typically exceeded the national averages by 15 to 25 percent in New England and by 5 to 15 percent in the Border States and Middle Atlantic States, occupational averages in the Southeast and Pacific generally fell slightly below the national levels, and those in the Southwest were usually 10 to 20 percent below. Regional pay patterns, however, were not consistent among individual jobs. For example, shipping clerks in the Border States averaged 48 percent more than those in the Southwest, but clicker-machine operators (who cut or stamp small pieces of various shapes from material or cardboard) in the latter region averaged 9 percent more than those in the Border States.

Occupational pay levels were generally higher in metropolitan than in nonmetropolitan areas, in plants with at least 250 employees than in smaller establishments, in union plants than in nonunion plants, and in establishments primarily making dress shirts than in those principally making sport shirts.

Extensive use of incentive pay plans, notably piece rate systems, contributed to wide ranges of rates within an occupation and area. Incentive earnings vary according to work experience, effort, work flow, and other factors which the worker may or may not control. Workers paid under incentive systems, four-fifths of the production workers, usually averaged from 10 to 15 percent more than time-rated workers in the same occupation. Incentive workers accounted for virtually all of the sewing-machine operators and were also predominant among the other sewing and finishing occupations. Workers paid on a time-rated basis, however, were predominant among sewing-machine adjusters, janitors, shipping clerks, and work distributors.

Virtually all production workers were in establishments with formal provisions for paid holidays and vacations. Three-fifths of the workers received 5 to 8 holidays annually; while nearly three-tenths—mainly workers under contracts negotiated by the Amalgamated Clothing and Textile

Workers Union (ACTWU)—were entitled to 10 holidays. Vacation plans in the industry typically provided 1 week of pay after 1 year of service, 2 or more weeks' pay after 3 years of service, and 3 weeks after 10 years. About one-fifth of the workers could receive 3 weeks after 1 year of service. Most of these workers were in plants covered by the ACTWU plan, which provides for a 2-week summer vacation for employees with 1 year of service (1 week after 6 months) and a 1-week winter vacation for employees with 1 year of service.

Life, hospitalization, and surgical insurance were provided for about nine-tenths of the workers. At least three-fifths of the workers were covered by accidental death and dismemberment insurance and basic medical and major medical plans. Slightly more than one-half were included in private pension plans, nearly all of which were paid for entirely by the employer. Paid funeral leave was available to seven-tenths of the workers and jury-duty pay to nearly three-fifths.

The study included establishments engaged primarily in manufacturing men's, youth's, and boys' shirts (including polo and sport shirts) and nightwear, cut and sewn from purchased woven or knit fabric. In May 1984, establishments within the scope of the survey—those with 20 workers or more—employed 64,789 production workers. This is almost exactly the same number of workers reported in 1981 and breaks a pattern of decline reported in similar BLS studies since 1964. In 1984, about one-half of the production workers were in establishments primarily making sport shirts. Plants making dress shirts accounted for just under two-fifths of the work force.

In addition to the six major regions studied, separate data were obtained for nine States and three local areas. These localities employed slightly more than four-fifths of the industry's production workers. Among the States, employment ranged from 10,500 in North Carolina to about 600 in Maryland.

The Bureau's eight regional offices will provide free of charge, while the supply lasts, separate releases issued earlier for the following States and areas: Alabama; Georgia; Maryland; Mississippi; North Carolina; Pennsylvania; South Carolina; Tennessee; Virginia; Allentown-Bethle-

hem-Easton, PA-NJ; Los Angeles-Long Beach, CA; and Pottsville-Shamokin, PA. A comprehensive bulletin, *Industry Wage Survey: Men's and Boys' Shirts and Nightwear, May 1984*, Bulletin 2232, is for sale by the Superintendent of Documents, Washington 20402.

—FOOTNOTES—

<sup>1</sup>Earnings data exclude premium pay for overtime and for work on weekends, holidays, and late shifts.

<sup>2</sup>For a report on the earlier survey, see *Industry Wage Survey: Men's and Boys' Shirts and Nightwear, May 1981*, BLS Bulletin 2131 (Bureau of Labor Statistics).

<sup>3</sup>New England, Middle Atlantic States, Border States, Southwest, and Pacific States.

## Expert panel offers suggestions on 1990 census methodology

Pursuant to a 1982 recommendation by the American Statistical Association, the Committee on National Statistics of the National Research Council established a panel under the aegis of the Census Bureau to make recommendations on methodology for the 1990 decennial census. Formally designated the Panel on Decennial Census Methodology, this group of experts was charged with suggesting research, experiments, and new methods and with guiding the Census Bureau in evaluating alternative techniques. Their work continued the longstanding policy of evaluating the results of the most recent census with a view toward resolving problems and testing new procedures well before the next census is undertaken.

The final report of the panel, *The Bicentennial Census: New Directions for Methodology in 1990*, was published in 1985. The 404-page volume first examines the history of the decennial census, noting particularly the great expansion in usage of census data since the first national study was conducted in 1790 and concomitant growth in numbers of criticisms of census procedures and results. Against this background, the authors present an analysis of existing problems with census methodology and propose solutions.

The major issues confronted in the most recent round of methodology review involved: (1) the proper adjustment of census counts and characteristics; (2) the appropriateness of sampling techniques within a census framework; and (3) the possible use of administrative records to improve the accuracy of census counts and the efficiency of census operations. In developing its recommendations, the panel considered the stated goal of the Census Bureau to develop better and more timely estimates for 1990 without an appreciable increase in per-housing-unit costs over 1980 levels. Following are selected recommendations from the final report:

**Table 1. Average hourly earnings and percent change in men's and boy's shirts and nightwear and Federal minimum wage levels, selected years, 1964-84**

Survey date	Average hourly earnings		Federal minimum	
	Level	Percent change <sup>1</sup>	Level	Percent change <sup>1</sup>
May 1984 . . . .	\$4.68	11	\$3.35	0
May 1981 . . . .	4.23	29	3.35	26
May 1978 . . . .	3.28	29	2.65	32.5
June 1974 . . . .	2.54	24	2.00	25
October 1971 . .	2.05	12	1.60	0
October 1968 . .	1.83	26	1.60	28
June 1964 . . . .	1.45	—	1.25	—

<sup>1</sup>Percent change from previous period.

- That the Census Bureau assess the need for a mid-decade census, particularly by studying the effect of errors in postcensal population estimates compared with errors in the decennial census on major data uses. Unless these studies do not support the value of a mid-decade census, the Bureau should make every effort to secure funding for a census in 1995.
- That the Bureau prune its proposed research and testing program for 1986 by deferring certain projects until 1987 or later and by forgoing research on proposals that are unlikely to be implemented in the 1990 study or that appear to hold little promise based on previous census experience or other survey research results. Other cut-backs might be accomplished by making fuller use of 1980 census data and experimental results. To this end, the Bureau should assign a high priority to the completion of 1980 census methodology studies and further analysis of 1980 data.
- That the Bureau assign a high priority to the completion of studies of undercount and overcount of various population groups in the 1980 census. A variety of question designs for sensitive race and ethnicity information should be tested for the 1990 study, including some that combine the collection of information on Hispanic origin with other race and ethnicity information. The report also recommends that the Census Bureau, the National Center for Health Statistics, and other Federal agencies work closely together to design questions and response editing rules on race and ethnicity that minimize conceptual differences between census and vital statistics records.
- That the Census Bureau not pursue research on or testing of a sample survey as a replacement for complete enumeration in 1990. This recommendation reflects the panel's belief that a large sample survey would result in less complete coverage than a census, and that there would be only minor cost savings in sampling on the scale necessary for satisfaction of present demands for small-area data from the census. However, the Bureau should include in its 1987 pretest program the testing of sampling for the follow-up of households that do not return their questionnaires. Sampling could prove cost-effective in the final stages of follow-up, where it becomes very expensive to count an additional person.
- Given the likelihood that the census will continue to produce different rates of undercoverage for various population groups, it is recommended that work proceed on the development of adjustment procedures and that adjustment be implemented if there is reasonable confidence that it will reduce differential coverage errors. The Census Bureau should also explore methods for providing estimates of errors associated with estimates of census over- and undercoverage, with a view to publishing such error estimates along with coverage evaluation results and any adjusted census data that may be issued.
- That the Census Bureau conduct research and testing in the area of improved accuracy of responses to content items (income, utility costs, and so forth) in the census. Further, the content improvement procedures examined should not be limited to reinterviews of samples of respondents, but should also include the use of administrative records. A specific recommendation urges the Bureau to investigate the cost and feasibility of obtaining data on housing structure items through alternative uses of local administrative records.

Copies of the full report of the Panel on Decennial Census Methodology, edited by Constance F. Citro and Michael L. Cohen, may be purchased from the National Academy Press, Washington, DC. Price: \$23.95. □

# Foreign Labor Developments



## International experiences with technological change

STEVEN DEUTSCH

Most industrial nations are concerned with the impact of microelectronics and technological change on the work force. In many instances, reports from national commissions, such as the Canadian Task Force on Microelectronics and Employment and the Swedish Computer Commission, have attempted to identify and address problems that can arise when new technology is introduced. These reports often lead to legislative solutions to the problems of new technology that are consistent with the larger role played by government in many countries in shaping the conditions at the workplace and the role of labor and management.

In countries with collective bargaining systems similar to the United States, there is evidence of growing reliance on some governmental mechanisms. For example, the Canadian Task Force on Microelectronics and Employment suggested the establishment of mandatory labor-management technology committees in all places of employment with more than 50 employees. These committees would "deal with issues such as training, retraining, redundancy, work-sharing, productivity improvements, and other matters related to technological change at the workplace."<sup>1</sup> A review of the pattern in most industrial nations reveals varying blends of governmental legislation and collectively bargained labor-management agreements.<sup>2</sup>

This reflects not only the tendency to involve government in labor-management relations, but also the relative size of the unionized labor force and the power of labor political parties. The percentage of the labor force which is unionized varies considerably among industrialized nations: United States, 22 percent; France, 28 percent; Japan, 33 percent; Germany, 42 percent; United Kingdom, 55 percent; Australia, 56 percent; Belgium, 79 percent; and Sweden, 83 percent.<sup>3</sup> Most of these nations have a labor party which tends to wed collective bargaining strategies to political and legislative agendas. For example, the Swedish Labor Feder-

ation, through the Social Democratic Party, has been successful in gaining governmental approval for legislative changes concerning job security, labor market policies (including advance notification and government subsidies to assure full employment), worker representation on corporate boards, joint consultation between management and labor (co-determination), empowering workers to improve work environments, and the establishment of wage earner funds to give workers gradual ownership and economic influence in the enterprise.<sup>4</sup>

There are many variations in the relative importance of collective bargaining versus legislative approaches, but even in England, Canada, or Australia, where there are strong traditions of deferral to bargaining, in recent years, the government has been active on issues of worker participation and technology.<sup>5</sup>

### Adversarial relations

*England.* Concern with technology was already well developed in England in the 1970's, prior to the resurgence of interest in the United States. Primarily, union-initiated proposed technology agreements with employers dealt with the basic questions of advance notification, job security, training and retraining, worker involvement in technological change, and design and implementation. However, "while unions in Britain have generally recognized the need to extend the scope of collective bargaining in order to influence the introduction of new technology, few have succeeded in achieving this end."<sup>6</sup> The reason for this lies largely in the tension over the short-term strategy of worker involvement in planning. In 1982, a group at the University of Aston examined a large number of English technology agreements and collective bargaining contracts; they concluded that, "To date, it is the defensive/reaction strategy that has predominated."<sup>7</sup>

Compounding the problem today are the troubled economic situation in Britain and the deterioration of labor relations in that country. High unemployment and bitter labor-management disputes overshadow cooperative developments and the substantial number of successfully negotiated agreements which provide for joint efforts and worker involvement in the change process. While the language in many of the agreements is suggestive of what should be implemented, such agreements will work best in a full

Steven Deutsch is director of the Center of the Study of Work, Economy, and Community and professor of sociology, University of Oregon.

employment economy and one in which the spirit of cooperation prevails—features both lacking in England today.

*Australia.* The Australian situation has paralleled that in many other industrial countries. In 1980, the government established the Committee of Inquiry into Technological Change in Australia. The committee made proposals to reform aspects of Australia's industrial relations system in such a way as to provide incentives for unions and employees to cooperate with employers in the introduction of technological change. However, the reality since has failed to see these fully materialize. The overall picture is characterized by leading industrial relations analysts in Australia:

. . . although governments, employees and unions have agreed about the need to introduce technological change without causing undue social and economic hardship, this consensus appears to have had little impact on the manner in which changes have been implemented. The majority of employers have introduced new technology without consulting their employees in advance; most unions have been ill-equipped or unprepared to assume a more assertive or interventionist role; and industrial tribunals, by and large, have been unwilling to interfere with managerial rights or prerogatives in this field. These factors have exacerbated conflict in the workplace as, in many cases, traditional patterns of work have been upset, wage relativities have been disturbed and job security has been decreased.<sup>8</sup>

As in the case of England, Australia has had a number of negotiated technology agreements on the primary issues of job security, work organization, work environment, and methods of work involvement. The Australian Council of Trade Unions, just as the Trades Union Congress in England, has passed official statements on technology, disseminated model contract clauses for unions, and conducted technology training for its membership. Nevertheless, the conclusion stated above illustrates the reason for the gap between the ideal and actual practice.

*Canada.* The U.S. industrial relations system shares some features with those of England, Australia, and Canada. These are traditions which have created a decentralized union structure with a large number of separate unions and individual negotiating situations. It is a system dependent on free collective bargaining with modest governmental intervention outside broad framework laws, and an ideology which tends to emphasize traditional managerial prerogatives and conflicts of interest between management and labor. Canada's experience is especially relevant for the United States because of geographical proximity, the role of U.S. firms in the Canadian economy, and the linked bargaining across the border (international unions in this country typically include Canadian affiliates).

Provincial laws on work environment have been patterned, in part, after Scandinavian models. For example, joint labor-management health and safety committees were mandatory in Saskatchewan in the 1970's, during which a climate of worker participation was cultivated.

In the Canadian Postal Service, where labor relations have been erratic in recent years, the following agreement over technological change notification was negotiated:

. . . the Employer agrees to notify the Union as far as possible in advance of his intention and to update the information provided as new developments arise and modifications are made . . . the Employer shall provide the Union, at least 120 days before the introduction of a technological change, with a detailed description of the project it intends to carry out, disclosing all foreseeable effects and repercussions on employees.<sup>9</sup>

A 1-year minimum advance notice currently is specified in the contract negotiated by Saskatchewan Telephone and Communication Workers of Canada, with a range of other time periods given in various contracts. Following notice by the employer to the union, the next step defines the role the union and workers will take in decisions affecting technological change. Many contracts spell out the establishment of joint labor-management committees to consult, plan, and execute programs of technological change, including issues of relocation and retraining of workers. Recently, the National Association of Broadcasting Corporation agreed that, "No employee who has completed his probationary period as of the date of execution of this Agreement will be laid off or suffer a reduction in salary during the term of this Agreement because of the introduction of new or modified equipment and/or associated changes in methods of operation."<sup>10</sup>

Involvement of the work force in the design and implementation of new technology has been a significant part of the Canadian labor relations scene in recent years, especially in the case of office automation and video display terminals (VDT's). The Canadian Union of Public Employees and the United Way of the Lower Mainland, British Columbia, have a contract which stipulates:

The selection and installation of equipment shall be done in consultation with the affected employees. The installation shall also involve consultation directed towards assuring that all 'ergonomic' factors are dealt with satisfactorily.<sup>11</sup>

The Newspaper Guild Local 115 and Suburban Press, Ltd., have a memorandum of agreement which states that "If an employee has been operating a VDT in the final two hours of a shift, the employee shall not be required to operate a VDT less than 30 minutes before leaving the plant."<sup>12</sup> Other provisions in this agreement deal with inspecting each VDT for radiation emissions. Several Canadian labor agreements, including those which cover the Newspaper Guild and Communications Workers, specify that women workers during pregnancy may have the option of being rotated onto a non-VDT job. This last provision is controversial because scientific data have not conclusively demonstrated danger during pregnancy caused by working on a VDT. However, the concern has been pushed by workers and some of the Canadian unions who have won such agreements from employers. An equivalent level of concern exists in the United States and a similar provision for pregnant women is being pursued in some contract negotiations.

## European Community: joint efforts

There are considerable variations in the pattern of labor relations abroad. Nations in the European Community have agreed to some coordinated policies which have influenced various aspects of cooperation, including sharing corporate economic data with the workers, and worker and union involvement in work organization decisionmaking. As of 1984, the European Community is “. . . examining with both sides of industry the best way and at what level to introduce basic principles on the information and consultation of workers affected by the introduction of new technologies, while taking account of practices and procedures already applied in the Member States.”<sup>13</sup>

In the past, many European unions have been more aggressive than those in the United States; this is particularly true for the issues of advance notification, joint participation in workplace design and the introduction of new technology, protection of jobs and programs for relocation, retraining, and other means of cushioning the effects of job loss.<sup>14</sup> At the same time, the industrial relations climate in much of Europe has been supportive of some participative and joint labor-management approaches to addressing issues of technological change. Both management and labor have generally agreed that the new technology offers an excellent opportunity for work redesign so as to eliminate boredom and monotony and facilitate the creation of semi-autonomous work groups with greater worker influence. “The technology-optimistic attitude, which was distinctive of the years of prosperity up through the sixties, could be found in all European countries; technology was unequivocally seen as a, and often the most important, remedy for securing full employment and greater welfare for union members.”<sup>15</sup> The economic crisis of the later 1970’s and early 1980’s has altered some of the earlier optimistic viewpoints and a more recent opinion suggests that, “There is considerable evidence that automation has outpaced the ability of managements and trade unions to control, much less to optimize, its [technology’s] implications for quality of work life, at least for very large numbers of enterprises.”<sup>16</sup>

A recent OECD study revealed: “A common theme of many of the reports is that new technology can yield great benefits. The question, who receives the benefits and who carries the burden of the costs?”<sup>17</sup> The report then presents as a possible model the Norwegian Data Agreement which provides for workers affected by the new information technology to be informed and consulted.

## Historically cooperative relations

*Norway and Sweden.* The Norwegian developments are seen as an integration of the legislative approach to improve the work environment and the negotiation process involving unions and employers to implement particular means whereby workers and their representatives have authentic

influence over the introduction of new technology and work organization.<sup>18</sup> Parts of Section 12 of the 1977 Norwegian Work Environment Act are very informative:

- *General requirements.* Technology, organization of the work, working hours and wage systems shall be set up so that the employees are not exposed to undesirable physical or mental strain and so that their possibilities of displaying caution and observing safety measures are not impaired.

Conditions shall be arranged so that employees are afforded reasonable opportunity for professional and personal development through their work.

- *Arrangements of work.* The individual employee’s opportunity for self-determination and professional responsibility shall be taken into consideration when planning and arranging the work. Efforts shall be made to avoid undiversified, repetitive work and work that is governed by machine or conveyor belt in such a manner that the employees themselves are prevented from varying the speed of the work. Otherwise efforts shall be made to arrange the work so as to provide possibilities for variation and for contact with others, for connection between individual job assignments, and for employees to keep themselves informed about production requirements and results.
- *Control and planning systems.* The employees and their elected union representatives shall be kept informed about the systems employed for planning and effecting the work and about planned changes in such systems. They shall be given the training necessary to enable them to learn these systems, and they shall take part in planning them.<sup>19</sup>

What this language specifies is an obligatory information-sharing process whereby workers cooperate with management in advance of the introduction of significant changes in technology, work organization, and job design. It is predicated on research which indicates that a cooperative approach will indeed continuously improve the work environment. It is a perspective which has had a good deal of impact on the thinking of practitioners and policymakers throughout the world.<sup>20</sup>

It would be a mistake to judge the Norwegian or Swedish approaches as being unqualified successes; however, they are interesting models of how the issues of work organization, technology, and labor-management relations have been addressed. In the Norwegian case, the broad Work Environment Act obliges employers to consult with workers and their representatives and sets up a joint approach to planning. In Norway, with more than a decade of experience, professional computer and technology experts serve as consultants for large unions who are planning a better working environment and actively and competently engage with management in such work-systems development.<sup>21</sup> In Scan-

dinavia, the unions have endorsed the new technologies, but they have actively worked on their own research and development with the aid of outside experts. For example, the Nordic Graphic Arts Workers Union Confederation has been designing a model high tech work environment, using microelectronic graphic arts equipment and computer-aided design. With consultants from the Swedish Center for Working Life and others, they have worked out the best situation from a worker viewpoint, while satisfying managerial and organizational goals of cost effectiveness and productivity.<sup>22</sup> In other instances, Swedish unions, under the 1976 Co-determination Act, have gained an employer commitment to actively involve workers in the planning of new technology systems. For postal social insurance office workers, it was clear from the beginning of the work system design that their concerns, which included the quality of service to the clients with whom they interacted, would be taken into account.<sup>23</sup>

In a 1979 agreement, the Swedish postal workers used the introduction of new technology and work reorganization as a means of improving the work environment. Approximately 4,700 women work in the central post office in Stockholm, and the technological and operational changes initially proposed threatened between 500 and 600 jobs. The union and management agreed on the goals of improved working environment, improved content of work, preserved level of employment, and development of new products and improved service to clients.<sup>24</sup>

In 1982, an "Agreement of Efficiency and Participation" was signed by the Swedish employers' federation (SAF) and the blue-collar (LO) and white-collar (PTK) union federations. It recognized the need for efficiency and productivity if Swedish enterprise was to be more competitive in the international markets; it also detailed some of the means of implementing technological change to achieve these goals. The paragraph dealing with technical development states:

*Item 1. General direction.* The parties are agreed that day-to-day as well as more far-reaching technical modernization offers many opportunities that must be taken to enable the company to survive, achieve success and therefore also safeguard jobs and employment. Capital expenditure makes it possible to improve productivity as well as creating opportunities to introduce new production systems, utilize modern technology, develop the expertise and skills of employees, and thereby increase the competitiveness of company.

*Item 2. Stimulating work.* In the event of technical change, a sound job content shall be the goal, together with opportunities for the employees to increase their skills and accept responsibility for their work. The knowledge of the employees should be stimulated together with their ability to cooperate with and have contact with their colleagues.

*Item 3. Major changes.* When technical change that involves major changes for the employees is being planned, the trade union organizations shall participate. Such participation shall take place in accordance with the provisions in [sections 7 and 8].

The employer shall describe the considerations underlying the new technology, and the technical, financial/economic, work environmental, and employment consequences that can be foreseen and possibly make proposals for appointing project groups.

*Item 4. Training information.* It is important that the employees are given opportunities for further development of their vocational expertise and skills. The company shall make available as early as possible training for the new jobs that technical change will involve. Such training shall be provided at the expense of the company and on unchanged pay and employment conditions.

According to the authors of the document, "LO, SAF, and PTK are in agreement about the need for increased knowledge and responsibility and the need to support those affected by technological change."<sup>25</sup>

A number of work redesign experiments were initiated in Norway and in Sweden in the late 1960's and early 1970's. Many of these cases have been widely discussed. What is more critical is to see what *post hoc* assessments tell about the patterns of cooperative labor-management relations as applied to changing technology and the workplace. A leading analysis by the Swedish Employers' Federation concludes:

If we glance quickly at the significant developments of the 1970's, we are struck by the fact that a large part of the evolution of our thinking regarding work organization and job content has arisen in connection with technological changes. In many cases, new organizational principles have scored genuine breakthroughs only when ways have been found to change material flows, machine grouping, work environments and design of factories.

An important explanation of why the demand for better jobs could have such a large concrete effect on production methods in the 1970's is that it is only recently that new demands for job satisfaction and job content could be met with demonstrably superior technical measures. And *it is only when practitioners out in the factories can be involved in these questions that technology can be changed in such a way as to provide new types of work organization and job content* (emphasis added).<sup>26</sup>

The Swedish process is designed to mutually benefit all parties. Swedish workers and unions have supported the application of the most advanced technology; in fact, Sweden leads the world in *per capita* use of robots today.<sup>27</sup> The system has allowed employers to increase efficiency and productivity, and thus helped maintain their competitive role in such world market industries as auto production and finished steel products. Employees have been involved in planning changes in the work environment and have considerable job security and a range of training programs, including those negotiated with employers.

In both Norway and Sweden, broad framework laws, passed by the Federal Government and then subject to local agreement or implementation, have served as the major device for engaging a cooperative approach to technological change by labor and management. Both parties have accepted the desirability of new technology and have decided



that solving problems in the work environment and designing and implementing the best system require joint efforts. The differences between Scandinavian and U.S. positions on technology and labor relations are considerable. These distinctions are influenced by the size of the public sector, proportion of the labor force organized into unions, and governmental policies and programs. With particular regard to Sweden, a leading American trade union researcher states:

... one of the distinguishing features is the breadth and depth of the activities in Sweden, involving trade unions, employers and governmental agencies. In the U.S., only the unions have shown consistent interest in the human problems associated with workplace technological change . . . the main lessons Americans can learn, are related to the *values* underlying the experiments and the many accomplishments of the Swedish approach. Chief among them appears to be a real concern for the welfare of individuals, which naturally extends to the workplace and the quality of work performed there. Jobs not only must provide a decent income, but also should be responsible and intellectually satisfying, to the greatest extent possible; if new technologies bring major changes, then adequate training must be provided; and above all, representatives of affected employees might be actively involved in all stages of the process of change, from initial planning through final implementation and evaluation.<sup>28</sup>

*Japan.* U.S. industries have surveyed the Japanese system of industrial relations, productivity, and quality control circles. One analyst has concluded that it is a system of ". . . predecision joint consultation to solve the problems of manpower and employment due to drastic technological changes, developed around 1960, and . . . built up to become a basic part of the later Japanese industrial relations. . . . This practice often takes the place of collective bargaining in Japanese industry."<sup>29</sup>

One rare example of a formal technology agreement is that between the Nissan Motor Co. and the Nissan Motor Workers' Union. All 3,000 workers at Nissan's Zama plant participated in quality circles at the time robots were intro-

duced in the 1970's and early 1980's, but the technology agreement only came into being in 1983. However, it does contain a clause which states, "in introducing new technology, the Company shall inform the Union in advance of the introduction of the program, possible effects on union members and proposals of countermeasures against such effects, and hold prior consultations with the Union." Also, "The Company shall neither dismiss nor layoff union members for reasons of the introduction of new technology."<sup>30</sup> Additional provisions address new technology in relation to safety and health, education and training programs, and necessary reassignments and job changes. What is critical is the transition from an earlier joint labor-management consultative agreement (1955) to this new technology agreement which specifically stipulates that the company will provide advance notification, job security, retraining, and the like. Whether this is the beginning of a new pattern in Japanese labor relations remains to be seen.

IN SUMMARY, most other industrial nations have shown greater interest and concern regarding new technology in recent years than has the United States. Unions in those countries have also acquired considerable experience in working out technology agreements and negotiating successfully in various industries.

In countries with a history of cooperation in labor-management relationships, there seems to be a more institutionalized joint approach to dealing with technological change than in those nations, such as the United States, with a tradition of more adversarial labor relations. Technological considerations have been identified in some countries as a critical factor in legislation mandating joint labor-management approaches at the workplace. Whether in the form of work environment legislation or codetermination laws, such regulations nearly always provide for consultation and participation by workers and their representatives in planning and executing technological and organizational design. □

—FOOTNOTES—

<sup>1</sup> Harish Jain, "Task force encourages diffusion of microelectronics in Canada," *Monthly Labor Review*, October 1983, p. 26.

<sup>2</sup> See "Work Organization and the Introduction of New Technology: A Survey of Legislative and Collective Agreements in Industrialized Countries," in *Automation, Work Organization and Occupational Stress* (Washington, International Labor Organization, 1984).

<sup>3</sup> These data are for the year 1978 and are from a U.S. Department of Labor report cited in Ira Magaziner and Robert Reich, *Minding America's Business* (New York, Vintage Press, 1983), p. 146.

<sup>4</sup> This is outlined in Sandra Albrecht and Steven Deutsch, "The Challenge of Economic Democracy—The Case of Sweden," *Economic and Industrial Democracy*, August 1983, pp. 287-320.

<sup>5</sup> A useful review is given in Everett Kassalow, "Industrial Democracy and Collective Bargaining: A Comparative View," *Labour and Society*, September 1982, pp. 209-29. See also, Greg Bamber, "Microchips and Industrial Relations," *Industrial Relations Journal*, November-December

1980, pp. 7-19; and Russell Lansbury and Edward Davis, eds., *Technology, Work and Industrial Relations* (Melbourne, Longman Cheshire, 1984).

<sup>6</sup> Greg Bamber and Russell Lansbury, "Labor-Management Relations and Technological Change: Some International Comparisons Between Australia and Britain," *Labor Law Journal*, August 1983, p. 522.

<sup>7</sup> Robin Williams and others, "Technology Agreements: Consensus, Control and Technical Change in the Workplace," in *Information Society: For Richer, For Poorer* (European Economic Community, Amsterdam, North-Holland, 1982), p. 260.

<sup>8</sup> Russell Lansbury and Edward Davis, "Technological Change and Industrial Relations in Australia," in Lansbury and Davis, *Technology, Work and Industrial Relations*, p. 3.

<sup>9</sup> Canadian Labour Congress, *Tech Change: A Handbook for Negotiators* (Ottawa, Canadian Labour Congress, 1984), p. 10.

<sup>10</sup> Susan Attenborough, *Microtechnology* (Ottawa, National Union of Provincial Government Employees, 1982), p. 36.

<sup>11</sup> Canadian Labour Congress, *Tech Change*, p. 24.

<sup>12</sup> Canadian Labour Congress, *Tech Change*, p. 27.

<sup>13</sup> European Communities, *Workers' Rights in Industry* (Brussels, European Economic Community, 1984), p. 10.

<sup>14</sup> An overview is presented in Steven Deutsch, "Unions and Technological Change: International Perspectives," in Donald Kennedy and others, eds., *Labor and Technology* (University Park, Pennsylvania State University, Department of Labor Studies, 1982). Also see Steve Early and Matt Witt, "How European unions cope with new technology," *Monthly Labor Review*, September 1982, pp. 36-38, and John Evans, *Technology and Collective Bargaining* (Brussels, European Trade Union Institute, 1985).

<sup>15</sup> Anders Hingel, "A Promethean Change of Industrial Relations: A Comparative Study of Western European Unions and Technological Developments," in Malcolm Warner, ed., *Microprocessors, Manpower, and Society* (New York, St. Martin's Press, 1984), p. 256.

<sup>16</sup> Joseph Thurman, "New Technology and Work Designs: Implications for Worker Attitudes and Industrial Relations," in *Changing Perceptions of Work in Industrial Countries: Their Effects on and Implications for Industrial Relations* (Geneva, International Institute for Labour Studies, 1983), pp. 188-89.

<sup>17</sup> Organization for Economic Cooperation and Development, *Microelectronics, Robots and Jobs* (Washington, OECD Publications Center, 1982), p. 111.

<sup>18</sup> Steven Deutsch, "Work Environment Reform and Industrial Democracy," *Work and Occupations*, May 1981, pp. 180-94; and Bjorn Gustavsen and Gerry Hunnius, *New Patterns of Work Reform* (Oslo, University of Oslo Press, 1981).

<sup>19</sup> *Act Relating to Worker Protection and Working Environment* (Oslo, Directorate of Labour Inspection, 1977), pp. 5-6.

<sup>20</sup> *New Technologies: The Impact on Employment and the Working Environment* (Geneva, International Labor Organization, 1983). Also enlightening on this issue is Alfred Hassencamp and Hans-Jurgen Bieneck, "Technical and Organizational Changes and Design of Working Conditions

in the Federal Republic of Germany," *Labour and Society*, January-March 1983, pp. 39-56.

<sup>21</sup> Arne Pape and Jostein Fjalstad, "Research on Social Aspects of Computerization and Democratization of Working Life," in P. Samet, ed., *Proceedings of the European Conference on Applied Information Technology of the International Federation for Information Processing (EURO IFIP)* (Amsterdam, North-Holland, 1979); and Max Elden and others, *Good Technology Is Not Enough: Automation and Work Design in Norway* (Trondheim, Institute for Social Science Research in Industry, 1982).

<sup>22</sup> This project (known as the Utopia Project) and a larger approach is reviewed in *Training Technology and Products Viewed from the Quality of Work Perspective* (Stockholm, Swedish Center for Working Life, 1981).

<sup>23</sup> Some of these approaches are described in Bo Goranzon, *Job Design and Automation in Sweden* (Stockholm, Swedish Center for Working Life, 1982).

<sup>24</sup> "Local Collective Agreement on the Development of a New Production-System at the Postgiro," Stockholm, 1979, Section 2.

<sup>25</sup> Swedish Trade Union Confederation (LO), *Computers on Human Terms* (Stockholm, Swedish Trade Union Confederation, October 1983), p. 4.

<sup>26</sup> Stefan Aguren and Jan Edgren, *New Factories: Job Design Through Factory Planning in Sweden* (Stockholm, Swedish Employers' Federation, 1980), p. 104.

<sup>27</sup> Bengt Abrahamsson, *Computer Technology and Industrial Relations: The Case of Sweden and Norway* (Rome, Olivetti Foundation, forthcoming), p. 44, citing 1984 research by the Swedish Institute for Social Research.

<sup>28</sup> Dennis Chamot, "Labor and Technological Change in Sweden," *Working Life in Sweden*, No. 29 (New York, Swedish Information Service, February 1985), p. 6.

<sup>29</sup> Akihiro Ishikawa, "Microelectronics and Japanese Industrial Relations," in Warner, *Microprocessors*, p. 355.

<sup>30</sup> *Agreement Concerning the Introduction of New Technology*, Nissan Motor Co. and Nissan Motor Workers' Union, Mar. 1, 1983.

# Major Agreements Expiring Next Month



This list of selected collective bargaining agreements expiring in April is based on information from 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.

Employer and location	Private industry	Labor organization <sup>1</sup>	Number of workers
Independent Building Contractors (Maine) .....	Construction .....	Carpenters .....	1,300
General Building Contractors and others, Philadelphia area (Pennsylvania) .....	Construction .....	Laborers .....	5,000
Building Contractors Association (New Jersey) .....	Construction .....	Carpenters .....	14,000
General Building Contractors, Philadelphia area (Pennsylvania) .....	Construction .....	Carpenters .....	5,000
Building Trades Employers Association, commercial building agreement (Rochester, NY) .....	Construction .....	Carpenters .....	1,100
Construction Contractors Council-AGC Labor Division, Inc. (Washington, DC and vicinity) .....	Construction .....	Carpenters .....	6,300
Construction Contractors Council-AGC Labor Division, Inc. (Washington, DC and vicinity) .....	Construction .....	Operating Engineers .....	1,100
Associated General Contractors and independent contractors (Lake Charles, LA) .....	Construction .....	Laborers .....	1,000
Associated General Contractors, Central Illinois Builders Chapter (Illinois) .....	Construction .....	Carpenters .....	1,200
Greater Peoria Contractors and Suppliers Association, Inc. (Illinois) ..	Construction .....	Laborers .....	1,500
Associated General Contractors, Builders division (Minneapolis and St. Paul, MN) .....	Construction .....	Carpenters .....	4,000
Associated General Contractors, Builders division (Minnesota) .....	Construction .....	Laborers .....	3,000
Associated General Contractors (St. Louis, MO) .....	Construction .....	Laborers .....	3,000
Construction Employers Association (Cleveland, OH) .....	Construction .....	Carpenters .....	3,500
Building Contractors of Southern New Jersey (New Jersey) .....	Construction .....	Carpenters .....	2,200
Associated General Contractors (Minnesota) .....	Construction .....	Iron Workers .....	1,100
Associated General Contractors, building construction agreement (Ohio) .....	Construction .....	Operating Engineers .....	1,000
Home Builders Association (St. Louis, MO) .....	Construction .....	Carpenters .....	4,500
Associated General Contractors (St. Louis, MO) .....	Construction .....	Carpenters .....	4,500
Associated General Contractors (New Orleans, LA) .....	Construction .....	Carpenters .....	3,000
Associated General Contractors (New Orleans, LA) .....	Construction .....	Laborers .....	1,200
Associated General Contractors, building construction (Minnesota) ..	Construction .....	Operating Engineers .....	1,750
Contractors Association of Eastern Pennsylvania, heavy and highway, Philadelphia area (Pennsylvania) .....	Construction .....	Laborers .....	2,000
Associated General Contractors, heavy and highway (Minnesota) .....	Construction .....	Laborers .....	4,250
Associated General Contractors of Missouri (Western Missouri) .....	Construction .....	Laborers .....	1,000
Ohio Contractors Association and Associated General Contractors (Ohio and West Virginia) .....	Construction .....	Teamsters (Ind.) .....	1,400
Ohio Contractors Association (Ohio) .....	Construction .....	Operating Engineers .....	4,000
Ohio Contractors Association (Ohio and Kentucky) .....	Construction .....	Bricklayers; Plasterers and Cement Masons .....	1,100
Montana Heavy, Highway and Building Contractors (Montana) .....	Construction .....	Various unions .....	5,600
Associated General Contractors (Chicago, IL) .....	Construction .....	Teamsters (Ind.) .....	4,000
Associated General Contractors and independent companies, heavy and highway (Minnesota) .....	Construction .....	Carpenters .....	3,500
Associated General Contractors, Duluth contractors and others (Minnesota) .....	Construction .....	Teamsters (Ind.) .....	1,800
Ohio Contractors Association (Ohio) .....	Construction .....	Laborers .....	10,000
Ohio Contractors Association (Cleveland, OH) .....	Construction .....	Teamsters (Ind.) .....	1,400
Associated General Contractors, heavy and highway (Minnesota) .....	Construction .....	Operating Engineers .....	5,000
Associated General Contractors of St. Louis (St. Louis, MO) .....	Construction .....	Operating Engineers .....	1,200
General Building Contractors Association, building and heavy, Philadelphia area (Pennsylvania) .....	Construction .....	Operating Engineers .....	4,500

See footnotes at end of table.

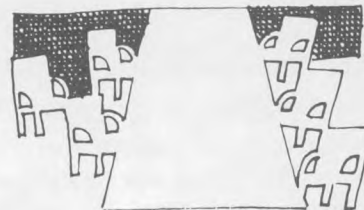
Continued—Major Agreements Expiring Next Month

Employer and location	Private industry	Labor organization <sup>1</sup>	Number of workers
Construction Contractors Council, commercial construction (Washington, DC and vicinity)	Construction	Laborers	2,500
Contractors Association of Eastern Pennsylvania (Pennsylvania)	Construction	Laborers	1,050
Construction Contractors Council, heavy construction (Washington, DC and vicinity)	Construction	Laborers	1,000
Central New Jersey Painting Contractors Association (New Jersey)	Construction	Painters	1,200
Associated Contractors of Essex County (Network, NJ)	Construction	Carpenters	1,850
National Electrical Contractors Association (Philadelphia, PA)	Construction	Electrical Workers (IBEW)	1,700
Roofing and Sheet Metal Contractors Association (Philadelphia, PA)	Construction	Sheet Metal Workers	1,800
Mechanical Contractors Association of Eastern Pennsylvania, Inc., 2 agreements (Pennsylvania)	Construction	Plumbers	4,200
Painting and Decorating Contractors of America (Minneapolis, MN)	Construction	Painters	1,050
National Electrical Contractors of America (St. Paul, MN)	Construction	Electrical Workers (IBEW)	1,400
Sheet Metal and Air Conditioning Contractors (St. Paul, MN)	Construction	Sheet Metal Workers	1,150
National Electrical Contractors of America (Cleveland, OH)	Construction	Electrical Workers (IBEW)	1,100
Mechanical Contractors Association (New Orleans, LA)	Construction	Plumbers	3,000
Roofing and Sheet Metal Contractors (Philadelphia, PA)	Construction	Roofers	1,700
Associated General Contractors and Minnesota Concrete and Masonry Contractors Association (Minneapolis, MN)	Construction	Bricklayers	1,750
Industrial Contractors (Florida and Georgia)	Construction	Carpenters	1,200
Minnesota Gypsum Drywall Contractors Association (Minneapolis and St. Paul, MN)	Construction	Carpenters	1,000
Chicago Meat Packers (Chicago, IL)	Food products	Teamsters (Ind.)	1,200
J.R. Simplot (Caldwell, ID)	Food products	Teamsters (Ind.)	1,100
Brown and Williamson Tobacco Corp. (Virginia)	Tobacco	Bakery, Confectionery and Tobacco Workers	1,050
James River Corp. (Green Bay, WI)	Paper	Paperworkers	1,000
Proctor and Gamble Paper Products Co. (Green Bay, WI)	Paper	Paperworkers	1,500
Owens-Illinois, Inc. (Interstate)	Rubber	Glass, Pottery, Plastics and Allied Workers	1,300
Southern California Shoe Manufacturers Association, Los Angeles area (California)	Leather	Clothing and Textile Workers	1,200
Lynchburg Foundry Co. (Lynchburg, VA)	Primary metals	Steelworkers	1,000
Northern California Foundries (California)	Primary metals	Molders	1,800
Gould Inc., battery group (Interstate)	Electrical products	Electrical Workers (IBEW)	1,300
The Hoover Co. (North Canton, OH)	Electrical products	Electrical Workers (IBEW)	2,800
Bendix Corp. (Interstate)	Transportation equipment	Auto Workers	5,500
United Technologies Corp., Diesel system (Springfield, MA)	Transportation equipment	Electrical Workers (IUE)	1,200
United Technologies Corp., Hamilton Standard division (Windsor, CT)	Transportation equipment	Machinists	3,050
Dana Corp., Weatherhead division (Interstate)	Transportation equipment	Auto Workers	1,000
Robertshaw Controls Co., Grayson division (Long Beach, CA)	Instruments	Auto Workers	1,000
American Airlines Inc., pilots (Interstate) <sup>2</sup>	Air transportation	Allied Pilots Association (Ind.)	3,400
Central Maine Power, Inc. (Augusta, ME)	Utilities	Electrical Workers (IBEW)	4,050
West Penn Power Co. (Pennsylvania)	Utilities	Utility Workers	1,100
Northern Illinois Ready Mix and Materials Association (Chicago, IL)	Wholesale trade	Teamsters (Ind.)	2,000
Greater New York Association of Meat and Poultry Dealers (New York, NY)	Wholesale trade	Food and Commercial Workers	3,000
Chicago Beer Wholesalers Association (Chicago, IL)	Wholesale trade	Teamsters (Ind.)	1,100
Minneapolis Automobile Dealers Association (Minnesota)	Retail trade	Teamsters (Ind.)	1,200
Northwestern Mutual Life Insurance Co. (Milwaukee, WI)	Insurance	Office and Professional Employees	1,550
	<b>Government activity</b>	<b>Labor organization<sup>1</sup></b>	<b>Number of workers</b>
California: Riverside County, supporting services	Multidepartments	Supporting Services Unit (Ind.)	2,050
District of Columbia: Washington Metropolitan Transit Authority	Transportation	Transit Union	5,500
Missouri: Kansas City, city wide unit	Multidepartments	State, County and Municipal Employees	2,400
Minnesota: St. Paul, Twin City Area Metropolitan Transit Authority	Transportation	Transit Union	2,100

<sup>1</sup> Affiliated with AFL-CIO except where noted as independent (Ind.).

<sup>2</sup> Information is from newspaper reports.

# Developments in Industrial Relations



## Comparable worth settlements

After suffering some reverses in the last year, backers of the comparable worth concept of pay equity were heartened by a settlement concluding the 5-year controversy between the State of Washington and several unions. Under the out-of-court settlement, nearly 35,000 State workers in predominantly female occupations will receive pay adjustments over a 6-year period to bring them to parity with other State workers in jobs requiring comparable levels of responsibility, skill, and training. In general, backers of the comparable worth concept contend that some workers are underpaid simply because they are in "women's occupations," such as secretaries, librarians, and nurses.

The events leading to the settlement began in 1981 when nine female employees filed suit against the State, contending that a study sponsored by the State showed pay discrimination against women. In 1983, a Federal district judge found the State guilty of pay discrimination under the Federal Civil Rights Act and ordered it to retroactively correct the disparity. In September 1985, the 9th U.S. Circuit Court of Appeals overturned that decision, but the State legislature had already appropriated \$41.6 million to finance a settlement to be negotiated with the State, County, and Municipal Employees and other unions representing State employees.

The accord, which will require additional appropriations to cover the \$106.5 million total cost, provides for the worth of jobs to be measured in terms of skill, effort, training, education, responsibility, and working conditions. During the first 15 months, \$46.5 million will be available for pay adjustments, followed by \$10 million allocations on July 1 of 1987 through 1992. The settlement does not provide for retroactivity of the pay adjustments. The 35,000 employees will also receive the same general wage increases the unions negotiate for other employees in their bargaining units during the 6-year period.

Pay equity adjustments also were a feature of an initial contract between the State, County, and Municipal Employees and the city of Chicago for 7,500 white-collar employees. Under the 3-year contract, all employees will re-

ceive wage increases totaling about 13 percent. In addition, 3,500 employees in 79 predominantly female job classifications will receive an additional 5 percent, which will be accomplished by raising these workers by one pay grade. According to the parties, 86 percent of the workers scheduled for upgrading are women.

In return for the upgrading, the union agreed to drop sex discrimination charges it had filed with the Equal Employment Opportunity Commission against the city in 1982.

The parties also established a joint job evaluation committee to study the city's pay system and recommend changes, if necessary.

In another area, the parties moved to end political favoritism by adopting criteria to be used in selecting workers for jobs and promotions.

State, County, and Municipal Employees' President Gerald W. McEntee hailed the accord as a "demonstration of the nationwide momentum on pay equity," despite the Appeals Court ruling in the Washington State case. McEntee said that during 1985, the union's "blueprint for equality" program had resulted in pay adjustments of \$12 million for 4,000 clericals and librarians in Los Angeles; \$20 million for 6,000 workers in the Iowa State government; \$40 million for 9,000 employees of the State of Minnesota; \$9.1 million for 10,000 employees of the State of Wisconsin; \$5.6 million for 9,000 employees of the State of Connecticut; and \$36 million to be used for adjusting the pay of thousands of employees of the State of New York.

In another pay equity agreement, the Auto Workers' initial contracts with the State of Michigan included special adjustments (20 cents an hour retroactive to October 1, 1985, and 20 cents effective October 1, 1986) for 70 percent of the 21,000 employees in the two bargaining units. The union said the special pay adjustments were intended to "achieve a greater degree of pay equity between traditionally 'female' State jobs and other jobs."

Terms for all employees included a 5-percent general pay increase effective October 1, 1986; a provision for reopening bargaining on a possible increase in October 1987; reduced employee premium costs for health insurance; and a joint review of workloads and caseloads.

The Auto Workers gained the right to represent the Human Services and Administrative Support units by defeating the incumbent Michigan State Employees Association in 1985 elections.

"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.

### **RCA offers retirement inducement**

Pay increases totaling 5.5 percent, lump-sum payments, and a retirement inducement were featured in settlements between RCA Corp. and the Electrical Workers (IBEW) and the Electronic Workers. The separate but coordinated bargaining by the two unions covered 14,500 workers at 12 electrical products plants.

The first cash payment, payable immediately, was equal to 3 percent of employee earnings from November 1, 1984, through October 31, 1985. Instead of continuing the provision for automatic annual cost-of-living adjustments in hourly pay based on the movement of the Consumer Price Index, employees will receive lump-sum payments of \$225 on June 2, 1986, \$500 on June 1, 1987, and \$525 on June 6, 1988.

Hourly pay rates will increase by 3 percent on December 1, 1986, and 2.5 percent on December 7, 1987. Workers in the upper pay grades will also receive an additional 5 to 20 cents and 5 to 15 cents an hour on the respective dates.

Pay progression was extended, with new employees starting at 80 percent of the standard rate for their job and receiving 5 percentage point increases every 6 months until they attain the standard rate.

The retirement inducement, limited to workers leaving the company between January 1 and July 1 of 1986, is \$5,000. It is available to employees with 30 years of service or whose age plus years of service total 85.

Other terms include a two-step increase in the pension rate to \$16 a month (from \$14) for each year of credited service; three \$100 credits to employees under a stock purchase plan; and some changes to help restrain the rise in health insurance costs.

### **Grocery workers accept concessions**

Following the lead of a June 1985 settlement with major St. Louis grocery store chains, United Food and Commercial Workers locals 219 and 35 and three chains in nearby Illinois agreed on cuts in pay and benefits to aid the companies in competing with nonunion stores.

The Illinois agreement cut the top rate for clerks to \$10.80 an hour, from \$11.15, effective immediately, and to \$10.50 in November 1986. Workers below the top rate will have their rates frozen for the term of the contract, which expires on November 26, 1988. To some extent, the pay cut and freeze will be offset by bonuses totaling \$1,000 to \$1,200, depending on the number of hours an employee works. Half of the bonus will be distributed in 1986 and the balance in 1987 and 1988.

The contract also provided for:

- A top rate of \$6.50 an hour for employees who work less than 30 hours a week. Previously there was no pay cap for these employees.
- For workers hired after the effective date of the con-

tract, Sunday work premium pay of \$1 an hour during their first year and \$2 an hour thereafter. Current employees will continue to receive time and one-half pay for work on Sunday.

- A 9-cent reduction, to 76 cents an hour, in the employers' payment to the health and welfare trust fund. Benefits financed by the fund were not reduced.
- Elimination of a sixth week of paid vacation after 25 years of service. Currently eligible workers will continue to receive 6 weeks.
- Elimination of one personal paid holiday and four paid sick leave days beginning January 1, 1986.
- Reduced employer financing of health and welfare and pension benefits for new employees.
- A guarantee that 50 percent of scheduled work hours will be given to employees who normally work 40 hours a week and 10 percent to those who normally work at least 30 hours a week. The union said these requirements will help counter a trend toward increasing use of part-time workers, to the detriment of full-time workers.

The three chains covered by the settlement are the Kroger Co., National Supermarkets, and Schnuck Markets.

### **Alaska construction workers agree to a pay cut**

Concern about the possibility of losing work to nonunion construction firms impelled unions in Alaska's petroleum producing area to agree to a 20-percent pay cut during the first year of their new 2-year agreement with the North Slope Contractors Association. Pay rates for the second year will be negotiated under a mid-term contract reopening provision.

The deciding factor in the unions' decision apparently was the oil companies 1985 announcement that bidding for projects would be opened to both union and nonunion contractors. Traditionally, most of the construction on the North Slope has been performed by unionized firms.

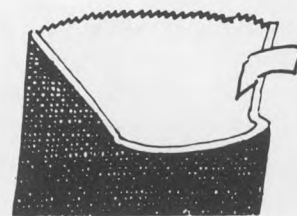
A union official said that the pay cut was not popular with union members, but it must be viewed in relation to the still-substantial earnings opportunity resulting from company-financed rooms, meals, and transportation, and a usual 70-hour work week.

Among the affected crafts, pay rates for plumbers and welders dropped to \$20.94 an hour, from \$26.17, and laborers dropped to \$16.27, from \$20.34. Employer payments for benefits remained at \$6.10 an hour for the plumbers and welders and \$6.45 for the laborers.

Other terms include a 40-hour work week guarantee; a limit of time and one-half pay for all work in excess of 8 hours per day; regular pay rates for work on second or third shifts, if such shifts are established; and a cut in the number of paid travel hours from the Fairbanks dispatch point. □

# Book Reviews

---



## New technology requires new management

*Beyond Mechanization.* By Larry Hirschhorn. Cambridge, MA, The MIT Press, 1984. 187 pp., bibliography. \$17.50.

Larry Hirschhorn's thesis is compelling. The production technology of the processing plant and computerized flexible manufacturing systems require a new approach to organizational design and management. In the older electromechanical factories, work could be broken down into measurable motions, and the worker trained to perform repetitive tasks, coordinated and controlled at higher levels. The new technology makes this approach unsafe and unproductive, since complex technological systems are vulnerable to costly breakdowns. The alternative is a different vision of organization and work roles in which operators develop diagnostic and maintenance skills, and are prepared to deal with the unexpected. Working together in self-regulating teams, they share information and rotate jobs to expand their knowledge of what can go wrong, and why. In this system, supervisors become teachers and coordinators, not policemen. If this approach had been employed at the Three Mile Island nuclear reactor, Hirschhorn believes operators would have been better prepared to have closed a valve quickly and avoided the danger of meltdown.

This concept is fully consistent with Joan Woodward's research in the 1960's showing that continuous processing plants (for example paper and pulp, chemicals, and oil refineries) were best run when operators had the training and authority to make decisions. It is supported by the sociotechnical theories of Eric Trist, Louis Davis, and Richard Walton, who was a consultant to the General Foods plant in Topeka, KS, which was designed according to the team concept in 1970. Hirschhorn points out that during the past decade, more than 500 American plants have been designed according to the team principle, generally with job rotation and salary, not wages, based on tasks mastered. "A worker may be a materials scheduler, a work assigner, a trainer, a financial coordinator managing the team's budget, a health and safety coordinator, a recorder, or the team's representative on a committee studying social-system issues throughout the plant" (p. 117).

Beyond improved safety and less likelihood of errors, what are the costs and benefits of the new plants? Writes Hirschhorn, "I know of no systematic study comparing the long-term performance of these plants with that over conventional ones. Cases studies and my own interviews with managerial and supervisory staff suggest that these plants produce a higher quality product than do conventional factories, while remaining profitable" (p. 120).

Yet, there are serious problems with many of these innovative work systems, and they are social rather than technical. Hirschhorn interviewed 22 managers and consultants, and two workers at 13 new plants. (The companies would not let him interview more workers.) He found one source of ineffectiveness when idealistic plant managers expected teams to govern themselves without skilled leadership and sufficient training in a group process. Disputes undermined effectiveness. Workers refused to discipline colleagues who abused trust. When teamwork broke down, disillusioned managers imposed traditional control. Most of these plants are nonunion, and it is notable that in one unionized factory, Hirschhorn finds better discipline, more effectiveness at resolving disputes. When there is experienced union leadership, utopian ideas are less likely to cloud the vision.

Hirschhorn touches on many factors that he believes impede the development of better sociotechnical solutions, including the problem of fitting the innovative factories into industrial bureaucracies. The new pay systems and job classifications clash with corporate policy. Here again, a strong union could help institutionalize a new approach.

Finally, Hirschhorn directs criticism at engineers for ignoring the human element in designing production systems. Like many who write today from a humanistic viewpoint, he blasts the founder of scientific management, Frederick Winslow Taylor, for having "introduced the study of human motion within a perspective emptied of psychological and physiological content" (p. 13). In his time, Taylor was concerned with the health and development of the worker. Like Hirschhorn, he complained of over-controlling managers. The difference is that Taylor's theory fit the simpler technology of his day and the poorly educated immigrant workers he first studied. Today's technology and work force require different organization, but as Hirschhorn points out,

our social R&D lags behind technical development. The point is not to blame the engineers but to show them a viable, more productive alternative.

—MICHAEL MACCOBY  
 Director, Program on Technology,  
 Policy and Human Development  
 J. F. Kennedy School of Government  
 Harvard University

## Publications received

### Economic and social statistics

- Allen, Steven G., *Union Work Rules and Efficiency in the Building Trades*. Cambridge, MA, National Bureau of Economic Research Inc., 1985, 48 pp. (NBER Working Paper Series, 1733.) \$2, paper.
- Bodmer, W. F., "Understanding Statistics," *Journal of the Royal Statistical Society*, Vol. 148, Pt. 2, 1985, pp. 69–81.
- Brant, J. D. and S. M. Chalk, "The Use of Automatic Editing in the 1981 Census," *Journal of the Royal Statistical Society*, Vol. 148, Pt. 2, 1985, pp. 126–46.
- Capalbo, Susan M. and Michael Denny, *Testing Long-Run Productivity for the Canadian and U.S. Agricultural Sectors*. Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 37 pp. (NBER Working Paper Series, 1764.) \$2, paper.
- Conrad, Klaus and Catherine J. Morrison, *The Impact of Pollution Abatement Investment on Productivity Change: An Empirical Comparison of the U.S., Germany, and Canada*. Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 30 pp. (NBER Working Paper Series, 1763.) \$2, paper.
- Ehrenberg, Ronald G. and Daniel R. Sherman, *Employment While in College, Academic Achievement and Post-College Outcomes: A Summary of Results*. Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 31 pp. (NBER Working Paper Series, 1742.) \$2, paper.
- Fay, Jon A. and James L. Medoff, "Labor and Output Over the Business Cycle: Some Direct Evidence," *The American Economic Review*, September 1985, pp. 638–55.
- Griffin, James M., "OPEC Behavior: A Test of Alternative Hypotheses," *The American Economic Review*, December 1985, pp. 954–63.
- Hartley, Michael, *Neoclassical Econometrics: The Kernel; Non-Negativity Constraints*. Washington, the World Bank, Development Research Department, 1985, 22 pp. and 35 pp., respectively. (Reports DRD136 and DRD137.)
- Hodge, Bartow and James P. Clements, *Business Systems Analysis*. Englewood Cliffs, NJ, Prentice-Hall, Inc., 1986, 370 pp. \$26.95.
- Jenkins, Shirley, Mignon Sauber, Eva Friedlander, *Ethnic Associations and Services to New Immigrants in New York City*. New York, Community Council of Greater New York, Research and Program Planning Information Department, 1985, 130 pp. \$10, paper.
- Kearl, J. R., *The Covariance Structure of Earnings and Income, Compensatory Behavior and On-the-Job Investments*. Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 35 pp. (NBER Working Paper Series, 1747.) \$2, paper.
- Pemberton, James, "A Model of Wage and Employment Dynamics with Endogenous Preferences," *Oxford Economic Papers*, September 1985, pp. 448–65.
- Riche, Martha Farnsworth, "Retirement's Lifestyle Pioneers," *American Demographics*, January 1986, beginning on p. 42.
- Rosenfeld, Jeffrey P., "Demographics on Vacation," *American Demographics*, January 1986, beginning on p. 38.
- Russell, Cheryl and Thomas G. Exter, "America at Mid-Decade," *American Demographics*, January 1986, pp. 22–29.
- "No Kids, No Cows, More Money," *American Demographics*, January 1986, pp. 32–37.
- Seneta, E., "A Sketch of the History of Survey Sampling in Russia," *Journal of the Royal Statistical Society*, Vol. 148, Pt. 2, 1985, pp. 118–25.
- Trajenberg, Manuel, *The Welfare Analysis of Product Innovations With an Application to CT Scanners*, Cambridge, MA, National Bureau of Economic Research Inc., 1985, 82 pp. (NBER Working Paper Series, 1724.) \$2, paper.
- U.S. Department of Commerce, *1985 OBERS, BEA Regional Projections: Vol. 2, Metropolitan Statistical Area Projections to 2035*. Washington, U.S. Department of Commerce, Bureau of Economic Analysis, 1985, 348 pp. (Stock No. 003–010–00159–3.) \$12, Superintendent of Documents, Washington 20402.
- Weitzman, Martin L., "The Simple Macroeconomics of Profit Sharing," *The American Economic Review*, December 1985, pp. 937–53.

### Health and safety

- Hausman, Jerry A., Bart D. Ostro, David A. Wise, *Air Pollution and Lost Work*. Cambridge, MA, National Bureau of Economic Research, Inc., 1984, 34 pp. (NBER Working Paper Series, 1263.) \$2, paper.
- Viscusi, W. Kip, "Market Incentives for Safety," *Harvard Business Review*, July–August 1985, pp. 133–38.

### Industrial relations

- Barbash, Jack, "Do We Really Want Labor on the Ropes?" *Harvard Business Review*, July–August 1985, beginning on p. 10.
- Burgmann, Meredith, "Australian Trade Unionism in 1984," *The Journal of Industrial Relations*, March 1985, pp. 81–88.
- Kassalow, Everett M., "Crisis in the World Steel Industry: Union-Management Responses in Four Countries," *Labour and Society*, September 1985, pp. 345–67.
- Leonard, Jonathan S., *The Effectiveness of Equal Employment Law and Affirmative Action Regulation*. Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 51 pp. (NBER Working Paper Series, 1745.) \$2, paper.
- Loney, Timothy J., "Formal Discussions in Federal Labor Relations—A Case of Goal Deflection," *Public Administration Review*, September–October 1985, pp. 609–15.
- McCorquodale, John, "The Myth of Mateship: Aborigines and Employment," *The Journal of Industrial Relations*, March 1985, pp. 3–16.



- Moore, Tim, "Industrial Relations Legislation in 1984," *The Journal of Industrial Relations*, March 1985, pp. 89-95.
- Sloan, Judith, "The Unionization of Young People in Australia," *The Journal of Industrial Relations*, March 1985, pp. 38-48.
- Zax, Jeffrey S., *Municipal Employment, Municipal Unions, and Demand for Municipal Services*. Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 30 pp. (NBER Working Paper Series, 1728.), \$2, paper.

### Industry and government organization

- Brown, Anthony, "The Regulatory Policy Cycle and the Airline Deregulation Movement," *Social Science Quarterly*, September 1985, pp. 552-63.
- Lissner, Will, "Free Competition by Free Enterprise," *American Journal of Economics and Sociology*, October 1985, p. 490.
- Sheehan, Michael F., "Plant Closings and the Community: The Instrumental Value of Public Enterprise in Countering Corporate Flight," *American Journal of Economics and Sociology*, October 1985, pp. 423-33.

### International economics

- Baily, Martin Neil and Alok K. Chakrabarti, "Innovation and U.S. Competitiveness," *The Brookings Review*, Fall 1985, pp. 14-21.
- Bernholz, Peter, Manfred Gärtner, Erwin W. Heri, "Historical Experiences with Flexible Exchange Rates: A Simulation of Common Qualitative Characteristics" *Journal of International Economics*, August 1985, pp. 21-45.
- Bernstein, Edward M., "The United States as an International Debtor Country," *The Brookings Review*, Fall 1985, pp. 28-36.
- Domowitz, Ian and Craig S. Hakkio, "Conditional Variance and the Risk Premium in the Foreign Exchange Market," *Journal of International Economics*, August 1985, pp. 47-66.
- Edwards, Sebastian, *Commodity Export Boom and the Real Exchange Rate: The Money-Inflation Link*. Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 29 pp. (NBER Working Papers Series, 1741.) \$2, paper.
- Ethier, Wilfred J., "International Trade and Labor Migration," *The American Economic Review*, September 1985, pp. 691-707.
- Frankel, Jeffrey A., *International Capital Mobility and Crowding Out in the U.S. Economy: Imperfect Integration of Financial Markets or of Goods Markets?* Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 53 pp. (NBER Working Paper Series, 1773.) \$2, paper.
- Grinols, Earl L. "Trade, Distortions, and Welfare Under Uncertainty," *Oxford Economic Papers*, September 1985, pp. 362-74.
- Hashimoto, Masanori and John Raisian, "Employment Tenure and Earnings Profiles in Japan and the United States," *The American Economic Review*, September 1985, pp. 721-35.
- Helpman, Elhanan and Assaf Razin, "Floating Exchange Rates with Liquidity Constraints in Financial Markets," *Journal of International Economics*, August 1985, pp. 99-117.
- Kawai, Masahiro, "Exchange Rates, the Current Account and Monetary Fiscal Policies in the Short Run and in the Long Run," *Oxford Economic Papers*, September 1985, pp. 391-425.

- Lawrence, Robert Z. and Robert E. Litan, "Living with the Trade Deficit: Adjustment Strategies to Preserve Free Trade," *The Brookings Review*, Fall 1985, pp. 3-13.

- Lincoln, Edward J., "Disentangling the Mess in U.S.-Japan Economic Relations," *The Brookings Review*, Fall 1985, pp. 22-27.

- "The Debt Problem: Acute and Chronic Aspects," *Journal of Development Planning*, No. 16, 1985, pp. 3-227.

- Venables, Anthony J., "Trade and Trade Policy with Imperfect Competition: The Case of Identical Products and Free Entry," *Journal of International Economics*, August 1985, pp. 1-19.

- Wijnbergen, Sweder Van, "Taxation of International Capital Flows, the Intertemporal Terms of Trade and the Real Price of Oil," *Oxford Economic Papers*, September 1985, pp. 382-90.

### Labor force

- Antel, John J., "Costly Employment Contract Renegotiation and the Labor Mobility of Young Men," *The American Economic Review*, December 1985, pp. 976-91.

- Burton, Daniel F., Jr. and others, eds., *The Jobs Challenge: Pressures and Possibilities*. Cambridge, MA, Ballinger Publishing Co., 1986, 304 pp.

- Cook, Robert F., Charles F. Adams, Jr., V. Lane Rawlins and Associates, *Public Service Employment: The Experience of a Decade*. Kalamazoo, MI, W. E. Upjohn Institute for Employment Research, 1985, 131 pp.

- Darby, Michael R., John Haltiwanger, Mark Plant, "Unemployment Rate Dynamics and Persistent Unemployment under Rational Expectations," *The American Economic Review*, September 1985, pp. 614-37.

- "Job Growth, Flexibility and Security," *The OECD Observer*, September 1985, pp. 3-8.

- "Migration: The Trends Converge," *The OECD Observer*, September 1985, pp. 9-11.

- Owen, John D., *Working Lives: The American Work Force Since 1920*. Lexington, MA, D.C. Heath and Co., Lexington Books, 1986, 218 pp., bibliography. \$25.

- Pissarides, Christopher A., "Short-Run Equilibrium Dynamics of Unemployment, Vacancies, and Real Wages," *The American Economic Review*, September 1985, pp. 676-90.

- Smith, Marvin M., "Early Labor Market Experiences of Youth and Subsequent Wages," *American Journal of Economics and Sociology*, October 1985, pp. 391-400.

- Swedish Ministry of Labour, *EFA's Research Programme*. Stockholm, Swedish Ministry of Labour, Delegation for Labour Market Policy Research, 1985, 31 pp.

- , *On the Composition and Outcome of Swedish Labour Market Policy: 1970-1985*. By Jan Johannesson. Stockholm, Swedish Ministry of Labour, Delegation of Labour Market Policy Research, 1985, 20 pp.

- "Women and Work—A Review of the Decade: Job Equality for Women; Progress, Problems and Perspectives," by Hedva Sarfati; "Rural Women and Technical Change: Theory, Empirical Analysis and Operational Projects," by Iftikhar Ahmed; "The Role of the Soviet Woman in Decision-Making in Trade Union Committees and in Industry," by Alexandra Biryukova; "From Drudgery to Dignity: The SEWA Experi-

ence," by Lalita Krishnaswami; "The Position of Women in the Labour Market in Hong Kong: A Content Analysis of the Recruitment Advertisements," by Suk-ching Ho, *Labour and Society*, September 1985, pp. 273-344.

Wurzburg, Gregory, "Youth Joblessness in Australia: The Problem Behind the Problem," *The OECD Observer*, September 1985, pp. 12-15.

### Monetary and fiscal policy

Canzoneri, Matthew B., "Monetary Policy Games and the Role of Private Information," *The American Economic Review*, December 1985, pp. 1056-70.

Slovak, Jeffrey S. "City Spending, Suburban Demands, and Fiscal Exploitation: A Replication and Extension," *Social Forces*, September 1985, pp. 168-90.

### Productivity and technological change

Fernandez, John P., *Child Care and Corporate Productivity: Resolving Family/Work Conflicts*. Lexington, MA, D.C. Heath and Co., Lexington Books, 1986, 222 pp., bibliography. \$25.

International Labour Office, *Technological Change: The Tripartite Response, 1982-85*. Geneva, International Labour Of-

fice, 1985, 355 pp. Available in the U.S. from the Washington branch of ILO.

### Welfare programs and social insurances

"Government Programs and the Poor—Two Views: Have the Poor Been 'Losing Ground'?" by Charles Murray; "How the Welfare System Promotes Economic Security," by Sar A. Levitan, *Political Science Quarterly*, Fall 1985, pp. 427-59.

Ippolito, Richard A., "The Labor Contract and True Economic Pension Liabilities," *The American Economic Review*, December 1985, pp. 1031-43.

Leonard, Jonathan S., *Labor Supply Incentives and Disincentives for the Disabled*. Cambridge, MA, National Bureau of Economic Research, Inc., 1985, 45 pp. (NBER Working Paper Series, 1744.) \$2, paper.

Lissner, Will, "The Debate Over Social Security," *American Journal of Economics and Sociology*, October 1985, p. 434.

Ozawa, Martha N., "Social Security Reform in Japan," *Social Service Review*, September 1985, pp. 476-95.

Rank, Mark R., "Exiting from Welfare: A Life-Table Analysis," *Social Service Review*, September 1985, pp. 358-76. □

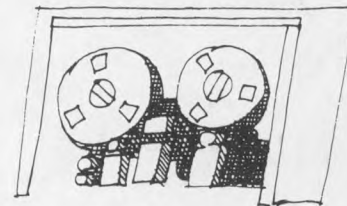
---

### 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, D.C. 20212.

---

# Current Labor Statistics



<b>Schedule of release dates for major BLS statistical series</b> .....	50
<b>Notes on Current Labor Statistics</b> .....	51
<b>Comparative indicators</b>	
1. Labor market indicators .....	60
2. Annual and quarterly percent changes in wages, prices, and productivity .....	61
3. Alternative measures of wage and compensation changes .....	61
<b>Labor force data</b>	
4. Employment status of the total population, data seasonally adjusted .....	62
5. Employment status of the civilian population, data seasonally adjusted .....	63
6. Selected employment indicators, data seasonally adjusted .....	64
7. Selected unemployment indicators, data seasonally adjusted .....	65
8. Unemployment rates by sex and age, data seasonally adjusted .....	66
9. Unemployed persons by reason for unemployment, data seasonally adjusted .....	66
10. Duration of unemployment, data seasonally adjusted .....	66
11. Unemployment rates of civilian workers, by State .....	67
12. Employment of workers by State .....	67
13. Employment of workers by industry, data seasonally adjusted .....	68
14. Average weekly hours by industry, data seasonally adjusted .....	69
15. Average hourly earnings by industry .....	70
16. Average weekly earnings by industry .....	71
17. Hourly Earnings Index by industry .....	71
18. Indexes of diffusion: proportion of industries in which employment increased, seasonally adjusted .....	72
19. Annual data: Employment status of the noninstitutional population .....	72
20. Annual data: Employment levels by industry .....	72
21. Annual data: Average hours and earnings levels by industry .....	73
<b>Labor compensation and collective bargaining data</b>	
22. Employment Cost Index, compensation, by occupation and industry group .....	74
23. Employment Cost Index, wages and salaries, by occupation and industry group .....	75
24. Employment Cost Index, private nonfarm workers, by bargaining status, region, and area size .....	76
25. Specified compensation and wage adjustments from contract settlements, and effective wage adjustments, situations covering 1,000 workers or more .....	77
26. Average specified compensation and wage adjustments, bargaining situation covering 1,000 workers or more .....	77
27. Average effective wage adjustments, bargaining situations covering 1,000 workers or more .....	78
28. Specified compensation and wage adjustments, State and local government bargaining situations covering 1,000 workers or more .....	78
29. Work stoppages involving 1,000 workers or more .....	78
<b>Price data</b>	
30. Consumer Price Index: U.S. City average, by expenditure category and commodity and service groups .....	79
31. Consumer Price Index: U.S. City average and local data, all items .....	82
32. Annual data: Consumer Price Index, all items and major groups .....	83
33. Producer Price Indexes by stage of processing .....	84
34. Producer Price Indexes, by durability of product .....	85
35. Annual data: Producer Price Indexes by stage of processing .....	85
36. U.S. export price indexes by Standard International Trade Classification .....	86
37. U.S. import price indexes by Standard International Trade Classification .....	87
38. U.S. export price indexes by end use category .....	88
39. U.S. import price indexes by end use category .....	88
40. U.S. export price indexes by Standard Industrial Classification .....	88
41. U.S. import price indexes by Standard Industrial Classification .....	89

**Contents—Continued**

**Productivity data**

42. Indexes of productivity, hourly compensation, unit costs, data seasonally adjusted . . . . . 89  
 43. Annual indexes of multifactor productivity . . . . . 90  
 44. Annual indexes of productivity, hourly compensation, unit costs, and prices . . . . . 90

**International comparisons**

45. Unemployment rates in nine countries, data seasonally adjusted . . . . . 91  
 46. Annual data: Employment status of civilian working-age population, ten countries . . . . . 92  
 47. Annual indexes of productivity and related measures, twelve countries . . . . . 93

**Injury and illness data**

48. Annual data: occupational injury illness incidence rates . . . . . 94

**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 . . . . .	March 7	February	April 4	March	May 2	April	1; 4-21
Producer Price Index . . . . .	March 14	February	April 11	March	May 16	April	2; 33-35
Consumer Price Index . . . . .	March 25	February	April 22	March	May 21	April	2; 30-32
Real earnings . . . . .	March 25	February	April 22	March	May 21	April	14-17
Productivity and costs:							
Nonfarm business and manufacturing . . . . .	.....	.....	April 24	1st quarter	.....	.....	2; 42-44
Nonfinancial corporations . . . . .	.....	.....	.....	.....	May 28	1st quarter	2; 42-44
Major collective bargaining settlements . . . . .	.....	.....	April 25	1st quarter	.....	.....	3; 25-28
Employment Cost Index . . . . .	.....	.....	April 29	1st quarter	.....	.....	1-3; 22-24

## 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 is 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, 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 being seasonally adjusted with a new 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 Estla Bee Dagum (Statistics Canada, Catalogue No. 12-564E, January 1983). The second change is that seasonal factors are now being calculated for use during the first 6 months of the year, rather than for the entire year, and then are calculated at mid-year 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 1986 issue of the *Review* to reflect experience through 1985.

Annual revisions of the seasonally adjusted payroll data shown in tables 13, 14, and 18 were made in July 1985 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 1967 = 100, the hourly rate expressed in 1967 dollars is \$2 ( $\$3/150 \times 100 = \$2$ ). The \$2 (or any other resulting values) are described as "real," "constant," or "1967" dollars.

### Additional information

Data that supplement the tables in this section are published by the Bureau in a variety of sources. Press 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 is 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 biennially 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.

## EMPLOYMENT 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

#### 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).

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 1985.

#### Additional sources of information

For detailed explanations of the data, see *BLS Handbook of Methods*, Bulletin 2134-1 (Bureau of Labor Statistics, 1982) 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 1982 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 200,000 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 blue-collar worker supervisors and all nonsupervisory workers closely associated with production operations. Those workers mentioned in tables 12-16 include production workers in manufacturing and mining; construction workers in construction; and for 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 nonagricultural 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 Earner 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 gross average weekly hours which were in excess of regular hours and for which overtime premiums were paid.

**The Diffusion Index**, introduced in table 17 of the May 1983 issue, 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 1985 data, published in the July 1985 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 1983; seasonally adjusted data have been revised back to January 1980. These revisions were published in the *Supplement to Employment and Earnings* (Bureau of Labor Statistics, 1985). Unadjusted data from April 1984 forward, and seasonally adjusted data from January 1981 forward are subject to revision in future benchmarks.

## COMPENSATION AND WAGE DATA (Tables 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

#### Additional sources of information

Detailed 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 and its annual supplement (Bureau of Labor Statistics, 1985). For a detailed discussion of the methodology of the survey, see *BLS Handbook of Methods*, Bulletin 2143-1 (Bureau of Labor Statistics, 1982). 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).

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.

Fixed employment weights from the 1970 Census of Population are used each quarter to calculate the indexes for civilian, private, and State and local governments. 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 1970 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 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 Chapter 11, "The Employment Cost Index," in the *Handbook of Methods*, Bulletin 2134-1 (Bureau of Labor Statistics, 1982), 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

(wages and benefits 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 chapter 10, "Negotiated Wage and Benefit Changes," of the *BLS Handbook of Methods*, Bulletin 2134-1. 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 work days lost by workers involved in the stoppages.

**Days of idleness as a percent of estimated working time:** Aggregate work days lost as a percent of the aggregate number of standard work days 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 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 1972-73 buying habits of about 80 percent of the noninstitutional population of the United States at that time, compared with 40 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 is 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 24,000 retail establishments and 24,000 tenants in 85 urban areas across the country are used to develop the "U.S. city average." Separate estimates for 28 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.

#### 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, April 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*, June 1982, pp. 9-14.

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, June 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 1976, 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 1972. 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*. Series on the net output of major mining and manufacturing industry groups will appear in the *Review* starting with data for July 1986.

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, June 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 Laspeyeres 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.

## PRODUCTIVITY DATA (Tables 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** is the labor compensation costs expended in the production of a unit of output and is 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.

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, June 1985).

**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 business 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, Vol. 1, Chapter 13 (Bureau of Labor Statistics, 1982). Historical data for selected industries are provided in the Bureau's *Handbook of Labor Statistics*, Bulletin 2217, 1985.

## International comparisons

### Description of the series

Comparative measures of labor force, employment, and unemployment (tables 45 and 46) are prepared regularly for the United States, Canada, Australia, Japan, France, Germany, Great Britain, Italy, the Netherlands, and Sweden. Unemployment rates, approximating U.S. concepts, are prepared monthly for most of the countries; the other measures, annually.

The Bureau of Labor Statistics also prepares international comparisons of manufacturing labor productivity and labor costs (table 47) that cover the United States and 11 foreign countries—those listed above plus Belgium and Norway. 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 are unavailable. The U.S. measures are described in the notes on U.S. productivity measurement; the measures for foreign countries are compiled from various national and international data sources.

### Definitions

**Output** measures are constant value output (value added) from the national accounts of each country, except for those for Japan prior to 1970 and for the Netherlands for 1969 forward, which are indexes of industrial production. The national accounting methods for measuring real output differ considerably among the 12 countries, but 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 and compensation** measures refer to all employed persons including the self-employed in the United States and Canada, and to all wage and salary employees in the other countries. *Hours* refer to hours *paid* in the United States, hours *worked* in the other countries. *Compensation (labor costs)* includes not only all payments made directly to employees and employer expenditures for social insurance and private benefit plans, but changes in significant employment or payroll taxes that are not compensation to employees but are labor costs to employers (France, Sweden, and

the United Kingdom). Self-employed workers are included in the U.S. and Canadian figures by assuming that their hourly compensation is equal to the average for wage and salary employees.

### Notes on the data

The data for the foreign countries in tables 45 and 46 have been adjusted, where necessary, for greater comparability with U.S. definitions of employment and unemployment. The adjusted statistics have been adapted to the age at which compulsory schooling ends in each country. Therefore, the adjusted statistics relate to the civilian population age 16 and over in the United States, France, and Sweden, and from 1973 onward, Great Britain; 15 and over in Canada, Australia, Japan, Germany, and the Netherlands; and 14 and over in Italy. Prior to 1973, the data for Great Britain related to persons age 15 and over. The institutional population is included in the denominator of the labor force participation rates and employment-population rates for Japan and Germany.

For most of the countries in table 47, 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 1976) refer to manufacturing and mining less energy-related products. For all countries, manufacturing includes the activities of government enterprises.

In addition, for all countries, preliminary estimates for recent years are generally based on current indicators of manufacturing output, employment and hours, and hourly compensation until national accounts and other statistics used for the long-term measures become available.

### Additional sources of information

For further information, see *International Comparisons of Unemployment*, Bulletin 1979 (Bureau of Labor Statistics, 1978), Appendix B and Supplements to Appendix B. Additional detail is also found in the *BLS Handbook of Methods*, Bulletin 2134, Vol. 1, Chapter 16. Additional international comparison statistics are available in the *Handbook of Labor Statistics* (BLS Bulletin 2217, 1985). The most recent statistics are presented and analyzed annually in the *Monthly Labor Review*, typically in the December issue (for the previous year) and in February.

## 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, etc., 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), ch. 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	1984	1985	1984				1985			
			I	II	III	IV	I	II	III	IV
<b>Employment data</b>										
Employment status of the civilian noninstitutionalized population (household survey) <sup>1</sup>										
Labor Force participation rate .....	64.4	64.8	64.1	64.5	64.4	64.5	64.8	64.7	64.7	64.9
Employment-population ratio .....	59.5	60.1	59.0	59.6	59.7	59.8	60.1	60.0	60.1	60.4
Unemployment rate .....	7.5	7.2	7.9	7.5	7.4	7.2	7.3	7.3	7.2	7.0
Men .....	7.4	7.0	7.9	7.4	7.3	7.1	7.1	7.1	7.0	6.9
16 to 24 years .....	14.4	14.1	15.0	14.3	14.5	13.8	14.1	14.2	14.0	14.0
25 years and over .....	5.7	5.3	6.1	5.7	5.5	5.4	5.4	5.4	5.3	5.2
Women .....	7.6	7.4	7.9	7.6	7.6	7.5	7.6	7.5	7.4	7.2
16 to 24 years .....	13.3	13.0	-	-	-	-	-	-	-	-
25 years and over .....	6.0	5.9	6.1	5.9	6.0	5.9	6.0	6.0	5.9	5.5
Unemployment rate, 15 weeks and over .....	2.4	2.0	2.7	2.5	2.3	2.1	2.0	2.0	2.0	1.9
Employment, nonagricultural (payroll data): <sup>1</sup> <sup>4</sup>										
Total .....	94,461	97,698	91,804	94,013	94,915	95,849	96,640	97,338	97,967	98,810
Private sector .....	78,477	81,403	75,932	78,082	78,898	79,745	80,522	81,143	81,588	82,316
Goods-producing .....	24,730	25,056	23,938	24,680	24,861	24,973	25,077	25,055	24,986	25,095
Manufacturing .....	19,412	19,426	18,885	19,394	19,509	19,564	19,564	19,430	19,331	19,383
Service-producing .....	69,731	72,642	67,866	69,333	70,055	70,876	71,563	72,283	72,981	73,715
Average hours .....										
Private sector .....	35.3	35.1	-	-	-	-	-	-	-	35.1
Manufacturing .....	40.7	40.5	-	-	-	-	-	-	-	40.8
Overtime .....	-	-	3.5	3.5	3.5	3.6	3.4	3.3	3.2	3.5
<b>Employment Cost Index</b>										
Percent change in the ECI, compensation: <sup>2</sup>										
All workers (excluding farm, household, and Federal workers) .....	-	-	1.7	.8	1.3	1.2	1.3	.7	1.6	.6
Private industry workers .....	-	-	1.7	.9	.8	1.3	1.2	.8	1.3	.6
Goods-producing <sup>3</sup> .....	-	-	1.6	.9	.9	1.1	1.5	.7	.6	.6
Servicing-producing <sup>3</sup> .....	-	-	1.9	1.0	.7	1.4	1.0	1.0	1.8	.5
State and local government workers .....	-	-	1.6	.4	3.5	1.0	1.2	.2	3.4	.7
Workers by bargaining status (private industry)										
Union .....	-	-	1.5	.9	.7	1.1	.7	.6	.8	.5
Nonunion .....	-	-	1.8	1.0	.9	1.3	1.6	1.0	1.4	.6

<sup>1</sup> Quarterly data seasonally adjusted.

<sup>2</sup> Annual changes are December-to-December change. Quarterly changes calculated using the last month of each quarter.

<sup>3</sup> Goods-producing industries include mining, construction, and manufacturing. Service-

producing industries include all other private sector industries.

- Data not available.

<sup>4</sup> Data for 1985 and 4th quarter 1985 are preliminary.

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

Selected measures	1984	1985	1984				1985			
			I	II	III	IV	I	II	III	IV
<b>Compensation data:</b> <sup>1, 2</sup>										
Employment Cost Index--Compensation (wages, salaries, benefits)	-	-	1.7	0.8	1.3	1.2	1.3	0.7	1.6	0.6
Civilian nonfarm .....	-	-	1.7	.9	.8	1.3	1.2	.8	1.3	.6
Private nonfarm .....	-	-	1.2	.8	1.3	1.2	1.2	.9	1.7	.6
Employment Cost Index--Wages and Salaries	-	-	1.2	.8	1.3	1.2	1.2	.9	1.7	.6
Civilian nonfarm .....	-	-	1.2	.9	.8	1.2	1.2	1.1	1.3	.6
Private nonfarm .....	-	-								
<b>Price data</b> <sup>1</sup>										
Consumer Price Index (All urban consumers): All items .....	-	-	-	-	-	-	-	-	-	-
Producer Price Index										
Finished goods .....	-	-	-	-	-	-	-	-	-	-
Finished consumer goods .....	-	-	-	-	-	-	-	-	-	-
Capital equipment .....	-	-	-	-	-	-	-	-	-	-
Intermediate materials, supplies, components .....	-	-	-	-	-	-	-	-	-	-
Crude materials .....	-	-	-	-	-	-	-	-	-	-
U.S. Export Price Index .....	-	-	-	-	-	-	-	-	-	-
U.S. Import Price Index .....	-	-	-	-	-	-	-	-	-	-
<b>Productivity data</b>										
Output per hour of all persons:										
Business sector .....	2.1	.2	5.1	2.5	-.8	-.3	1.0	.8	1.6	-3.1
Nonfarm business sector .....	1.6	-.2	3.6	2.2	-1.3	-1.3	1.0	.2	.4	-3.1
Nonfinancial corporations <sup>3</sup> .....	2.1	-1	4.7	2.1	-2.3	-1.1	.1	-2	2.8	-

<sup>1</sup> Annual changes are December-to-December change. Quarterly changes are calculated using the last month of each quarter.

<sup>2</sup> Excludes Federal and private household workers.

<sup>3</sup> Output per hour of all employees.  
- Data not available.

## 3. Alternative measures of wage and compensation changes

Components	Quarterly average						Four quarters ended in--					
	1984		1985				1984		1985			
	III	IV	I	II	III	IV	III	IV	I	II	III	IV
<b>Average hourly compensation:</b> <sup>1</sup>												
All persons, business sector .....	-	-	-	-	-	-	-	-	-	-	-	-
All employees, nonfarm business sector .....	-	-	-	-	-	-	-	-	-	-	-	-
<b>Hourly earnings Index:</b> <sup>2</sup>												
All private nonfarm .....	-	-	-	-	-	-	-	-	-	-	-	-
<b>Employment Cost Index--compensation:</b>												
Civilian nonfarm <sup>3</sup> .....	1.3	1.2	1.3	0.7	1.6	0.6	5.1	5.2	4.8	4.6	4.9	4.3
Private nonfarm .....	.8	1.3	1.2	.8	1.3	.6	4.8	4.9	4.4	4.2	4.7	3.9
Union .....	.7	1.1	.7	.6	.8	.5	4.1	4.3	3.5	3.1	3.2	2.6
Nonunion .....	.9	1.3	1.6	1.0	1.4	.6	5.2	5.2	4.9	4.9	5.4	4.6
State and local governments .....	3.5	1.0	1.2	.2	3.4	.7	6.6	6.6	6.3	6.1	6.0	5.7
<b>Employment Cost Index--wages and salaries:</b>												
Civilian nonfarm <sup>3</sup> .....	1.3	1.2	1.2	.9	1.7	.6	4.3	4.5	4.4	4.5	5.0	4.4
Private nonfarm .....	.8	1.2	1.2	1.1	1.3	.6	4.1	4.1	4.1	4.3	4.8	4.1
Union .....	.7	.9	.7	1.1	.9	.5	3.3	3.4	3.0	3.4	3.6	3.1
Nonunion .....	.8	1.3	1.4	1.1	1.5	.6	4.5	4.5	4.6	4.8	5.4	4.6
State and local governments .....	3.4	.8	1.0	.2	3.5	.8	5.8	5.9	5.6	5.5	5.6	5.6
<b>Total effective wage adjustments:</b> <sup>4</sup>												
From current settlements .....	1.2	.7	.8	.8	1.2	.5	4.2	3.7	3.6	3.5	3.5	3.3
From prior settlements .....	.2	.3	.1	.2	.2	.2	1.0	.8	.7	.9	.9	.7
From cost-of-living provision .....	.7	.2	.6	.5	.6	.2	2.1	2.0	2.2	1.9	1.8	1.8
From cost-of-living provision .....	.3	.2	.1	.1	.4	.1	1.2	.9	.7	.7	.8	.8
<b>Negotiated wage adjustments from settlements:</b> <sup>4</sup>												
First-year adjustments .....	2.1	2.3	3.3	2.5	2.0	2.1	3.2	2.4	2.4	2.4	2.4	2.3
Annual rate over life of contract .....	2.6	1.5	3.2	2.8	3.1	1.9	2.8	2.4	2.3	2.4	2.5	2.7
<b>Negotiated wage and benefit adjustments from settlements:</b> <sup>5</sup>												
First-year adjustment .....	2.7	3.7	3.6	3.5	2.0	2.0	4.2	3.6	3.4	3.5	3.1	-
Annual rate over life of contract .....	3.1	2.0	2.7	3.4	3.0	1.4	3.2	2.8	2.6	2.7	2.7	2.8

<sup>1</sup> Seasonally adjusted.

<sup>2</sup> Production or nonsupervisory workers.

<sup>3</sup> Excludes Federal and household workers.

<sup>4</sup> Limited to major collective bargaining units of 1,000 workers or more. The

most recent data are preliminary.

<sup>5</sup> Limited to major collective bargaining units of 5,000 workers or more. The

most recent data are preliminary.

- Data not available.

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

(Number in thousands)

Employment status	Annual average		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
<b>TOTAL</b>															
Noninstitutional population <sup>1, 2</sup> .....	178,080	179,912	179,081	179,219	179,368	179,501	179,649	179,798	179,967	180,131	180,304	180,470	180,642	180,810	181,361
Labor force <sup>2</sup> .....	115,241	117,167	116,451	116,685	117,036	116,958	117,044	116,726	116,976	117,069	117,522	117,814	117,832	117,927	118,477
Participation rate <sup>3</sup> .....	64.7	65.1	65.0	65.1	65.2	65.2	65.2	64.9	65.0	65.0	65.2	65.3	65.2	65.2	65.3
Total employed <sup>2</sup> .....	106,702	108,856	108,012	108,290	108,652	108,574	108,644	108,303	108,575	108,936	109,251	109,513	109,671	109,904	110,646
Employment-population ratio <sup>4</sup> .....	59.9	60.5	60.3	60.4	60.6	60.5	60.5	60.2	60.3	60.5	60.6	60.7	60.7	60.8	61.0
Resident Armed Forces <sup>1</sup> .....	1,697	1,706	1,697	1,703	1,701	1,702	1,705	1,702	1,704	1,726	1,732	1,700	1,702	1,698	1,691
Civilian employed .....	105,005	107,150	106,315	106,587	106,951	106,872	106,939	106,601	106,871	107,210	107,519	107,813	107,969	108,206	108,955
Agriculture .....	3,321	3,179	3,319	3,325	3,314	3,353	3,284	3,140	3,120	3,095	3,017	3,058	3,070	3,151	3,299
Nonagricultural industries .....	101,685	103,971	102,996	103,262	103,637	103,519	103,655	103,461	103,751	104,115	104,502	104,755	104,899	105,055	105,655
Unemployed .....	8,539	8,312	8,439	8,395	8,384	8,384	8,400	8,423	8,401	8,133	8,271	8,301	8,161	8,023	7,831
Unemployment rate <sup>5</sup> .....	7.4	7.1	7.2	7.2	7.2	7.2	7.2	7.2	7.2	6.9	7.0	7.0	6.9	6.8	6.6
Not in labor force .....	62,839	62,744	62,630	62,534	62,332	62,543	62,605	63,072	62,991	63,062	62,782	62,656	62,810	62,883	62,885
<b>Men, 16 years and over</b>															
Noninstitutional population <sup>1, 2</sup> .....	85,156	86,025	85,629	85,692	85,764	85,827	85,898	85,970	86,052	86,132	86,217	86,293	86,374	86,459	86,882
Labor force <sup>2</sup> .....	65,386	65,967	65,737	65,872	65,898	65,929	66,012	65,808	65,884	65,945	66,074	66,227	66,176	66,139	66,679
Participation rate <sup>3</sup> .....	76.8	76.7	76.8	76.8	76.8	76.8	76.8	76.5	76.6	76.6	76.6	76.6	76.6	76.5	76.7
Total employed <sup>2</sup> .....	60,642	61,447	61,163	61,207	61,381	61,373	61,498	61,175	61,273	61,510	61,629	61,656	61,731	61,793	62,458
Employment-population ratio <sup>4</sup> .....	71.2	71.4	71.4	71.4	71.6	71.5	71.6	71.2	71.2	71.4	71.5	71.4	71.5	71.5	71.9
Resident Armed Forces <sup>1</sup> .....	1,551	1,556	1,549	1,554	1,553	1,553	1,556	1,552	1,554	1,574	1,580	1,551	1,552	1,549	1,539
Civilian employed .....	59,091	59,891	59,614	59,653	59,828	59,820	59,942	59,623	59,719	59,936	60,049	60,105	60,179	60,244	60,919
Unemployed .....	4,744	4,521	4,574	4,575	4,517	4,556	4,514	4,633	4,611	4,435	4,445	4,571	4,445	4,346	4,221
Unemployment rate <sup>5</sup> .....	7.3	6.9	7.0	7.0	6.9	6.9	6.8	7.0	7.0	6.7	6.7	6.9	6.7	6.6	6.3
<b>Women, 16 years and over</b>															
Noninstitutional population <sup>1, 2</sup> .....	92,924	93,886	93,452	93,527	93,603	93,674	93,751	93,828	93,915	93,999	94,087	94,177	94,266	94,351	94,479
Labor force <sup>2</sup> .....	49,855	51,200	50,714	50,903	51,138	51,029	51,032	50,918	51,092	51,124	51,448	51,587	51,655	51,788	51,797
Participation rate <sup>3</sup> .....	53.7	54.5	54.3	54.4	54.6	54.5	54.4	54.3	54.4	54.4	54.7	54.8	54.8	54.9	54.8
Total employed <sup>2</sup> .....	46,061	47,409	46,849	47,083	47,271	47,201	47,146	47,128	47,302	47,426	47,622	47,857	47,939	48,111	48,187
Employment-population ratio <sup>4</sup> .....	49.6	50.5	50.1	50.3	50.5	50.4	50.3	50.2	50.4	50.5	50.6	50.8	50.9	51.0	51.0
Resident Armed Forces <sup>1</sup> .....	146	150	148	149	148	149	149	150	150	152	152	149	149	149	152
Civilian employed .....	45,915	47,259	46,701	46,934	47,123	47,052	46,997	46,978	47,152	47,274	47,470	47,708	47,790	47,962	48,035
Unemployed .....	3,794	3,791	3,865	3,820	3,867	3,828	3,886	3,790	3,790	3,698	3,826	3,730	3,716	3,677	3,610
Unemployment rate <sup>5</sup> .....	7.6	7.4	7.6	7.5	7.6	7.5	7.6	7.4	7.4	7.2	7.4	7.2	7.2	7.1	7.0

<sup>1</sup> The population and Armed Forces figures are not adjusted for seasonal variation.

<sup>2</sup> Includes members of the Armed Forces stationed in the United States.

<sup>3</sup> Labor force as a percent of the noninstitutional population.

<sup>4</sup> Total employed as a percent of the noninstitutional population.

<sup>5</sup> 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		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
<b>TOTAL</b>															
Civilian noninstitutional population <sup>1</sup> .....	176,383	178,206	177,384	177,516	177,667	177,799	177,944	178,096	178,263	178,405	178,572	178,770	178,940	179,112	179,670
Civilian labor force .....	113,544	115,461	114,754	114,982	115,335	115,256	115,339	115,024	115,272	115,343	115,790	116,114	116,130	116,229	116,786
Participation rate .....	64.4	64.8	64.7	64.8	64.9	64.8	64.8	64.6	64.7	64.7	64.8	65.0	64.9	64.9	65.0
Employed .....	105,005	107,150	106,315	106,587	106,951	106,872	106,939	106,601	106,871	107,210	107,519	107,813	107,969	108,206	108,955
Employment-population ratio <sup>2</sup> .....	59.5	60.1	59.9	60.0	60.2	60.1	60.1	59.9	60.0	60.1	60.2	60.3	60.3	60.4	60.6
Unemployed .....	8,539	8,312	8,439	8,395	8,384	8,384	8,400	8,423	8,401	8,133	8,271	8,301	8,161	8,023	7,831
Unemployment rate .....	7.5	7.2	7.4	7.3	7.3	7.3	7.3	7.3	7.3	7.1	7.1	7.1	7.0	6.9	6.7
Not in labor force .....	62,839	62,744	62,630	62,534	62,332	62,543	62,605	63,072	62,991	63,062	62,782	62,656	62,810	62,883	62,885
<b>Men, 20 years and over</b>															
Civilian noninstitutional population <sup>1</sup> .....	76,219	77,195	76,760	76,829	76,904	76,988	77,068	77,135	77,243	77,306	77,389	77,498	77,566	77,651	78,101
Civilian labor force .....	59,701	60,277	59,997	60,037	60,154	60,165	60,240	60,246	60,158	60,269	60,407	60,526	60,553	60,548	61,212
Participation rate .....	78.3	78.1	78.2	78.1	78.2	78.1	78.2	78.1	77.9	78.0	78.1	78.1	78.1	78.0	78.4
Employed .....	55,769	56,562	56,231	56,274	56,411	56,390	56,544	56,384	56,403	56,636	56,751	56,849	56,897	56,982	57,706
Employment-population ratio <sup>2</sup> .....	73.2	73.3	73.3	73.2	73.4	73.2	73.4	73.1	73.0	73.3	73.3	73.4	73.4	73.4	73.9
Agriculture .....	2,418	2,278	2,409	2,368	2,329	2,358	2,352	2,260	2,230	2,231	2,171	2,188	2,210	2,278	2,349
Nonagricultural industries .....	53,351	54,284	53,822	53,906	54,082	54,032	54,192	54,124	54,173	54,405	54,580	54,661	54,687	54,704	55,356
Unemployed .....	3,932	3,715	3,766	3,763	3,743	3,775	3,696	3,862	3,755	3,633	3,656	3,677	3,656	3,567	3,507
Unemployment rate .....	6.6	6.2	6.3	6.3	6.2	6.3	6.1	6.4	6.2	6.0	6.1	6.1	6.0	5.9	5.7
<b>Women, 20 years and over</b>															
Civilian noninstitutional population <sup>1</sup> .....	85,429	86,506	86,015	86,086	86,181	86,274	86,380	86,477	86,575	86,652	86,727	86,810	86,901	86,988	87,112
Civilian labor force .....	45,900	47,283	46,753	46,853	47,095	47,103	47,082	47,185	47,190	47,340	47,558	47,663	47,713	47,870	47,895
Participation rate .....	53.7	54.7	54.4	54.4	54.6	54.6	54.5	54.6	54.5	54.6	54.8	54.9	54.9	55.0	55.0
Employed .....	42,793	44,154	43,593	43,713	43,927	43,925	43,883	44,033	44,070	44,197	44,363	44,609	44,656	44,882	44,980
Employment-population ratio <sup>2</sup> .....	50.1	51.0	50.7	50.8	51.0	50.9	50.8	50.9	50.9	51.0	51.2	51.4	51.4	51.6	51.6
Agriculture .....	595	596	593	606	630	633	600	572	596	581	557	609	591	597	696
Nonagricultural industries .....	42,198	43,558	43,000	43,107	43,297	43,292	43,283	43,461	43,474	43,616	43,806	44,000	44,065	44,285	44,284
Unemployed .....	3,107	3,129	3,160	3,140	3,168	3,178	3,199	3,152	3,120	3,143	3,195	3,054	3,057	2,988	2,915
Unemployment rate .....	6.8	6.6	6.8	6.7	6.7	6.7	6.8	6.7	6.6	6.6	6.7	6.4	6.4	6.2	6.1
<b>Both sexes, 16 to 19 years</b>															
Civilian noninstitutional population <sup>1</sup> .....	14,735	14,506	14,610	14,600	14,582	14,538	14,496	14,483	14,445	14,448	14,456	14,463	14,472	14,474	14,458
Civilian labor force .....	7,943	7,901	8,004	8,092	8,086	7,988	8,017	7,593	7,924	7,734	7,825	7,925	7,864	7,811	7,678
Participation rate .....	53.9	54.5	54.8	55.4	55.5	54.9	55.3	52.4	54.9	53.5	54.1	54.8	54.3	54.0	53.1
Employed .....	6,444	6,434	6,491	6,600	6,613	6,557	6,512	6,184	6,398	6,377	6,405	6,355	6,416	6,342	6,269
Employment-population ratio <sup>2</sup> .....	43.7	44.4	44.4	45.2	45.4	45.1	44.9	42.7	44.3	44.1	44.3	43.9	44.3	43.8	43.4
Agriculture .....	309	305	317	351	355	362	332	308	294	283	289	261	269	276	254
Nonagricultural industries .....	6,135	6,129	6,174	6,249	6,258	6,195	6,180	5,876	6,104	6,094	6,116	6,094	6,147	6,066	6,015
Unemployed .....	1,499	1,468	1,513	1,492	1,473	1,431	1,505	1,409	1,526	1,357	1,420	1,570	1,448	1,469	1,409
Unemployment rate .....	18.9	18.6	18.9	18.4	18.2	17.9	18.8	18.6	19.3	17.5	18.1	19.8	18.4	18.8	18.4
<b>White</b>															
Civilian noninstitutional population <sup>1</sup> .....	152,347	153,679	153,103	153,191	153,296	153,388	153,489	153,597	153,717	153,819	153,938	154,082	154,203	154,327	154,784
Civilian labor force .....	98,492	99,926	99,358	99,612	99,862	99,718	99,771	99,527	99,705	99,817	100,179	100,533	100,478	100,533	100,961
Participation rate .....	64.6	65.0	64.9	65.0	65.1	65.0	65.0	64.8	64.9	64.9	65.1	65.2	65.2	65.1	65.2
Employed .....	92,120	93,736	93,040	93,414	93,617	93,470	93,574	93,132	93,378	93,684	94,055	94,369	94,507	94,585	95,165
Employment-population ratio <sup>2</sup> .....	60.5	61.0	60.8	61.0	61.1	60.9	61.0	60.6	60.7	60.9	61.1	61.2	61.3	61.3	61.5
Unemployed .....	6,372	6,191	6,318	6,198	6,245	6,248	6,197	6,395	6,327	6,133	6,124	6,164	5,971	5,948	5,796
Unemployment rate .....	6.5	6.2	6.4	6.2	6.3	6.3	6.2	6.4	6.3	6.1	6.1	6.1	5.9	5.9	5.7
<b>Black</b>															
Civilian noninstitutional population <sup>1</sup> .....	19,348	19,664	19,518	19,542	19,569	19,594	19,620	19,646	19,675	19,700	19,728	19,761	19,790	19,819	19,837
Civilian labor force .....	12,033	12,364	12,305	12,299	12,294	12,364	12,372	12,317	12,354	12,289	12,378	12,412	12,457	12,522	12,548
Participation rate .....	62.2	62.9	63.0	62.9	62.8	63.1	63.1	62.7	62.8	62.4	62.7	62.8	62.9	63.2	63.3
Employed .....	10,119	10,501	10,451	10,333	10,422	10,489	10,466	10,538	10,499	10,560	10,500	10,566	10,518	10,657	10,737
Employment-population ratio <sup>2</sup> .....	52.3	53.4	53.5	52.9	53.3	53.5	53.3	53.6	53.4	53.6	53.2	53.5	53.1	53.8	54.1
Unemployed .....	1,914	1,864	1,854	1,966	1,872	1,875	1,906	1,779	1,855	1,729	1,878	1,846	1,939	1,865	1,810
Unemployment rate .....	15.9	15.1	15.1	16.0	15.2	15.2	15.4	14.4	15.0	14.1	15.2	14.9	15.6	14.9	14.4

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		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
<b>Hispanic origin<sup>3</sup></b>															
Civilian noninstitutional population <sup>1</sup> .....	11,478	11,915	11,716	11,753	11,789	11,826	11,862	11,897	11,933	11,969	12,004	12,040	12,075	12,111	12,148
Civilian labor force .....	7,451	7,698	7,506	7,591	7,621	7,607	7,616	7,669	7,713	7,781	7,844	7,854	7,782	7,772	7,787
Participation rate .....	64.9	64.6	64.1	64.6	64.6	64.3	64.2	64.5	64.6	65.0	65.3	65.2	64.4	64.2	64.1
Employed .....	6,651	6,888	6,713	6,832	6,838	6,814	6,806	6,856	6,870	6,973	7,026	6,982	6,953	6,962	6,998
Employment-population ratio <sup>2</sup> .....	57.9	57.8	57.3	58.1	58.0	57.6	57.4	57.6	57.6	58.3	58.5	58.0	57.6	57.5	57.6
Unemployed .....	800	811	793	759	783	793	810	813	843	808	818	878	829	810	789
Unemployment rate .....	10.7	10.5	10.6	10.0	10.3	10.4	10.6	10.6	10.9	10.4	10.4	11.1	10.7	10.4	10.1

<sup>1</sup> The population figures are not seasonally adjusted.

<sup>2</sup> Civilian employment as a percent of the civilian noninstitutional population.

<sup>3</sup> Data for 1980-85 have been revised to reflect new population estimates.

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		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
<b>CHARACTERISTIC</b>															
Civilian employed, 16 years and over .....	105,005	107,150	106,315	106,587	106,951	106,872	106,939	106,601	106,871	107,210	107,519	107,813	107,969	108,206	108,955
Men .....	59,091	59,891	59,614	59,653	59,828	59,820	59,942	59,623	59,719	59,936	60,049	60,105	60,179	60,244	60,919
Women .....	45,915	47,259	46,701	46,934	47,123	47,052	46,997	46,978	47,152	47,274	47,470	47,708	47,790	47,962	48,035
Married men, spouse present ..	39,056	39,248	39,402	39,324	39,467	39,362	39,260	38,966	39,096	39,142	39,103	39,272	39,314	39,278	39,615
Married women, spouse present .....	25,636	26,336	25,970	26,079	26,163	26,087	26,036	26,174	26,316	26,392	26,531	26,702	26,721	26,804	26,958
Women who maintain families ..	5,465	5,597	5,567	5,533	5,600	5,603	5,626	5,643	5,607	5,627	5,556	5,514	5,605	5,693	5,702
<b>MAJOR INDUSTRY AND CLASS OF WORKER</b>															
Agriculture:															
Wage and salary workers .....	1,555	1,535	1,598	1,597	1,596	1,653	1,582	1,530	1,479	1,456	1,438	1,465	1,537	1,572	1,673
Self-employed workers .....	1,553	1,458	1,523	1,508	1,502	1,493	1,498	1,451	1,474	1,444	1,414	1,436	1,361	1,409	1,492
Unpaid family workers .....	213	185	222	229	223	219	196	159	170	176	179	172	158	164	163
Nonagricultural industries:															
Wage and salary workers .....	93,565	95,871	95,086	95,235	95,606	95,493	95,660	95,391	95,523	95,791	96,546	96,530	96,676	96,921	97,911
Government .....	15,770	16,031	15,820	15,957	15,969	15,955	15,936	16,000	15,949	16,075	16,145	16,213	16,157	16,194	16,418
Private industries .....	77,794	79,841	79,266	79,278	79,637	79,538	79,724	79,391	79,574	79,716	80,401	80,317	80,519	80,727	81,494
Private households .....	1,238	1,249	1,364	1,288	1,225	1,218	1,255	1,228	1,251	1,295	1,266	1,271	1,197	1,131	1,256
Other .....	76,556	78,592	77,902	77,990	78,412	78,320	78,469	78,163	78,323	78,421	79,135	79,046	79,322	79,596	80,238
Self-employed workers .....	7,785	7,811	7,753	7,694	7,764	7,717	7,711	7,728	7,724	7,874	7,846	7,991	8,013	7,903	7,655
Unpaid family workers .....	335	289	336	336	321	305	290	292	277	303	266	248	249	250	273
<b>PERSONS AT WORK PART TIME<sup>1</sup></b>															
All industries:															
Part time for economic reasons ..	5,744	5,590	5,638	5,356	5,682	5,690	5,876	5,544	5,596	5,680	5,554	5,475	5,498	5,494	5,543
Slack work .....	2,430	2,430	2,473	2,244	2,585	2,567	2,607	2,524	2,414	2,480	2,433	2,251	2,306	2,303	2,364
Could only find part-time work ..	2,948	2,819	2,890	2,817	2,763	2,767	2,871	2,751	2,766	2,835	2,815	2,897	2,883	2,864	2,883
Voluntary part time .....	13,169	13,489	13,343	13,524	13,517	13,356	13,078	13,439	13,634	13,622	13,496	13,713	13,645	13,556	13,958
Nonagricultural industries:															
Part time for economic reasons ..	5,512	5,334	5,392	5,098	5,421	5,402	5,550	5,278	5,328	5,413	5,299	5,241	5,295	5,294	5,275
Slack work .....	2,291	2,273	2,320	2,073	2,397	2,380	2,418	2,334	2,251	2,319	2,292	2,115	2,196	2,195	2,208
Could only find part-time work ..	2,866	2,730	2,735	2,732	2,670	2,679	2,785	2,675	2,686	2,740	2,730	2,801	2,784	2,760	2,776
Voluntary part time .....	12,704	13,038	12,859	13,057	13,016	12,926	12,612	12,995	13,235	13,179	13,053	13,277	13,194	13,122	13,441

<sup>1</sup> 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		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
<b>CHARACTERISTIC</b>															
Total, all civilian workers .....	7.5	7.2	7.4	7.3	7.3	7.3	7.3	7.3	7.3	7.1	7.1	7.1	7.0	6.9	6.7
Both sexes, 16 to 19 years .....	18.9	18.6	18.9	18.4	18.2	17.9	18.8	18.6	19.3	17.5	18.1	19.8	18.4	18.8	18.4
Men, 20 years and over .....	6.6	6.2	6.3	6.3	6.2	6.3	6.1	6.4	6.2	6.0	6.1	6.1	6.0	5.9	5.7
Women, 20 years and over .....	6.8	6.6	6.8	6.7	6.7	6.7	6.8	6.7	6.6	6.6	6.7	6.4	6.4	6.2	6.1
White, total .....	6.5	6.2	6.4	6.2	6.3	6.3	6.2	6.4	6.3	6.1	6.1	6.1	5.9	5.9	5.7
Both sexes, 16 to 19 years .....	16.0	15.7	15.7	15.4	15.1	15.2	16.0	16.0	16.1	15.2	15.3	17.0	15.5	15.9	14.9
Men, 16 to 19 years .....	16.8	16.5	16.1	16.8	15.6	15.7	16.7	16.7	17.1	17.2	16.2	18.5	15.8	16.2	14.7
Women, 16 to 19 years .....	15.2	14.8	15.3	14.0	14.7	14.5	15.1	15.2	15.0	13.0	14.4	15.3	15.1	15.5	15.1
Men, 20 years and over .....	5.7	5.4	5.5	5.4	5.4	5.4	5.2	5.7	5.6	5.3	5.2	5.2	5.2	5.1	5.0
Women, 20 years and over .....	5.8	5.7	5.9	5.7	5.9	5.8	5.8	5.8	5.7	5.7	5.7	5.5	5.4	5.4	5.3
Black, total .....	15.9	15.1	15.1	16.0	15.2	15.2	15.4	14.4	15.0	14.1	15.2	14.9	15.6	14.9	14.4
Both sexes, 16 to 19 years .....	42.7	40.2	41.5	42.1	41.5	39.3	40.4	39.5	41.2	35.3	38.8	39.7	40.8	41.6	41.9
Men, 16 to 19 years .....	42.7	41.0	43.9	40.9	41.1	39.4	39.3	41.0	43.1	34.9	41.1	41.0	45.2	41.0	41.3
Women, 16 to 19 years .....	42.6	39.2	38.9	43.3	41.9	39.3	41.5	37.8	39.0	35.9	36.1	38.2	36.0	42.3	42.4
Men, 20 years and over .....	14.3	13.2	12.9	14.2	13.3	13.3	13.4	12.5	12.8	11.9	13.3	13.7	13.7	13.1	12.7
Women, 20 years and over .....	13.5	13.1	13.0	13.7	13.0	13.2	13.5	12.7	13.1	13.1	13.5	12.1	13.6	12.6	12.0
Hispanic origin, total <sup>2</sup> .....	10.7	10.5	10.6	10.0	10.3	10.4	10.6	10.6	10.9	10.4	10.4	11.1	10.7	10.4	10.1
Married men, spouse present .....	4.6	4.3	4.5	4.4	4.3	4.3	4.0	4.6	4.4	4.1	4.3	4.2	4.3	4.3	4.3
Married women, spouse present .....	5.7	5.6	5.7	5.4	5.8	5.8	5.7	5.8	5.7	5.4	5.6	5.3	5.5	5.3	5.1
Women who maintain families .....	10.3	10.4	10.2	10.9	10.3	10.7	10.8	9.9	10.3	10.8	11.3	10.4	10.0	9.4	9.9
Full-time workers .....	7.2	6.8	7.0	7.0	6.9	6.9	6.9	6.9	7.0	6.8	6.8	6.8	6.7	6.6	6.4
Part-time workers .....	9.3	9.3	9.3	8.8	9.5	9.7	10.0	9.5	9.4	9.0	9.3	9.6	8.8	9.0	8.4
Unemployed 15 weeks and over .....	2.4	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.8
Labor force time lost <sup>1</sup> .....	8.6	8.1	8.3	8.2	8.2	8.2	8.3	8.2	8.2	8.1	8.1	7.9	7.9	7.8	7.6
<b>INDUSTRY</b>															
Nonagricultural private wage and salary workers ....	7.4	7.2	7.3	7.3	7.2	7.3	7.2	7.3	7.3	7.1	7.2	7.1	7.0	6.9	6.7
Mining .....	10.0	9.5	10.3	10.8	10.9	10.6	7.5	10.9	9.9	8.6	8.9	7.7	7.3	10.3	10.9
Construction .....	14.3	13.1	13.5	13.4	13.3	13.3	11.0	13.5	13.4	13.1	13.6	13.5	13.4	12.6	12.9
Manufacturing .....	7.5	7.7	7.6	7.6	7.7	7.9	7.8	7.7	7.9	7.8	7.7	7.5	7.7	7.3	7.0
Durable goods .....	7.2	7.6	7.2	7.3	7.5	7.7	7.8	7.9	7.9	7.9	7.7	7.3	7.6	7.3	7.0
Nondurable goods .....	7.8	7.8	8.0	8.0	8.1	8.2	7.8	7.5	7.9	7.6	7.8	7.8	7.8	7.3	7.1
Transportation and public utilities .....	5.5	5.1	5.1	5.4	4.7	5.4	5.2	5.3	5.7	4.5	5.3	5.1	5.1	5.0	4.3
Wholesale and retail trade .....	8.0	7.6	7.7	7.7	7.5	7.4	7.8	7.7	7.6	7.7	7.8	7.7	7.5	7.6	7.2
Finance and service industries .....	5.9	5.6	5.9	5.7	5.7	5.7	6.1	5.7	5.6	5.5	5.5	5.4	5.4	5.3	5.2
Government workers .....	4.5	3.9	4.1	4.0	4.0	3.9	3.9	3.9	4.0	3.9	3.8	3.9	3.6	3.8	3.4
Agricultural wage and salary workers .....	13.5	13.2	15.4	13.6	12.5	13.2	11.9	12.5	14.0	14.0	13.3	12.9	12.5	10.6	10.9

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

<sup>2</sup> Data for 1980-85 have been revised to reflect new population estimates.

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

(Civilian workers)

Sex and age	Annual average		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Total, 16 years and over .....	7.5	7.2	7.4	7.3	7.3	7.3	7.3	7.3	7.3	7.1	7.1	7.1	7.0	6.9	6.7
16 to 24 years .....	13.9	13.6	13.6	13.7	13.5	13.4	14.0	13.6	13.9	13.0	13.3	13.9	13.5	13.3	13.0
16 to 19 years .....	18.9	18.6	18.9	18.4	18.2	17.9	18.8	18.6	19.3	17.5	18.1	19.8	18.4	18.8	18.4
16 to 17 years .....	21.2	21.0	21.0	20.4	20.6	20.8	21.2	21.6	21.7	19.1	20.3	22.7	21.4	21.1	20.9
18 to 19 years .....	17.4	17.0	17.3	17.4	16.5	16.3	17.1	16.4	17.3	16.8	16.7	17.8	16.9	17.5	16.4
20 to 24 years .....	11.5	11.1	10.9	11.2	11.1	11.1	11.6	11.2	11.2	10.8	10.9	10.9	11.0	10.6	10.4
25 years and over .....	5.8	5.6	5.7	5.6	5.6	5.7	5.5	5.8	5.6	5.5	5.6	5.4	5.4	5.3	5.1
25 to 54 years .....	6.1	5.8	6.0	5.9	6.0	6.1	5.8	6.0	5.9	5.8	5.8	5.7	5.6	5.5	5.4
55 years and over .....	4.5	4.1	4.2	4.0	4.0	4.1	4.3	4.3	4.4	4.1	4.1	3.9	3.8	3.9	3.9
Men, 16 years and over .....	7.4	7.0	7.1	7.1	7.0	7.1	7.0	7.2	7.2	6.9	6.9	7.1	6.9	6.7	6.5
16 to 24 years .....	14.4	14.1	13.9	14.3	13.9	13.8	14.7	14.2	14.6	13.8	13.8	14.6	13.9	13.5	12.8
16 to 19 years .....	19.6	19.5	19.3	19.4	18.5	18.5	19.4	19.2	20.5	19.6	19.3	21.5	19.4	19.3	18.2
16 to 17 years .....	21.9	21.9	21.3	21.3	21.7	21.4	22.2	23.2	22.1	21.9	20.7	24.0	20.9	21.6	20.9
18 to 19 years .....	18.3	17.9	18.0	18.4	16.1	16.8	17.6	16.4	18.7	18.1	18.3	19.9	18.7	18.0	16.2
20 to 24 years .....	11.9	11.4	11.3	11.8	11.7	11.4	12.3	11.7	11.6	10.9	11.0	11.1	11.2	10.6	10.3
25 years and over .....	5.7	5.3	5.5	5.4	5.3	5.5	5.1	5.6	5.4	5.3	5.3	5.2	5.1	5.0	5.0
25 to 54 years .....	5.9	5.6	5.7	5.6	5.6	5.8	5.3	5.8	5.6	5.6	5.5	5.5	5.4	5.4	5.3
55 years and over .....	4.6	4.1	4.3	4.1	3.9	4.0	4.1	4.4	4.6	3.8	4.0	4.1	4.0	3.9	3.9
Women, 16 years and over .....	7.6	7.4	7.6	7.5	7.6	7.5	7.6	7.5	7.4	7.3	7.5	7.3	7.2	7.1	7.0
16 to 24 years .....	13.3	13.0	13.2	13.0	13.1	12.9	13.3	12.9	13.1	12.2	12.9	13.1	13.1	13.2	13.2
16 to 19 years .....	18.0	17.6	18.5	17.4	17.9	17.2	18.1	17.8	17.9	15.3	16.9	17.9	17.4	18.3	18.5
16 to 17 years .....	20.4	20.0	20.7	19.4	19.3	20.0	20.1	19.9	21.2	15.8	19.8	21.2	22.0	20.6	20.8
18 to 19 years .....	16.6	16.0	16.5	16.3	16.9	15.7	16.5	16.4	15.7	15.3	14.9	15.5	15.1	16.9	16.5
20 to 24 years .....	10.9	10.7	10.6	10.6	10.5	10.7	10.8	10.6	10.7	10.7	10.9	10.7	10.8	10.6	10.5
25 years and over .....	6.0	5.9	6.0	6.0	6.0	6.0	6.1	6.0	5.9	5.8	6.0	5.6	5.6	5.4	5.3
25 to 54 years .....	6.3	6.2	6.4	6.3	6.4	6.3	6.4	6.3	6.2	6.1	6.2	5.9	5.9	5.7	5.6
55 years and over .....	4.2	4.1	4.1	3.9	4.2	4.2	4.4	4.1	4.2	4.5	4.2	3.7	3.6	3.9	3.8

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

(Numbers in thousands)

Reason for unemployment	Annual average		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Job losers .....	4,421	4,139	4,271	4,236	4,177	4,229	3,994	4,167	4,206	4,144	4,142	4,040	4,081	3,933	3,776
On layoff .....	1,171	1,157	1,216	1,203	1,155	1,182	1,068	1,135	1,134	1,112	1,167	1,161	1,175	1,132	1,163
Other job losers .....	3,250	2,982	3,055	3,033	3,022	3,047	2,926	3,032	3,072	3,032	2,975	2,879	2,906	2,801	2,613
Job leavers .....	823	877	877	868	861	852	870	983	894	875	852	911	808	876	996
Reentrants .....	2,184	2,256	2,240	2,238	2,301	2,283	2,378	2,233	2,184	2,191	2,335	2,237	2,226	2,225	2,066
New entrants .....	1,110	1,039	1,045	1,056	1,074	1,051	1,142	1,018	1,098	941	918	1,045	1,055	1,033	1,025
<b>PERCENT OF UNEMPLOYED</b>															
Job losers .....	51.8	49.8	50.6	50.4	49.6	50.3	47.6	49.6	50.2	50.8	50.2	49.1	50.0	48.8	48.0
On layoff .....	13.7	13.9	14.4	14.3	13.7	14.0	12.7	13.5	13.5	13.6	14.2	14.1	14.4	14.0	14.8
Other job losers .....	38.1	35.9	36.2	36.1	35.9	36.2	34.9	36.1	36.6	37.2	36.1	35.0	35.6	34.7	33.2
Job leavers .....	9.6	10.6	10.4	10.3	10.2	10.1	10.4	11.7	10.7	10.7	10.3	11.1	9.9	10.9	12.7
Reentrants .....	25.6	27.1	26.6	26.6	27.4	27.1	28.4	26.6	26.1	26.9	28.3	27.2	27.2	27.6	26.3
New entrants .....	13.0	12.5	12.4	12.6	12.8	12.5	13.6	12.1	13.1	11.5	11.1	12.7	12.9	12.8	13.0
<b>PERCENT OF CIVILIAN LABOR FORCE</b>															
Job losers .....	3.9	3.6	3.7	3.7	3.6	3.7	3.5	3.6	3.6	3.6	3.6	3.5	3.5	3.4	3.2
Job leavers .....	.7	.8	.8	.8	.7	.7	.8	.9	.8	.8	.7	.8	.7	.8	.9
Reentrants .....	1.9	2.0	2.0	1.9	2.0	2.0	2.1	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.8
New entrants .....	1.0	.9	.9	.9	.9	.9	1.0	.9	1.0	.8	.8	.9	.9	.9	.9

**10. Duration of unemployment, monthly data seasonally adjusted**

(Numbers in thousands)

Weeks of unemployment	Annual average		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Less than 5 weeks .....	3,350	3,498	3,627	3,501	3,556	3,528	3,607	3,466	3,525	3,422	3,484	3,430	3,465	3,374	3,311
5 to 14 weeks .....	2,451	2,509	2,540	2,488	2,487	2,516	2,594	2,536	2,514	2,508	2,505	2,536	2,448	2,460	2,441
15 weeks and over .....	2,737	2,305	2,247	2,413	2,400	2,374	2,274	2,328	2,329	2,274	2,307	2,277	2,205	2,188	2,056
15 to 26 weeks .....	1,104	1,025	932	1,065	1,061	1,031	1,063	1,033	1,078	1,047	1,035	1,057	894	973	969
27 weeks and over .....	1,634	1,280	1,315	1,348	1,339	1,343	1,211	1,295	1,251	1,227	1,272	1,220	1,311	1,215	1,087
Mean duration in weeks .....	18.2	15.6	15.9	16.0	15.9	16.1	15.0	15.5	15.5	15.5	15.5	15.4	15.7	15.4	14.9
Median duration in weeks .....	7.9	6.8	6.8	7.1	7.0	6.8	6.7	6.8	7.1	7.2	6.9	7.0	6.9	6.9	6.8

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

State	Dec. 1984	Dec. 1985 <sup>p</sup>	State	Dec. 1984	Dec. 1985
Alabama	11.6	8.0	Montana	7.4	8.8
Alaska	10.3	10.3	Nebraska	4.3	6.1
Arizona	4.3	6.4	Nevada	8.0	8.2
Arkansas	9.2	9.4	New Hampshire	3.5	2.6
California	6.9	6.3	New Jersey	5.4	5.4
Colorado	5.3	6.5	New Mexico	7.4	8.6
Connecticut	4.4	4.3	New York	6.5	5.9
Delaware	5.4	4.3	North Carolina	6.7	4.2
District of Columbia	8.3	8.0	North Dakota	5.8	6.8
Florida	6.1	5.6	Ohio	9.2	8.5
Georgia	5.5	5.8	Oklahoma	6.7	7.1
Hawaii	5.9	5.4	Oregon	9.6	7.8
Idaho	6.9	7.9	Pennsylvania	7.3	7.3
Illinois	8.6	8.3	Rhode Island	5.3	4.4
Indiana	8.8	7.4	South Carolina	6.9	7.4
Iowa	7.3	7.9	South Dakota	5.1	5.2
Kansas	5.4	5.5	Tennessee	8.7	7.6
Kentucky	9.3	10.4	Texas	5.6	6.3
Louisiana	9.8	11.5	Utah	6.4	6.0
Maine	5.9	5.2	Vermont	5.2	4.5
Maryland	4.9	4.5	Virginia	5.0	5.5
Massachusetts	3.9	3.9	Washington	9.8	8.0
Michigan	10.6	7.6	West Virginia	16.1	12.4
Minnesota	7.1	7.5	Wisconsin	7.7	7.5
Mississippi	10.3	10.0	Wyoming	5.6	8.3
Missouri	7.0	6.2			

<sup>p</sup> = preliminary

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	Dec., 1984	Nov., 1985	Dec., 1985 <sup>p</sup>	State	Dec., 1984	Nov., 1985	Dec., 1985 <sup>p</sup>
Alabama	1,404.7	1,440.6	1,439.9	Nebraska	653.9	659.0	654.7
Alaska	220.1	227.4	223.9	Nevada	434.2	450.0	449.2
Arizona	1,244.2	1,316.6	1,323.8	New Hampshire	457.1	480.4	483.5
Arkansas	791.8	814.9	814.8	New Jersey	3,406.1	3,499.7	3,503.1
California	10,869.9	11,127.9	11,186.2	New Mexico	512.5	525.0	525.8
Colorado	1,438.8	1,438.2	1,440.6	New York	7,744.9	7,893.0	7,909.8
Connecticut	1,568.5	1,598.0	1,601.2	North Carolina	2,624.5	2,699.8	2,706.7
Delaware	288.3	299.9	300.2	North Dakota	252.7	253.5	251.2
District of Columbia	623.3	634.0	637.5	Ohio	4,332.8	4,452.8	4,461.7
Florida	4,371.5	4,499.5	4,532.1	Oklahoma	1,196.9	1,178.9	1,177.1
Georgia	2,534.1	2,616.0	2,626.1	Oregon	1,015.5	1,042.9	1,036.2
Hawaii	418.0	427.3	430.2	Pennsylvania	4,720.4	4,798.8	4,793.1
Idaho	329.3	340.6	338.6	Rhode Island	431.8	433.7	431.4
Illinois	4,654.3	4,714.2	4,708.6	South Carolina	1,281.6	1,319.6	1,321.8
Indiana	2,169.8	2,258.2	2,254.6	South Dakota	250.0	246.5	247.0
Iowa	1,085.1	1,087.8	1,080.9	Tennessee	1,847.1	1,899.2	1,900.9
Kansas	982.9	994.1	986.0	Texas	6,637.9	6,747.3	6,766.7
Kentucky	1,249.7	1,266.0	1,271.7	Utah	620.1	638.2	638.1
Louisiana	1,618.8	1,606.1	1,600.4	Vermont	221.9	227.6	231.5
Maine	450.7	465.9	465.2	Virginia	2,413.7	2,473.9	2,490.2
Maryland	1,861.8	1,919.3	1,927.1	Washington	1,663.7	1,715.8	1,711.3
Massachusetts	2,937.9	2,973.3	2,985.9	West Virginia	597.8	600.4	600.9
Michigan	3,407.3	3,515.5	3,523.8	Wisconsin	1,982.9	2,015.7	2,009.2
Minnesota	1,870.1	1,907.0	1,896.5	Wyoming	203.1	203.7	201.9
Mississippi	836.3	854.5	855.8	Puerto Rico	699.2	694.3	702.8
Missouri	2,041.2	2,132.3	2,131.0	Virgin Islands	37.3	36.1	36.8
Montana	281.3	280.1	276.8				

<sup>p</sup> = 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		1985											1986	
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec. <sup>P</sup>	Jan. <sup>P</sup>
<b>TOTAL</b> .....	94,461	97,698	96,419	96,591	96,910	97,120	97,421	97,473	97,707	97,977	98,217	98,559	98,801	99,069	99,635
<b>PRIVATE SECTOR</b> .....	78,477	81,403	80,319	80,480	80,767	80,962	81,208	81,260	81,366	81,634	81,765	82,073	82,317	82,557	83,157
<b>GOODS PRODUCING</b> .....	24,730	25,056	25,112	25,062	25,056	25,090	25,066	25,010	24,980	25,015	24,962	25,051	25,089	25,145	25,335
Mining .....	974	969	974	976	977	982	982	974	969	965	962	960	954	953	951
Oil and gas extraction .....	613	616	621	620	618	623	624	619	619	615	615	610	605	603	597
<b>Construction</b> .....	4,345	4,661	4,534	4,525	4,553	4,641	4,658	4,638	4,660	4,688	4,721	4,753	4,754	4,761	4,918
General building contractors .....	1,158	1,240	1,219	1,214	1,223	1,233	1,234	1,223	1,228	1,242	1,252	1,262	1,269	1,272	1,335
<b>Manufacturing</b> .....	19,412	19,426	19,604	19,561	19,526	19,467	19,426	19,398	19,351	19,362	19,279	19,338	19,381	19,431	19,466
Production workers .....	13,310	13,215	13,399	13,347	13,309	13,249	13,203	13,169	13,137	13,145	13,087	13,140	13,169	13,228	13,251
<b>Durable goods</b> .....	11,522	11,566	11,702	11,675	11,651	11,608	11,586	11,560	11,509	11,519	11,449	11,493	11,512	11,536	11,550
Production workers .....	7,749	7,692	7,843	7,806	7,776	7,730	7,704	7,671	7,630	7,638	7,586	7,627	7,636	7,658	7,666
Lumber and wood products .....	707	703	709	704	701	694	697	694	697	700	701	708	712	717	722
Furniture and fixtures .....	487	497	499	498	499	497	493	494	494	499	494	496	497	500	500
Stone, clay, and glass products ..	595	600	602	600	601	600	599	598	599	601	598	600	601	604	610
Primary metal industries .....	858	816	844	840	832	823	819	815	806	798	795	799	804	811	800
Blast furnaces and basic steel products .....	334	303	315	313	311	306	305	304	302	289	291	292	299	303	296
Fabricated metal products .....	1,464	1,472	1,486	1,483	1,480	1,479	1,477	1,472	1,467	1,467	1,462	1,465	1,466	1,463	1,462
Machinery, except electrical .....	2,197	2,181	2,228	2,224	2,220	2,207	2,203	2,191	2,175	2,167	2,143	2,143	2,137	2,132	2,136
Electrical and electronic equipment .....	2,208	2,207	2,252	2,248	2,243	2,223	2,216	2,205	2,190	2,194	2,175	2,179	2,180	2,185	2,191
Transportation equipment .....	1,906	1,990	1,974	1,972	1,969	1,982	1,981	1,990	1,985	1,995	1,986	2,008	2,017	2,023	2,027
Motor vehicles and equipment ....	860	872	891	876	867	876	873	875	868	868	861	872	868	874	879
Instruments and related products ..	714	724	723	725	727	726	723	725	724	725	722	722	723	725	725
Miscellaneous manufacturing industries .....	384	376	385	381	379	377	378	376	372	373	373	373	375	376	377
<b>Nondurable goods</b> .....	7,890	7,859	7,902	7,886	7,875	7,859	7,840	7,838	7,842	7,843	7,830	7,845	7,869	7,895	7,916
Production workers .....	5,561	5,523	5,556	5,541	5,533	5,519	5,499	5,498	5,507	5,507	5,501	5,513	5,533	5,570	5,585
Food and kindred products .....	1,619	1,636	1,633	1,633	1,638	1,630	1,634	1,644	1,630	1,638	1,633	1,636	1,638	1,652	1,649
Tobacco manufactures .....	65	65	67	66	66	66	66	66	65	64	65	64	65	64	65
Textile mill products .....	746	703	720	712	706	707	701	699	696	697	695	698	700	701	703
Apparel and other textile products .....	1,197	1,162	1,182	1,175	1,167	1,164	1,153	1,142	1,160	1,152	1,155	1,158	1,160	1,171	1,177
Paper and allied products .....	681	683	683	682	682	681	682	684	684	683	681	682	688	685	687
Printing and publishing .....	1,372	1,422	1,403	1,406	1,407	1,411	1,414	1,419	1,426	1,429	1,427	1,431	1,442	1,442	1,449
Chemicals and allied products .....	1,048	1,042	1,052	1,052	1,052	1,049	1,044	1,042	1,040	1,038	1,040	1,036	1,033	1,033	1,036
Petroleum and coal products .....	189	177	185	184	183	182	181	180	178	176	170	170	169	169	169
Rubber and misc. plastics products .....	782	795	798	799	798	795	791	789	787	792	790	795	800	804	810
Leather and leather products .....	192	175	179	177	176	174	174	173	176	174	174	175	174	174	171
<b>SERVICE-PRODUCING</b> .....	69,731	72,642	71,307	71,529	71,854	72,030	72,355	72,463	72,727	72,962	73,255	73,508	73,712	73,924	74,300
<b>Transportation and public utilities</b> .....	5,171	5,300	5,259	5,272	5,269	5,278	5,301	5,295	5,302	5,282	5,317	5,327	5,342	5,345	5,377
Transportation .....	2,929	3,058	3,015	3,029	3,028	3,037	3,057	3,052	3,060	3,038	3,078	3,087	3,106	3,110	3,129
Communication and public utilities .....	2,242	2,241	2,244	2,243	2,241	2,241	2,244	2,243	2,242	2,244	2,239	2,240	2,236	2,235	2,248
<b>Wholesale trade</b> .....	5,550	5,769	5,686	5,697	5,714	5,733	5,748	5,768	5,773	5,791	5,805	5,830	5,833	5,845	5,867
Durable goods .....	3,272	3,417	3,358	3,367	3,377	3,388	3,402	3,414	3,426	3,434	3,442	3,454	3,464	3,470	3,485
Nondurable goods .....	2,278	2,352	2,328	2,330	2,337	2,345	2,346	2,354	2,347	2,357	2,363	2,376	2,369	2,375	2,382
<b>Retail trade</b> .....	16,584	17,426	17,090	17,160	17,249	17,280	17,392	17,425	17,453	17,514	17,539	17,610	17,640	17,715	17,922
General merchandise stores .....	2,278	2,355	2,341	2,343	2,349	2,348	2,371	2,361	2,344	2,354	2,356	2,365	2,367	2,362	2,418
Food stores .....	2,655	2,827	2,753	2,773	2,790	2,794	2,823	2,831	2,842	2,849	2,852	2,869	2,865	2,882	2,914
Automotive dealers and service stations .....	1,802	1,892	1,855	1,865	1,873	1,884	1,890	1,895	1,895	1,902	1,906	1,912	1,914	1,916	1,932
Eating and drinking places .....	5,403	5,692	5,559	5,588	5,615	5,642	5,660	5,692	5,728	5,725	5,740	5,758	5,774	5,802	5,821
<b>Finance, insurance, and real estate</b> .....	5,682	5,924	5,790	5,809	5,835	5,858	5,888	5,906	5,932	5,959	5,987	6,011	6,048	6,069	6,104
Finance .....	2,855	2,978	2,910	2,919	2,933	2,941	2,956	2,968	2,984	2,998	3,011	3,023	3,038	3,053	3,067
Insurance .....	1,753	1,816	1,783	1,789	1,792	1,799	1,808	1,814	1,817	1,827	1,831	1,837	1,850	1,854	1,866
Real estate .....	1,074	1,130	1,097	1,101	1,110	1,118	1,124	1,124	1,131	1,134	1,145	1,151	1,160	1,162	1,171
<b>Services</b> .....	20,761	21,929	21,382	21,480	21,644	21,723	21,813	21,856	21,926	22,073	22,155	22,244	22,365	22,438	22,552
Business services .....	4,076	4,453	4,295	4,324	4,377	4,402	4,424	4,441	4,446	4,489	4,504	4,539	4,571	4,606	4,636
Health services .....	6,104	6,266	6,169	6,186	6,204	6,218	6,240	6,243	6,260	6,291	6,308	6,333	6,363	6,384	6,404
<b>Government</b> .....	15,984	16,295	16,100	16,111	16,143	16,158	16,213	16,213	16,341	16,343	16,452	16,486	16,484	16,512	16,478
Federal .....	2,807	2,875	2,836	2,834	2,850	2,859	2,873	2,872	2,878	2,886	2,904	2,892	2,904	2,911	2,910
State .....	3,712	3,780	3,730	3,733	3,744	3,749	3,759	3,765	3,788	3,789	3,818	3,827	3,833	3,829	3,821
Local .....	9,465	9,640	9,534	9,544	9,549	9,550	9,581	9,576	9,675	9,668	9,730	9,767	9,747	9,772	9,747

P = preliminary

revision.

NOTE: See "Notes on the data" for a description of the most recent benchmark

**14. Average weekly hours of production or nonsupervisory workers on private nonagricultural payrolls by industry, monthly data seasonally adjusted**

Industry	Annual average		1985												1986
	1984	1985 <sup>P</sup>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec. <sup>P</sup>	Jan. <sup>P</sup>
<b>PRIVATE SECTOR</b> .....	35.3	35.1	35.1	35.1	35.2	35.0	35.1	35.1	35.0	35.1	35.1	35.0	35.1	35.1	35.1
<b>CONSTRUCTION</b> .....	37.7	37.7	37.7	37.8	38.1	38.0	37.6	37.2	37.6	37.5	37.9	37.9	37.4	37.2	38.5
<b>MANUFACTURING</b> .....	40.7	40.5	40.6	40.1	40.4	40.2	40.4	40.4	40.3	40.6	40.7	40.7	40.7	41.0	40.9
Overtime hours .....	3.4	3.3	3.4	3.3	3.2	3.4	3.1	3.2	3.2	3.3	3.3	3.4	3.4	3.6	3.5
<b>Durable goods</b> .....	41.4	41.2	41.3	40.7	41.1	40.9	41.1	41.2	41.0	41.3	41.3	41.3	41.3	41.7	41.6
Overtime hours .....	3.6	3.5	3.6	3.5	3.5	3.6	3.2	3.3	3.3	3.4	3.5	3.5	3.6	3.8	3.7
Lumber and wood products .....	39.9	39.8	39.7	38.9	39.6	39.5	39.8	40.1	39.7	40.0	40.1	40.3	39.9	40.1	40.3
Furniture and fixtures .....	39.7	39.4	40.4	39.5	39.5	39.3	38.9	38.9	38.8	39.2	39.4	39.4	39.4	40.0	40.5
Stone, clay, and glass products .....	42.0	41.9	41.7	41.6	42.0	42.0	42.1	41.9	42.0	42.0	42.0	42.1	41.6	41.7	42.2
Primary metal industries .....	41.7	41.5	41.0	40.9	41.1	41.0	41.2	41.6	41.4	41.7	41.5	41.8	41.8	42.2	41.5
Blast furnaces and basic steel products .....	40.6	41.1	39.9	40.5	40.5	40.2	40.7	41.2	41.2	41.8	41.0	41.7	42.0	42.0	41.0
Fabricated metal products .....	41.4	41.3	41.4	40.9	41.1	41.1	41.1	41.3	41.3	41.4	41.6	41.5	41.4	41.6	41.6
Machinery except electrical .....	41.9	41.5	41.7	41.1	41.6	41.2	41.4	41.6	41.3	41.6	41.6	41.6	41.6	41.8	41.5
Electrical and electronic equipment .....	41.0	40.6	40.8	40.2	40.7	40.2	40.4	40.6	40.3	40.7	40.5	40.6	41.0	41.4	41.5
Transportation equipment .....	42.7	42.6	43.1	41.9	42.5	42.3	42.6	42.3	42.5	42.9	42.9	42.8	42.6	43.0	42.8
Motor vehicles and equipment .....	43.8	43.5	44.3	42.4	43.2	43.3	43.5	42.7	43.3	43.8	43.8	43.8	43.7	44.1	43.6
Instruments and related products .....	41.3	41.0	41.2	40.7	41.0	40.7	40.9	41.1	40.7	40.7	40.9	40.8	41.1	42.2	41.2
Miscellaneous manufacturing .....	39.4	39.4	39.2	39.0	39.1	39.0	39.3	39.4	39.0	39.3	39.8	39.9	39.7	40.0	40.1
<b>Nondurable goods</b> .....	39.6	39.6	39.5	39.3	39.4	39.1	39.4	39.4	39.4	39.6	39.8	39.9	39.8	40.1	39.9
Overtime hours .....	3.1	3.1	3.0	2.9	2.9	3.0	2.9	3.0	3.0	3.1	3.1	3.2	3.2	3.4	3.3
Food and kindred products .....	39.8	40.0	39.8	39.7	39.8	39.6	40.1	39.6	40.0	39.9	40.2	40.3	39.9	40.3	40.0
Tobacco manufactures .....	38.9	37.1	38.3	39.2	38.9	35.4	37.0	36.6	34.6	36.8	36.9	38.2	35.2	38.0	37.8
Textile mill products .....	39.9	39.7	39.2	38.8	39.1	38.8	38.9	39.4	39.1	40.0	40.7	40.7	41.0	41.3	41.1
Apparel and other textile products .....	36.4	36.3	36.2	35.9	36.1	35.6	36.2	36.3	36.3	36.4	36.5	36.6	36.8	37.1	37.1
Paper and allied products .....	43.1	43.1	43.0	42.9	42.9	43.0	43.0	42.9	42.7	43.0	43.1	43.3	43.3	43.6	43.5
Printing and publishing .....	37.9	37.7	37.8	37.7	37.6	37.6	37.4	37.5	37.5	37.9	38.0	37.9	37.8	38.2	37.9
Chemicals and allied products .....	41.9	41.9	42.0	41.9	42.1	41.9	41.9	42.0	41.8	41.8	41.6	41.7	41.9	41.9	41.7
Petroleum and coal products .....	43.7	43.0	43.2	43.1	43.3	42.0	41.7	42.6	42.9	43.3	43.4	44.3	43.1	43.9	44.0
Leather and leather products .....	36.8	37.3	36.8	36.4	37.1	37.0	37.1	37.0	37.0	37.3	37.8	37.9	37.7	37.8	37.3
<b>TRANSPORTATION AND PUBLIC UTILITIES</b> .....	39.4	39.4	39.3	39.4	39.5	39.4	39.5	39.5	39.2	39.6	39.5	39.5	39.4	39.4	39.4
<b>WHOLESALE TRADE</b> .....	38.6	38.7	38.6	38.6	38.7	38.6	38.7	38.8	38.6	38.6	38.7	38.6	38.7	38.7	38.6
<b>RETAIL TRADE</b> .....	30.0	29.7	29.8	29.8	29.8	29.7	29.9	29.9	29.7	29.6	29.6	29.5	29.5	29.3	29.4
<b>SERVICES</b> .....	32.8	32.8	32.7	32.8	32.8	32.7	32.8	32.8	32.7	32.8	32.8	32.9	32.8	32.8	32.8

<sup>P</sup> = 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		1985												1986
	1984	1985 <sup>P</sup>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec. <sup>P</sup>	Jan. <sup>P</sup>
<b>PRIVATE SECTOR</b> .....	\$8.33	\$8.58	\$8.50	\$8.52	\$8.52	\$8.54	\$8.53	\$8.56	\$8.54	\$8.54	\$8.68	\$8.65	\$8.68	\$8.72	\$8.74
Seasonally adjusted .....	-	-	8.44	8.49	8.52	8.54	8.55	8.59	8.57	8.60	8.65	8.64	8.67	8.74	8.68
<b>MINING</b> .....	11.63	11.95	11.86	11.90	11.91	11.93	11.86	11.99	11.88	11.95	12.00	11.95	12.02	12.20	12.25
<b>CONSTRUCTION</b> .....	12.12	12.26	12.30	12.33	12.22	12.21	12.19	12.12	12.16	12.22	12.40	12.36	12.22	12.43	12.31
<b>MANUFACTURING</b> .....	9.18	9.52	9.43	9.43	9.45	9.48	9.48	9.50	9.53	9.48	9.55	9.54	9.61	9.72	9.69
<b>Durable goods</b> .....	9.74	10.09	9.99	9.99	10.01	10.03	10.04	10.08	10.10	10.05	10.15	10.14	10.21	10.33	10.28
Lumber and wood products .....	8.03	8.20	8.10	8.09	8.06	8.04	8.12	8.24	8.20	8.26	8.31	8.29	8.28	8.30	8.28
Furniture and fixtures .....	6.85	7.19	7.01	7.01	7.07	7.08	7.11	7.18	7.22	7.22	7.29	7.31	7.34	7.40	7.39
Stone, clay, and glass products .....	9.57	9.83	9.70	9.73	9.71	9.80	9.80	9.84	9.89	9.87	9.90	9.86	9.90	9.92	9.97
Primary metal industries .....	11.47	11.68	11.55	11.69	11.66	11.64	11.64	11.65	11.78	11.63	11.69	11.61	11.76	11.83	11.78
Blast furnaces and basic steel products .....	12.99	13.35	13.07	13.42	13.27	13.32	13.31	13.29	13.51	13.37	13.45	13.34	13.44	13.45	13.34
Fabricated metal products .....	9.38	9.66	9.59	9.59	9.62	9.64	9.63	9.65	9.66	9.61	9.70	9.68	9.73	9.86	9.82
Machinery, except electrical .....	9.96	10.29	10.13	10.14	10.15	10.17	10.22	10.28	10.31	10.27	10.39	10.41	10.48	10.55	10.51
Electrical and electronic equipment .....	9.04	9.47	9.33	9.33	9.39	9.40	9.39	9.46	9.47	9.50	9.55	9.56	9.61	9.70	9.66
Transportation equipment .....	12.22	12.71	12.67	12.63	12.59	12.63	12.63	12.66	12.65	12.65	12.78	12.77	12.83	13.03	12.92
Motor vehicles and equipment .....	12.74	13.44	13.41	13.35	13.29	13.40	13.38	13.39	13.38	13.34	13.51	13.46	13.55	13.83	13.72
Instruments and related products .....	8.85	9.19	9.00	9.11	9.10	9.11	9.13	9.15	9.20	9.22	9.28	9.27	9.30	9.42	9.36
Miscellaneous manufacturing .....	7.04	7.28	7.23	7.19	7.20	7.22	7.28	7.28	7.30	7.26	7.30	7.30	7.35	7.46	7.51
<b>Nondurable goods</b> .....	8.37	8.68	8.59	8.60	8.61	8.67	8.64	8.65	8.72	8.67	8.70	8.69	8.75	8.84	8.82
Food and kindred products .....	8.38	8.54	8.48	8.51	8.53	8.59	8.58	8.55	8.54	8.47	8.51	8.49	8.58	8.69	8.69
Tobacco manufactures .....	11.27	12.05	11.39	11.80	12.00	12.16	12.65	12.83	12.91	12.44	11.47	11.45	12.08	11.87	11.89
Textile mill products .....	6.46	6.71	6.59	6.60	6.64	6.70	6.68	6.69	6.69	6.72	6.75	6.76	6.79	6.83	6.84
Apparel and other textile products .....	5.55	5.73	5.73	5.70	5.73	5.74	5.69	5.70	5.70	5.68	5.75	5.73	5.75	5.81	5.85
Paper and allied products .....	10.41	10.82	10.63	10.64	10.64	10.72	10.75	10.79	10.91	10.86	10.90	10.91	10.97	11.05	10.97
Printing and publishing .....	9.40	9.69	9.58	9.60	9.61	9.60	9.60	9.61	9.67	9.73	9.79	9.75	9.81	9.90	9.80
Chemicals and allied products .....	11.08	11.57	11.39	11.39	11.37	11.48	11.46	11.52	11.60	11.62	11.67	11.72	11.82	11.88	11.89
Petroleum and coal products .....	13.43	14.04	13.96	13.99	14.06	14.18	14.00	13.97	14.03	13.99	14.07	13.97	14.06	14.20	14.31
Rubber and miscellaneous plastics products .....	8.29	8.53	8.49	8.48	8.46	8.48	8.45	8.50	8.54	8.51	8.55	8.53	8.62	8.73	8.67
Leather and leather products .....	5.70	5.82	5.82	5.79	5.82	5.84	5.83	5.83	5.83	5.80	5.82	5.76	5.83	5.81	5.88
<b>TRANSPORTATION AND PUBLIC UTILITIES</b> .....	11.11	11.38	11.26	11.27	11.24	11.27	11.24	11.32	11.35	11.40	11.52	11.46	11.57	11.61	11.60
<b>WHOLESALE TRADE</b> .....	8.96	9.26	9.16	9.22	9.19	9.24	9.24	9.28	9.27	9.25	9.33	9.25	9.32	9.41	9.39
<b>RETAIL TRADE</b> .....	5.88	5.97	5.97	5.99	5.97	5.96	5.97	5.94	5.93	5.91	5.99	5.97	6.00	5.99	6.05
<b>FINANCE, INSURANCE, AND REAL ESTATE</b> .....	7.62	7.93	7.77	7.87	7.87	7.85	7.83	7.95	7.87	7.90	8.03	8.00	8.05	8.14	8.13
<b>SERVICES</b> .....	7.64	7.95	7.84	7.87	7.87	7.89	7.88	7.91	7.86	7.87	8.04	8.04	8.10	8.18	8.19

- Data not available.  
<sup>P</sup> = 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		1985												1986
	1984	1985 <sup>P</sup>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec. <sup>P</sup>	Jan. <sup>P</sup>
<b>PRIVATE SECTOR</b>															
Current dollars .....	\$294.05	\$301.16	\$294.95	\$294.79	\$298.20	\$298.05	\$298.55	\$303.02	\$301.46	\$302.32	\$305.54	\$303.62	\$302.93	\$307.82	\$303.28
Seasonally adjusted .....	-	-	296.24	298.00	299.90	298.90	300.11	301.51	299.95	301.86	303.62	303.26	303.45	306.77	304.67
Constant (1977) dollars .....	173.48	171.60	171.28	170.50	171.68	170.80	170.50	172.56	171.48	171.68	173.01	171.54	170.47	172.74	-
<b>MINING</b> .....	503.58	518.63	508.79	514.08	519.28	516.57	515.91	523.96	509.65	517.44	524.40	516.24	520.47	538.02	535.33
<b>CONSTRUCTION</b> .....	456.92	462.20	447.72	451.28	460.69	461.54	464.44	461.77	469.38	468.03	477.40	472.15	448.47	459.91	457.93
<b>MANUFACTURING</b>															
Current dollars .....	373.63	385.56	380.03	374.37	381.78	380.15	382.04	385.70	382.15	382.99	389.64	388.28	393.05	404.35	393.41
Constant (1977) dollars .....	220.43	219.69	220.69	216.52	219.79	217.85	218.18	219.65	217.38	217.48	220.63	219.37	221.19	226.91	-
<b>Durable goods</b> .....	403.24	415.71	410.59	403.60	412.41	410.23	411.64	417.31	410.06	412.05	420.21	418.78	423.72	437.99	424.56
Lumber and wood products .....	320.40	326.36	315.90	309.85	317.56	317.58	325.61	336.19	325.54	333.70	337.39	334.92	327.06	332.83	327.89
Furniture and fixtures .....	271.95	283.29	276.19	270.59	277.85	276.83	275.16	281.46	276.53	285.19	290.14	292.40	292.13	303.40	291.91
Stone, clay, and glass products .....	401.94	411.88	392.85	393.09	404.91	411.60	415.52	418.20	418.35	418.49	420.75	418.06	413.82	413.66	408.77
Primary metal industries .....	478.30	484.72	473.55	478.12	481.56	480.73	479.57	486.97	485.34	480.32	487.47	480.65	491.57	503.96	488.87
Blast furnaces and basic steel products .....	527.39	548.69	517.57	544.85	540.09	547.45	543.05	552.86	559.31	550.84	554.14	545.61	557.76	566.25	542.94
Fabricated metal products .....	388.33	398.96	395.11	387.44	396.34	395.24	395.79	400.48	394.13	395.93	403.52	401.72	404.77	420.04	406.55
Machinery, except electrical .....	417.32	427.04	422.42	415.74	424.27	417.99	421.06	427.65	420.65	422.10	432.22	430.97	438.06	451.54	436.17
Electrical and electronic equipment .....	370.64	384.48	379.73	373.20	383.11	376.00	377.48	385.02	376.91	383.80	387.73	388.14	396.89	409.34	399.92
Transportation equipment .....	521.79	541.45	546.08	524.15	537.59	538.04	539.30	539.32	531.30	531.30	544.43	545.28	550.41	574.62	552.98
Motor vehicles and equipment .....	558.01	584.64	594.06	559.37	576.79	586.92	587.38	579.79	574.00	566.95	586.33	586.86	590.78	625.12	598.19
Instruments and related products .....	365.51	376.79	369.90	369.87	374.01	368.96	372.50	376.07	370.76	373.41	381.41	377.29	384.09	403.18	384.70
Miscellaneous manufacturing .....	277.38	286.83	279.08	276.82	282.24	280.86	285.38	286.10	281.78	284.59	292.00	294.19	295.47	302.88	296.65
<b>Nondurable goods</b> .....	331.45	343.73	336.73	333.68	338.37	337.26	339.55	342.54	341.82	344.20	348.00	346.73	350.00	358.02	350.15
Food and kindred products .....	333.52	341.60	334.96	331.89	335.23	336.73	343.20	340.29	341.60	341.34	347.21	343.00	344.92	353.68	344.99
Tobacco manufactures .....	438.40	447.06	424.85	442.50	452.40	424.38	469.32	483.69	437.65	461.52	438.15	448.84	439.71	451.06	437.55
Textile mill products .....	257.75	266.39	257.01	254.10	258.96	257.28	260.52	266.93	258.23	270.14	275.40	276.48	279.75	283.45	279.76
Apparel and other textile products .....	202.02	208.00	205.13	202.35	206.85	203.20	205.98	209.19	206.34	207.32	209.88	210.86	212.18	216.13	214.70
Paper and allied products .....	448.67	466.34	456.03	451.14	454.33	458.82	460.10	463.97	465.86	465.89	473.06	472.40	477.20	489.52	475.00
Printing and publishing .....	356.26	365.31	359.25	358.08	362.30	360.00	358.08	358.45	360.69	369.74	373.98	369.53	373.76	384.12	368.48
Chemicals and allied products .....	464.25	484.78	477.24	476.10	478.68	481.01	480.17	484.99	482.56	483.39	487.81	486.38	496.44	503.71	494.62
Petroleum and coal products .....	586.89	603.72	597.49	594.58	601.77	595.56	583.80	596.52	606.10	605.77	620.49	620.27	610.20	623.38	623.92
Rubber and miscellaneous plastics products .....	345.69	350.58	352.34	343.44	347.71	346.83	345.61	350.20	346.72	346.36	351.41	350.58	356.01	366.66	358.07
Leather and leather products .....	209.76	217.09	211.85	207.28	212.43	215.50	218.04	221.54	218.63	216.92	219.41	216.58	219.79	220.78	216.97
<b>TRANSPORTATION AND PUBLIC UTILITIES</b> .....	437.73	448.37	438.01	440.66	441.73	441.78	441.73	449.40	448.33	454.86	457.34	452.67	457.02	459.76	452.40
<b>WHOLESALE TRADE</b> .....	345.86	358.36	351.74	352.20	353.82	354.82	357.59	360.99	359.68	358.90	362.00	357.98	361.62	366.99	360.58
<b>RETAIL TRADE</b> .....	176.40	177.31	173.73	174.31	175.52	175.22	177.91	179.39	180.27	179.07	177.90	175.52	175.80	179.10	173.64
<b>FINANCE, INSURANCE, AND REAL ESTATE</b> .....	278.13	288.65	282.83	286.47	286.47	285.74	284.23	291.77	285.68	286.77	292.29	290.40	291.41	298.74	295.93
<b>SERVICES</b> .....	250.59	260.76	254.80	256.56	256.56	257.21	257.68	261.03	260.17	260.50	263.71	263.71	264.87	268.30	266.99

- 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					
	Jan. 1985	Nov. 1985	Dec. 1985 <sup>P</sup>	Jan. 1986 <sup>P</sup>	Jan. 1985	Sept. 1985	Oct. 1985	Nov. 1985	Dec. 1985 <sup>P</sup>	Jan. 1986 <sup>P</sup>
<b>PRIVATE SECTOR (in current dollars)</b> .....	163.7	167.3	168.4	168.4	163.0	166.7	166.4	167.1	168.3	167.7
Mining <sup>1</sup> .....	177.4	180.0	181.5	181.2	-	-	-	-	-	-
Construction .....	149.4	149.0	151.1	149.6	149.2	150.0	149.4	148.9	150.7	149.5
Manufacturing .....	166.8	170.2	171.2	171.5	166.3	169.1	169.4	170.1	170.8	170.9
Transportation and public utilities .....	164.3	169.3	170.0	169.8	163.5	167.3	167.0	168.1	169.4	169.0
Wholesale trade <sup>1</sup> .....	169.2	172.2	173.8	173.3	-	-	-	-	-	-
Retail trade .....	155.1	156.9	156.8	157.4	154.5	157.2	156.7	157.4	158.0	156.8
Finance, insurance, and real estate <sup>1</sup> .....	168.2	174.2	176.1	176.0	-	-	-	-	-	-
Services .....	166.6	172.4	174.0	174.0	164.9	171.5	171.1	172.1	173.8	172.3
<b>PRIVATE SECTOR (in constant dollars)</b> .....	95.1	94.1	94.5	-	94.5	94.7	94.3	94.2	94.3	-

<sup>1</sup> 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.
<b>Over 1-month span</b>												
1984	67.3	72.7	66.8	67.3	60.5	64.3	65.7	58.1	48.4	66.5	55.1	63.5
1985	57.6	50.3	55.9	44.6	50.3	47.0	54.9	56.8	45.7	63.5	61.6	63.2
1986	p65.4	p51.6	-	-	-	-	-	-	-	-	-	-
<b>Over 3-month span</b>												
1984	78.1	75.9	77.6	68.9	69.7	67.0	65.4	60.3	60.0	56.5	67.0	60.0
1985	58.6	54.1	46.8	45.9	44.1	49.7	50.5	49.2	53.8	52.7	65.1	p67.8
1986	p63.5	-	-	-	-	-	-	-	-	-	-	-
<b>Over 6-month span</b>												
1984	79.2	77.8	77.3	75.4	69.2	64.9	63.2	64.1	67.0	59.7	57.6	60.3
1985	52.2	49.5	44.3	44.6	44.3	42.4	46.8	50.0	56.8	p61.6	p58.1	-
1986	-	-	-	-	-	-	-	-	-	-	-	-
<b>Over 12-month span</b>												
1984	81.9	78.4	76.8	75.1	72.7	73.0	70.0	65.7	63.5	60.5	56.2	51.9
1985	50.8	48.4	49.5	47.3	46.2	47.3	p48.6	p48.4	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-

- 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. 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	1977	1978	1979	1980	1981	1982	1983	1984	1985
Noninstitutional population	160,689	163,541	166,460	169,349	171,775	173,939	175,891	178,080	179,912
<b>Labor force</b>									
Total (number)	100,665	103,882	106,559	108,544	110,315	111,872	113,226	115,241	117,167
Percent of population	62.6	63.5	64.0	64.1	64.2	64.3	64.4	64.7	65.1
<b>Employed</b>									
Total (number)	93,673	97,679	100,421	100,907	102,042	101,194	102,510	106,702	108,856
Percent of population	58.0	60.0	60.0	60.0	59.0	58.0	58.0	60.0	60.0
Resident Armed Forces	1,656	1,631	1,597	1,604	1,645	1,668	1,676	1,697	1,706
Civilian									
Total	92,017	96,048	98,824	99,303	100,397	99,526	100,834	105,005	107,150
Agriculture	3,283	3,387	3,347	3,364	3,368	3,401	3,383	3,321	3,179
Nonagricultural industries	88,734	92,661	95,477	95,938	97,030	96,125	97,450	101,685	103,971
<b>Unemployed</b>									
Total (number)	6,991	6,202	6,137	7,637	8,273	10,678	10,717	8,539	8,312
Percent of labor force	6.9	6.0	5.8	7.0	7.5	9.5	9.5	7.4	7.1
Not in labor force (number)	60,025	59,659	59,900	60,806	61,460	62,067	62,665	62,839	62,744

**20. Annual data: Employment levels by industry**

(Numbers in thousands)

Industry	1977	1978	1979	1980	1981	1982	1983	1984	1985 P
<b>Total employment</b>	82,471	86,697	89,823	90,406	91,156	89,566	90,196	94,461	97,698
Private sector	67,344	71,026	73,876	74,166	75,126	73,729	74,330	78,477	81,403
<b>Goods-producing</b>	24,346	25,585	26,461	25,658	25,497	23,813	23,334	24,730	25,056
Mining	813	851	958	1,027	1,139	1,128	952	974	969
Construction	3,851	4,229	4,463	4,346	4,188	3,905	3,948	4,345	4,661
Manufacturing	19,682	20,505	21,040	20,285	20,170	18,781	18,434	19,412	19,426
<b>Service-producing</b>	58,125	61,113	63,363	64,748	65,659	65,753	66,862	69,731	72,642
Transportation and public utilities	4,713	4,923	5,136	5,146	5,165	5,082	4,954	5,171	5,300
Wholesale trade	4,708	4,969	5,204	5,275	5,358	5,278	5,268	5,550	5,769
Retail trade	13,808	14,573	14,989	15,035	15,189	15,179	15,613	16,584	17,426
Finance, insurance, and real estate	4,467	4,724	4,975	5,160	5,298	5,341	5,468	5,682	5,924
Services	15,303	16,252	17,112	17,890	18,619	19,036	19,694	20,761	21,929
<b>Government</b>	15,127	15,672	15,947	16,241	16,031	15,837	15,869	15,984	16,295
Federal	2,727	2,753	2,773	2,866	2,772	2,739	2,774	2,807	2,875
State	3,377	3,474	3,541	3,610	3,640	3,640	3,662	3,712	3,780
Local	9,023	9,446	9,633	9,765	9,619	9,458	9,434	9,465	9,640

NOTE: Data include Alaska and Hawaii beginning in 1959. See "Notes on the data" for a description of the most recent benchmark

revision.  
p = preliminary

**21. Annual data: Average hours and earnings of production or nonsupervisory workers on nonagricultural payrolls, by industry**

Industry	1977	1978	1979	1980	1981	1982	1983	1984	1985 <sup>P</sup>
<b>Private sector</b>									
Average weekly hours .....	36.0	35.8	35.7	35.3	35.2	34.8	35.0	35.3	35.1
Average hourly earnings .....	5.25	5.69	6.16	6.66	7.25	7.68	8.02	8.33	8.58
Average weekly earnings .....	189.00	203.70	219.91	235.10	255.20	267.26	280.70	294.05	301.16
<b>Mining</b>									
Average weekly hours .....	43.4	43.4	43.0	43.3	43.7	42.7	42.5	43.3	43.4
Average hourly earnings .....	6.94	7.67	8.49	9.17	10.04	10.77	11.28	11.63	11.95
Average weekly earnings .....	301.20	332.88	365.07	397.06	438.75	459.88	479.40	503.58	518.63
<b>Construction</b>									
Average weekly hours .....	36.5	36.8	37.0	37.0	36.9	36.7	37.1	37.7	37.7
Average hourly earnings .....	8.10	8.66	9.27	9.94	10.82	11.63	11.94	12.12	12.26
Average weekly earnings .....	295.65	318.69	342.99	367.78	399.26	426.82	442.97	456.92	462.20
<b>Manufacturing</b>									
Average weekly hours .....	40.3	40.4	40.2	39.7	39.8	38.9	40.1	40.7	40.5
Average hourly earnings .....	5.68	6.17	6.70	7.27	7.99	8.49	8.83	9.18	9.52
Average weekly earnings .....	228.90	249.27	269.34	288.62	318.00	330.26	354.08	373.63	385.56
<b>Transportation and public utilities</b>									
Average weekly hours .....	39.9	40.0	39.9	39.6	39.4	39.0	39.0	39.4	39.4
Average hourly earnings .....	6.99	7.57	8.16	8.87	9.70	10.32	10.79	11.11	11.38
Average weekly earnings .....	278.90	302.80	325.58	351.25	382.18	402.48	420.81	437.73	448.37
<b>Wholesale trade</b>									
Average weekly hours .....	38.8	38.8	38.8	38.5	38.5	38.3	38.5	38.6	38.7
Average hourly earnings .....	5.39	5.88	6.39	6.96	7.56	8.09	8.55	8.96	9.26
Average weekly earnings .....	209.13	228.14	247.93	267.96	291.06	309.85	329.18	345.86	358.36
<b>Retail trade</b>									
Average weekly hours .....	31.6	31.0	30.6	30.2	30.1	29.9	29.8	30.0	29.7
Average hourly earnings .....	3.85	4.20	4.53	4.88	5.25	5.48	5.74	5.88	5.97
Average weekly earnings .....	121.66	130.20	138.62	147.38	158.03	163.85	171.05	176.40	177.31
<b>Finance, insurance, and real estate</b>									
Average weekly hours .....	36.4	36.4	36.2	36.2	36.3	36.2	36.2	36.5	36.4
Average hourly earnings .....	4.54	4.89	5.27	5.79	6.31	6.78	7.29	7.62	7.93
Average weekly earnings .....	165.26	178.00	190.77	209.60	229.05	245.44	263.90	278.13	288.65
<b>Services</b>									
Average weekly hours .....	33.0	32.8	32.7	32.6	32.6	32.6	32.7	32.8	32.8
Average hourly earnings .....	4.65	4.99	5.36	5.85	6.41	6.92	7.31	7.64	7.95
Average weekly earnings .....	153.45	163.67	175.27	190.71	208.97	225.59	239.04	250.59	260.76

P = preliminary

22. Employment Cost Index, compensation,<sup>1</sup> by occupation and industry group

(June 1981 = 100)

Series	1983	1984				1985				Percent change	
	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	3 months ended	12 months ended
										Dec., 1985	
<b>Civilian workers</b> <sup>2</sup> .....	117.8	119.8	120.8	122.4	123.9	125.5	126.4	128.4	129.2	0.6	4.3
Workers, by occupational group:											
White-collar workers .....	118.9	120.9	122.1	124.0	125.5	127.3	128.3	130.7	131.6	.7	4.9
Blue-collar workers .....	115.8	117.7	118.6	119.6	120.9	122.2	123.1	124.4	124.9	.4	3.3
Service workers .....	119.1	122.0	122.1	124.6	126.8	127.8	128.0	130.9	131.8	.7	3.9
Workers, by industry division:											
Manufacturing .....	116.0	117.9	119.1	120.4	122.0	123.9	124.6	125.5	126.0	.4	3.3
Nonmanufacturing .....	118.6	120.7	121.6	123.3	124.8	126.2	127.2	129.7	130.6	.7	4.6
Services .....	122.6	125.0	125.5	128.8	130.9	131.9	132.6	136.4	137.1	.5	4.7
Public administration <sup>3</sup> .....	121.4	122.9	123.7	126.9	128.6	130.1	130.3	134.2	134.8	.4	4.8
<b>Private industry workers</b> .....	117.0	119.0	120.1	121.1	122.7	124.2	125.2	126.8	127.5	.6	3.9
Workers, by occupational group:											
White-collar workers .....	117.9	119.9	121.4	122.4	123.9	125.8	127.1	128.8	129.8	.8	4.8
Blue-collar workers .....	115.7	117.5	118.4	119.3	120.6	121.9	122.8	124.0	124.4	.3	3.2
Service workers .....	117.9	121.5	121.2	123.2	125.7	126.3	126.5	128.8	129.5	.5	3.0
Workers, by industry division:											
Manufacturing .....	116.0	117.9	119.1	120.4	122.0	123.9	124.6	125.5	126.0	.4	3.3
Nonmanufacturing .....	117.5	119.6	120.7	121.6	123.1	124.4	125.6	127.6	128.4	.6	4.3
<b>State and local government workers</b> .....	122.0	123.9	124.4	128.8	130.1	131.7	132.0	136.5	137.5	.7	5.7
Workers, by occupational group:											
White-collar workers .....	122.6	124.5	125.0	129.7	131.1	132.5	132.9	137.6	138.6	.7	5.7
Blue-collar workers .....	119.2	121.9	122.3	125.0	125.9	128.1	128.5	131.9	132.7	.6	5.4
Workers, by industry division:											
Services .....	122.6	124.5	125.0	129.9	131.3	132.8	133.2	137.9	139.1	.9	5.9
Schools .....	122.6	124.5	124.7	130.6	132.0	133.4	133.7	139.1	140.3	.9	6.3
Elementary and secondary .....	123.9	125.4	125.7	132.1	133.5	134.4	134.6	140.9	142.0	.8	6.4
Hospitals and other services <sup>4</sup> .....	122.6	124.4	125.7	127.9	129.2	131.1	131.5	134.1	135.2	.8	4.6
Public administration <sup>3</sup> .....	121.4	122.9	123.7	126.9	128.6	130.1	130.3	134.2	134.8	.4	4.8

<sup>1</sup> Cost (cents-per-hour worked) measured in the Employment Cost Index consists of wages, salaries and employer cost of employee benefits.

<sup>2</sup> Consist of private industry workers (excluding farm and household workers)

and State and local government (excluding Federal Government) workers.

<sup>3</sup> Consists of legislative, judicial, administrative, and regulatory activities.

<sup>4</sup> Includes, for example, library, social, and health services.

### 23. Employment Cost Index, wages and salaries only, by occupation and industry group

(June 1981 = 100)

Series	1983		1984				1985				Percent change	
	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	3 months ended	12 months ended	
										Dec., 1985		
<b>Civilian workers</b> <sup>1</sup> .....	116.5	117.9	118.8	120.3	121.7	123.1	124.2	126.3	127.0	0.6	4.4	
Workers, by occupational group:												
White-collar workers .....	117.9	119.3	120.4	122.2	123.5	125.2	126.4	128.8	129.8	.8	5.1	
Blue-collar workers .....	114.0	115.3	116.1	117.0	118.2	119.3	120.5	122.0	122.3	.2	3.5	
Service workers .....	117.4	120.0	119.8	122.3	124.3	124.8	125.3	128.0	128.6	.5	3.5	
Workers, by industry division												
Manufacturing .....	114.5	115.7	116.8	118.0	119.5	121.0	122.3	123.2	123.8	.5	3.6	
Nonmanufacturing .....	117.4	118.9	119.7	121.3	122.6	123.9	125.0	127.6	128.4	.6	4.7	
Services .....	121.3	123.3	123.8	127.2	128.9	129.7	130.5	134.2	134.8	.4	4.6	
Public administration <sup>2</sup> .....	119.4	120.4	121.3	124.4	125.7	127.0	127.2	131.4	132.0	.5	5.0	
<b>Private industry workers</b> .....	115.8	117.2	118.2	119.2	120.6	122.0	123.3	124.9	125.6	.6	4.1	
Workers, by occupational group:												
White-collar workers .....	117.2	118.5	119.9	120.9	122.3	124.0	125.5	127.3	128.3	.8	4.9	
Professional and technical .....	120.4	122.2	123.8	125.2	127.3	127.7	128.7	131.2	131.5	.2	3.3	
Managers and administrators .....	115.7	118.0	119.2	121.0	122.2	123.8	126.5	127.7	128.4	.5	5.1	
Salesworkers .....	111.2	110.2	111.9	110.5	111.6	116.3	117.4	119.3	122.5	2.7	9.8	
Clerical workers .....	118.3	119.8	120.7	122.0	122.9	124.7	125.6	127.1	127.9	.6	4.1	
Blue-collar workers .....	113.9	115.1	115.9	116.7	118.0	119.1	120.3	121.7	122.0	.2	3.4	
Craft and kindred workers .....	115.4	116.5	117.3	118.0	119.4	120.8	122.0	123.7	123.8	.1	3.7	
Operatives, except transport .....	113.6	114.9	115.8	116.6	117.9	118.9	120.1	121.1	121.6	.4	3.1	
Transport equipment operatives .....	110.2	111.7	112.7	113.4	114.0	114.5	115.7	117.7	117.8	.1	3.3	
Nonfarm laborers .....	112.1	112.9	114.1	114.7	115.9	116.7	118.5	118.6	119.8	1.0	3.4	
Service workers .....	116.5	119.8	119.3	121.2	123.7	123.8	124.4	126.3	126.6	.2	2.3	
Workers, by industry division:												
Manufacturing .....	114.5	115.7	116.8	118.0	119.5	121.0	122.3	123.2	123.8	.5	3.6	
Durables .....	114.4	115.7	116.6	117.7	119.1	120.6	122.0	122.7	123.4	.6	3.6	
Nondurables .....	114.6	115.8	117.1	118.6	120.2	121.6	122.6	124.0	124.6	.5	3.7	
Nonmanufacturing .....	116.5	118.0	119.0	119.9	121.2	122.6	123.9	125.9	126.6	.6	4.5	
Construction .....	112.9	113.3	114.0	114.3	114.4	115.5	116.6	117.3	117.9	.5	3.1	
Transportation and public utilities .....	116.8	118.5	119.3	119.9	120.7	121.7	122.8	124.8	125.2	.3	3.7	
Wholesale and retail trade .....	112.3	114.3	116.0	116.5	118.1	118.8	121.1	122.7	123.7	.8	4.7	
Wholesale trade .....	116.5	118.2	120.0	120.7	122.9	123.7	126.8	127.7	128.3	.5	4.4	
Retail trade .....	110.6	112.8	114.4	114.9	116.2	116.9	118.9	120.8	121.9	.9	4.9	
Finance, insurance, and real estate .....	116.9	116.1	116.9	115.3	115.8	122.0	121.7	124.1	126.5	1.9	9.2	
Services .....	121.9	124.2	124.7	127.1	129.5	129.9	131.0	133.9	134.1	.1	3.6	
<b>State and local government workers</b> .....	120.0	121.6	122.0	126.1	127.1	128.4	128.7	133.2	134.2	.8	5.6	
Workers, by occupational group												
White-collar workers .....	120.6	122.2	122.5	127.1	128.0	129.3	129.6	134.3	135.3	.7	5.7	
Blue-collar workers .....	116.9	119.1	119.6	121.9	122.5	124.2	124.5	127.9	128.4	.4	4.8	
Workers, by industry division												
Services .....	120.6	122.2	122.5	127.2	128.1	129.4	129.7	134.5	135.6	.8	5.9	
Schools .....	120.6	122.2	122.3	127.8	128.7	129.9	130.2	135.8	137.0	.9	6.4	
Elementary and secondary .....	121.7	122.9	123.0	129.3	130.2	130.8	131.1	137.5	138.5	.7	6.4	
Hospitals and other services <sup>3</sup> .....	120.6	121.9	123.1	125.1	125.9	127.7	128.0	130.2	130.9	.5	4.0	
Public administration <sup>2</sup> .....	119.4	120.4	121.3	124.4	125.7	127.0	127.2	131.4	132.0	.5	5.0	

<sup>1</sup> Consists of private industry workers (excluding farm and household workers) and State and local government (excluding Federal Government) workers.

<sup>2</sup> Consists of legislative, judicial, administrative, and regulatory activities.

<sup>3</sup> Includes, for example, library, social and health services.

**24. Employment Cost Index, private nonfarm workers, by bargaining status, region, and area size**

(June 1981 = 100)

Series	1983		1984				1985				Percent change	
	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	3 months ended	12 months ended	
										Dec., 1985	Dec., 1985	
<b>COMPENSATION</b>												
<b>Workers, by bargaining status<sup>1</sup></b>												
Union .....	118.8	120.6	121.7	122.6	123.9	124.8	125.5	126.5	127.1	0.5	2.6	
Manufacturing .....	117.2	119.3	120.5	121.6	123.2	124.2	124.2	125.0	125.5	.4	1.9	
Nonmanufacturing .....	120.4	121.9	122.8	123.6	124.5	125.3	126.6	127.8	128.6	.6	3.3	
Nonunion .....	115.9	118.0	119.2	120.3	121.9	123.8	125.0	126.8	127.5	.6	4.6	
Manufacturing .....	114.9	116.6	117.9	119.3	120.8	123.6	124.8	125.7	126.3	.5	4.6	
Nonmanufacturing .....	116.4	118.6	119.8	120.7	122.4	123.9	125.1	127.3	128.1	.6	4.7	
<b>Workers, by region<sup>1</sup></b>												
Northeast .....	117.5	118.9	120.7	122.4	123.8	125.1	126.4	128.8	129.9	.9	4.9	
South .....	117.1	119.7	120.7	120.7	122.2	124.2	125.2	126.5	127.2	.6	4.1	
Midwest (formerly North Central) .....	114.7	117.2	117.9	119.7	120.8	122.0	122.7	124.2	124.6	.3	3.1	
West .....	120.0	121.0	122.2	122.5	124.9	126.8	127.9	129.1	129.8	.5	3.9	
<b>Workers, by area size<sup>1</sup></b>												
Metropolitan areas .....	117.4	119.4	120.6	121.5	123.2	124.7	125.7	127.3	128.1	.6	4.0	
Other areas .....	114.5	116.7	117.4	119.0	119.8	121.4	122.5	123.9	123.9	.0	3.4	
<b>WAGES AND SALARIES</b>												
<b>Workers, by bargaining status</b>												
Union .....	116.9	118.1	119.0	119.8	120.9	121.7	123.0	124.1	124.7	.5	3.1	
Manufacturing .....	114.8	116.1	117.1	118.1	119.5	120.4	121.7	122.8	123.3	.4	3.2	
Nonmanufacturing .....	118.9	120.1	120.7	121.3	122.1	122.8	124.1	125.3	125.9	.5	3.1	
Nonunion .....	115.2	116.7	117.8	118.8	120.4	122.1	123.4	125.2	125.9	.6	4.6	
Manufacturing .....	114.2	115.4	116.5	117.9	119.5	121.5	122.8	123.7	124.4	.6	4.1	
Nonmanufacturing .....	115.6	117.2	118.3	119.2	120.7	122.3	123.6	125.9	126.6	.6	4.9	
<b>Workers, by region<sup>1</sup></b>												
Northeast .....	116.6	117.4	118.9	120.5	121.9	123.0	124.6	126.8	128.1	1.0	5.1	
South .....	115.7	117.9	119.0	119.0	120.2	122.3	123.4	124.8	125.4	.5	4.3	
Midwest (formerly North Central) .....	113.6	115.5	116.0	117.8	118.7	119.6	121.1	122.5	122.9	.3	3.5	
West .....	118.5	118.8	119.6	120.0	122.5	124.0	125.1	126.6	127.1	.4	3.8	
<b>Workers, by area size<sup>1</sup></b>												
Metropolitan areas .....	116.2	117.6	118.6	119.5	121.0	122.4	123.8	125.5	126.3	.6	4.4	
Other areas .....	113.4	115.1	116.0	117.5	118.3	119.6	120.6	121.9	122.0	.1	3.1	

<sup>1</sup> 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							
	1984	1985	1984				1985			
			I	II	III	IV	I	II <sup>P</sup>	III <sup>P</sup>	IV <sup>P</sup>
<b>Specified adjustments:</b>										
Total compensation <sup>1</sup> adjustments, <sup>2</sup> settlements covering 5,000 workers or more:										
First year of contract .....	3.6	2.6	5.1	3.5	2.7	3.7	3.6	3.5	2.0	2.0
Annual rate over life of contract .....	2.8	2.7	4.7	3.2	3.1	2.0	2.7	3.4	3.0	1.4
<b>Wage adjustments, settlements covering 1,000 workers or more:</b>										
First year of contract .....	2.4	2.3	2.8	2.6	2.1	2.3	3.3	2.5	2.0	2.1
Annual rate over life of contract .....	2.4	2.7	3.3	2.7	2.6	1.5	3.2	2.8	3.1	1.9
<b>Effective adjustments:</b>										
Total effective wage adjustment <sup>3</sup> .....	3.7	3.3	.9	.9	1.2	.7	.8	.8	1.2	.5
From settlements reached in period .....	.8	.7	.1	.1	.2	.3	.1	.2	.2	.2
Deferred from settlements reached in earlier periods .....	2.0	1.8	.4	.7	.7	.2	.6	.5	.6	.2
From cost-of-living-adjustments clauses .....	.9	.8	.3	.2	.3	.2	.1	.1	.4	.1

<sup>1</sup> Compensation includes wages, salaries, and employers' cost of employee benefits when contract is negotiated.

<sup>2</sup> Adjustments are the net result of increases, decreases and no changes in

compensation or wages.

<sup>3</sup> Because of rounding total may not equal sum of parts.

<sup>P</sup> = 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--							
	1984				1985			
	I	II	III	IV	I	II <sup>P</sup>	III <sup>P</sup>	IV <sup>P</sup>
<b>Specified total compensation adjustments, settlements covering 5,000 workers or more, all industries:</b>								
First year of contract .....	4.8	4.7	4.2	3.6	3.4	3.5	3.1	( <sup>1</sup> )
Annual rate over life of contract .....	3.6	3.5	3.2	2.8	2.6	2.7	2.7	2.8
<b>Specified wage adjustments, settlements covering 1,000 workers or more:</b>								
<b>All industries</b>								
First year of contract .....	3.5	3.5	3.2	2.4	2.4	2.4	2.4	2.3
Contracts with COLA clauses .....	4.0	4.6	4.5	2.9	2.5	2.3	1.9	1.6
Contracts without COLA clauses .....	3.0	2.7	2.3	2.1	2.4	2.4	2.7	2.7
Annual rate over life of contract .....	3.0	3.1	2.8	2.4	2.3	2.4	2.5	2.7
Contracts with COLA clauses .....	2.6	2.9	2.8	1.8	1.3	1.5	1.8	2.5
Contracts without COLA clauses .....	3.4	3.2	2.8	2.7	2.8	2.8	3.0	2.8
<b>Manufacturing</b>								
First year of contract .....	2.6	3.0	2.6	2.3	2.1	2.0	1.5	.8
Contracts with COLA clauses .....	2.4	3.2	1.5	2.1	2.0	1.9	1.5	.8
Contracts without COLA clauses .....	2.9	2.8	3.7	2.9	2.5	2.2	1.5	.9
Annual rate over life of contract .....	2.8	3.1	2.8	1.5	1.4	1.5	1.6	1.8
Contracts with COLA clauses .....	2.2	2.8	1.8	1.0	.9	1.0	1.4	2.1
Contracts without COLA clauses .....	3.7	3.6	3.8	3.3	3.2	3.0	2.4	1.6
<b>Nonmanufacturing</b>								
First year of contract .....	3.8	3.7	3.3	2.5	2.6	2.7	3.2	3.3
Contracts with COLA clauses .....	4.9	5.2	5.4	5.5	5.1	4.3	4.0	3.6
Contracts without COLA clauses .....	3.0	2.6	2.1	2.0	2.4	2.5	3.0	3.3
Annual rate over life of contract .....	3.1	3.0	2.8	2.9	2.8	2.9	3.3	3.3
Contracts with COLA clauses .....	2.9	3.0	3.1	4.8	4.0	3.8	3.9	3.6
Contracts without COLA clauses .....	3.3	3.0	2.6	2.6	2.7	2.8	3.2	3.3
<b>Construction</b>								
First year of contract .....	1.2	.8	.9	.5	.9	1.1	1.0	1.5
Contracts with COLA clauses .....	.1	-.4	4.0	4.0	4.6	9.2	( <sup>1</sup> )	( <sup>1</sup> )
Contracts without COLA clauses .....	1.4	.9	.9	.4	.8	1.0	( <sup>1</sup> )	( <sup>1</sup> )
Annual rate over life of contract .....	2.0	1.7	1.4	1.0	1.4	1.7	1.7	2.1
Contracts with COLA clauses .....	.7	.0	1.4	1.4	1.7	4.6	( <sup>1</sup> )	( <sup>1</sup> )
Contracts without COLA clauses .....	2.2	1.8	1.4	1.0	1.4	1.7	( <sup>1</sup> )	( <sup>1</sup> )

<sup>1</sup> Data do not meet publication standards.

<sup>P</sup> = 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--						
	1984			1985			
	II	III	IV	I	II <sup>P</sup>	III <sup>P</sup>	IV <sup>P</sup>
<b>For all workers:<sup>1</sup></b>							
Total .....	4.3	4.2	3.7	3.6	3.5	3.5	3.3
From settlements reached in period .....	1.0	1.0	.8	.7	.9	.9	.7
Deferred from settlements reached in earlier period .....	2.2	2.1	2.0	2.2	1.9	1.8	1.8
From cost-of-living-adjustments clauses .....	1.1	1.2	.9	.7	.7	.8	.8
<b>For workers receiving changes:</b>							
Total .....	5.3	5.0	4.4	4.5	4.2	4.3	4.1
From settlements reached in period .....	3.6	3.7	3.0	2.9	2.9	2.8	3.4
Deferred from settlements reached in earlier period .....	4.9	4.2	4.0	4.2	3.9	3.7	3.7
From cost-of-living-adjustments clauses .....	4.0	3.2	2.7	2.3	2.3	2.8	2.2

<sup>1</sup> Because of rounding total may not equal sum of parts.

<sup>P</sup> = 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		Second 6 months 1985 <sup>P</sup>
	1984	1985	
<b>Specified adjustments:</b>			
Total compensation <sup>1</sup> adjustments, <sup>2</sup> settlements covering 5,000 workers or more:			
First year of contract .....			
Annual rate over life of contract .....	5.2	4.2	3.8
	5.4	5.2	5.3
<b>Wage adjustments, settlements covering 1,000 workers or more:</b>			
First year of contract .....			
Annual rate over life of contract .....	4.8	4.6	4.4
	5.1	5.4	5.6
<b>Effective adjustments:</b>			
Total effective wage adjustment <sup>3</sup> .....	5.0	5.8	4.1
From settlements reached in period .....	1.9	4.1	3.2
Deferred from settlements reached in earlier periods .....	3.1	1.6	.9
From cost-of-living-adjustment clauses .....	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )

<sup>1</sup> Compensation includes wages, salaries, and employers' cost of employee benefits when contract is negotiated.

<sup>2</sup> Adjustments are the net result of increases, decreases and no changes in compensation or wages.

<sup>3</sup> Because of rounding total may not equal sum of parts.

<sup>4</sup> Less than .05 percent.

<sup>P</sup> = preliminary

**29. Work stoppages involving 1,000 workers or more**

Measure	Annual totals		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug. <sup>P</sup>	Sept. <sup>P</sup>	Oct. <sup>P</sup>	Nov. <sup>P</sup>	Dec. <sup>P</sup>	Jan. <sup>P</sup>
<b>Number of stoppages:</b>															
Beginning in period .....	62	-	2	4	4	3	2	2	9	6	11	4	2	2	-
In effect during period .....	68	-	9	13	12	8	8	8	13	18	20	18	11	8	-
<b>Workers involved:</b>															
Beginning in period (in thousands) .....	376.0	-	4.7	29.3	15.2	6.2	6.9	15.7	52.3	15.3	69.5	74.6	25.0	8.2	-
In effect during period (in thousands) .....	391.0	-	16.0	43.9	48.2	14.1	14.8	28.5	60.2	66.8	93.9	117.3	64.6	38.1	-
<b>Days idle:</b>															
Number (in thousands) .....	8,499.0	-	278.3	259.3	698.5	229.5	203.3	454.3	500.2	869.7	931.4	1,433.0	651.2	665.4	-
Percent of estimated working time <sup>1</sup> .....	.04	-	.01	.01	.03	.01	.01	.02	.02	.03	.04	.06	.03	.03	-

<sup>1</sup> 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

1986, pp. 54-56.

- Data not available.

<sup>P</sup> = preliminary



**30. Consumer Price Index for All Urban Consumers: U.S. city average, by expenditure category and commodity service group; and CPI for Urban Wage Earners and Clerical Workers, all items**

(1967=100, unless otherwise indicated)

Series	Annual average		1985													1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	
<b>CONSUMER PRICE INDEX FOR ALL URBAN CONSUMERS:</b>																
All items .....	311.1	322.2	316.1	317.4	318.8	320.1	321.3	322.3	322.8	323.5	324.5	325.5	326.6	327.4	328.4	
All items (1957-59=100) .....	361.9	374.7	367.6	369.1	370.7	372.3	373.7	374.8	375.5	376.2	377.4	378.5	379.9	380.8	381.9	
Food and beverages .....	295.1	302.0	299.3	301.4	301.6	301.6	301.0	301.4	301.6	301.8	302.1	302.5	303.6	305.6	307.9	
Food .....	302.9	309.8	307.3	309.5	309.7	309.6	308.9	309.3	309.5	309.7	309.9	309.8	311.0	313.2	315.6	
Food at home .....	292.6	296.8	296.1	298.6	298.4	297.7	296.2	296.0	296.2	295.9	295.6	295.3	296.6	299.3	302.5	
Cereals and bakery products .....	305.3	317.0	312.4	313.7	314.4	314.8	315.9	317.3	317.3	318.5	319.2	318.9	319.9	321.9	322.0	
Meats, poultry, fish, and eggs .....	266.6	263.4	266.6	267.0	266.1	263.6	259.8	259.8	260.5	259.7	260.6	261.1	266.1	269.9	271.5	
Dairy products .....	253.2	258.0	258.8	252.2	258.9	258.3	258.4	257.8	258.2	257.4	258.0	257.1	257.1	256.9	257.2	
Fruits and vegetables .....	317.4	325.7	320.8	333.0	332.1	333.2	330.3	329.0	328.9	326.3	319.9	317.1	314.3	323.9	334.4	
Other foods at home .....	352.2	361.1	358.0	359.8	360.5	360.8	361.3	360.8	360.6	361.7	362.6	363.0	362.2	361.3	365.7	
Sugar and sweets .....	389.1	398.8	394.5	394.8	394.8	396.1	397.6	398.3	400.2	401.8	401.1	402.6	401.4	402.2	405.1	
Fats and oils .....	288.0	294.4	295.9	295.1	294.9	294.0	294.0	296.0	297.8	297.1	294.8	291.2	292.1	290.3	292.1	
Nonalcoholic beverages .....	443.0	451.7	449.4	452.7	454.0	454.0	454.1	451.5	448.2	449.6	452.8	454.1	451.7	448.8	459.7	
Other prepared foods .....	284.9	294.2	289.6	291.5	292.2	292.8	293.4	293.4	294.5	295.8	296.3	296.8	296.8	297.3	298.0	
Food away from home .....	333.4	346.6	339.9	341.4	342.6	343.9	345.1	346.9	347.3	348.4	349.9	350.3	351.3	352.1	353.1	
Alcoholic beverages .....	222.1	229.5	224.3	225.8	226.5	226.7	227.7	227.8	228.2	228.9	229.3	230.6	232.2	236.2	237.5	
Housing .....	336.5	349.9	342.0	343.6	344.7	345.9	348.5	350.4	351.6	352.9	353.8	354.4	355.0	355.8	356.8	
Shelter .....	361.7	382.0	371.2	373.3	374.3	375.9	379.5	381.0	383.2	385.9	386.9	389.1	391.3	392.3	393.8	
Renters' costs (12/82=100) .....	108.6	115.4	111.8	112.4	112.9	113.5	114.5	115.1	115.8	116.6	117.0	117.9	118.4	118.3	118.8	
Rent, residential .....	249.3	264.6	257.1	258.4	259.2	260.4	262.6	263.6	265.0	266.6	267.7	269.9	271.7	272.4	273.4	
Other renters' costs .....	373.4	398.4	378.5	381.9	386.1	390.9	396.5	401.6	405.1	409.9	410.7	412.5	408.7	398.1	401.1	
Homeowners' costs (12/82=100) .....	107.3	113.1	110.0	110.7	110.8	111.3	112.4	112.8	113.5	114.3	114.6	115.1	115.8	116.3	116.7	
Owners' equivalent rent (12/82=100) .....	107.3	113.2	110.0	110.7	110.9	111.3	112.5	112.8	113.5	114.3	114.6	115.1	115.9	116.3	116.7	
Household insurance (12/82=100) .....	107.5	112.4	109.0	109.5	110.4	111.4	112.0	112.7	112.7	113.0	113.7	114.6	114.5	115.0	115.7	
Maintenance and repairs .....	359.2	368.9	366.0	366.8	370.0	368.0	366.2	367.6	367.8	370.6	368.7	368.5	372.7	373.7	379.1	
Maintenance and repair services .....	409.7	421.1	414.7	415.8	422.2	418.2	416.0	423.2	421.1	425.1	421.9	422.2	426.4	426.2	432.6	
Maintenance and repair commodities .....	262.7	269.6	269.9	270.5	270.6	270.4	269.2	265.7	267.8	269.2	268.6	268.0	271.5	273.3	277.1	
Fuel and other utilities .....	387.3	393.6	387.2	386.5	388.2	388.7	393.0	399.4	399.9	398.9	400.5	395.6	392.1	393.3	394.6	
Fuels .....	485.5	488.1	481.2	480.8	482.2	483.0	490.0	497.7	497.3	494.4	496.8	488.4	481.5	483.6	484.7	
Fuel oil, coal, and bottled gas .....	641.8	619.5	621.6	623.4	620.8	623.5	620.8	612.0	601.9	594.6	601.7	615.3	641.6	657.3	650.3	
Gas (piped) and electricity .....	445.2	452.7	444.1	443.3	445.5	445.9	454.7	465.6	467.1	465.1	466.5	453.9	440.5	439.9	442.6	
Other utilities and public services .....	230.2	240.7	235.3	234.3	236.3	236.4	236.8	241.1	242.8	244.2	244.6	244.7	245.9	245.8	247.3	
Household furnishings and operations .....	242.5	247.2	244.2	246.2	246.9	247.9	247.6	247.1	246.5	247.0	247.1	248.4	248.9	248.8	248.8	
Housefurnishings .....	199.1	200.1	198.8	200.7	200.6	201.7	201.2	200.0	198.8	199.1	199.0	200.3	200.8	200.1	199.8	
Housekeeping supplies .....	303.2	313.6	309.9	311.5	311.8	312.6	312.9	313.6	313.1	313.5	313.9	315.7	316.4	317.7	318.3	
Housekeeping services .....	327.5	338.9	331.3	333.9	337.4	337.9	338.0	338.3	339.8	340.7	341.5	342.2	342.7	343.2	343.9	
Apparel and upkeep .....	200.2	206.0	199.8	201.8	205.3	205.9	205.3	204.6	202.8	205.3	209.6	211.1	211.2	209.0	205.0	
Apparel commodities .....	187.0	191.6	185.7	187.5	191.3	191.8	191.0	190.2	188.0	190.6	195.3	196.7	196.8	194.2	189.5	
Men's and boys' apparel .....	192.4	197.9	193.2	192.8	195.2	197.4	197.8	196.4	194.5	197.2	201.5	203.2	203.6	202.0	198.6	
Women's and girls' apparel .....	163.6	169.5	161.3	164.1	169.9	170.0	168.0	166.5	163.4	167.7	176.1	177.9	176.5	176.2	164.4	
Infants' and toddlers' apparel .....	287.0	299.7	290.3	298.8	302.1	295.3	298.3	300.7	294.5	300.6	302.0	302.1	307.0	314.3	313.9	
Footwear .....	209.5	212.1	208.6	210.1	213.1	213.2	213.2	213.9	211.4	210.3	210.9	212.3	215.5	213.1	209.1	
Other apparel commodities .....	216.4	215.5	212.2	215.5	216.9	215.8	215.1	216.3	216.7	217.5	215.2	214.9	214.9	216.2	215.5	
Apparel services .....	305.0	320.9	312.5	316.0	317.1	318.4	319.4	319.9	321.4	322.9	324.1	325.7	326.3	326.9	329.8	
Transportation .....	311.7	319.9	314.7	314.3	316.7	320.0	321.4	321.8	321.8	320.7	319.7	320.9	323.2	324.0	323.9	
Private transportation .....	306.6	314.2	309.1	308.7	311.0	314.6	316.0	316.3	316.1	314.9	313.6	314.7	317.0	317.8	317.3	
New vehicles .....	208.0	214.9	212.7	213.6	213.8	213.9	214.2	214.3	214.3	214.2	214.2	215.9	218.2	219.2	219.7	
New cars .....	208.5	215.2	213.1	213.9	214.1	214.1	214.5	214.7	214.7	214.6	214.5	216.2	218.4	219.4	219.9	
Used cars .....	375.7	379.7	382.8	384.6	386.1	386.4	384.2	380.3	376.7	374.0	374.3	375.3	376.4	375.6	374.1	
Motor fuel .....	370.7	373.8	357.6	352.4	360.6	374.2	381.6	384.7	385.5	381.9	377.7	374.6	376.7	377.5	373.3	
Gasoline .....	370.2	373.3	356.8	351.6	360.0	373.8	381.4	384.5	385.3	381.8	377.4	374.2	376.1	376.8	372.5	
Maintenance and repair .....	341.5	351.4	346.9	348.2	348.5	348.2	349.6	350.4	351.1	351.9	353.5	355.7	355.8	357.5	357.9	
Other private transportation .....	273.3	287.6	283.9	284.4	284.5	285.8	285.6	286.6	287.6	287.7	285.8	289.6	293.9	295.2	297.7	
Other private transportation commodities .....	201.5	202.6	202.0	203.8	201.9	202.8	201.3	203.9	202.2	202.8	203.4	202.8	201.6	202.1	203.4	
Other private transportation services .....	295.0	312.8	308.3	308.5	309.1	310.5	310.7	311.3	313.0	313.0	310.4	315.4	321.2	322.7	325.5	
Public transportation .....	385.2	402.8	394.5	394.4	397.3	398.0	398.4	399.3	402.4	403.7	408.0	411.5	412.8	412.9	419.6	
Medical care .....	379.5	403.1	391.1	393.8	396.5	398.0	399.5	401.7	404.0	406.6	408.3	410.5	413.0	414.7	418.2	
Medical care commodities .....	239.7	256.7	248.2	249.8	251.9	253.9	255.2	257.0	257.8	259.3	260.2	261.3	262.7	262.9	264.5	
Medical care services .....	410.3	435.1	422.4	425.3	428.1	429.4	430.9	433.0	435.8	438.6	440.5	443.0	445.8	448.0	451.9	
Professional services .....	346.1	367.3	356.8	359.3	361.9	363.0	364.5	366.4	368.1	370.0	371.7	373.2	375.5	377.1	378.9	
Other medical care services .....	488.0	517.0	501.7	505.2	508.0	509.6	511.2	513.6	517.6	521.6	523.9	527.4	530.8	533.6	540.3	
Entertainment .....	255.1	265.0	261.0	261.3	262.2	263.3	263.6	264.8	265.7	265.7	266.8	268.4	269.0	268.3	270.8	
Entertainment commodities .....	253.3	260.6	257.1	257.9	258.7	259.5	259.5	260.1	260.8	260.5	262.5	264.0	264.0	262.5	264.7	
Entertainment services .....	258.3	271.8	267.0	266.7	267.6	269.2	269.9	272.0	273.3	273.6	273.5	275.2	276.6	277.1	279.9	
Other goods and services .....	307.7	326.6	319.1	320.5	321.1	321.8	322.3	323.0</								

## 30. Continued— Consumer Price Index for All Urban Consumers: U.S. city average, by expenditure category and commodity service group; and CPI for Urban Wage Earners and Clerical Workers, all items

(1967 = 100, unless otherwise indicated)

Series	Annual average		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
	All items .....	311.1	322.2	316.1	317.4	318.8	320.1	321.3	322.3	322.8	323.5	324.5	325.5	326.6	327.4
Commodities .....	280.7	286.7	282.7	284.0	285.3	286.8	287.0	286.9	286.5	286.5	287.1	287.9	289.2	289.9	290.1
Food and beverages .....	295.1	302.0	299.3	301.4	301.6	301.6	301.0	301.4	301.6	301.8	302.1	302.5	303.6	305.6	307.9
Commodities less food and beverages .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nondurables less food and beverages .....	275.7	282.1	274.4	274.7	277.9	281.5	283.1	283.5	282.9	283.1	284.6	285.3	286.8	286.8	284.9
Apparel commodities .....	187.0	191.6	185.7	187.5	191.3	191.8	191.0	190.2	188.0	190.6	195.3	196.7	196.8	194.2	189.5
Nondurables less food, beverages, and apparel .....	325.8	333.3	324.5	324.2	327.1	332.3	335.1	336.2	336.4	335.4	335.3	335.6	337.8	339.1	338.7
Durables .....	266.5	270.7	270.2	271.4	271.9	272.6	271.6	270.4	269.3	268.6	268.7	270.2	271.5	271.4	271.4
Services .....	363.0	381.5	372.1	373.5	375.0	376.2	378.9	381.3	383.3	384.9	386.5	387.7	388.7	389.5	391.7
Rent of shelter .....	107.7	113.9	110.6	111.3	111.5	112.0	113.2	113.6	114.3	115.1	115.4	116.1	116.7	117.0	117.4
Household services less rent of shelter .....	108.1	111.2	108.9	108.9	109.7	109.8	110.9	112.7	113.2	113.2	113.5	112.1	110.8	110.8	111.4
Transportation services .....	321.1	337.0	331.8	332.2	333.2	334.1	334.5	335.3	337.0	337.4	337.1	341.1	344.7	346.1	349.0
Medical care services .....	410.3	435.1	422.4	425.3	428.1	429.4	430.9	433.0	435.8	438.6	440.5	443.0	445.8	448.0	451.9
Other services .....	296.0	314.1	307.1	307.8	308.6	309.9	310.7	312.0	313.0	313.8	319.7	321.4	322.5	322.9	324.8
Special indexes:															
All items less food .....	311.3	323.3	316.3	317.4	319.1	320.8	322.4	323.6	324.2	325.0	326.2	327.4	328.5	328.9	329.5
All items less shelter .....	295.1	303.9	298.9	300.0	301.5	302.8	303.4	304.3	304.4	304.6	305.7	306.3	307.2	307.9	308.8
All items less homeowners' costs .....	106.3	109.7	107.8	108.2	108.7	109.2	109.5	109.8	109.9	110.1	110.4	110.7	111.1	111.3	111.6
All items less medical care .....	307.3	317.7	311.9	313.1	314.5	315.8	317.0	317.9	318.4	318.9	319.9	320.8	321.9	322.6	323.4
Commodities less food .....	267.0	272.5	267.8	268.6	270.6	272.8	273.4	273.1	272.4	272.3	271.9	272.4	275.7	275.7	274.7
Nondurables less food .....	270.8	277.2	269.7	270.2	273.2	276.5	278.0	278.4	277.9	278.1	279.6	280.7	282.0	282.0	280.4
Nondurables less food and apparel .....	311.9	319.2	310.9	310.8	313.5	318.1	320.7	321.7	321.9	321.1	321.0	322.0	324.0	325.1	324.9
Nondurables .....	286.6	293.2	288.0	289.2	291.0	292.7	293.3	293.7	293.5	293.7	294.6	295.1	296.4	297.4	297.7
Services less rent of shelter .....	108.5	113.5	111.1	111.3	111.9	112.2	112.8	113.7	114.2	114.5	115.0	115.1	115.2	115.4	116.2
Services less medical care .....	355.6	373.3	364.3	365.5	366.9	368.1	370.9	373.3	375.2	376.7	378.3	379.3	380.1	380.8	382.7
Energy .....	423.6	426.5	414.5	411.4	416.6	424.4	431.7	436.8	437.1	438.8	432.6	427.1	425.1	426.5	424.7
All items less energy .....	302.9	314.8	309.2	310.9	312.0	312.7	313.3	313.9	314.5	315.6	316.8	318.4	319.8	320.5	321.8
All items less food and energy .....	301.2	314.4	307.9	309.5	310.8	311.8	312.8	313.4	314.1	315.3	316.9	318.9	320.4	320.7	321.6
Commodities less food and energy .....	253.1	259.7	256.5	258.1	259.3	260.0	259.6	259.0	258.2	258.8	260.2	262.0	262.7	262.8	261.8
Energy commodities .....	409.8	409.9	395.7	391.3	398.3	410.8	417.0	418.7	418.1	414.0	411.2	410.1	415.2	417.9	413.2
Services less energy .....	356.4	375.9	366.4	368.0	369.4	370.7	372.9	374.6	376.6	378.6	380.2	382.5	384.8	385.8	387.9
Purchasing power of the consumer dollar:															
1967 = \$1.00 .....	32.1	31.0	31.6	31.5	31.4	31.2	31.1	31.0	31.0	30.9	30.8	30.7	30.6	30.5	30.5
1957-59 = \$1.00 .....	27.6	26.7	27.2	27.1	27.0	26.9	26.8	26.7	26.6	26.6	26.5	26.4	26.3	26.3	26.2
<b>CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS AND CLERICAL WORKERS:</b>															
All items .....	307.6	318.5	312.6	313.9	315.3	316.7	317.8	318.7	319.1	319.6	320.5	321.3	322.6	323.4	324.3
All items (1957-59 = 100) .....	357.7	370.4	363.6	365.1	366.7	368.3	369.6	370.6	371.2	371.8	372.7	373.7	375.1	376.1	377.1
Food and beverages .....	295.2	301.8	299.1	301.2	301.6	301.4	300.8	301.2	301.4	301.6	301.8	302.2	303.4	305.4	307.7
Food .....	302.7	309.3	306.9	309.0	309.3	309.2	308.4	308.8	309.0	309.1	309.3	309.3	310.6	312.8	315.1
Food at home .....	291.2	295.3	294.5	297.0	296.9	296.1	294.6	294.5	294.6	294.3	294.0	293.7	295.2	297.9	300.9
Cereals and bakery products .....	303.7	315.4	310.7	311.9	312.7	313.1	314.1	315.7	315.7	316.8	317.6	317.3	318.2	320.4	320.4
Meats, poultry, fish, and eggs .....	266.0	262.7	266.0	266.3	265.6	262.9	259.2	259.3	259.7	259.0	259.9	260.4	265.4	269.2	270.7
Dairy products .....	252.2	256.9	257.8	258.3	257.8	257.2	257.3	256.7	256.6	256.3	256.8	255.9	255.9	255.7	256.0
Fruits and vegetables .....	312.5	320.3	314.9	327.1	326.8	328.1	324.8	323.5	323.9	320.6	313.6	311.2	309.4	319.3	329.7
Other foods at home .....	352.7	361.5	358.3	360.2	361.0	361.3	361.6	361.3	361.1	362.2	362.9	363.4	362.5	361.6	366.1
Sugar and sweets .....	388.6	398.3	394.0	394.4	394.2	395.5	396.9	399.0	399.8	401.4	400.8	402.2	400.9	401.8	404.7
Fats and oils .....	287.5	293.9	295.3	294.7	294.3	293.7	293.6	295.6	297.3	296.5	294.1	290.6	291.8	289.6	291.6
Nonalcoholic beverages .....	444.4	453.2	450.9	454.2	455.5	455.6	455.4	449.8	451.2	454.1	455.6	453.1	450.4	461.0	
Other prepared foods .....	286.4	295.7	290.9	292.9	293.7	294.2	294.9	295.0	296.1	297.3	297.7	298.3	298.3	298.7	299.4
Food away from home .....	336.7	349.7	343.0	344.6	345.8	347.1	348.4	350.1	350.4	351.5	353.0	353.4	354.4	355.2	356.2
Alcoholic beverages .....	225.3	232.6	227.6	229.1	229.9	229.9	230.8	231.0	231.0	232.2	232.6	239.1	238.8	239.1	240.1
Housing .....	329.2	343.3	335.7	337.2	338.2	339.5	342.1	344.0	345.0	346.2	347.2	347.5	348.3	349.1	350.1
Shelter .....	350.0	370.4	360.0	362.0	363.0	364.7	368.1	369.5	371.5	374.0	375.0	377.1	379.3	380.4	381.8
Renters' costs (12/84 = 100) .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rent, residential .....	248.6	263.7	256.3	257.5	258.4	259.6	261.8	262.7	264.1	265.7	266.8	268.9	270.7	271.5	272.5
Other renters' costs .....	372.4	397.9	377.8	380.8	385.3	391.0	396.7	401.0	405.2	409.6	409.8	411.6	408.0	397.5	400.8
Homeowners' costs (12/84 = 100) .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Owners' equivalent rent (12/84 = 100) .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Household insurance (12/84 = 100) .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance and repairs .....	356.3	364.1	360.9	361.5	364.3	363.1	361.8	362.9	363.4	365.6	364.4	364.6	367.7	368.5	373.2
Maintenance and repair services .....	403.5	415.0	407.8	408.8	414.8	411.7	410.1	417.0	415.3	419.6	416.8	417.4	420.9	420.1	426.2
Maintenance and repair commodities .....	257.2	261.1	260.8	261.1	261.6	261.6	260.7	258.4	260.0	260.6	260.5	262.7	264.2	267.2	267.2
Fuel and other utilities .....	388.6	394.7	388.3	387.5	389.2	389.7	393.8	400.9	401.2	401.1	401.9	396.3	393.2	394.3	395.6
Fuels .....	485.0	487.5	480.7	480.3	481.6	482.3	488.9	497.7	497.0	494.0	496.7	487.2	481.0	483.1	484.1
Fuel oil, coal, and bottled gas .....	644.3	622.0	623.9	625.7	623.1	625.9	623.2	614.3	604.2	596.9	604.3	618.1	644.3	659.9	652.7
Gas (piped) and electricity .....	444.1	451.6	443.2	442.3	444.4	444.6	453.0	465.1	466.3	464.2	465.9	452.0	439.5	438.8	441.4
Other utilities and public services .....	231.2	241.6	236.3	235.1	237.2	237.3	237.7	242.0	243.7	245.1	245.6	245.7	246.8	246.7	248.3
Household furnishings and operations .....	239.1	243.4	240.4	242.6	243.2	244.1	244.0	243.3	242.6	243.1	243.2	244.5	245.1	245.2	245.1
Housefurnishings .....	197.0	197.6	196.3	198.3	198.2	199.2	198.9	197.6	196.2	196.6	196.5	197.7	198.3		

**30. Continued— Consumer Price Index for All Urban Consumers: U.S. city average, by expenditure category and commodity service group; and CPI for Urban Wage Earners and Clerical Workers, all items**

(1967=100, unless otherwise indicated)

Series	Annual average		1985												1986
	1984	1985	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Apparel commodities .....	186.6	191.3	185.1	187.2	190.9	191.5	190.7	190.0	187.8	190.4	195.1	196.6	196.5	194.1	189.4
Men's and boys' apparel .....	192.9	198.2	193.6	193.1	195.7	197.8	198.2	196.6	194.8	197.3	201.8	203.5	203.7	202.2	198.8
Women's and girls' apparel .....	165.0	171.3	162.1	165.8	171.5	172.0	169.7	168.4	165.5	169.9	178.2	180.0	178.3	174.5	166.1
Infants' and toddlers' apparel .....	297.6	311.7	299.7	310.1	314.5	306.4	310.6	313.5	306.4	311.2	314.9	314.8	320.7	317.3	332.7
Footwear .....	210.0	212.5	209.5	210.8	213.4	213.3	213.3	214.1	211.6	210.5	211.0	212.6	215.9	213.6	209.9
Other apparel commodities .....	204.5	203.1	199.9	203.0	204.2	203.3	202.7	204.0	204.5	205.2	202.5	202.4	202.5	202.4	203.5
Apparel services .....	302.9	318.5	310.2	313.6	314.7	316.1	317.0	317.6	319.0	320.5	321.6	323.2	323.6	324.4	327.2
Transportation .....	313.9	321.6	316.7	316.3	318.7	322.0	323.3	323.6	323.5	322.3	321.1	322.2	324.6	325.3	325.1
Private transportation .....	310.1	317.4	312.6	312.2	314.6	318.0	319.4	319.6	319.3	318.0	316.6	317.6	320.1	320.8	320.2
New vehicles .....	207.3	214.2	212.0	212.8	213.2	213.2	213.5	213.6	213.6	213.5	213.5	215.3	217.5	218.6	219.0
New cars .....	207.9	214.5	212.4	213.1	213.4	213.4	213.8	214.0	214.0	213.9	213.8	215.5	217.8	218.8	219.2
Used cars .....	375.7	379.7	382.8	384.6	386.2	386.4	384.2	380.3	376.7	374.0	374.3	375.3	376.4	375.6	374.1
Motor fuel .....	372.2	375.4	359.0	354.0	362.2	375.7	383.0	386.2	387.2	383.8	379.5	376.3	378.7	379.6	375.3
Gasoline .....	371.8	375.0	358.2	353.2	361.6	375.3	382.7	386.0	387.0	383.7	379.2	375.8	378.1	378.9	374.6
Maintenance and repair .....	342.2	352.6	347.9	349.2	349.6	349.3	350.6	351.5	352.2	352.9	354.5	356.9	357.2	359.0	359.4
Other private transportation .....	274.2	287.7	284.7	285.2	285.1	286.3	285.9	286.9	287.7	287.6	285.2	289.2	293.7	294.7	296.9
Other private transportation commodities .....	203.9	204.7	204.2	206.1	204.2	205.1	203.5	205.9	204.3	204.9	205.6	205.0	203.7	204.3	205.6
Other private transportation services .....	295.4	312.3	308.6	308.7	309.2	310.4	310.4	310.9	312.4	312.1	308.9	314.1	320.2	321.3	323.7
Public transportation .....	376.8	391.7	384.2	384.2	386.7	387.4	387.6	388.4	392.1	393.5	396.8	399.3	400.1	400.2	408.6
Medical care .....	377.7	401.2	389.3	392.0	394.6	396.1	397.7	399.8	402.0	404.5	406.3	408.5	410.9	412.6	416.0
Medical care commodities .....	239.7	256.3	248.0	249.6	251.5	253.5	254.8	256.7	257.4	259.0	259.8	260.9	262.2	262.3	264.1
Medical care services .....	407.9	432.7	420.1	423.1	425.7	427.1	428.7	430.7	433.3	436.1	438.1	440.6	443.2	445.4	449.2
Professional services .....	346.5	367.7	357.2	359.7	362.4	363.6	365.0	366.8	368.5	370.4	372.1	373.7	375.8	377.6	379.3
Other medical care services .....	484.7	513.9	498.8	502.3	505.0	506.6	508.2	510.5	514.4	518.4	520.7	524.4	527.5	530.4	536.9
Entertainment .....	251.2	260.1	256.6	256.9	257.3	258.6	258.9	260.1	260.9	260.8	261.6	263.0	263.7	263.0	265.4
Entertainment commodities .....	247.7	254.2	251.1	251.9	252.2	253.2	253.1	253.9	254.5	254.3	256.0	257.1	257.2	255.7	257.8
Entertainment services .....	258.5	271.6	267.4	266.8	267.4	269.2	270.0	272.0	273.2	273.3	272.6	274.6	276.3	276.8	280.0
Other goods and services .....	304.9	322.7	315.6	317.1	317.6	318.3	318.8	319.5	321.8	322.9	328.7	330.1	330.5	331.9	334.9
Tobacco products .....	309.7	328.1	320.8	323.0	323.4	323.6	323.6	324.4	329.7	331.1	332.4	334.0	334.3	337.1	342.4
Personal care .....	269.4	279.6	274.9	275.9	276.3	277.5	278.6	279.2	279.9	280.9	281.8	282.7	283.1	284.0	285.9
Toilet goods and personal care appliances .....	270.3	279.0	274.6	275.9	276.5	277.5	277.8	278.2	279.2	280.0	281.1	282.0	281.9	283.3	285.9
Personal care services .....	268.8	280.5	275.7	276.3	276.5	278.0	279.7	280.7	280.9	282.2	282.8	283.7	284.8	285.2	286.4
Personal and educational expenses .....	368.2	399.3	387.9	389.3	390.1	390.7	390.9	391.6	392.5	393.2	414.5	416.5	417.3	417.4	418.9
School books and supplies .....	327.5	355.7	345.5	348.7	348.8	349.4	349.5	349.9	350.6	351.2	366.9	369.2	369.3	369.4	375.6
Personal and educational services .....	378.2	410.1	398.3	399.4	400.3	401.0	401.2	401.9	402.9	403.6	426.1	428.1	428.9	429.1	429.7
All items .....	307.6	318.5	312.6	313.9	315.3	316.7	317.8	318.7	319.1	319.6	320.5	321.3	322.6	323.4	324.3
Commodities .....	280.4	286.5	282.5	283.8	285.2	286.7	286.8	286.8	286.4	286.3	286.8	287.6	288.9	289.7	289.8
Food and beverages .....	295.2	301.8	299.1	301.2	301.6	301.4	300.8	301.2	301.4	301.6	301.8	302.2	303.4	305.4	307.7
Commodities less food and beverages .....	269.3	-	270.7	271.4	273.6	276.3	277.5	277.7	-	-	-	-	-	-	-
Nondurables less food and beverages .....	277.5	283.8	275.8	276.2	279.4	283.2	284.9	285.4	285.0	285.1	286.5	287.0	288.5	288.7	286.9
Apparel commodities .....	186.6	191.3	185.1	187.2	190.9	191.5	190.7	190.0	187.8	190.4	195.1	196.6	196.5	194.1	189.4
Nondurables less food, beverages, and apparel .....	327.0	334.2	325.2	324.7	327.8	333.1	336.0	337.2	337.6	336.6	336.4	336.5	336.8	340.1	339.6
Durables .....	261.1	265.2	264.9	266.2	266.7	267.3	266.3	265.1	263.8	263.1	263.1	264.5	265.7	265.7	265.6
Services .....	358.0	377.3	368.3	369.6	371.0	372.2	374.9	377.4	379.2	380.7	382.0	383.0	384.2	385.1	387.2
Rent of shelter (12/84=100) .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Household services less rent of shelter (12/84=100) .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transportation services .....	317.2	332.2	327.7	328.1	328.8	329.6	329.9	330.6	332.2	332.4	331.4	335.5	339.3	340.5	343.3
Medical care services .....	407.9	432.7	420.1	423.1	425.7	427.1	428.7	430.7	433.3	436.1	438.1	440.6	443.2	445.4	449.2
Other services .....	292.9	310.1	303.5	304.2	304.9	306.2	307.2	308.4	309.3	310.1	315.0	316.7	317.8	318.3	320.4
Special indexes:															
All items less food .....	307.5	319.4	312.7	313.7	315.4	317.2	318.7	319.8	320.3	320.9	321.9	322.9	324.2	324.6	325.1
All items less shelter .....	295.1	303.4	298.6	299.7	301.1	302.4	303.0	303.9	304.0	304.0	304.8	305.4	306.4	307.2	307.9
All items less homeowners' costs .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All items less medical care .....	304.0	314.3	308.7	309.9	311.3	312.6	313.7	314.6	314.9	315.3	316.1	316.9	318.1	318.9	319.6
Commodities less food .....	267.1	272.8	268.2	269.0	271.0	273.3	273.8	273.6	272.8	272.7	273.4	274.5	275.9	275.0	275.0
Nondurables less food .....	272.6	279.0	271.2	271.7	274.7	278.2	279.8	280.4	280.2	280.2	281.5	282.4	283.8	283.9	282.3
Nondurables less food and apparel .....	313.2	320.3	311.8	311.5	314.4	319.1	321.8	322.9	323.2	322.4	322.3	323.1	325.0	326.3	325.9
Nondurables .....	287.4	293.9	288.6	289.8	291.6	293.4	294.0	294.4	294.3	294.5	295.2	295.7	297.1	298.2	298.4
Services less rent of shelter (12/84=100) .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Services less medical care .....	350.5	369.0	360.4	361.6	362.8	364.1	366.8	369.3	371.1	372.5	373.6	374.5	375.5	376.2	378.2
Energy .....	423.3	426.3	413.8	410.6	416.0	424.2	431.3	436.9	437.2	433.9	432.5	426.6	425.4	426.8	424.7
All items less energy .....	298.3	309.9	304.7	306.4	307.4	308.1	308.6	309.1	309.5	310.4	311.5	313.0	314.5	315.3	316.5
All items less food and energy .....	295.8	308.7	302.7	304.3	305.5	306.4	307.3	307.8	308.3	309.4	310.7	312.7	314.2	314.6	315.4
Commodities less food and energy .....	250.5	256.8	253.8	255.5	256.2	257.2	256.8	256.2	255.3	255.8	257.2	258.8	259.5	259.2	258.8
Energy commodities .....	410.5	410.9	396.2	391.8	399.0	411.6	418.0	419.9	419.6	415.7	412.6	411.2	416.3	418.9	414.1
Services less energy .....	350.8	371.1	362.0	363.6	364.9	366.2	368.4	369.9	371.9	373.7	374.9	377.3	379.8	380.8	382.9
Purchasing power of the consumer dollar:															
1967=\$1.00 .....	32.5	31.4	32.0	31.9	31.7	3									

**31. Consumer Price Index: U.S. city average and available local area data: all items**

(1967=100, unless otherwise indicated)

Area <sup>1</sup>	Pricing schedule <sup>2</sup>	Other index base	All Urban Consumers								Urban Wage Earners						
			1985						1986		1985						1986
			Jan.	Feb.	Sept.	Oct.	Nov.	Dec.	Jan.	Jan.	Feb.	Sept.	Oct.	Nov.	Dec.	Jan.	
U.S. city average .....		-	316.1	317.4	324.5	325.5	326.6	327.4	328.4	312.6	313.9	320.5	321.3	322.6	323.4	324.3	
Chicago, Ill.-Northwestern																	
Ind. ....	M	-	315.1	316.7	326.3	322.6	324.2	325.9	326.3	302.5	304.0	312.1	308.9	310.9	312.6	312.9	
Detroit, Mich. ....	M	-	310.9	313.7	320.5	319.7	323.1	323.1	323.1	301.2	304.0	310.3	309.7	313.2	313.1	313.4	
Los Angeles-Long Beach, Anaheim, Calif. ....	M	-	313.0	314.1	323.8	326.1	325.0	326.1	326.8	308.1	309.1	317.7	320.0	319.1	320.1	320.9	
New York, N.Y.-Northeastern N.J. ....	M	-	308.4	310.2	316.9	317.4	319.9	320.8	323.1	302.0	303.6	309.3	309.9	312.5	313.5	315.8	
Philadelphia, Pa.-N.J. ....	M	-	306.3	309.2	316.5	317.4	318.8	319.7	320.3	309.4	312.4	319.1	320.3	321.5	322.5	323.0	
Anchorage, Alaska (10/67 = 100) .....	1	10/67	278.3	-	284.5	-	286.9	-	287.1	271.7	-	277.3	-	280.1	-	280.2	
Baltimore, Md. ....	1	-	315.2	-	327.5	-	327.3	-	332.0	315.1	-	326.3	-	326.3	-	331.1	
Boston, Mass. ....	1	-	309.4	-	321.3	-	325.4	-	327.1	307.8	-	319.3	-	323.0	-	324.5	
Cincinnati, Ohio-Ky.-Ind. ....	1	-	325.1	-	329.8	-	333.4	-	333.2	318.9	-	322.8	-	326.2	-	326.0	
Denver-Boulder, Colo. ....	1	-	350.6	-	358.0	-	359.4	-	364.4	346.2	-	353.3	-	354.1	-	359.1	
Miami, Fla. (11/77 = 100) .....	1	11/77	168.6	-	173.5	-	173.9	-	174.6	169.8	-	174.5	-	174.9	-	175.7	
Milwaukee, Wis. ....	1	-	324.6	-	332.4	-	333.9	-	333.9	343.4	-	351.4	-	353.2	-	353.0	
Northeast, Pa. ....	1	-	301.5	-	306.8	-	310.6	-	311.6	301.0	-	306.3	-	309.6	-	310.6	
Portland, Oreg.-Wash. ....	1	-	306.8	-	314.9	-	317.1	-	321.3	297.4	-	305.4	-	307.3	-	311.0	
St. Louis, Mo.-Ill. ....	1	-	313.3	-	321.6	-	321.6	-	322.4	310.4	-	318.5	-	318.5	-	319.1	
San Diego, Calif. ....	1	-	364.1	-	377.3	-	379.0	-	381.9	329.1	-	340.3	-	341.9	-	344.7	
Seattle-Everett, Wash. ....	1	-	319.5	-	321.8	-	324.0	-	327.0	306.7	-	308.9	-	310.8	-	313.5	
Washington, D.C.-Md.-Va. ....	1	-	314.6	-	323.6	-	326.9	-	331.1	317.7	-	327.4	-	330.5	-	332.6	
Atlanta, Ga. ....	2	-	-	322.6	-	333.0	-	335.3	-	-	320.3	-	330.0	-	332.6	-	
Buffalo, N.Y. ....	2	-	-	301.3	-	309.3	-	309.8	-	-	288.1	-	295.3	-	295.9	-	
Cleveland, Ohio ....	2	-	-	340.4	-	348.6	-	348.8	-	-	319.8	-	327.0	-	327.5	-	
Dallas-Ft. Worth, Tex. ....	2	-	-	333.2	-	343.9	-	344.5	-	-	326.9	-	337.5	-	338.3	-	
Honolulu, Hawaii ....	2	-	-	292.6	-	295.6	-	298.5	-	-	300.3	-	302.7	-	305.8	-	
Houston, Tex. ....	2	-	-	333.6	-	337.6	-	336.8	-	-	331.1	-	335.0	-	334.1	-	
Kansas City, Mo.-Kansas ....	2	-	-	314.6	-	323.1	-	321.8	-	-	304.4	-	312.9	-	311.7	-	
Minneapolis-St. Paul, Minn.-Wis. ....	2	-	-	330.4	-	340.6	-	340.4	-	-	326.0	-	336.0	-	336.0	-	
Pittsburgh, Pa. ....	2	-	-	323.8	-	328.4	-	331.5	-	-	306.0	-	309.9	-	312.8	-	
San Francisco-Oakland, Calif. ....	2	-	-	328.7	-	336.7	-	336.4	-	-	324.2	-	331.0	-	331.3	-	
Region <sup>3</sup>																	
Northeast .....	2	12/77	-	168.2	-	172.5	-	174.3	-	-	166.4	-	170.3	-	172.1	-	
North Central .....	2	12/77	-	171.2	-	174.9	-	176.0	-	-	168.1	-	171.4	-	172.6	-	
South .....	2	12/77	-	171.5	-	175.7	-	176.3	-	-	171.3	-	175.3	-	176.0	-	
West .....	2	12/77	-	171.3	-	176.9	-	177.2	-	-	169.6	-	174.8	-	175.2	-	
Population size class <sup>3</sup>																	
A-1 .....	2	12/77	-	168.5	-	172.9	-	174.2	-	-	164.9	-	168.7	-	170.2	-	
A-2 .....	2	12/77	-	173.1	-	177.6	-	178.4	-	-	170.4	-	174.6	-	175.4	-	
B .....	2	12/77	-	171.8	-	176.3	-	177.2	-	-	169.6	-	173.6	-	174.6	-	
C .....	2	12/77	-	169.7	-	173.8	-	174.9	-	-	170.2	-	174.1	-	175.3	-	
D .....	2	12/77	-	169.4	-	173.8	-	174.7	-	-	171.2	-	174.9	-	176.0	-	
Region/population size class cross classification <sup>3</sup>																	
Class A:																	
Northeast .....	2	12/77	-	165.5	-	169.6	-	171.2	-	-	162.4	-	166.1	-	167.7	-	
North Central .....	2	12/77	-	174.3	-	178.2	-	179.4	-	-	169.6	-	173.1	-	174.5	-	
South .....	2	12/77	-	171.0	-	175.6	-	176.5	-	-	171.2	-	175.7	-	176.5	-	
West .....	2	11/77	-	173.5	-	179.1	-	179.3	-	-	169.6	-	174.6	-	175.0	-	
Class B:																	
Northeast .....	2	12/77	-	171.5	-	174.9	-	176.7	-	-	168.7	-	171.8	-	173.5	-	
North Central .....	2	12/77	-	169.7	-	173.4	-	174.2	-	-	166.4	-	169.5	-	170.5	-	
South .....	2	12/77	-	173.0	-	177.4	-	178.0	-	-	169.9	-	173.9	-	174.7	-	
West .....	2	12/77	-	172.0	-	177.9	-	178.4	-	-	172.7	-	178.4	-	178.9	-	

See footnotes at end of table.

**31. Continued— Consumer Price Index: U.S. city average and available local area data: all items**

(1967=100, unless otherwise indicated)

Area <sup>1</sup>	Pricing schedule <sup>2</sup>	Other index base	All Urban Consumers								Urban Wage Earners						
			1985						1986		1985						1986
			Jan.	Feb.	Sept.	Oct.	Nov.	Dec.	Jan.	Jan.	Feb.	Sept.	Oct.	Nov.	Dec.	Jan.	
Class C:																	
Northeast .....	2	12/77	-	175.8	-	181.7	-	184.1	-	-	180.6	-	186.5	-	188.8	-	-
North Central .....	2	12/77	-	166.7	-	170.1	-	171.5	-	-	163.8	-	166.9	-	168.2	-	-
South .....	2	12/77	-	171.2	-	174.3	-	175.3	-	-	172.8	-	175.7	-	176.7	-	-
West .....	2	12/77	-	164.2	-	169.7	-	169.1	-	-	163.2	-	168.3	-	167.8	-	-
Class D:																	
Northeast .....	2	12/77	-	170.3	-	175.6	-	178.1	-	-	170.6	-	175.3	-	177.7	-	-
North Central .....	2	12/77	-	168.2	-	171.6	-	172.6	-	-	170.5	-	173.1	-	174.2	-	-
South .....	2	12/77	-	170.1	-	174.8	-	174.5	-	-	172.0	-	176.2	-	176.1	-	-
West .....	2	12/77	-	170.0	-	174.5	-	176.2	-	-	171.5	-	176.0	-	177.7	-	-

<sup>1</sup> Area is generally the Standard Metropolitan Statistical Area (SMSA), exclusive of farms. L.A.-Long Beach, Anaheim, Calif. is a combination of two SMSA's, and N.Y., N.Y.-Northeastern N.J. and Chicago, Ill.-Northwestern Ind. are the more extensive Standard Consolidated Areas. Area definitions are those established by the Office of Management and Budget in 1973, except for Denver-Boulder, Colo. which does not include Douglas County. Definitions do not include revisions made since 1973.

<sup>2</sup> 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.

<sup>3</sup> Regions are defined as the four Census regions.

The population size classes are aggregations of areas which have urban population as defined:

A-1 - More than 4,000,000.

A-2 - 1,250,000 to 4,000,000.

B - 385,000 to 1,250,000

C - 75,000 to 385,000.

D - Less than 75,000.

Population size class A is the aggregation of population size classes A-1 and A-2.

- 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	1977	1978	1979	1980	1981	1982	1983	1984	1985
Consumer Price Index for All Urban Consumers:									
All items:									
Index .....	181.5	195.4	217.4	246.8	272.4	289.1	298.4	311.1	322.2
Percent change .....	6.5	7.7	11.3	13.5	10.4	6.1	3.2	4.3	3.6
Food and beverages:									
Index .....	188.0	206.3	228.5	248.0	267.3	278.2	284.4	295.1	302.0
Percent change .....	6.0	9.7	10.8	8.5	7.8	4.1	2.2	3.8	2.3
Housing:									
Index .....	186.5	202.8	227.6	263.3	293.5	314.7	323.1	336.5	349.9
Percent change .....	6.8	8.7	12.2	15.7	11.5	7.2	2.7	4.1	4.0
Apparel and upkeep:									
Index .....	154.2	159.6	166.6	178.4	186.9	191.8	196.5	200.2	206.0
Percent change .....	4.5	3.5	4.4	7.1	4.8	2.6	2.5	1.9	2.9
Transportation:									
Index .....	177.2	185.5	212.0	249.7	280.0	291.5	298.4	311.7	319.9
Percent change .....	7.1	4.7	14.3	17.8	12.1	4.1	2.4	4.5	2.6
Medical care:									
Index .....	202.4	219.4	239.7	265.9	294.5	328.7	357.3	379.5	403.1
Percent change .....	9.6	8.4	9.3	10.9	10.8	11.6	8.7	6.2	6.2
Entertainment:									
Index .....	167.7	176.6	188.5	205.3	221.4	235.8	246.0	255.1	265.0
Percent change .....	4.9	5.3	6.7	8.9	7.8	6.5	4.3	3.7	3.9
Other goods and services:									
Index .....	172.2	183.3	196.7	214.5	235.7	259.9	288.3	307.7	326.6
Percent change .....	5.8	6.4	7.3	9.0	9.9	10.3	10.9	6.7	6.1
Consumer Price Index for Urban Wage Earners and Clerical Workers:									
All items:									
Index .....	181.5	195.3	217.7	247.0	272.3	288.6	297.4	307.6	318.5
Percent change .....	6.5	7.6	11.5	13.5	10.2	6.0	3.0	3.4	3.5

## 33. Producer Price Indexes, by stage of processing

(1967=100)

Grouping	Annual average		1985											1986
	1984	1985	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
<b>Finished goods</b> .....	291.1	293.8	292.6	292.1	293.1	294.1	294.0	294.8	293.5	289.9	294.8	296.7	297.2	296.2
Finished consumer goods .....	290.3	291.9	290.7	290.1	291.2	292.4	292.2	293.1	291.4	288.1	292.4	294.7	295.4	294.1
Finished consumer goods .....	273.3	271.2	275.6	273.7	272.2	269.5	268.7	271.2	268.7	265.7	268.7	272.0	274.4	274.9
Finished consumer goods excluding foods .....	294.1	297.4	293.5	293.6	295.9	299.0	299.0	299.2	297.8	294.5	299.4	301.1	301.1	298.8
Nondurable goods less food .....	337.3	339.4	332.7	333.4	337.4	342.4	342.1	342.4	340.0	340.3	340.2	343.3	343.7	340.3
Durable goods .....	236.8	241.5	240.9	240.4	240.7	241.4	241.9	241.9	241.8	234.0	244.9	245.0	244.4	243.6
Capital equipment .....	294.0	300.5	299.2	299.3	299.9	300.3	300.5	300.8	301.0	296.3	303.7	303.8	303.5	304.0
<b>Intermediate materials, supplies, and components</b> .....	320.0	318.7	318.7	318.6	319.3	319.9	319.3	318.6	317.9	317.7	317.8	318.1	318.8	317.2
Materials and components for manufacturing .....	301.8	299.4	300.5	300.0	300.6	300.5	300.3	299.8	299.1	298.4	298.0	297.6	297.6	297.0
Materials for food manufacturing .....	271.1	258.7	265.3	263.9	263.9	261.9	262.0	260.3	253.0	249.9	252.3	253.6	253.0	252.4
Materials for nondurable manufacturing .....	290.5	285.8	288.0	287.3	287.1	286.7	286.4	285.8	285.8	285.1	283.6	282.6	282.5	283.2
Materials for durable manufacturing .....	325.1	320.2	320.7	319.9	322.1	323.0	322.3	320.9	320.3	319.2	318.6	317.4	317.6	313.9
Components for manufacturing .....	287.5	291.5	290.8	291.0	291.1	291.1	291.3	291.6	291.9	292.1	292.2	292.4	292.4	292.9
Materials and components for construction .....	310.3	315.2	313.3	313.5	314.0	315.9	317.3	316.9	316.5	315.6	315.4	315.1	315.4	316.3
Processed fuels and lubricants .....	566.2	549.4	546.3	547.9	552.3	558.0	549.1	544.0	539.8	542.4	544.9	550.7	557.3	539.8
Containers .....	302.3	311.2	311.8	313.1	312.4	311.7	312.0	311.4	310.3	309.9	310.4	309.8	310.7	310.7
Supplies .....	283.4	284.2	283.8	283.8	283.7	283.4	283.3	283.6	284.1	284.5	285.0	285.8	285.9	286.7
<b>Crude materials for further processing</b> .....	330.8	306.2	318.1	312.3	311.0	309.1	305.6	303.9	295.3	296.8	298.0	305.6	304.7	301.3
Foodstuffs and feedstuffs .....	259.5	235.0	250.0	242.9	239.9	236.3	233.7	231.6	221.0	222.9	224.5	236.7	236.8	231.4
Nonfood materials <sup>1</sup> .....	380.5	355.4	358.2	358.4	360.2	357.7	354.0	353.5	351.2	352.2	353.3	352.3	351.1	351.2
<b>Special groupings</b>														
Finished goods, excluding foods .....	294.8	299.1	295.9	296.0	297.8	300.1	300.2	300.5	299.5	295.7	301.4	302.7	302.5	301.1
Finished energy goods .....	750.3	721.4	692.0	693.2	714.9	746.1	741.4	733.8	719.9	718.2	716.1	732.9	736.1	704.8
Finished goods less energy .....	265.1	269.2	269.3	268.8	268.8	268.4	268.4	269.7	269.0	265.3	270.6	271.7	272.1	272.7
Finished consumer goods less energy .....	257.8	261.3	261.8	261.1	260.9	260.3	260.3	261.9	260.9	257.5	262.2	263.5	264.1	264.8
Finished goods less food and energy .....	262.3	268.7	267.2	267.2	267.7	268.2	268.6	269.4	269.4	265.4	271.6	271.8	271.4	272.1
Finished consumer goods less food and energy .....	245.9	252.1	250.5	250.5	251.1	251.5	252.0	252.9	252.9	249.3	254.9	255.1	254.7	255.5
Consumer nondurable goods less food and energy .....	239.0	246.2	243.9	244.4	245.0	245.2	245.6	247.4	247.3	247.9	248.2	248.6	248.5	250.6
Intermediate materials less foods and feeds .....	325.0	325.0	324.5	324.7	325.5	326.4	325.7	325.0	324.5	324.4	324.3	324.5	325.2	323.5
Intermediate foods and feeds .....	253.1	232.7	239.2	236.7	235.4	232.6	232.2	231.7	227.1	225.4	228.5	231.0	231.7	232.4
Intermediate energy goods .....	545.0	528.8	526.0	527.5	531.5	536.7	528.6	523.8	519.8	522.3	524.4	529.5	536.3	519.1
Intermediate goods less energy .....	303.8	303.9	304.2	304.0	304.3	304.5	304.6	304.3	303.9	303.4	303.3	303.2	303.3	303.4
Intermediate materials less foods and energy .....	303.6	305.2	305.3	305.2	305.6	305.9	306.0	305.6	305.5	305.0	304.6	304.2	304.2	304.2
Crude energy materials .....	785.2	749.1	754.1	746.4	749.1	760.7	754.5	752.6	742.9	743.2	743.4	742.9	739.5	739.9
Crude materials less energy .....	255.5	233.2	245.9	240.4	238.6	234.8	231.7	230.1	221.8	223.5	224.8	233.4	232.9	229.1
Crude nonfood materials less energy .....	266.1	249.7	255.3	255.4	257.3	252.3	247.4	247.2	245.8	246.7	247.2	244.9	242.6	243.7

<sup>1</sup> Crude nonfood materials except fuel.

### 34. Producer Price indexes, by durability of product

(1967 = 100)

Grouping	Annual average		1985											1986
	1984	1985	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Total durable goods .....	293.6	297.3	296.4	296.3	297.1	297.6	297.8	297.8	297.8	295.1	298.8	298.7	298.5	298.2
Total nondurable goods .....	323.3	317.3	319.0	317.7	318.4	318.9	317.5	317.3	314.1	313.8	314.6	317.9	318.7	316.9
Total manufactures .....	302.9	304.3	303.4	303.3	304.2	305.2	304.8	304.6	303.8	302.1	304.6	305.4	305.7	304.7
Durable .....	293.9	298.1	297.0	296.9	297.6	298.4	298.7	298.7	298.6	295.8	299.7	299.6	299.5	299.1
Nondurable .....	312.3	310.5	309.9	309.9	310.8	312.1	311.0	310.6	309.0	308.4	309.4	311.3	312.0	310.3
Total raw or slightly processed goods .....	346.6	328.2	336.8	332.2	332.1	329.8	327.3	327.5	320.2	320.8	320.9	327.7	328.8	326.9
Durable .....	266.7	252.2	259.2	261.2	262.1	255.4	247.3	247.6	249.7	249.7	248.8	245.9	243.8	247.6
Nondurable .....	351.4	332.8	341.4	336.4	336.2	334.3	332.1	332.3	324.4	325.1	325.2	332.7	334.0	331.7

### 35. Annual data: Producer Price Indexes, by stage of processing

(1967 = 100)

Index	1977	1978	1979	1980	1981	1982	1983	1984	1985
<b>Finished goods:</b>									
Total .....	181.7	195.9	217.7	247.0	269.8	280.7	285.2	291.1	293.8
Consumer goods .....	180.7	194.9	217.9	248.9	271.3	281.0	284.6	290.3	291.9
Capital equipment .....	184.6	199.2	216.5	239.8	264.3	279.4	287.2	294.0	300.5
<b>Intermediate materials, supplies, and components:</b>									
Total .....	201.5	215.6	243.2	280.3	306.0	310.4	312.3	320.0	318.7
Materials and components for manufacturing .....	195.4	208.7	234.4	265.7	286.1	289.8	293.4	301.8	299.4
Materials and components for construction .....	203.4	224.7	247.4	268.3	287.6	293.7	301.8	310.3	315.2
Processed fuels and lubricants .....	282.5	295.3	364.8	503.0	595.4	591.7	564.8	566.2	549.4
Containers .....	188.3	202.8	226.8	254.5	276.1	285.6	286.6	302.3	311.2
Supplies .....	188.7	198.5	218.2	244.5	263.8	272.1	277.1	283.4	284.2
<b>Crude materials for further processing:</b>									
Total .....	209.2	234.4	274.3	304.6	329.0	319.5	323.6	330.8	306.2
Foodstuffs and feedstuffs .....	192.1	216.2	247.9	259.2	257.4	247.8	252.2	259.5	235.0
Nonfood materials except fuel .....	212.2	233.1	284.5	346.1	413.7	376.8	372.2	380.5	355.4
Fuel .....	372.1	426.8	507.6	615.0	751.2	886.1	931.5	931.3	912.3

## 36. U.S. export price indexes by Standard International Trade Classification,

(June 1977=100, unless otherwise indicated)

Category	1974 SITC	1983			1984			1985				
		June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.
<b>ALL COMMODITIES (9/83=100)</b> .....		-	100.0	99.5	100.2	101.5	99.3	98.1	97.5	97.5	96.5	96.8
<b>Food (3/83=100)</b> .....	0	105.1	113.1	108.8	106.2	109.6	103.5	96.5	95.8	94.0	90.2	93.6
Meat (3/83=100) .....	01	100.5	100.8	101.2	108.9	108.7	105.6	104.4	103.9	104.7	106.1	112.3
Fish (3/83=100) .....	03	96.5	97.7	100.4	99.8	98.7	98.0	98.7	101.0	103.6	102.6	101.8
Grain and grain preparations (3/80=100) .....	04	103.5	111.5	105.6	102.7	107.4	101.2	92.9	92.4	90.3	82.6	87.1
Vegetables and fruit (3/83=100) .....	05	105.8	114.8	116.1	116.2	126.8	125.5	114.6	119.4	120.1	126.8	118.8
Feedstuffs for animals (3/83=100) .....	08	100.6	121.4	117.4	106.9	98.8	83.5	82.4	72.8	68.6	75.7	83.4
Misc. food products (3/83=100) .....	09	101.1	102.8	101.7	104.9	110.6	109.5	108.4	110.6	109.2	108.1	107.7
<b>Beverages and tobacco (6/83=100)</b> .....	1	100.0	100.0	101.5	101.6	101.9	102.8	101.3	99.9	100.1	99.7	98.6
Beverages (9/83=100) .....	11	-	100.0	103.3	102.3	102.9	103.3	103.7	104.0	105.3	101.8	100.9
Tobacco and tobacco products (6/83=100) .....	12	100.0	100.0	101.4	101.6	101.8	102.7	101.1	99.5	99.6	99.5	98.4
<b>Crude materials (6/83=100)</b> .....	2	100.0	114.6	112.2	112.5	118.3	105.2	101.4	97.5	96.8	93.3	93.2
Raw hides and skins (6/80=100) .....	21	118.2	129.2	135.2	145.6	154.7	153.7	133.6	121.0	126.2	129.0	139.9
Oilseeds and oleaginous fruit (9/77=100) .....	22	75.0	105.6	96.8	93.9	104.3	79.9	74.8	71.0	71.2	64.2	63.9
Crude rubber (including synthetic and reclaimed) (9/83=100) .....	23	-	100.0	102.2	103.3	106.0	104.1	104.0	106.4	106.3	107.1	106.0
Wood .....	24	127.1	128.7	129.8	131.1	129.4	123.8	125.4	128.7	125.7	124.5	128.1
Pulp and waste paper (6/83=100) .....	25	100.0	103.5	106.0	112.5	122.1	120.8	114.2	100.5	96.1	93.8	92.7
Textile fibers .....	26	111.3	117.3	123.1	120.5	125.6	109.4	106.7	102.4	105.8	103.6	102.6
Crude fertilizers and minerals .....	27	145.0	144.8	144.8	146.6	147.7	163.0	163.2	165.6	167.9	169.4	165.5
Metalliferous ores and metal scrap .....	28	-	100.0	96.7	100.2	98.5	93.2	92.4	89.2	82.0	80.1	78.0
<b>Mineral fuels</b> .....	3	-	100.0	99.2	99.1	99.7	99.7	99.7	100.1	99.2	97.6	96.6
<b>Animal and vegetable oils, fats, and waxes</b> .....	4	100.0	125.6	122.0	129.8	164.5	145.7	147.9	142.0	144.5	114.5	101.4
Fixed vegetable oils and fats (6/83=100) .....	42	100.0	138.2	129.3	133.2	176.4	159.0	156.7	152.9	164.8	128.8	108.7
<b>Chemicals (3/83=100)</b> .....	5	96.4	97.0	98.6	101.4	99.7	98.3	97.7	97.0	96.8	97.1	96.6
Organic chemicals (12/83=100) .....	51	-	-	100.0	100.2	101.0	97.4	94.7	93.8	96.5	97.1	95.4
Fertilizers, manufactured (3/83=100) .....	56	88.9	89.8	96.8	108.3	96.9	97.4	94.8	92.5	87.9	89.8	90.0
<b>Intermediate manufactured products (9/81=100)</b> .....	-	100.4	100.8	100.0	101.0	101.3	102.0	100.4	99.4	99.2	99.2	99.2
Leather and furskins (9/79=100) .....	6	67.2	70.1	75.8	83.5	81.2	80.8	79.0	82.5	79.2	75.9	78.5
Rubber manufactures .....	61	144.8	145.0	145.0	146.7	147.5	148.9	148.5	150.2	149.0	148.3	148.7
Paper and paperboard products (6/78=100) .....	62	135.8	139.7	145.5	150.2	154.7	160.0	159.5	155.0	151.6	149.6	148.1
Iron and steel (3/82=100) .....	64	95.9	96.6	96.3	95.9	96.1	96.8	96.5	95.5	95.3	95.9	98.3
Nonferrous metals (9/81=100) .....	-	102.8	102.3	93.8	94.2	92.9	90.4	82.5	79.7	79.6	79.8	78.2
Metal manufactures, n.e.s. (3/82=100) .....	-	101.5	101.9	102.1	103.1	104.5	105.1	105.0	105.4	105.2	105.4	104.4
<b>Machinery and transport equipment, excluding military and commercial aircraft (12/78=100)</b> .....	67	135.3	135.9	137.0	138.5	139.4	140.1	141.5	142.3	143.0	143.1	143.3
Power generating machinery and equipment (12/78=100) .....	68	152.5	152.3	154.4	158.4	156.9	160.6	167.5	165.3	167.4	167.1	167.6
Machinery specialized for particular industries (9/78=100) .....	69	148.9	149.1	151.1	152.3	152.8	153.7	153.4	155.0	155.7	156.0	156.1
Metalworking machinery (6/78=100) .....	7	148.4	148.3	148.7	150.8	151.2	151.7	151.9	153.4	155.1	156.3	158.4
General industrial machines and parts n.e.s. 9/78=100) .....	71	145.0	145.4	145.9	148.6	149.0	149.3	150.2	152.4	152.0	152.4	152.2
Office machines and automatic data processing equipment .....	72	103.6	103.2	102.5	101.4	101.5	99.8	101.4	100.9	100.0	99.9	99.4
Telecommunications, sound recording and reproducing equipment .....	73	131.1	132.2	132.1	133.0	132.3	134.4	134.3	133.3	133.3	134.1	134.5
Electrical machinery and equipment .....	74	108.5	109.4	109.8	110.2	112.6	113.8	114.6	114.9	116.1	115.3	113.8
Road vehicles and parts (3/80=100) .....	75	125.6	127.5	128.8	130.2	131.2	131.0	131.8	133.1	133.9	133.8	135.0
Other transport equipment, excl. military and commercial aviation .....	76	175.8	176.4	179.3	183.1	187.7	189.6	191.7	195.5	196.9	199.6	201.0
<b>Other manufactured articles</b> .....	77	-	100.0	100.2	100.6	100.4	100.7	99.3	99.5	100.4	100.3	100.3
Apparel (9/83=100) .....	78	-	100.0	100.8	101.9	102.1	103.9	103.4	104.7	104.7	105.0	105.3
Professional, scientific, and controlling instruments and apparatus .....	79	169.8	169.0	171.5	171.8	172.0	175.8	171.7	175.5	178.3	178.7	178.8
Photographic apparatus and supplies, optical goods, watches and clocks (12/77=100) .....	8	129.8	130.0	132.0	132.0	131.3	132.7	130.3	128.0	129.1	127.5	128.5
Miscellaneous manufactured articles, n.e.s. ....	84	100.0	100.0	98.2	98.5	97.9	95.2	94.1	92.4	93.1	93.1	92.4
<b>Gold, non-monetary (6/82=100)</b> .....	971	-	-	-	-	-	-	-	-	-	-	-

- Data not available.



### 37. U.S. import price indexes by Standard International Trade Classification

(June 1977=100, unless otherwise indicated)

Category	1974 SITC	1983	1984					1985				
		Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.		
<b>ALL COMMODITIES (9/82=100)</b> .....		97.3	98.0	98.3	96.7	95.7	93.5	93.0	92.9	94.6		
<b>Food (9/77=100)</b> .....	0	100.4	102.5	103.5	102.0	98.1	98.5	96.8	94.9	102.8		
Meat .....	01	134.1	133.4	133.8	135.4	132.3	130.4	118.2	120.6	131.2		
Dairy products and eggs (6/81=100) .....	02	99.6	100.8	99.8	98.9	98.4	98.3	97.9	99.1	100.5		
Fish .....	03	136.0	132.7	134.2	134.2	133.9	132.9	129.4	129.7	132.7		
Bakery goods, pasta products, grain and grain preparations (9/77=100) .....	04	132.7	136.5	134.8	132.9	132.8	131.8	132.3	136.3	141.9		
Fruits and vegetables .....	05	125.0	136.1	135.8	135.4	117.2	127.1	129.4	120.2	131.2		
Sugar, sugar preparations, and honey (3/82=100) .....	06	117.9	117.1	120.3	119.0	118.5	118.4	122.6	123.1	111.9		
Coffee, tea, cocoa .....	07	59.6	61.4	62.4	60.3	58.4	57.0	56.0	54.4	64.6		
<b>Beverages and tobacco</b> .....	1	155.4	155.3	156.3	157.1	156.5	156.2	157.1	158.0	161.6		
Beverages .....	11	152.7	152.6	153.6	153.5	152.8	154.2	154.3	156.0	159.1		
<b>Crude materials</b> .....	2	98.6	103.2	102.6	100.6	98.9	94.0	93.6	91.5	91.2		
Crude rubber (inc. synthetic & reclaimed) (3/84=100) .....	23	-	100.0	93.7	90.7	83.8	77.6	76.4	68.9	73.2		
Wood (9/81=100) .....	24	107.2	114.8	103.2	99.6	104.0	100.7	106.9	101.6	99.4		
Pulp and waste paper (12/81=100) .....	25	80.9	87.6	96.1	96.3	93.2	84.0	80.4	76.8	75.8		
Crude fertilizers and crude minerals (12/83=100) .....	27	100.0	100.0	96.2	98.0	98.6	100.3	101.7	102.7	102.1		
Metalliferous ores and metal scrap (3/84=100) .....	28	-	100.0	102.8	100.1	95.6	90.4	87.6	89.5	90.1		
Crude vegetable and animal materials, n.e.s. ....	29	-	100.0	100.8	101.1	106.4	104.3	104.9	102.5	102.5		
<b>Fuels and related products (6/82=100)</b> .....	3	87.6	88.3	88.0	86.9	85.2	82.9	80.9	79.8	80.1		
Petroleum and petroleum products (6/82=100) .....	33	87.6	88.2	88.1	87.0	85.2	83.8	81.6	80.3	81.1		
<b>Fats and oils (9/83=100)</b> .....	4	100.4	117.4	141.8	124.4	114.9	89.9	76.7	57.6	50.6		
Vegetable oils (9/83=100) .....	42	100.5	118.1	143.1	125.3	115.3	89.5	75.9	56.2	48.9		
<b>Chemicals (9/82=100)</b> .....	5	99.5	101.1	100.6	98.8	97.1	95.7	94.9	94.5	94.2		
Medicinal and pharmaceutical products (3/84=100) .....	54	-	100.0	98.5	96.4	94.6	91.6	95.1	95.3	96.7		
Manufactured fertilizers (3/84=100) .....	56	-	100.0	101.7	98.5	92.9	94.2	82.0	80.8	78.5		
Chemical materials and products, n.e.s. (9/84=100) .....	59	-	-	-	100.0	97.5	96.1	95.6	96.9	97.8		
<b>Intermediate manufactured products (12/77=100)</b> .....	6	137.3	137.6	139.6	137.2	136.8	133.1	132.4	133.6	133.4		
Leather and furskins .....	61	137.6	141.6	145.3	144.0	140.4	135.3	133.3	137.0	141.3		
Rubber manufactures, n.e.s. ....	62	141.1	141.8	140.8	139.6	140.5	139.5	138.6	137.3	138.1		
Cork and wood manufactures .....	63	134.7	130.1	131.0	126.4	126.1	121.3	121.2	123.4	124.0		
Paper and paperboard products .....	64	147.0	148.0	150.4	156.1	157.5	157.6	157.2	157.8	156.5		
Textiles .....	65	128.5	130.8	130.1	131.6	132.9	130.4	127.5	126.5	128.1		
Nonmetallic mineral manufactures, n.e.s. ....	66	166.4	168.4	166.6	156.6	159.4	154.3	151.8	157.6	162.3		
Iron and steel (9/78=100) .....	67	119.5	118.5	123.8	124.7	123.7	121.0	120.1	119.1	118.3		
Nonferrous metals (12/81=100) .....	68	94.8	95.0	96.3	90.2	87.3	81.9	82.3	83.7	80.4		
Metal manufactures, n.e.s. ....	69	118.9	119.7	120.5	119.3	119.3	117.4	117.8	119.5	121.6		
<b>Machinery and transport equipment (6/81=100)</b> .....	7	104.1	104.0	104.1	102.6	102.9	101.6	102.6	103.5	107.2		
Machinery specialized for particular industries (9/78=100) .....	72	100.8	100.4	100.0	98.8	98.0	96.2	97.0	101.4	104.7		
Metalworking machinery (3/80=100) .....	73	95.7	94.3	93.8	92.1	89.9	86.3	90.5	94.2	98.1		
General industrial machinery and parts, n.e.s. (6/81=100) .....	74	93.5	93.7	94.4	92.4	91.3	89.2	91.1	94.3	98.0		
Office machines and automatic data processing equipment (3/80=100) .....	75	96.9	97.8	96.7	94.1	92.2	89.6	89.4	90.3	93.7		
Telecommunications, sound recording and reproducing apparatus (3/80=100) .....	76	94.9	94.2	94.8	93.6	91.3	90.0	88.8	88.3	88.6		
Electrical machinery and equipment (12/81=100) .....	77	95.9	94.2	91.2	87.0	86.4	82.1	83.9	81.4	83.3		
Road vehicles and parts (6/81=100) .....	78	109.5	109.0	110.4	109.8	111.3	111.5	112.1	112.7	117.8		
<b>Misc. manufactured articles (3/80=100)</b> .....	8	100.0	100.6	101.5	99.7	100.0	97.0	98.0	99.6	100.8		
Plumbing, heating, and lighting fixtures (6/80=100) .....	81	108.2	109.5	112.0	110.7	111.6	113.9	114.1	117.8	115.0		
Furniture and parts (6/80=100) .....	82	136.0	136.8	140.8	138.4	142.5	137.4	136.7	142.1	142.7		
Clothing (9/77=100) .....	84	128.5	130.2	132.5	135.4	138.5	136.7	133.9	134.5	134.5		
Footwear .....	85	136.0	136.8	140.8	138.4	142.5	137.4	136.7	142.1	142.7		
Professional, scientific, and controlling instruments and apparatus (12/79=100) .....	87	97.6	98.7	97.8	95.6	92.9	89.2	92.3	98.8	102.4		
Photographic apparatus and supplies, optical goods, watches, and clocks (3/80=100) .....	88	90.6	89.6	92.8	91.2	91.3	88.9	89.5	91.1	94.9		
Misc. manufactured articles, n.e.s. (6/82=100) .....	89	104.9	105.2	104.0	98.3	96.3	91.2	95.2	96.4	97.9		
<b>Gold, non-monetary (6/82=100)</b> .....	971	-	-	-	-	-	-	-	-	-		

- Data not available.

**38. U.S. export price indexes by end-use category**

(September 1983 = 100 unless otherwise indicated)

Category	Percentage of 1980 Trade Value	1983	1984				1985			
		Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.
Foods, feeds, and beverages .....	16.294	95.0	92.8	98.5	88.8	83.0	81.5	80.9	76.2	77.5
Raw materials .....	30.696	100.7	102.2	102.5	100.5	99.1	97.6	97.2	96.5	96.2
Raw materials, nondurable .....	21.327	101.9	103.6	104.4	102.8	101.4	99.6	99.5	98.7	98.3
Raw materials, durable .....	9.368	97.7	98.8	97.7	95.0	93.3	92.6	91.6	91.1	91.0
Capital goods (12/82=100) .....	30.186	102.0	103.2	103.9	104.6	105.6	106.2	106.6	106.6	106.6
Automotive vehicles, parts and engines (12/82=100) .....	7.483	103.9	104.5	105.3	105.3	105.7	106.7	108.0	108.1	109.2
Consumer goods .....	7.467	99.6	100.9	100.9	101.3	100.8	100.9	101.1	101.9	101.7
Durables .....	3.965	98.9	100.1	99.6	99.4	99.3	99.1	99.2	100.4	100.0
Nondurables .....	3.501	100.3	101.8	102.1	103.0	102.3	102.7	103.0	103.3	103.3

**39. U.S. import price indexes by end-use category**

(December 1982=100)

Category	Percentage of 1980 Trade Value	1983	1984				1985			
		Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.
Foods, feeds, and beverages .....	7.477	104.0	106.0	107.2	105.6	101.8	102.1	100.4	99.0	106.0
Petroleum and petroleum products, excl. natural gas .....	31.108	88.1	88.8	88.5	87.5	85.7	84.4	82.1	80.9	81.5
Raw materials, excluding petroleum .....	19.205	-	-	-	-	-	-	-	-	-
Raw materials, nondurable .....	9.391	99.0	100.7	102.1	101.7	100.7	95.0	93.9	93.5	91.8
Raw materials, durable .....	9.814	104.7	106.5	106.7	103.3	101.6	97.7	97.8	97.4	96.2
Capital goods .....	13.164	101.3	100.8	99.8	98.0	97.8	94.8	96.3	97.6	100.0
Automotive vehicles, parts and engines .....	11.750	103.8	103.6	104.9	104.0	105.2	105.4	105.9	106.4	111.4
Consumer goods .....	14.250	100.4	101.0	101.9	100.6	101.1	99.5	99.4	101.0	102.5
Durable .....	5.507	101.1	101.1	101.4	98.8	98.5	97.0	97.0	98.9	100.8
Nondurable .....	8.743	99.5	100.9	102.5	103.0	104.6	103.0	102.5	103.9	104.7

- Data not available.

**40. U.S. export price indexes by Standard Industrial Classification <sup>1</sup>**

Industry group	1983	1984				1985			
	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.
Manufacturing:									
Food and kindred products (6/83=100) .....	108.3	109.0	112.7	105.6	103.3	99.5	99.5	96.7	98.1
Tobacco manufactures .....	-	-	-	-	-	-	-	-	-
Textile mill products .....	-	-	-	-	-	-	-	-	-
Apparel and related products .....	-	-	-	-	-	-	-	-	-
Lumber and wood products, except furniture (6/83=100) .....	101.0	101.5	100.1	97.0	97.9	99.9	99.5	98.3	101.2
Furniture and fixtures (9/83=100) .....	100.9	101.8	103.1	103.5	104.9	105.2	106.5	107.1	108.4
Paper and allied products (3/81=100) .....	94.7	98.6	104.3	106.2	103.6	97.1	94.7	93.2	92.1
Printing, publishing, and allied products .....	-	-	-	-	-	-	-	-	-
Chemicals and allied products (12/84=100) .....	101.4	103.3	102.3	101.3	100.7	100.3	99.6	99.7	99.2
Petroleum and coal products (12/83=100) .....	100.0	101.6	102.1	100.7	100.4	101.3	102.7	102.0	99.1
Rubber and miscellaneous plastic products .....	-	-	-	-	-	-	-	-	-
Leather and leather products .....	-	-	-	-	-	-	-	-	-
Stone, clay, glass, and concrete products .....	-	-	-	-	-	-	-	-	-
Primary metal products (3/82=100) .....	105.0	105.1	104.0	100.0	95.8	91.2	92.7	93.6	93.6
Fabricated metal products .....	-	-	-	-	-	-	-	-	-
Machinery, except electrical (9/78=100) .....	135.8	137.4	137.9	138.0	139.9	140.4	140.5	140.6	140.5
Electrical machinery (12/80=100) .....	107.6	108.0	109.5	110.7	111.1	111.3	112.4	111.9	111.2
Transportation equipment (12/78=100) .....	153.6	155.7	157.2	157.8	158.9	160.5	162.0	162.8	164.4
Scientific instruments; optical goods; clocks (6/77=100) .....	152.8	153.1	153.2	156.0	153.0	154.9	156.6	156.2	156.7
Miscellaneous manufactured commodities .....	-	-	-	-	-	-	-	-	-

<sup>1</sup> SIC - based classification.

- Data not available.

41. U.S. import price indexes by Standard Industrial Classification <sup>1</sup>

Industry group	1983		1984				1985			
	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	
<b>Manufacturing:</b>										
Food and kindred products (6/77=100) .....	120.8	122.3	126.6	124.1	122.6	118.8	115.0	114.2	115.1	-
Tobacco manufactures .....	-	-	-	-	-	-	-	-	-	-
Textile mill products (9/82=100) .....	103.3	104.4	103.8	104.3	104.7	102.8	101.0	100.4	101.8	-
Apparel and related products (6/77=100) .....	126.5	128.1	129.6	133.9	138.2	135.6	133.0	133.9	134.4	-
Lumber and wood products, except furniture (6/77=100) .....	125.0	129.4	121.1	117.3	120.0	116.3	120.6	117.5	115.8	-
Furniture and fixtures (6/80=100) .....	95.5	95.7	96.9	96.2	95.6	93.9	96.1	97.7	98.2	-
Paper and allied products (6/77=100) .....	132.9	136.5	141.9	146.0	145.5	141.5	139.8	138.7	137.4	-
Printing, publishing, and allied products .....	-	-	-	-	-	-	-	-	-	-
Chemicals and allied products (9/82=100) .....	99.5	101.8	101.8	99.8	98.2	95.3	93.9	93.3	95.8	-
Petroleum and coal products .....	-	-	-	-	-	-	-	-	-	-
Rubber and miscellaneous plastic products (12/80=100) .....	97.4	98.1	98.5	97.8	98.0	96.9	96.7	96.6	97.5	-
Leather and leather products .....	139.1	140.3	143.7	141.6	144.2	139.1	138.9	142.3	144.0	-
Stone, clay, glass, concrete products .....	-	-	-	-	-	-	-	-	-	-
Primary metal products (6/81=100) .....	90.5	90.1	91.9	88.3	86.6	82.2	83.0	83.4	81.9	-
Fabricated metal products (12/84=100) .....	-	-	-	-	100.0	99.0	99.1	101.0	102.6	-
Machinery, except electrical (3/80=100) .....	98.0	97.8	97.1	95.5	94.1	91.8	93.4	96.6	100.0	-
Electrical machinery (9/84=100) .....	-	-	-	100.0	98.6	95.1	95.8	94.5	95.9	-
Transportation equipment (6/81=100) .....	110.3	110.6	111.6	110.7	112.9	113.1	114.2	114.8	119.6	-
Scientific instruments; optical goods; clocks (12/79=100) .....	94.3	94.0	95.5	94.4	93.2	90.7	91.7	94.6	99.0	-
Miscellaneous manufactured commodities (9/82=100) .....	99.7	99.8	99.1	95.8	96.4	95.1	95.1	96.6	98.7	-

<sup>1</sup> SIC - based classification.

- Data not available.

42. Indexes of productivity, hourly compensation, and unit costs, quarterly data seasonally adjusted

(1977=100)

Item	Annual average	Quarterly Indexes													
		1983	1983				1984				1985				
			I	II	III	IV	I	II	III	IV	I	II	III		
<b>Business:</b>															
Output per hour of all persons .....	103.7	102.2	103.6	104.3	104.7	105.7	107.0	107.2	108.0	106.9	107.3	108.3	108.3	108.3	108.3
Compensation per hour .....	161.7	160.2	161.0	161.8	164.2	166.7	167.5	169.3	171.1	173.1	174.5	176.8	176.8	176.8	176.8
Real compensation per hour .....	98.4	99.0	98.5	97.9	98.4	98.6	98.2	98.3	98.5	98.9	98.6	99.4	99.4	99.4	99.4
Unit labor costs .....	156.0	156.8	155.4	155.1	156.8	157.7	156.5	158.0	158.4	161.9	162.6	163.2	163.2	163.2	163.2
Unit nonlabor payments .....	145.5	139.8	144.6	147.9	149.1	151.6	157.2	158.5	160.2	159.1	159.9	160.5	160.5	160.5	160.5
Implicit price deflator .....	152.4	151.0	151.7	152.7	154.2	155.6	156.7	158.1	159.0	160.9	161.7	162.3	162.3	162.3	162.3
<b>Nonfarm business:</b>															
Output per hour of all persons .....	103.4	101.6	103.6	104.1	104.4	105.2	106.6	106.3	106.9	106.0	106.3	106.9	106.9	106.9	106.9
Compensation per hour .....	162.0	160.1	161.5	162.4	164.0	166.5	168.0	169.5	171.0	173.1	174.6	176.2	176.2	176.2	176.2
Real compensation per hour .....	98.6	99.0	98.8	98.3	98.3	98.4	98.4	98.4	98.5	98.9	98.7	99.0	99.0	99.0	99.0
Unit labor costs .....	156.6	157.6	155.9	155.9	157.1	158.3	157.6	159.5	160.0	163.3	164.1	164.8	164.8	164.8	164.8
Unit nonlabor payments .....	147.0	140.6	146.4	149.4	151.4	152.2	156.8	158.0	160.3	160.3	161.8	163.0	163.0	163.0	163.0
Implicit price deflator .....	153.4	151.9	152.7	153.8	155.2	156.3	157.3	159.0	160.1	162.3	163.4	164.2	164.2	164.2	164.2
<b>Nonfinancial corporations:</b>															
Output per hour of all employees .....	106.1	104.0	105.8	107.2	107.2	108.1	108.9	108.2	108.8	108.1	108.1	109.2	109.2	109.2	109.2
Compensation per hour .....	161.0	159.2	160.6	161.8	162.6	164.8	165.8	167.1	168.7	170.3	171.6	173.0	173.0	173.0	173.0
Real compensation per hour .....	97.9	98.4	98.2	97.9	97.4	97.5	97.2	97.1	97.1	97.3	97.0	97.2	97.2	97.2	97.2
Total unit costs .....	155.2	156.7	155.2	154.4	154.7	155.0	155.0	157.5	158.0	160.2	161.6	161.1	161.1	161.1	161.1
Unit labor costs .....	151.8	153.1	151.7	150.9	151.7	152.5	152.3	154.5	155.0	157.5	158.8	158.3	158.3	158.3	158.3
Unit nonlabor costs .....	164.9	167.0	165.1	164.4	163.3	162.0	162.8	165.9	166.4	168.1	169.8	168.8	168.8	168.8	168.8
Unit profits .....	117.2	92.5	111.8	126.6	135.9	143.2	151.1	145.3	150.7	150.4	148.9	160.1	160.1	160.1	160.1
Unit nonlabor payments .....	149.1	142.3	147.4	151.9	154.2	155.7	158.9	159.1	161.2	162.2	162.9	165.9	165.9	165.9	165.9
Implicit price deflator .....	150.9	149.4	150.2	151.2	152.6	153.6	154.6	156.1	157.1	159.1	160.2	160.9	160.9	160.9	160.9
<b>Manufacturing:</b>															
Output per hour of all persons .....	111.6	110.0	110.9	113.0	112.7	114.2	114.8	116.7	116.5	116.7	118.6	119.7	119.7	119.7	119.7
Compensation per hour .....	163.4	162.7	163.0	163.5	164.6	167.1	168.3	169.9	172.1	174.4	176.5	177.8	177.8	177.8	177.8
Real compensation per hour .....	99.4	100.6	99.6	98.9	98.6	98.8	98.6	98.7	99.1	99.6	99.7	99.9	99.9	99.9	99.9
Unit labor costs .....	146.4	147.9	147.0	144.7	146.1	146.3	146.6	145.5	147.7	149.5	148.8	148.6	148.6	148.6	148.6

**43. Annual indexes of multifactor productivity and related measures selected years**

(1977=100)

Item	1950	1960	1970	1973	1975	1976	1978	1979	1980	1981	1982	1983
<b>Private business</b>												
Productivity:												
Output per hour of all persons .....	49.7	64.8	86.1	94.8	94.5	97.6	100.5	99.3	98.7	100.6	100.8	103.7
Output per unit of capital services .....	98.5	98.4	98.5	103.0	92.0	96.1	101.8	100.3	95.6	94.1	89.5	92.3
Multifactor productivity .....	63.6	75.4	90.2	97.5	93.6	97.1	101.0	99.7	97.6	98.3	96.8	99.6
Output .....	39.5	53.3	78.3	91.8	88.0	93.7	105.5	107.9	106.4	109.2	106.3	111.1
Inputs:												
Hours of all persons .....	79.4	82.2	90.8	96.8	93.1	95.9	105.0	108.6	107.8	108.5	105.4	107.2
Capital services .....	40.1	54.1	79.4	89.1	95.7	97.5	103.6	107.5	111.4	116.0	118.8	120.4
Combined units of labor and capital input .....	62.1	70.7	86.7	94.1	94.0	96.5	104.5	108.2	109.0	111.0	109.9	111.6
Capital per hour of all persons .....	50.5	65.9	87.4	92.0	102.8	101.6	98.7	98.9	103.3	106.9	112.7	112.3
<b>Private nonfarm business</b>												
Productivity:												
Output per hour of all persons .....	55.6	68.0	86.8	95.3	94.8	97.8	100.6	99.0	98.2	99.6	99.9	103.5
Output per unit of capital services .....	98.1	98.4	98.6	103.2	91.7	96.1	101.9	100.1	95.2	93.2	88.7	91.9
Multifactor productivity .....	68.1	77.6	90.7	97.9	93.6	97.2	101.0	99.4	97.2	97.4	95.9	99.4
Output .....	38.3	52.3	77.8	91.7	87.6	93.6	105.7	108.0	106.4	108.7	105.9	111.3
Inputs:												
Hours of all persons .....	69.0	77.0	89.7	96.2	92.4	95.7	105.1	109.1	108.4	109.1	106.0	107.6
Capital services .....	39.1	53.2	78.9	88.8	95.6	97.4	103.7	107.9	111.7	116.6	119.4	121.1
Combined units of labor and capital input .....	56.3	67.4	85.9	93.6	93.5	96.3	104.6	108.7	109.5	111.6	110.4	112.0
Capital per hour of all persons .....	56.6	69.1	88.0	92.4	103.4	101.8	98.7	98.9	103.1	106.8	112.6	112.6
<b>Manufacturing</b>												
Productivity:												
Output per hour of all persons .....	49.4	60.0	79.2	93.0	93.4	97.6	100.9	101.6	101.7	104.9	107.1	111.6
Output per unit of capital services .....	94.2	87.9	91.8	108.2	89.4	96.1	101.5	99.5	90.7	89.9	82.9	87.6
Multifactor productivity .....	59.8	67.0	82.3	96.8	92.2	97.1	101.1	101.0	98.8	100.8	100.3	104.9
Output .....	38.6	50.7	77.0	95.9	85.4	93.6	105.3	108.2	103.5	106.1	99.3	104.4
Inputs:												
Hours of all persons .....	78.2	84.4	97.3	103.1	91.4	95.9	104.4	106.5	101.7	101.1	92.7	93.5
Capital services .....	41.0	57.6	83.9	88.6	95.5	97.4	103.8	108.8	114.1	118.0	119.8	119.2
Combined units of labor and capital inputs .....	64.6	75.6	93.5	99.0	92.6	96.3	104.2	107.1	104.8	105.2	99.0	99.5
Capital per hour of all persons .....	52.5	68.3	86.2	85.9	104.5	101.6	99.4	102.1	112.2	116.7	129.2	127.5

**44. Annual indexes of productivity, hourly compensation, unit costs, and prices, selected years**

(1977=100)

Item	1951	1961	1971	1974	1976	1977	1979	1980	1981	1982	1983	1984	1985
<b>Business:</b>													
Output per hour of all persons .....	53.9	69.9	91.2	93.9	98.3	100.0	99.6	99.2	100.7	100.3	102.9	105.0	-
Compensation per hour .....	21.6	34.9	61.5	77.6	92.8	100.0	119.1	131.5	143.7	154.9	161.5	167.8	-
Real compensation per hour .....	50.5	70.7	92.0	95.4	98.7	100.0	99.4	96.7	95.7	97.3	98.2	97.9	-
Unit labor costs .....	40.1	49.9	67.4	82.7	94.3	100.0	119.6	132.6	142.7	154.5	157.0	159.8	-
Unit nonlabor payments .....	41.6	46.7	64.5	76.4	93.4	100.0	112.5	118.8	134.7	136.8	145.8	156.8	-
Implicit price deflator .....	40.6	48.8	66.4	80.5	94.0	100.0	117.0	127.6	139.8	148.1	153.0	158.7	-
<b>Nonfarm business:</b>													
Output per hour of all persons .....	59.6	73.1	91.8	94.3	98.5	100.0	99.2	98.8	99.8	99.2	102.6	104.3	-
Compensation per hour .....	23.3	36.4	61.9	78.0	92.8	100.0	118.9	131.3	143.6	154.8	162.1	168.1	-
Real compensation per hour .....	54.3	73.8	92.6	95.9	98.8	100.0	99.2	96.6	95.7	97.2	98.6	98.1	-
Unit labor costs .....	39.0	49.8	67.4	82.7	94.2	100.0	119.8	132.9	144.0	156.0	158.0	161.2	-
Unit nonlabor payments .....	40.2	46.9	65.0	74.0	93.1	100.0	110.5	118.5	133.5	136.6	147.4	156.6	-
Implicit price deflator .....	39.4	48.8	66.6	79.7	93.8	100.0	116.5	127.8	140.3	149.2	154.2	159.6	-
<b>Nonfinancial corporations:</b>													
Output per hour of all employees .....	-	75.7	93.6	94.6	98.4	100.0	99.8	99.1	99.6	100.4	103.9	106.1	-
Compensation per hour .....	-	38.0	63.0	78.2	92.9	100.0	118.7	131.1	143.3	154.3	160.6	166.0	-
Real compensation per hour .....	-	77.1	94.2	96.1	98.9	100.0	99.1	96.4	95.5	96.9	97.7	96.9	-
Unit labor costs .....	-	50.3	67.3	82.6	94.3	100.0	119.0	132.3	143.8	153.8	154.5	156.4	-
Unit nonlabor payments .....	-	52.1	65.4	73.1	93.8	100.0	108.4	118.6	137.8	142.1	152.2	161.4	-
Implicit price deflator .....	-	50.9	66.6	79.4	94.2	100.0	115.4	127.6	141.7	149.8	153.7	158.1	-
<b>Manufacturing:</b>													
Output per hour of all persons .....	53.1	64.0	85.3	90.6	97.1	100.0	101.4	101.4	103.6	105.9	112.9	118.5	-
Compensation per hour .....	23.5	37.5	60.8	76.2	92.1	100.0	118.6	132.4	145.2	157.5	163.2	169.1	-
Real compensation per hour .....	54.8	76.0	91.0	93.6	98.1	100.0	99.1	97.4	96.7	98.9	99.3	98.7	-
Unit labor costs .....	44.3	58.7	71.3	84.1	94.9	100.0	117.0	130.6	140.1	148.7	144.5	142.8	-
Unit nonlabor payments .....	55.6	60.5	71.9	67.7	93.5	100.0	98.9	97.8	111.8	114.0	132.4	140.5	-
Implicit price deflator .....	47.6	59.2	71.5	79.3	94.5	100.0	111.7	121.0	131.8	138.6	141.0	142.1	-

- Data not available.

#### 45. Unemployment rates in nine countries, quarterly data seasonally adjusted

Country	Annual average		1984			1985			
	1984	1985	II	III	IV	I	II	III	IV
<b>Total labor force basis</b>									
United States .....	7.4	7.1	7.4	7.3	7.1	7.2	7.2	7.1	6.9
Canada .....	-	-	11.3	11.2	11.1	11.1	10.5	10.2	10.1
Australia .....	-	-	9.1	8.8	8.5	8.5	8.4	8.1	-
Japan .....	-	-	2.7	2.8	2.7	2.6	2.6	2.6	-
France .....	-	-	9.7	9.9	10.0	10.2	10.1	10.1	9.9
Germany .....	-	-	7.7	7.8	7.7	7.8	7.8	7.8	7.7
Great Britain .....	-	-	12.7	13.0	12.8	13.0	13.1	13.4	13.0
Italy <sup>1, 2</sup> .....	-	-	5.9	5.7	5.7	5.8	5.8	6.0	6.2
Sweden .....	-	-	-	-	-	-	-	-	-
<b>Civilian labor force basis</b>									
United States .....	7.5	7.2	7.5	7.4	7.2	7.3	7.3	7.2	7.0
Canada .....	-	-	11.4	11.2	11.1	11.1	10.6	10.3	10.2
Australia .....	-	-	9.2	8.8	8.6	8.5	8.5	8.2	-
Japan .....	-	-	2.7	2.8	2.7	2.6	2.6	2.7	-
France .....	-	-	9.9	10.1	10.3	10.4	10.3	10.4	10.1
Germany .....	-	-	7.9	8.0	7.8	7.9	8.0	7.9	7.9
Great Britain .....	-	-	12.9	13.2	13.0	13.1	13.3	13.5	13.1
Italy .....	-	-	6.0	5.8	5.8	5.9	5.9	6.2	6.3
Sweden .....	-	-	-	-	-	-	-	-	-

<sup>1</sup> Quarterly rates are for the first month of the quarter.

<sup>2</sup> 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 more than double the Italian unemployment rate

shown.

- Data not available.

NOTE: Quarterly and monthly figures for France, Germany, and Great Britain 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, ten countries**

(Numbers in thousands)

Employment status and country	1976	1977	1978	1979	1980	1981	1982	1983	1984
<b>Labor force</b>									
United States .....	96,158	99,009	102,251	104,962	106,940	108,670	110,204	111,550	113,544
Canada .....	10,203	10,500	10,895	11,231	11,573	11,904	11,958	12,183	12,399
Australia .....	6,244	6,358	6,443	6,519	6,693	6,810	6,910	6,997	7,133
Japan .....	53,100	53,820	54,610	55,210	55,740	56,320	56,980	58,110	58,480
France .....	22,010	22,320	22,490	22,680	22,810	22,950	23,170	23,110	23,260
Germany .....	25,900	25,870	26,000	26,240	26,500	26,610	26,640	26,640	26,700
Great Britain .....	25,290	25,430	25,620	25,710	25,870	25,870	25,880	25,980	26,390
Italy .....	20,300	20,530	20,630	20,910	21,210	21,410	21,450	21,610	21,600
Netherlands .....	4,890	4,950	5,010	5,100	5,290	5,500	5,560	5,720	5,740
Sweden .....	4,149	4,168	4,203	4,262	4,312	4,326	4,350	4,369	4,385
<b>Participation rate</b>									
United States .....	61.6	62.3	63.2	63.7	63.8	63.9	64.0	64.0	64.4
Canada .....	61.1	61.6	62.7	63.4	64.1	64.8	64.1	64.4	64.8
Australia .....	62.7	62.7	62.0	61.7	62.2	62.0	61.8	61.5	61.5
Japan .....	62.4	62.5	62.8	62.7	62.6	62.6	62.7	63.1	62.7
France .....	57.4	57.6	57.6	57.5	57.2	57.1	57.1	56.5	56.6
Germany .....	53.8	53.4	53.3	53.3	53.2	52.9	52.5	52.8	53.1
Great Britain .....	63.2	63.2	63.3	63.2	63.2	62.2	61.9	62.2	62.7
Italy .....	47.8	48.0	47.7	47.8	48.0	48.0	47.4	47.2	47.5
Netherlands .....	49.1	49.0	48.8	49.0	50.0	51.3	51.2	52.4	52.3
Sweden .....	66.0	65.9	66.1	66.6	67.0	66.8	66.8	66.9	67.0
<b>Employed</b>									
United States .....	88,752	92,017	96,048	98,824	99,303	100,397	99,526	100,834	105,005
Canada .....	9,477	9,651	9,987	10,395	10,708	11,006	10,644	10,734	11,000
Australia .....	5,946	6,000	6,038	6,111	6,284	6,416	6,415	6,300	6,490
Japan .....	52,020	52,720	53,370	54,040	54,600	55,060	55,620	56,550	56,870
France .....	21,020	21,200	21,280	21,310	21,340	21,220	21,250	21,150	20,940
Germany .....	25,010	24,970	25,130	25,460	25,730	25,520	25,060	24,650	24,610
Great Britain .....	23,810	23,840	24,040	24,360	24,100	23,190	22,820	22,650	22,960
Italy .....	19,600	19,800	19,870	20,100	20,380	20,480	20,430	20,470	20,400
Netherlands .....	4,630	4,700	4,750	4,830	4,960	4,990	4,930	4,890	4,880
Sweden .....	4,083	4,093	4,109	4,174	4,226	4,218	4,213	4,218	4,249
<b>Employment-population ratio</b>									
United States .....	56.8	57.9	59.3	59.9	59.2	59.0	57.8	57.9	59.5
Canada .....	56.7	56.6	57.5	58.7	59.3	59.9	57.0	56.7	57.4
Australia .....	59.7	59.2	58.1	57.9	58.4	58.4	57.3	55.4	56.0
Japan .....	61.1	61.2	61.3	61.4	61.3	61.2	61.2	61.4	61.0
France .....	54.8	54.7	54.5	54.0	53.5	52.8	52.4	51.7	50.9
Germany .....	52.0	51.6	51.5	51.7	51.6	50.7	49.4	48.8	48.9
Great Britain .....	59.5	59.3	59.4	59.8	58.9	55.8	54.6	54.2	54.6
Italy .....	46.1	46.3	45.9	45.9	46.1	45.9	45.2	44.7	44.8
Netherlands .....	46.5	46.5	46.3	46.4	46.9	46.5	45.4	44.8	44.5
Sweden .....	64.9	64.8	64.6	65.3	65.6	65.1	64.7	64.4	64.7
<b>Unemployed</b>									
United States .....	7,406	6,991	6,202	6,137	7,637	8,273	10,678	10,717	8,539
Canada .....	726	849	908	836	865	898	1,314	1,448	1,399
Australia .....	298	358	405	408	409	394	495	697	642
Japan .....	1,080	1,100	1,240	1,170	1,140	1,260	1,360	1,560	1,610
France .....	990	1,120	1,210	1,370	1,470	1,730	1,920	1,960	2,320
Germany .....	890	900	870	780	770	1,090	1,580	1,990	2,090
Great Britain .....	1,480	1,590	1,580	1,350	1,770	2,680	3,060	3,330	3,430
Italy .....	700	740	760	810	830	920	1,020	1,140	1,200
Netherlands .....	260	250	260	270	330	510	630	830	860
Sweden .....	66	75	94	88	86	108	137	151	136
<b>Unemployment rate</b>									
United States .....	7.7	7.1	6.1	5.8	7.1	7.6	9.7	9.6	7.5
Canada .....	7.1	8.1	8.3	7.4	7.5	7.5	11.0	11.9	11.3
Australia .....	4.8	5.6	6.3	6.3	6.1	5.8	7.2	10.0	9.0
Japan .....	2.0	2.0	2.3	2.1	2.0	2.2	2.4	2.7	2.8
France .....	4.5	5.0	5.4	6.0	6.4	7.5	8.3	8.5	10.0
Germany .....	3.4	3.5	3.4	3.0	2.9	4.1	5.9	7.5	7.8
Great Britain .....	5.9	6.3	6.2	5.3	6.8	10.4	11.8	12.8	13.0
Italy .....	3.4	3.6	3.7	3.9	3.9	4.3	4.8	5.3	5.9
Netherlands .....	5.3	5.0	5.2	5.3	6.2	9.3	11.3	14.5	15.0
Sweden .....	1.6	1.8	2.2	2.1	2.0	2.5	3.1	3.5	3.1

### 47. Annual indexes of productivity and related measures, twelve countries

(1977=100)

Item and country	1960	1970	1973	1975	1976	1978	1979	1980	1981	1982	1983	1984
<b>Output per hour</b>												
United States .....	60.0	79.2	93.0	93.4	97.6	100.9	101.6	101.7	104.9	107.1	111.6	115.6
Canada .....	50.3	76.8	91.3	91.0	96.2	101.4	104.2	101.9	104.0	101.1	107.6	111.9
Japan .....	22.0	61.4	80.2	85.3	93.3	107.9	117.4	128.6	135.7	145.4	152.8	167.4
Belgium .....	32.8	59.9	78.3	86.0	95.0	106.4	112.0	119.7	126.5	128.6	137.0	-
Denmark .....	36.4	65.3	82.8	94.4	98.0	102.4	108.3	114.3	116.2	115.3	118.8	123.6
France .....	36.3	69.3	82.0	88.4	94.9	105.9	110.6	112.4	116.0	123.5	128.8	135.2
Germany .....	39.8	70.9	83.4	89.8	96.2	102.5	107.4	108.4	110.3	111.6	116.8	122.3
Italy .....	36.5	72.7	90.9	91.1	98.9	103.0	110.5	116.9	121.0	123.4	126.4	134.4
Netherlands .....	31.7	63.0	80.1	85.1	96.1	106.6	112.1	114.6	118.7	121.6	130.4	-
Norway .....	54.6	81.7	94.7	96.8	99.7	101.8	107.2	109.3	109.7	112.7	119.4	121.4
Sweden .....	42.3	80.7	94.8	100.2	101.7	102.8	110.9	112.7	113.2	116.5	126.4	134.9
United Kingdom .....	53.8	77.6	93.1	94.5	99.4	101.6	102.1	99.9	106.1	110.9	118.3	123.0
<b>Output</b>												
United States .....	50.7	77.0	95.9	85.4	93.6	105.3	108.2	103.5	106.1	99.3	104.4	115.3
Canada .....	41.5	75.1	94.6	92.3	98.1	104.9	110.9	107.7	108.8	96.4	102.2	110.6
Japan .....	17.9	65.3	87.4	82.2	93.2	107.3	118.0	130.7	139.0	148.6	160.1	180.3
Belgium .....	41.6	78.0	95.7	92.1	99.4	101.6	104.2	107.3	104.8	104.8	106.2	-
Denmark .....	48.2	81.7	95.4	94.8	99.4	100.7	107.2	112.1	108.5	108.2	115.0	123.6
France .....	35.4	73.3	88.6	90.0	96.1	103.4	106.1	106.6	104.9	105.1	106.4	108.0
Germany .....	49.2	86.0	95.2	90.4	97.6	101.3	106.1	106.6	104.6	101.4	102.5	106.5
Italy .....	37.4	78.0	90.5	86.9	97.9	101.8	108.6	115.4	114.3	111.6	109.0	113.1
Netherlands .....	44.1	82.7	94.2	91.7	99.1	102.8	105.5	107.3	107.3	105.2	106.3	-
Norway .....	55.1	87.0	99.5	101.0	101.4	98.2	100.3	101.3	100.1	99.9	98.7	101.2
Sweden .....	52.6	92.5	100.3	106.1	106.1	97.3	103.6	104.0	100.6	100.1	106.0	113.2
United Kingdom .....	71.0	94.6	104.6	96.1	98.1	100.6	100.6	91.8	86.2	86.8	89.0	92.0
<b>Total hours</b>												
United States .....	84.4	97.3	103.1	91.4	95.9	104.4	106.5	101.7	101.1	92.7	93.5	99.8
Canada .....	82.6	97.7	103.6	101.4	102.0	103.4	106.4	105.7	104.6	95.4	94.9	98.9
Japan .....	81.5	106.4	109.0	96.4	99.9	99.5	100.5	101.6	102.4	102.2	104.8	107.7
Belgium .....	127.1	130.2	122.3	107.1	104.6	95.6	93.0	89.7	82.8	81.6	77.5	-
Denmark .....	132.4	125.1	115.2	100.4	101.4	98.3	99.0	98.0	93.4	93.9	96.8	99.9
France .....	97.6	105.7	108.0	101.9	101.3	97.6	95.9	94.8	90.4	85.0	82.6	79.9
Germany .....	123.6	121.3	114.2	100.6	101.5	98.8	98.8	98.4	94.8	90.8	87.7	87.0
Italy .....	102.3	107.4	99.6	95.4	99.0	98.8	98.2	98.7	94.5	90.5	86.2	84.2
Netherlands .....	139.1	131.1	117.7	107.8	103.1	96.4	94.1	93.7	90.4	86.5	81.5	-
Norway .....	101.0	106.4	105.1	104.3	101.7	96.5	93.6	92.6	91.3	88.6	82.7	83.4
Sweden .....	124.4	114.6	105.7	105.9	104.3	94.6	93.4	92.3	88.9	85.9	83.9	83.9
United Kingdom .....	131.8	121.9	112.4	101.7	98.7	99.0	98.6	91.9	81.3	78.2	75.2	74.8
<b>Compensation per hour</b>												
United States .....	36.7	57.6	69.0	85.5	92.3	108.3	118.8	132.7	145.2	158.0	163.4	169.4
Canada .....	27.1	46.5	59.2	78.2	89.9	106.7	118.3	130.6	151.5	167.2	178.5	181.4
Japan .....	8.9	33.9	55.7	85.4	91.1	105.9	112.8	121.2	130.2	136.9	141.5	146.0
Belgium .....	13.9	34.7	53.6	79.0	89.4	107.9	117.5	130.2	144.7	152.0	164.9	-
Denmark .....	12.6	36.3	56.1	81.0	90.4	110.2	123.2	135.9	149.7	165.4	172.6	182.8
France .....	15.1	36.5	52.1	76.6	88.8	113.7	129.7	148.1	171.3	202.7	227.4	247.5
Germany .....	18.8	48.1	67.6	84.8	91.4	107.7	115.4	125.0	133.8	140.9	146.7	152.1
Italy .....	8.3	26.1	43.7	70.2	84.1	114.5	134.7	160.2	197.1	237.3	277.0	306.0
Netherlands .....	12.2	38.5	60.1	81.9	92.1	108.7	117.3	123.5	130.3	139.4	147.3	-
Norway .....	15.8	37.9	54.6	77.2	88.9	110.0	116.0	128.0	142.8	156.1	173.8	185.6
Sweden .....	14.7	38.5	54.2	77.3	91.5	111.4	120.1	133.6	148.1	158.9	173.2	192.0
United Kingdom .....	14.9	30.9	45.0	75.1	88.9	116.8	137.1	162.8	185.6	201.8	216.2	233.4
<b>Unit labor costs: National currency basis:</b>												
United States .....	61.1	72.7	74.2	91.5	94.6	107.3	117.0	130.5	138.4	147.6	146.4	146.5
Canada .....	53.9	60.6	64.8	86.0	93.5	105.3	113.5	128.1	145.7	165.4	165.9	162.1
Japan .....	40.5	55.2	69.4	100.1	97.7	98.2	96.1	94.2	95.9	94.1	92.6	87.2
Belgium .....	42.4	57.9	68.5	91.9	94.1	101.4	104.9	108.9	114.4	118.3	120.4	-
Denmark .....	34.5	55.6	67.8	85.8	92.3	107.6	113.7	118.9	128.8	143.5	145.3	147.8
France .....	41.6	52.6	63.6	86.7	93.6	107.4	117.3	131.7	147.7	164.1	176.5	183.1
Germany .....	47.3	67.9	81.0	94.4	95.0	105.0	107.5	115.3	121.3	126.2	125.6	124.3
Italy .....	22.8	36.0	48.1	77.1	85.1	111.2	121.9	137.0	162.9	192.4	219.2	227.7
Netherlands .....	38.3	61.1	75.1	96.2	95.9	101.9	104.7	107.8	109.8	114.6	113.0	-
Norway .....	29.0	46.4	57.6	79.7	89.1	108.1	108.2	117.0	130.2	138.5	145.6	152.9
Sweden .....	34.8	47.7	57.2	77.1	90.0	108.4	108.3	118.6	130.9	136.3	137.1	142.3
United Kingdom .....	27.6	39.8	48.3	79.4	89.5	114.9	134.3	163.0	174.9	181.9	182.8	189.8
<b>Unit labor costs: U.S. dollar basis:</b>												
United States .....	61.1	72.7	74.2	91.5	94.6	107.3	117.0	130.5	138.4	147.6	146.4	146.5
Canada .....	59.0	61.7	68.8	89.8	100.7	98.1	103.0	116.4	129.1	142.3	143.1	133.0
Japan .....	30.2	41.3	68.6	90.4	88.2	126.2	117.9	111.8	116.4	101.2	104.4	98.4
Belgium .....	30.4	41.8	63.2	89.8	87.4	115.6	128.1	133.6	110.7	92.6	84.4	-
Denmark .....	30.1	44.5	67.6	89.8	91.7	117.3	129.7	126.8	108.4	103.2	95.3	85.7
France .....	41.7	46.8	70.4	99.5	96.3	117.3	135.5	153.4	133.4	122.6	113.9	103.0
Germany .....	26.3	43.2	71.0	89.2	87.6	121.6	136.2	147.5	124.9	120.7	114.1	101.4
Italy .....	32.5	50.6	73.1	104.3	90.5	115.6	129.5	141.4	126.3	125.4	127.4	114.5
Netherlands .....	24.9	41.4	66.3	93.5	89.0	115.7	128.1	133.2	108.2	105.2	97.2	-
Norway .....	21.7	34.5	53.4	81.4	86.9	109.7	113.8	126.2	120.6	114.1	106.2	99.7
Sweden .....	30.1	41.1	58.7	83.2	92.3	107.2	112.9	125.3	115.4	96.9	79.8	76.9
United Kingdom .....	44.5	54.6	67.9	101.1	92.6	126.4	163.4	217.2	202.9	182.2	158.8	145.4

- Data not available.

## 48. Occupational injury and illness incidence rates by industry, United States

Industry and type of case <sup>1</sup>	Incidence rates per 100 full-time workers <sup>2</sup>								
	1977	1978	1979	1980	1981	1982	1983	1984	1985
<b>PRIVATE SECTOR<sup>3</sup></b>									
Total cases .....	-	-	-	-	8.3	7.7	7.6	8.0	-
Lost workday cases .....	-	-	-	-	3.8	3.5	3.4	3.7	-
Lost workdays .....	-	-	-	-	61.7	58.7	58.5	63.4	-
<b>Agriculture, forestry, and fishing<sup>3</sup></b>									
Total cases .....	-	-	-	-	12.3	11.8	11.9	12.0	-
Lost workday cases .....	-	-	-	-	5.9	5.9	6.1	6.1	-
Lost workdays .....	-	-	-	-	82.8	86.0	90.8	90.7	-
<b>Mining</b>									
Total cases .....	-	-	-	-	11.6	10.5	8.4	9.7	-
Lost workday cases .....	-	-	-	-	6.2	5.4	4.5	5.3	-
Lost workdays .....	-	-	-	-	146.4	137.3	125.1	160.2	-
<b>Construction</b>									
Total cases .....	-	-	-	-	15.1	14.6	14.8	15.5	-
Lost workday cases .....	-	-	-	-	6.3	6.0	6.3	6.9	-
Lost workdays .....	-	-	-	-	113.1	115.7	118.2	128.1	-
General building contractors:									
Total cases .....	-	-	-	-	15.1	14.1	14.4	15.4	-
Lost workday cases .....	-	-	-	-	6.1	5.9	6.2	6.9	-
Lost workdays .....	-	-	-	-	107.1	112.0	113.0	121.3	-
Heavy construction contractors:									
Total cases .....	-	-	-	-	14.9	15.1	15.4	14.9	-
Lost workday cases .....	-	-	-	-	6.0	5.8	6.2	6.4	-
Lost workdays .....	-	-	-	-	106.0	113.1	122.4	131.7	-
Special trade contractors:									
Total cases .....	-	-	-	-	15.2	14.7	14.8	15.8	-
Lost workday cases .....	-	-	-	-	6.6	6.2	6.4	7.1	-
Lost workdays .....	-	-	-	-	119.3	118.6	119.0	130.1	-
<b>Manufacturing</b>									
Total cases .....	-	-	-	-	11.5	10.2	10.0	10.6	-
Lost workday cases .....	-	-	-	-	5.1	4.4	4.3	4.7	-
Lost workdays .....	-	-	-	-	82.0	75.0	73.5	77.9	-
<b>Durable goods</b>									
Lumber and wood products:									
Total cases .....	-	-	-	-	17.6	16.9	18.3	19.6	-
Lost workday cases .....	-	-	-	-	9.0	8.3	9.2	9.9	-
Lost workdays .....	-	-	-	-	158.4	153.3	163.5	172.0	-
Furniture and fixtures:									
Total cases .....	-	-	-	-	15.1	13.9	14.1	15.3	-
Lost workday cases .....	-	-	-	-	6.2	5.5	5.7	6.4	-
Lost workdays .....	-	-	-	-	91.9	85.6	83.0	101.5	-
Stone, clay, and glass products:									
Total cases .....	-	-	-	-	14.1	13.0	13.1	13.6	-
Lost workday cases .....	-	-	-	-	6.9	6.1	6.0	6.6	-
Lost workdays .....	-	-	-	-	122.2	112.2	112.0	120.8	-
Primary metal industries:									
Total cases .....	-	-	-	-	14.4	12.4	12.4	13.3	-
Lost workday cases .....	-	-	-	-	6.7	5.4	5.4	6.1	-
Lost workdays .....	-	-	-	-	121.3	101.6	103.4	115.3	-
Fabricated metal products:									
Total cases .....	-	-	-	-	17.5	15.3	15.1	16.1	-
Lost workday cases .....	-	-	-	-	7.5	6.4	6.1	6.7	-
Lost workdays .....	-	-	-	-	109.9	102.5	96.5	104.9	-
Machinery, except electrical:									
Total cases .....	-	-	-	-	12.9	10.7	9.8	10.7	-
Lost workday cases .....	-	-	-	-	5.1	4.2	3.6	4.1	-
Lost workdays .....	-	-	-	-	74.9	66.0	58.1	65.8	-
Electric and electronic equipment:									
Total cases .....	-	-	-	-	7.4	6.5	6.3	6.8	-
Lost workday cases .....	-	-	-	-	3.1	2.7	2.6	2.8	-
Lost workdays .....	-	-	-	-	48.4	42.2	41.4	45.0	-
Transportation equipment:									
Total cases .....	-	-	-	-	9.8	9.2	8.4	9.3	-
Lost workday cases .....	-	-	-	-	4.6	4.0	3.6	4.2	-
Lost workdays .....	-	-	-	-	78.1	72.2	64.5	68.8	-
Instruments and related products:									
Total cases .....	-	-	-	-	6.5	5.6	5.2	5.4	-
Lost workday cases .....	-	-	-	-	2.7	2.3	2.1	2.2	-
Lost workdays .....	-	-	-	-	39.2	37.0	35.6	37.5	-
Miscellaneous manufacturing industries:									
Total cases .....	-	-	-	-	10.7	9.9	9.9	10.5	-
Lost workday cases .....	-	-	-	-	4.4	4.1	4.0	4.3	-
Lost workdays .....	-	-	-	-	68.3	69.9	66.3	70.2	-

See footnotes at end of table.



48. —Continued Occupational injury and illness incidence rates by industry, United States

Industry and type of case <sup>1</sup>	Incidence rates per 100 full-time workers <sup>2</sup>								
	1977	1978	1979	1980	1981	1982	1983	1984	1985
<b>Nondurable goods</b>									
Food and kindred products:									
Total cases .....	-	-	-	-	17.8	16.7	16.5	16.7	-
Lost workday cases .....	-	-	-	-	8.6	8.0	7.9	8.1	-
Lost workdays .....	-	-	-	-	130.7	129.3	131.2	131.6	-
Tobacco manufacturing:									
Total cases .....	-	-	-	-	8.2	7.2	6.5	7.7	-
Lost workday cases .....	-	-	-	-	3.9	3.2	3.0	3.2	-
Lost workdays .....	-	-	-	-	56.8	44.6	42.8	51.7	-
Textile mill products:									
Total cases .....	-	-	-	-	8.8	7.6	7.4	8.0	-
Lost workday cases .....	-	-	-	-	3.2	2.8	2.8	3.0	-
Lost workdays .....	-	-	-	-	59.2	53.8	51.4	54.0	-
Apparel and other textile products:									
Total cases .....	-	-	-	-	6.3	6.0	6.4	6.7	-
Lost workday cases .....	-	-	-	-	2.2	2.1	2.4	2.5	-
Lost workdays .....	-	-	-	-	35.0	36.4	40.6	40.9	-
Paper and allied products:									
Total cases .....	-	-	-	-	11.6	10.6	10.0	10.4	-
Lost workday cases .....	-	-	-	-	5.4	4.9	4.5	4.7	-
Lost workdays .....	-	-	-	-	103.6	99.1	90.3	93.8	-
Printing and publishing:									
Total cases .....	-	-	-	-	6.7	6.6	6.6	6.5	-
Lost workday cases .....	-	-	-	-	3.0	2.8	2.9	2.9	-
Lost workdays .....	-	-	-	-	47.4	45.7	44.6	46.0	-
Chemicals and allied products:									
Total cases .....	-	-	-	-	6.6	5.7	5.5	5.3	-
Lost workday cases .....	-	-	-	-	3.0	2.5	2.5	2.4	-
Lost workdays .....	-	-	-	-	48.1	39.4	42.3	40.8	-
Petroleum and coal products:									
Total cases .....	-	-	-	-	6.7	5.3	5.5	5.1	-
Lost workday cases .....	-	-	-	-	2.9	2.5	2.4	2.4	-
Lost workdays .....	-	-	-	-	51.2	46.4	46.8	53.5	-
Rubber and miscellaneous plastics products:									
Total cases .....	-	-	-	-	14.6	12.7	13.0	13.6	-
Lost workday cases .....	-	-	-	-	7.2	6.0	6.2	6.4	-
Lost workdays .....	-	-	-	-	117.4	100.9	101.4	104.3	-
Leather and leather products:									
Total cases .....	-	-	-	-	11.5	9.9	10.0	10.5	-
Lost workday cases .....	-	-	-	-	5.1	4.5	4.4	4.7	-
Lost workdays .....	-	-	-	-	82.6	86.5	87.3	94.4	-
<b>Transportation and public utilities</b>									
Total cases .....	-	-	-	-	9.0	8.5	8.2	8.8	-
Lost workday cases .....	-	-	-	-	5.3	4.9	4.7	5.2	-
Lost workdays .....	-	-	-	-	100.6	96.7	94.9	105.1	-
<b>Wholesale and retail trade</b>									
Total cases .....	-	-	-	-	7.3	7.2	7.2	7.4	-
Lost workday cases .....	-	-	-	-	3.1	3.1	3.1	3.3	-
Lost workdays .....	-	-	-	-	45.3	45.5	47.8	50.5	-
Wholesale trade:									
Total cases .....	-	-	-	-	7.7	7.1	7.0	7.2	-
Lost workday cases .....	-	-	-	-	3.6	3.4	3.2	3.5	-
Lost workdays .....	-	-	-	-	54.7	52.1	50.6	55.5	-
Retail trade:									
Total cases .....	-	-	-	-	7.1	7.2	7.3	7.5	-
Lost workday cases .....	-	-	-	-	2.9	2.9	3.0	3.2	-
Lost workdays .....	-	-	-	-	41.1	42.6	46.7	48.4	-
<b>Finance, insurance, and real estate</b>									
Total cases .....	-	-	-	-	1.9	2.0	2.0	1.9	-
Lost workday cases .....	-	-	-	-	.8	.9	.9	.9	-
Lost workdays .....	-	-	-	-	11.6	13.2	12.8	13.6	-
<b>Services</b>									
Total cases .....	-	-	-	-	5.0	4.9	5.1	5.2	-
Lost workday cases .....	-	-	-	-	2.3	2.3	2.4	2.5	-
Lost workdays .....	-	-	-	-	35.9	35.8	37.0	41.1	-

<sup>1</sup> Total cases include fatalities.

<sup>2</sup> 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.)

<sup>3</sup> Excludes farms with fewer than 11 employees since 1976. - Data not available.

# New from BLS

## SALES PUBLICATIONS

### BLS Bulletins

Employment and Wages, Annual Averages 1984. Bulletin 2249, 524 pp., \$20 (GPO Stock No. 029-001-02861-0). Presents complete count of employment and wages for workers covered by unemployment insurance programs during 1984. BLS compiles data on a national basis, by State, and by industry. Coverage extends to the District of Columbia, Puerto Rico, and Virgin Islands.

### Area Wage Surveys

These bulletins cover office, professional, technical, maintenance, custodial, and material movement jobs in major metropolitan areas. The annual series of 70 is available by subscription for \$102 per year. Individual area bulletins are also available separately.

Chattanooga, Tennessee-Georgia, Metropolitan Area, September 1985. Bulletin 3030-40, 29 pp., \$1.75 (GPO Stock No. 829-001-00040-3).

Columbus, Ohio, Metropolitan Area, October 1985. Bulletin 3030-51, 39 pp., \$1.75 (GPO Stock No. 829-001-00051-9).

Gainesville, Florida, Metropolitan Area, September 1985. Bulletin 3030-42, 23 pp. \$1.25 (GPO Stock No. 829-001-00042-0).

Indianapolis, Indiana, Metropolitan Area, October 1985. Bulletin 3030-50, 40 pp., \$1.75 (GPO Stock No. 829-001-00050-1).

Kansas City, Missouri-Kansas, Metropolitan Area, September 1985. Bulletin 3030-46, 53 pp., \$2.25 (GPO Stock No. 829-001-00046-2).

Miami, Florida, Metropolitan Area, October 1985. Bulletin 3030-47, 38 pp., \$1.75 (GPO Stock No. 829-001-00047-1).

New Orleans, Louisiana, Metropolitan Area, October 1985. Bulletin 3030-49, 33 pp., \$1.50 (GPO Stock No. 829-001-00049-7).

### Periodicals

CPI Detailed Report. Each issue provides a comprehensive report on price movements for the month, plus statistical tables, charts, and technical notes. \$4 (\$25 per year).

Current Wage Developments. Each issue includes selected wage and benefit changes, work stoppages, and statistics on compensation changes. \$2 (\$21 per year). November issue features major collective bargaining settlements in private industry, first 9 months of 1985.

Employment and Earnings. Each issue covers employment and unemployment developments in the month plus regular statistical tables on national, State, and area employment, hours, and earnings. \$4.50 (\$31 per year).

Producer Price Indexes. Each issue includes a comprehensive report on price movements for the month, plus regular tables and technical notes. \$4.25 (\$29 per year).

## OTHER PUBLICATIONS

(Single copies available upon request while supplies last.)

Current BLS Publications (September 1985). 15 pp. Catalog of BLS publications in print. Includes ordering information.

### Area Wage Summaries

Ann Arbor, MI. October 1955. 5 pp.

Madison, WI. September 1985. 4 pp.

Northwest Texas, September 1985. 3 pp.

## BLS REPORTS

Employment in Perspective: Minority Workers, Third Quarter 1985. Report 724. 4 pp. Focuses on differences in the work experience of black, Hispanic, and white workers over the entire year of 1984.

Employment in Perspective: Women in the Labor Force (formerly called Working Women), Third Quarter 1985. Report 725. 3 pp. Describes women's employment situation in the third quarter and summarizes information on women who are self-employed.

Major Programs, Bureau of Labor Statistics. Report 718. Presents in highly concentrated form the scope of the Bureau's major statistical programs, the data available, the form of publication, some of the uses of the data, and selected publications and data tapes.

## BLS Summaries

Occupational Earnings in Banking, Selected Metropolitan Areas, 1985. Summary 85-11 (No. 1 of 2). 6 pp.

Occupational Earnings in Selected Areas, 1985. Summary 85-12 (No. 2 of 3). 7 pp.

## To Order:

*Sale Publications:* Order bulletins by title, bulletin number, and GPO stock number from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 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 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 2421, 441 G Street, N.W., Washington, D.C. 20212, or from the Bureau of Labor Statistics, Chicago Regional Office, P.O. Box 2145, Chicago, IL 60690.



U.S. Department of Labor  
Bureau of Labor Statistics  
Washington, D.C. 20210

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

MLR LIBRA442L ISSDUE013R 1  
LIBRARY  
FED RESERVE BANK OF ST LOUIS  
PO BOX 442  
SAINT LOUIS MO 63166