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Monthly Labor Review

U.S. Department of Labor
Bureau of Labor Statistics
June 1990

In this issue:

Import and export prices in 1989
Measuring differences in union and nonunion pay
Productivity in photographic equipment
From MLR's 75th year, an editor looks back





U.S. Department of Labor
Elizabeth Dole, *Secretary*

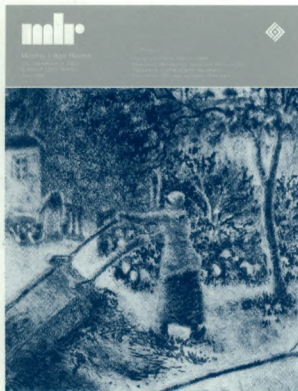
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Monthly Labor Review

June 1990
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Robert W. Fisher, *Executive Editor*

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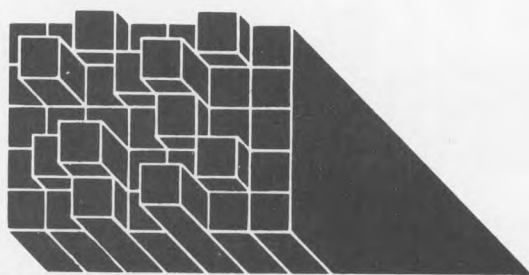
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Labor month in review



QUALITY AWARD. The President's Council on Management Improvement honored the BLS Consumer Price Index staff with a coveted management excellence award. The award, presented June 1 at the Third Annual Conference on Quality and Productivity, was based on a nomination by the Department of Labor. The Council presents only 10 such awards each year.

Basis for the citation. The Council made the award for improving the timeliness of the release of statistical information on price change for use by policymakers and the general public. Using a team approach, the CPI staff identified problems and implemented solutions that led to this improvement. Managers and staff also conducted a survey to identify opportunities to better meet the needs of CPI data users. According to BLS Commissioner Janet L. Norwood, these cooperative efforts by many employees to produce a good product for BLS "customers" exemplify "total quality management" at work within the Department of Labor.

Timeliness. Because the consumer sector represents about two-thirds of current spending in the U.S. economy, a more timely CPI alerts the Nation's policymakers to inflationary pressures in the economy so that policy decisions can be made more expeditiously. It also enables the Commerce Department's Bureau of Economic Analysis to do better and more timely deflation of personal consumption expenditures to measure real changes in the consumption component of gross national product.

The Bureau's efforts accelerated release of the CPI, resulting in an average monthly improvement of 5 days—the equivalent of a 25-percent reduction in the time taken to process, review, analyze, and issue the data. On June 15, 1990, the CPI will be released on the earliest date in the history of the program.

A CPI Program team involved with the receipt and recording of data collected by BLS field staff achieved a 3-day reduction

in processing time. The team reviewed existing procedures, recommended improvements, developed a test plan, and implemented the improvements. Their efforts resulted in a decline in the number of workers involved in data keying and computer processing and a significant improvement in the productivity of the data entry staff.

A team of managers succeeded in cutting 1 day off the time needed for data review. After analyzing the process and identifying the most important source of errors, they implemented revised procedures that feature additional data analysis and edits that significantly reduce rework in later data review process stages.

An additional day was shaved from press release preparation through the efforts of a team of managers, economic analysts, and computer systems staff, who reviewed the processing and development materials for press releases. The team found that a major source of delay in the process was the mailing of press release tables to BLS regional offices. As a result, they developed a system for electronic transmission of the tables that saved 1 day in mailing time and the cost of overnight mail charges.

User survey. An overriding focus on customer needs is key to the success of public- and private-sector organizations. The CPI staff conducted a User Survey to strengthen the customer focus of their program by:

- Obtaining information about how CPI customers use data in order to better understand how users are affected by changes in the CPI Program;
- Evaluating information services, the quality attribute of the CPI Program that is most visible to customers; and
- Learning directly from customers what opportunities exist to better meet their needs.

To address these aims, the CPI staff contacted a sample of 4,213 of the more than 150,000 users who obtain their CPI data directly from BLS.

The most enlightening finding about uses of the CPI was that more than 75 percent of customers use it to adjust payments for inflation. The types of payments most commonly adjusted are rent/lease and wage/salary payments, but large numbers of customers also use the CPI to adjust purchase contracts, alimony/child support payments, and retirement payments. The knowledge that the financial well-being of customers is directly affected by the CPI provides a strong motivation for quality improvement throughout the program.

Feedback from the survey was generally very positive. Users liked the CPI publications and felt that BLS staff who handle telephone requests are responsive and knowledgeable. CPI customers did express dissatisfaction with the timeliness of CPI information, confirming that recent improvement efforts in that area were properly focused. The survey also uncovered other opportunities to better meet user needs. The most important such need is for less complicated information on CPI methods, data availability, and data sources. This crucial need by customers for education in the proper use of CPI data and for information on limitations inherent in all statistical estimates is one that the CPI Program must begin to satisfy immediately.

Several projects are planned or under way to meet the needs revealed in the survey. Development of two new publications has begun: 1) a simple question-and-answer treatment of CPI methods and uses, and 2) a compilation of data series available. A publication describing the use of the CPI for adjustment of payments is now being mailed to all users on CPI mailing lists. And a number of quality improvement teams have begun to analyze different survey processes to find additional ways to accelerate the CPI release. In the planning stages are projects to speed up the printing and mailing of CPI publications, and to develop a short informational seminar on the CPI to be delivered by program staff at user conferences around the country. □

Import and export price gains ease in 1989

Annual rates of price increase for both imports and exports were considerably lower than those posted during the preceding 2 years, reflecting a slowdown in the U.S. economy and the turnaround of the dollar

Kim Arbogast
and
Adam Ochlis

Prices of U.S. imports advanced 1.9 percent during 1989, as all major categories except fuels recorded annual price declines or smaller rates of increase than in 1987 and 1988.¹ (See table 1.) Prices of fuels and related products, noted for their volatility, rose 30 percent over the year after declining more than 16 percent in 1988. When fuels are excluded, import prices actually fell 0.5 percent in 1989. In 1987 and 1988, nonfuel import prices had advanced 8.9 and 6.9 percent, respectively, reacting to the depreciating dollar and strong domestic growth.

Export prices climbed just 0.6 percent in 1989, following gains of 6.0 and 6.4 percent in 1987 and 1988. A decrease in food prices from the previous year's drought-inflated levels, as well as weaker world demand for industrial products, helped to dampen price increases. Export prices decreased in the year's final three quarters after a relatively steep 1.5-percent jump in the first quarter, in part the result of strong export growth in the first half of the year.

Developments influencing prices

Exchange rates influenced import and export prices throughout 1989. The year marked the first time since 1984 that the trade-weighted value of the dollar strengthened against foreign currencies. The 3.5-percent annual appreciation of the dollar, spurred by the 7.3-percent gain in

the first half of the year,² contributed heavily to the 0.8-percent drop in prices for all nonfuel imports during the second quarter. The April-to-June movement represented the year's largest 3-month decline and the steepest quarterly slide in nonfuel import prices since the 1.8-percent decrease recorded for the first quarter of 1985. (See chart 1.)

The stronger dollar in the first half of 1989, which lowered United States import prices, and the slowing U.S. economy in the second half of the year, which reduced industrial demand, had their greatest effect on prices for imported raw materials and the finished goods they are used to produce. The rapid growth in prices for the intermediate manufactures category experienced during the 2 earlier years came to a halt in 1989 when prices decreased 0.7 percent after double-digit advances in 1987 and 1988. The same was true for the machinery and transport equipment category, where prices rose a modest 0.2 percent after averaging 6.6-percent increases for the preceding 2 years. (See chart 2.)

Export prices also responded to moderating growth in the U.S. and global economies and to the movement of the dollar in 1989. In particular, chemicals prices declined 8.4 percent during the year, following 18.6- and 11.2-percent jumps in 1987 and 1988. Prices of exported crude materials advanced just 0.7 percent in 1989, as large increases for some categories,

Kim Arbogast and Adam Ochlis are economists in the Division of International Prices, Bureau of Labor Statistics. John Skwiot, an economist in the same division, prepared the charts.

caused by strong export growth, offset decreases for other categories. Prices for exported machinery and transport equipment, which had increased 3.3 percent in 1988, rose 2.6 percent during the year. (See chart 3.)

The dollar's strength early in 1989 coincided with the firm U.S. economy through the middle of the year. Most major foreign currencies depreciated against the dollar through June. The Japanese yen, the West German mark, and the U.K. pound all declined more than 10 percent versus the dollar in the first half of the year.³ The trend of dollar appreciation slowed in the second half when speculation about a domestic economic slowdown and the possibility of a recession moderated demand for dollars.

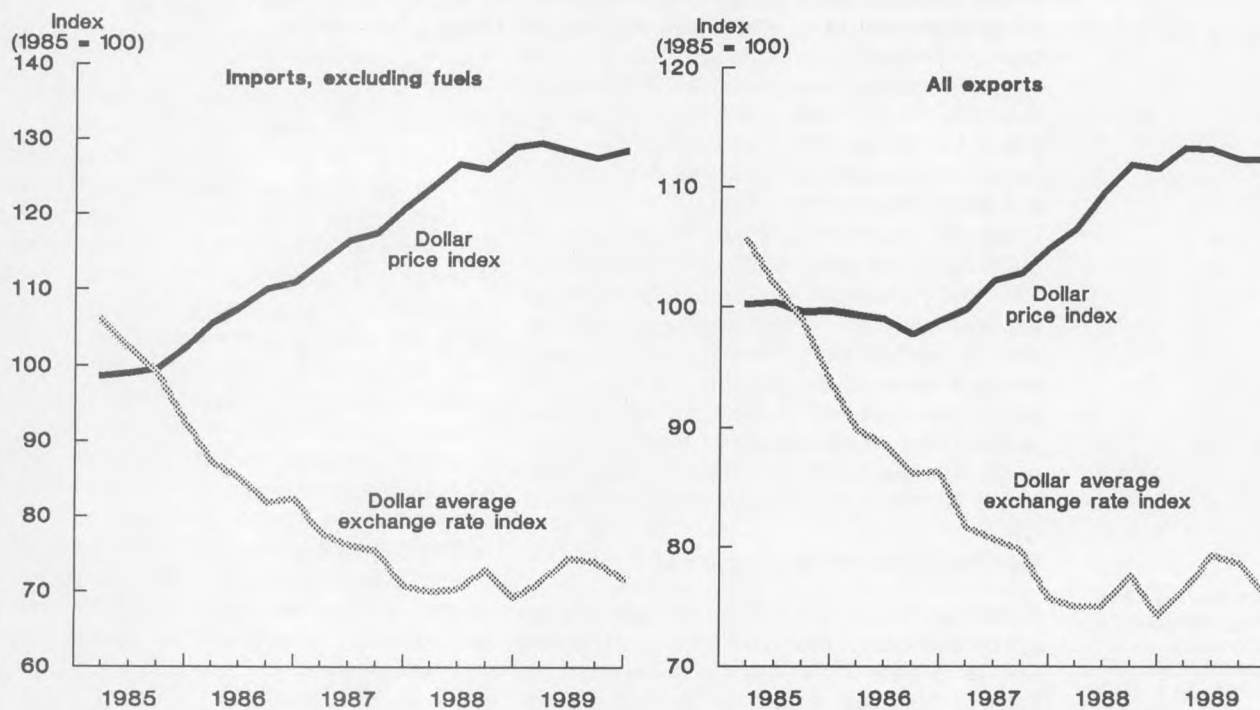
The dollar's depreciation during the second half again spanned most major currencies, although the magnitude of the decline against each varied considerably. For example, the mark appreciated nearly 14 percent against the dollar between July and December, while the pound and yen rose just 2.8 and 0.2 percent, respectively, over the same period.⁴ For the year, the dollar averaged 7.7 percent higher against the yen, 8.7 percent higher against the pound, and 7.0 percent higher against the mark. The dollar continued to depreciate against the currencies of the

Newly Industrialized Countries (Taiwan, South Korea, Hong Kong, and Singapore), losing 7.8 and 8.2 percent of its average value against the Taiwan dollar and South Korean won for the year as a whole. (See chart 4.)

The first-half appreciation of the dollar in 1989 took many observers by surprise and may have signaled a temporary halt of effective cooperation by major industrial nations to control currency movements. Prior to 1989, an overall 4-year decline of the dollar, which was precipitated by the Group of Five's (G-5) signing of the Plaza Accord in 1985 and which continued—albeit at a slower rate—following the signing of the Louvre Accord by the Group of Seven (G-7) in 1987,⁵ was designed to promote U.S. exports and to balance world trade. However, the trade-weighted 2.1-percent depreciation of the dollar in 1988 for all import commodities was the smallest annual decline since 1985. The dollar's rise during the middle of 1988, while reversed in the fourth quarter, foreshadowed things to come.

The erratic nature of currency fluctuations and the numerous factors that influence exchange rates had more effect in 1989 than in the past. Interest rates, international developments, and a global increase in oil prices created a

Chart 1. Quarterly indexes of U.S. dollar prices and average exchange rates for all imports except fuels, and all exports, 1985-89



climate more conducive to volatile currency swings throughout the year.

Interest rates. High U.S. interest rates, a tight money supply, and widening interest rate differentials with foreign trading partners were the major reasons behind the dollar's increase early in 1989. In an effort to ease inflationary concerns and temper economic growth by discouraging borrowing, U.S. monetary authorities permitted short-term interest rates to rise. On February 24, the Federal Reserve increased the discount rate by one-half of a percentage point.⁶ In the interim, monetary policy in West Germany, Japan, and England kept interest rates in those nations stable, causing demand for the dollar to grow, and hence increasing its value.

In April, spurred by the G-7 statement that the "continued rise of the dollar which undermined adjustment efforts, or an excess decline, would be counterproductive,"⁷ many European central banks followed West Germany's lead by raising their own discount rates. Concern for the dollar's upswing also emanated from the White House, which claimed that the strong dollar could detract from the goal of reducing global trade imbalances.

From the end of 1988 through June of 1989, the dollar was nearly 13 and 17 percent higher against the mark and yen,⁸ with similar double-digit increases posted against other European currencies. Despite the efforts of the G-7 to fight the rise of the dollar, its exchange rate climbed to yearly highs of 2.03 marks and 149 yen,⁹ notably higher than the 1.90-mark and 140-yen levels thought to be the upper limits desired by the G-7.

During the second half of 1989, the combination of declining U.S. interest rates and rising foreign rates began to narrow the differential. After continued strong domestic economic growth in the beginning of the year, statistics that indicated an easing economy led to fears of a slowdown. Monetary policy was loosened and short-term interest rates declined. On August 1, many banks reduced their prime lending rates.¹⁰

In September, finance ministers of the G-7 met and again issued a statement that the strong dollar was unwanted and could adversely affect the world economy. Thereafter, the dollar started to fall, picking up speed when the central bank of West Germany increased its discount rate another 1 percent in October in response to its own growing economy. Other Western European countries, including Britain, France, and Switzerland, supported their discount rates as well, while Japan raised its rate by one-half of 1 percent.¹¹ Meanwhile, U.S. interest rates continued their descent as the year came to a close.

After reaching a high of 9.57 percent in March, the average annual yield for 1-year U.S. Treasury notes and bonds fell to 7.77 percent by November.¹²

Canada was the one major industrialized country whose currency failed to depreciate against the dollar during the first half of 1989. Subsequently, the U.S. dollar lost nearly 4 percent of its annual average value against the Canadian dollar.¹³ High Canadian interest rates throughout 1989 matched those in the United States, as Canada attempted to slow its economy and avoid accelerating inflation. Average short-term interest rates peaked in Canada at about the same time as in the United States, rising to 12.58 percent in April after averaging 11.15 percent at the end of 1988. The rate differential reached a 9-year high in November, when interest rates in the United States dropped and those in Canada remained stable.¹⁴

International developments. Developments around the world, ranging from in-house government dissension in England to the opening of borders in Eastern Europe, played a role—albeit not a quantifiable one—in currency markets during 1989. In general, political instability abroad worked to the dollar's advantage during the first half of the year, while events later in the year benefited the foreign currencies.

In April, Japanese Prime Minister Noboru Takeshita announced that he would resign after allegations linked him to an insider trading scandal. In addition, the ruling Liberal Democratic Party lost the upper house of parliament, and speculation about the potential resignation by the Bank of Japan's Governor Sumitomo contributed to continued political uncertainty in that country.¹⁵

During the spring, West Germany's Chancellor Helmut Kohl was engaged in an intra-party struggle. This, and a belief that Kohl's ruling coalition could possibly be replaced by an alliance of socialists and environmentalists, caused many investors to view the dollar as a safer haven than the mark. Also contributing to economic uncertainty was confusion over the implementation and ensuing removal of a withholding tax on interest, as well as Kohl's struggle in NATO over nuclear weapons policy.¹⁶

In the People's Republic of China, anti-government protests by students, although unsuccessful, moved some to worry that disorder could spread to other parts of Asia. There also was concern that the economies of other countries in the region that rely heavily on export growth, especially the Newly Industrialized Countries, might be adversely affected by possible lower demand for goods in China. Both the

Political instability abroad worked to the dollar's advantage during first-half 1989.

Taiwan dollar and South Korean won, which had been appreciating against the U.S. dollar through the year's first 5 months, began to decline in June. The yen, which had been depreciating up to that time, experienced its biggest monthly drop of the year during June, falling more than 4 percent.¹⁷

The U.K. pound grew stronger against the dollar during the second half of the year, although its rise was the smallest among the other G-7 European countries.¹⁸ Developments reflected political tensions which heightened towards the end of October, when both the Chancellor of the Exchequer and Prime Minister Margaret Thatcher's chief economic advisor resigned in a dispute over who was in charge of monetary and economic policy.

The controversy, reported as Thatcher's most serious crisis in her 10-year tenure, centered around Britain's joining the European Monetary System (EMS). At the time, Britain was the last major country in the European Community yet to commit to the EMS. Thatcher, who previously opposed joining the EMS and believed that Britain should keep its independence in determining economic policy rather than targeting the pound with the other European currencies, softened her stance, providing certain conditions were met. Among the conditions specified were guarantees that the movement of capital would not be restricted, that all subsidies would be removed, and that foreign exchange controls would be eliminated.¹⁹

The steepest decline of the dollar in the second half of the year occurred against the West German mark, which seemed to benefit most from the opening of East Germany's borders in November and the subsequent opening of many other Eastern European countries. The ramifications of these political developments were especially vague, however, as some analysts predicted that the mark would start to depreciate for the very same reasons.

Increase in oil prices. The sharp increase in world oil prices also played a role in the higher value of the dollar early in the year. Because all of the world's oil is purchased in dollars, higher oil prices translated into stronger demand for dollars from abroad. In the United States alone, the price index for imported crude petroleum jumped 36.9 percent through the first 6 months of 1989. During the final two quarters, however, the index rose just 3 percent.

The trade deficit

Despite the appreciation of the dollar, the Nation's real merchandise trade deficit fell to \$107.6 billion in 1989, the third consecutive

annual decline since the \$167.8 billion peak in 1986.²⁰ (See charts 5 and 6.) Although the trade deficit declined at a slower 12.4-percent rate for the year, in comparison to the 20.7-percent reduction in 1988, it ended the year at its lowest level since 1983. Imports grew 5.8 percent in 1989 to \$494.4 billion, slightly slower than the 6.1-percent rate recorded in 1988. However, exports increased 12.3 percent to \$386.8 billion, considerably less than the 16.2-percent and 20.6-percent advances in 1987 and 1988, respectively.

The imbalance with selected trading partners fell in 1989 as well. The deficit with the European Community dropped 87.6 percent to \$1.5 billion for the year.²¹ Highlights of this reduction include a 25.2-percent decrease in the deficit with France, a 34.5-percent fall in the deficit with West Germany, and the reversal of the previous year's \$497 million deficit with the United Kingdom to a \$1.7 billion surplus in 1989. The U.S. trade debt with the Newly Industrialized Countries improved by 16.3 percent for the year, with deficits falling to \$3.8 billion with Hong Kong, \$6.4 billion with South Korea, and \$1.9 billion with Singapore. The deficit with Taiwan, however, rose 0.9 percent to \$13.2 billion, while that with Japan remained persistently high, declining only 7.5 percent to \$49.1 billion.

On the export side, the year started out strong for overall deficit reduction, with seasonally adjusted and annualized merchandise exports in the first half of 1989 climbing 10.3 percent over 1988 levels, while the constant-dollar value of imports rose just 3.3 percent for the same period.²² The resulting \$102.8 billion deficit for the first 6 months of 1989 was a 16.3-percent improvement over 1988. The robust export growth began in 1987 and continued through June of 1989, as exports became increasingly important to the U.S. economy. Exports of goods and services as a percentage of constant-dollar GNP climbed from 11.1 percent in 1987 to 13.2 percent the following year, and to 14.0 percent for the first two quarters of 1989.²³ If services are excluded, the export share of GNP is even higher, having risen from 17.2 percent in 1987 to 20.7 percent in the first half of 1989.²⁴

The depreciation of the dollar was an important factor in the two-and-a-half-year U.S. export expansion. After an expected lag, the sharp fall in the value of the dollar between 1985 and 1988 increased the competitiveness of U.S. exports on world markets in 1987 and 1988. Despite a subsequent reversal of the dollar's direction, which resulted in a 6.9-percent appreciation of the currency on a trade-weighted

A sharp increase in world oil prices also tended to drive up the dollar.

basis for U.S. exports in first-half 1989, the lingering effects of the cheaper dollar remained a positive influence on exports during the first half of the year.

Strong economic growth among the Nation's major trading partners contributed to the export boom by ensuring healthy demand for U.S. exports from early 1987 through midyear 1989. For Canada, the annual increase in gross domestic product (GDP) rose steadily from 3.1 percent in 1986 to 5.0 percent in 1988; in Japan, it climbed from 2.5 percent to 5.7 percent for the same period; and the rate of increase for the European Community rose from 2.6 percent to 3.8 percent.²⁵

In the second half of 1989, the real U.S. trade deficit deteriorated to \$112.4 billion dollars, as exports grew only 3.7 percent above first-half levels and the rate of increase in imports quickened to 4.9 percent.²⁶ Although the dollar reversed direction in the latter half of the year, falling 4.2 percent on an export trade-weighted basis, lagged effects of the dollar's unexpected appreciation in the first half reduced U.S. competitiveness in world markets in the final two quarters of 1989. The resulting slowdown in export growth was intensified by softened demand for U.S. exports late in 1989, as the increase in GDP slowed for many U.S. trade partners, such as Canada, Japan, and the European Community. As previously noted, the latter countries were raising interest rates during this time to curb their growing economies.

The divergent trends in constant-dollar exports between the first and second halves of 1989 were especially evident for industrial supplies and materials and for consumer goods. In the former category, exports were a seasonally adjusted and annualized 14.7 percent greater in the first 6 months of 1989 than in 1988 and just 0.8 percent higher in the second half of the year than in the first half.²⁷ For consumer goods, the first-half increase in exports was 24.4 percent and a comparatively small 6.7 percent in the latter half. (See chart 7.)

When measured in current dollars, the category of capital goods excluding autos also exhibited a large difference in export growth between the two periods. For the first two quarters, exports of capital goods climbed 12.5 percent, a sharp contrast to the 6.6-percent rise in the final two quarters.²⁸

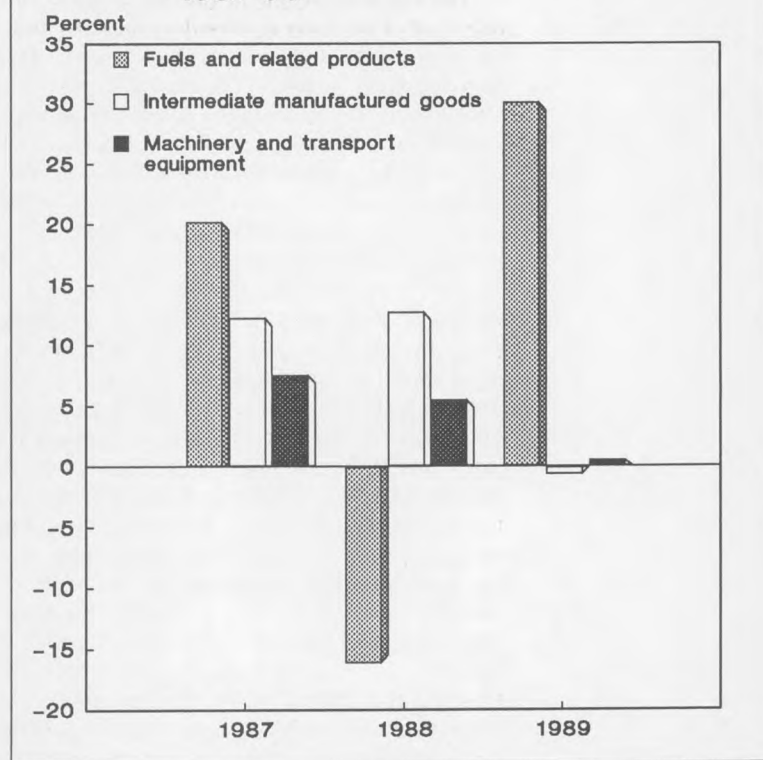
Unlike the overall large increase in exports in 1989, merchandise import growth in constant dollars moderated only slightly for the year. Of the \$27.3 billion rise in imports in 1989, 22.7 percent was due to an increase in oil imports.²⁹ In current dollars, oil imports constituted a

much larger 35.6-percent share of the year's \$31.2 billion increase in all imports because of sharply higher crude petroleum prices in 1989.³⁰

In contrast to those for exports, the trends in current- and constant-dollar values for non-petroleum imports were notably different. Current-dollar nonpetroleum imports, which are not adjusted for price changes, rose 4.9 percent in 1989, a little less than one-half the rates of increase in both 1987 and 1988.³¹ However, constant-dollar nonpetroleum imports, which measure actual volumes, climbed 5.5 percent for the year, slightly faster than the 5.2-percent rate recorded in 1988.³²

While the level of U.S. exports has responded favorably to currency fluctuations and increased dramatically over the last 3 years, import penetration has not abated in response to the depreciation of the dollar between 1985 and 1988. In fact, constant-dollar imports of goods and services as a percentage of gross domestic purchases have risen fairly steadily. In 1989, the import share totaled 15.3 percent, compared to 14.8 percent in 1988 and 14.0 percent in 1987.³³ For merchandise imports only, the degree of import penetration was even larger, having grown to 24.6 percent in 1989 from 23.6 percent in 1988, and 24.2 percent in 1987.³⁴

Chart 2. Annual percent price changes for selected categories of U.S. Imports, 1987-89



A notable factor in the failure of U.S. import volumes to decline significantly has been the minimal amount of home currency appreciation passed along by foreign producers to U.S. consumers in the form of higher prices since 1985.³⁵ Although the pass-through rate for nonfuel imports increased to 58.4 percent for the period between March 1985 and December 1988, compared to 42.5 percent between March 1985 and December 1987,³⁶ the rate still remains considerably below levels of the 1970's. Plausible explanations for the lower pass-through rates are that foreign producers are shaving profits, as well as cutting costs, to preserve U.S. market share.

Import price trends

Energy. After a 16.1-percent decline in 1988, the index for imported fuels and related products climbed 30 percent in 1989, largely because of a 41-percent jump in crude petroleum prices. Early in the year, perceptions of improved unity within the Organization of Petroleum Exporting Countries (OPEC), coupled with strong world demand for OPEC oil, contributed to the surge in imported petroleum prices, much of which occurred in the first quarter.

In November of 1988, the 13-member cartel had unanimously signed an agreement to restrict their combined output to 18.5 million barrels per day (mb/d) for the first half of 1989, substantially below the 20.9 mb/d production level recorded in 1988.³⁷ After gaining quota parity with Iran, Iraq signed the agreement, marking this as the first time Iraq has signed any OPEC agreement since 1986. Subsequently, the November accord was hailed as one of the strongest OPEC actions in years, and much needed after lack of unity within the cartel during 1988 led to overproduction, which caused crude oil prices to drop 20.5 percent for that year.

Despite the perceived cohesiveness of the organization, OPEC production for the first 3 months of 1989 averaged 21.1 mb/d, 2.6 mb/d over quota.³⁸ Although every country in the cartel overproduced during the first quarter, the United Arab Emirates and Kuwait exceeded their quotas by the largest amounts. The United Arab Emirates produced 1.7 mb/d, almost 75 percent above its allotment, while Kuwaiti oil production was 1.3 mb/d, 25.4 percent above quota.³⁹ Many observers had speculated that Iran and Iraq would produce as much oil as possible to finance reconstruction after the Iran-Iraq war ended in August of 1988. Realizing that revenue maximization would not be achieved by flooding the market, however, neither country exceeded its first-quarter quota by a large margin.

Unlike the situation in 1988, increased demand for OPEC oil absorbed the excess supply and, in turn, drove up prices during the first 3 months of 1989. Petroleum consumption by member nations of the Organization for Economic Cooperation and Development (OECD)⁴⁰ rose by 537,000 b/d for the period.⁴¹ Petroleum consumption in the United States, which accounts for over 45 percent of OECD consumption, grew just 0.2 percent. However, a 6.6-percent reduction in U.S. crude oil production for the first quarter forced the Nation to increase its reliance on foreign oil to fill the widening gap between petroleum supply and demand.⁴² OPEC provided much of the crude oil needed, as output was reduced by some non-OPEC countries, such as the United Kingdom, where a series of oilfield accidents late in 1988 had forced cutbacks in North Sea area production.

In the second quarter of the year, crude petroleum prices rose 7.2 percent, considerably less than the 27.8-percent jump in the first quarter. The primary reason for the moderating prices was increased overproduction by OPEC, which coincided with disunity among cartel members. Total OPEC production averaged 22.2 mb/d from April to May, 3.7 mb/d above quota.⁴³ All 13 members produced over quota, with the United Arab Emirates and Kuwait exceeding their allotments by 827,000 and 898,000 b/d, respectively, in continued protest of what they believed to be unjustifiably low quotas assigned to them in November of 1988.⁴⁴

As the third largest reserve holder in the world, with most of its oil sold as petroleum products, Kuwait has a big incentive to exceed quota and therefore benefits from lower crude oil prices that increase product margins.⁴⁵ It was Kuwait's tendency to overproduce that resulted in the continuing deterioration of Saudi-Kuwaiti relations, causing both the June and September OPEC meetings to fall short of expectations. Saudi Arabia's continual insistence on stable prices and the maintenance of its 24.6-percent OPEC share remained a source of friction with Kuwait and the United Arab Emirates, both of which prefer quota allocation based on reserve holdings and production capacity. The agreements reached at the two meetings increased the OPEC production ceiling by 1 mb/d for each quarter, but Kuwait, which, along with the United Arab Emirates, had pushed for a disproportionate increase in its quota, signed both accords "with reservations," thus making it known that Kuwait would continue to produce at a level it considered optimal for its own interests.

The breakdown of relations among OPEC members led to repeated overproduction in both

Merchandise import growth moderated only slightly for the year.

the third and fourth quarters of 1989 as demand from the slower-growing Western economies fell slightly, causing crude petroleum prices to stabilize in the latter half of the year. In the United States, petroleum consumption from July to December averaged 17.25 mb/d, 230,000 b/d below year-earlier levels.⁴⁶

Although crude oil prices were sharply higher for the year, net U.S. petroleum imports were up 8.1 percent in 1989 to 7.119 mb/d, the highest level since 1979.⁴⁷ This reflected the continuation of a 3-year trend of growing U.S. dependence on crude oil imports. Net imports as a percentage of U.S. petroleum products supplied reached 41.3 percent for the year, compared to 38.1 percent in 1988. Plummeting world oil prices in the mid-1980's precipitated the increased reliance on foreign oil, as U.S. petroleum consumption rose 1.5 mb/d from 1985 to 1989⁴⁸ while domestic production fell 1.34 mb/d over the same period.⁴⁹

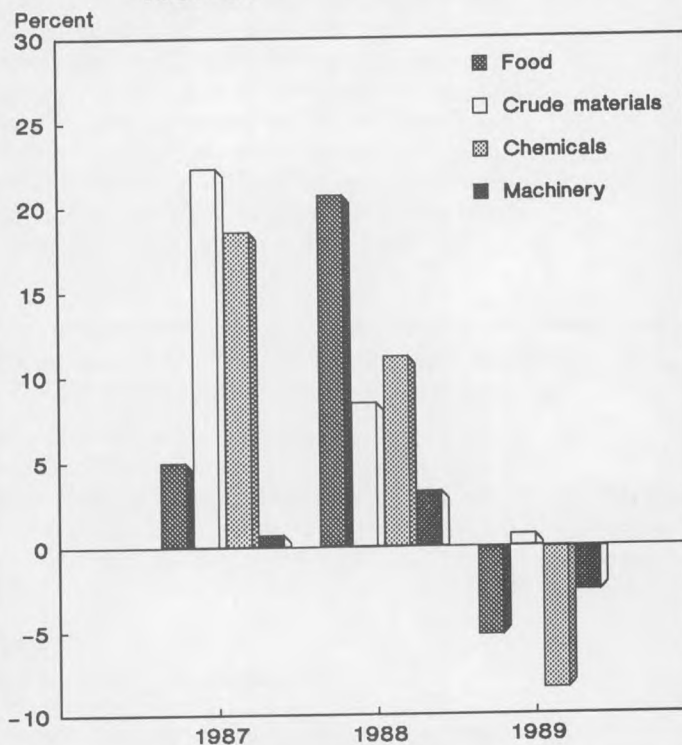
Growing U.S. dependence on foreign oil, largely from OPEC, is likely to continue, because the U.S. oil industry has not supported significant amounts of additional spending on exploration projects. The average number of rotary rigs in operation in the United States, an important indicator of future U.S. production levels, totaled 869 in 1989 compared to 936 in 1988 and the 3,970 record set in 1981.⁵⁰ The number of oil wells completed in the United States dropped to 10,860 for the year, 15.9 percent below the number completed in 1988.

Intermediate manufactures. Import prices for intermediate manufactured products decreased 0.7 percent in 1989. The drop was primarily a result of domestic economic conditions, which were characterized by some analysts as the foreshadowing of a recession, by others simply as a slowdown, and by Federal Reserve Board Chairman Alan Greenspan as a "temporary hesitation."⁵¹

The downward trend in the index for intermediate manufactured products, which accounts for nearly 16 percent of the all-import index, marked the end of 3 years of upswings that had included 12.3- and 12.7-percent surges in 1987 and 1988. Among the index's nine subcategories, three experienced annual price declines while another three experienced rates of increase smaller than those recorded in 1987 and 1988. (See chart 8.)

Steel prices, which had climbed a cumulative 30 percent over the years 1987-88, showed no change in 1989. Nonferrous metals prices, which had risen 66.6 percent over the same period, decreased 14.4 percent in 1989, and

Chart 3. Annual percent price changes for selected categories of U.S. exports, 1987-89



prices for metal manufactures, which had increased nearly 21 percent during 1987-88, moved up 2.4 percent, the smallest change in that index since 1984. These three categories represent the first, second, and fourth largest groups within the intermediate manufactured products index, with iron and steel and nonferrous metals accounting for more than one-third of the aggregate index. The 8.1-percent jump in nonmetallic mineral manufactures, caused in part by the 14.8-percent increase for gemstones, was the only major subcategory to post a significant increase.

While the economy completed its seventh consecutive year of expansion in 1989,⁵² the rate of growth declined, with most economic indicators falling from previous levels. Real GNP increased 3.0 percent in 1989, the smallest annual advance since 1986 and significantly below the 4.4-percent advance in 1988.⁵³ In addition, output from the automobile, construction, and housing industries, which are major end users of iron, steel, and nonferrous metals, fell from the record levels set in the past few years. The result was stagnant or lower prices for the intermediate products, especially in the second half of the year, during which the slowdown combined

Import and Export Prices in 1989

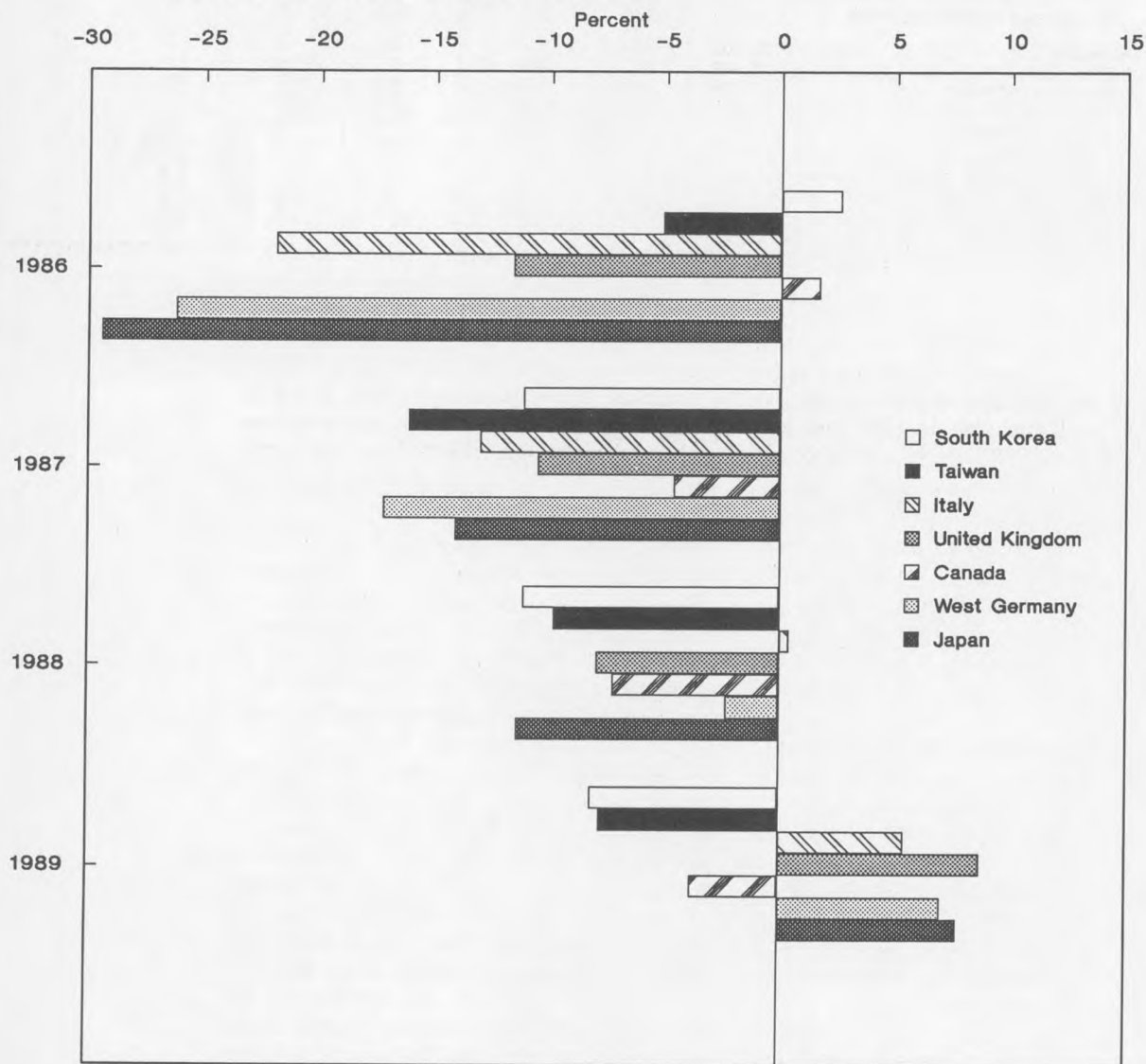
with cautious expectations for the near future to reduce demand even further.

During the expansive years of 1987 and 1988, demand for intermediate products and the outputs they are used to manufacture skyrocketed, supply shortages arose, and prices jumped. In response to rising prices, metal plants that had closed during the recessionary times of the early 1980's were reopened, company investment increased, and capacity levels grew. The additional capacity that came online between late 1988 and the middle of 1989, along

with the economy's slowdown, resulted in rising inventory levels that lasted throughout the year.

Import prices for iron and steel moderated during 1989, as the 1.5-percent increase during the first quarter was followed by relative price inactivity in the middle 6 months, and was subsequently negated by the 2.2-percent drop in the final quarter. At the subgroup level, the small annual increase for the universals, plates, and sheets index was offset by declines in the indexes for ferroalloys and for tubes, pipes, and fittings.

Chart 4. Annual percent change in the exchange rate of the dollar against various foreign currencies, 1986-89



SOURCE: Federal Reserve Bulletin, various issues, table 3.28, "Foreign Exchange Rates."

Table 1. Changes in import and export price indexes for selected product categories, 1988 – 89

SITC code	Product category	Percent	Annual percent change		Quarterly percent change			
			December 1987 to December 1988	December 1988 to December 1989	December 1988 to March 1989	March 1989 to June 1989	June 1989 to September 1989	September 1989 to December 1989
	All imports	100.000	4.5	1.9	1.8	0.1	-1.2	1.2
	All imports excluding fuels	90.746	6.9	-5	.4	-8	-7	.7
0	Food	4.940	1.6	-5.5	-.2	-2.5	-4.7	1.8
1	Beverages and tobacco	1.117	2.4	5.3	.7	.2	3.0	1.4
2	Crude materials	3.629	17.3	-5.0	2.1	-1.3	-4.9	-8
3	Fuels and related products	9.252	-16.1	30.0	18.4	9.7	-6.1	6.5
4	Fats and oils .....	.179	10.0	-10.3	.2	4.4	-9.1	-5.6
5	Chemicals and related products	4.213	11.0	-2.7	1.1	-2.6	-2.2	1.0
6	Intermediate manufactured products ..	15.847	12.7	-.7	1.7	-.9	-.6	-.9
7	Machinery and transport equipment ..	44.295	5.5	.2	.2	-.7	-.2	.9
8	Miscellaneous manufactured articles ..	15.745	3.9	1.8	.0	.0	.5	1.3
	All exports	100.000	6.4	.6	1.5	-.1	-.7	-.1
0	Food	9.603	20.7	-5.2	3.0	-1.8	-4.4	-1.9
1	Beverages and tobacco	1.628	4.4	7.3	4.9	.3	2.4	-.4
2	Crude materials	10.676	8.5	.7	5.0	.3	2.4	-1.7
3	Fuels and related products	4.013	-3.8	14.7	2.9	5.3	2.2	3.6
4	Fats and oils .....	.560	12.1	-5.2	-1.3	-3.3	-4.0	3.5
5	Chemicals and related products	11.645	11.2	-8.4	.0	-2.9	-3.4	-2.3
6	Intermediate manufactured products ..	8.194	8.5	1.7	-1.7	.4	-.2	-.2
7	Machinery and transport equipment ..	45.294	3.3	2.6	.9	.5	.7	.6
8	Miscellaneous manufactured articles ..	7.702	4.6	3.9	.8	1.3	.7	1.1

Import prices and volumes of iron and steel reflected the condition of the domestic steel industry, which was considerably stronger in the beginning of the year than at yearend. For example, U.S. steel shipments in 1989 rose less than 1 percent over 1988's record-setting total,⁵⁴ despite having increased 4.5 percent in the first quarter.⁵⁵ Capacity utilization, while on a par with 1988 levels through May at nearly 90 percent,⁵⁶ ended the year at just over 84 percent.⁵⁷ In addition, steel production, which rose 9 and 12 percent in 1987 and 1988, respectively, declined more than 2 percent in 1989. Domestic consumption also fell more than 5 percent for the year.

Declines in shipments to the two largest domestic markets, service centers and the automotive industry, were the primary reason for the steel industry's lethargy. Shipments to service centers and distributors, which account for more than one-fifth of all steel shipments, fell an estimated 3.2 percent to 18.4 million tons in 1989;⁵⁸ meanwhile, those to auto markets dropped 7.1 percent to 11.2 million tons, after increasing more than 13 percent in the first quarter.⁵⁹

The decline in sales of both domestic and imported automobiles in the United States caused car inventories to grow throughout 1989, particularly in the latter half of the year. Con-

currently, distributor steel inventories rose and peaked in the summer because of deliberate overstocking in midyear to combat the threat of a potential steelworkers strike that failed to occur, lower lead times between orders by customers and contracted delivery dates, and a general inability to draw down stock levels in the face of weak demand.

Import volumes of steel also declined in 1989, falling 16.7 percent from the previous year.⁶⁰ The combination of sluggish U.S. demand, the relatively weak dollar, and stronger economies in Europe and Japan kept foreign shipments to this country below the import levels dictated by the Voluntary Restraint Agreements (VRA's) that were negotiated in 1984. In all, the volume of imports from the 29 countries affected by the VRA's⁶¹ for steel mill products and certain fabricated steel products declined 12.3 percent during 1989.⁶² This continues a trend also noted in 1988, during which foreign producers exported to the United States just 75 percent of their allotted total,⁶³ and concentrated more on supplying their own growing markets. U.S. purchasers of steel have responded to lower import levels by buying their steel domestically. Imports from Canada, the only major producer not covered by a VRA, decreased more than 6 percent as well.⁶⁴ Since the VRA's went into effect, total imports as a percent of U.S.

market share have fallen from 28.4 percent to just over 17 percent in 1989.⁶⁵

The VRA's have achieved their goal of reducing foreign competition in the U.S. steel market. To ensure that this trend would continue, the industry began lobbying for a 5-year extension of the program well before its scheduled September 30, 1989, expiration date. In July, the agreements were extended until March 31, 1992. The new pacts, while similar to the earlier ones, allow import penetration starting at 18.4 percent to increase by 1 percent each year. Provisions were also made to loosen restrictions in the event that steel supplies become scarce at any time. However, a decision to extend the VRA's for only two-and-a-half years was a compromise of a sort, as domestic steel purchasers had argued for the abolition of such agreements.

Prior to the extension, the International Trade Commission released the findings of its investigation of the effects of the VRA's on the domestic steel industry. The investigation, which was initiated by the Subcommittee on Trade of the U.S House of Representatives' Ways and Means Committee, concluded that the VRA's caused imported and domestic steel prices to increase between 0.2 and 1.6 percent

more each year between 1985 and 1988 than if the agreements had not been in place.⁶⁶ However, the Commission also decided that the VRA's had little, if any, adverse effect on the automotive, construction, or agricultural equipment industries.

Import prices for *nonferrous metals*, historically the most volatile category of the intermediate manufactured products index, followed a path similar to that of iron and steel prices in 1989, rising moderately in the first quarter and dropping rapidly in the final three quarters. The 14.4-percent annual decline was the first downward movement in the index since 1985 and the largest decrease since publication of the nonferrous metals index began in 1982. Import prices for all of the major subcategories of the index declined, except for a slight annual increase for zinc.

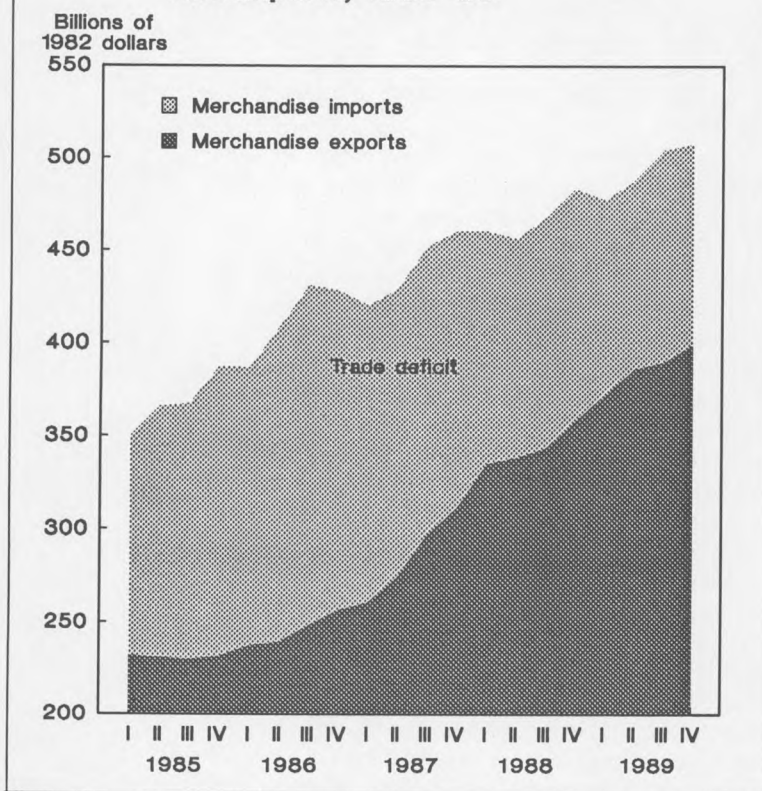
The slowdown in the economy also was the driving force behind lower prices for copper, aluminum, and nickel, and the slowed increase for zinc. Prices of the aforementioned metals, like those of iron and steel, all depend heavily on consumer demand and the strength of industrial activity. Consequently, the slowdown in the key transportation, housing, and construction sectors affected nonferrous metal prices similarly.

Copper prices—which in general appeared to be affected by the economic slowdown, falling 16.1 percent in 1989 after rising 32.9 percent in 1988—were more erratic during the year due to world production problems caused by work stoppages and other troubles in Belgium, Peru, Canada, Mexico, Chile, Zambia, and Papua New Guinea. All of the problems were resolved later in the year, except for the disorder in Papua New Guinea. The United States was the only major free world copper producer that failed to experience supply problems in 1989.

In response to the production disruptions and despite weak seasonal demand, imported copper prices increased 5.2 percent during the third quarter after falling the previous two. Unlike those of the other metals, copper supplies did not finish the year at especially strong levels, although the resolution of the supply interruptions and the continued slack in industrial activity caused prices to fall nearly 9 percent in the fourth quarter.

Despite the turmoil in most copper producing countries, global copper production increased during the year, most notably in the United States, which is second only to Chile as the world's largest copper producing nation.⁶⁷ The U.S. producers took advantage of the new solvent extraction electrowinning (SX-EW)

Chart 5. Value of U.S. merchandise exports and imports, 1985-89



technology, an innovative, low-cost method of extracting copper from ore. In 1989, about 18 percent of U.S. copper was produced using SX-EW technology, up from about 12 percent in 1987.⁶⁸ Copper ranks second only to aluminum as the most commonly used nonferrous metal in the U.S. and world economies.

The Nation's building and construction industry continued to be the largest market for copper shipments, accounting for more than 40 percent of all U.S. shipments.⁶⁹ In 1989, spending on construction projects grew just 1.2 percent, the lowest rate of increase since 1982.⁷⁰ The electrical and electronics sector and the industrial machinery and equipment industry were other major end markets for copper, while demand from the automobile industry accounted for slightly more than 10 percent of all copper shipments.⁷¹

Among the other nonferrous metals, aluminum recorded a price decline—18.7 percent—during the year because of increased capacity levels worldwide and weakening demand from many major end markets. Nickel prices fell almost 43 percent during the final three quarters and slightly more than 30 percent for the year as a whole. This was due to the softening stainless steel market, which accounts for about 40 percent of U.S. nickel demand and 60 percent of world demand.⁷²

The 8.1-percent increase for imported *non-metallic mineral manufactures*, which represent almost 16 percent of the intermediate manufactured products index, was the largest jump among all the index subcategories. The large increase in gemstone prices was primarily a result of the 15.5-percent price increase in March for rough or uncut diamonds by De Beers' Central Selling Organization, the South African cartel which controls 80 percent of the worldwide rough diamond market.⁷³ The 1989 increase for gemstones was the largest in 4 consecutive years of price increases by De Beers.

Imported diamond and other gemstone prices slowed considerably following the first quarter's 7.8-percent rise, especially in the United States, where diamond demand slackened following the cartel's action. Global demand for diamonds remains high, however, particularly in Japan, where the government substantially reduced the luxury tax, which applies to such items. Speculation for the future centers upon whether producers in Australia, Botswana, Namibia, Zaire, and the Soviet Union will follow the lead of those in Angola and break with the De Beers pricing strategy in an attempt to sell more of their stones on the

open market. In all, De Beers' second-half 1989 sales were 24 percent lower than first-half sales, while their annual sales were 2 percent lower than 1988's record level.⁷⁴

Machinery and transport equipment. The sluggish performance of the U.S. economy in 1989 and the appreciation of the dollar during the first half of the year were evident, to perhaps the greatest degree, in the price trends for imported machinery and transport equipment. The index for this category of goods, which accounts for almost 45 percent of the all-import index, experienced just a 0.2-percent annual upturn, substantially lower than the 7.6- and 5.5-percent yearly gains of 1987 and 1988. If the heavily weighted subcategory of road vehicles and parts is excluded, import prices for the remaining finished goods actually declined 0.5 percent.

There is evidence that the slowdown of the domestic economy played a part in the stagnation of import price growth, in that none of the machinery and transport equipment index's seven published subcategories posted a yearly rise of more than 0.8 percent in 1989. In comparison, over the 3-year period from 1986 through 1988, all subcategories except one registered annual increases of at least 2.9 percent each year. In 1989, import prices decreased in four subcategories—specifically, specialized machinery, office machines and automated data processing equipment, telecommunications equipment, and electrical machinery and equipment. Not since 1985 had any subcategory experienced an annual drop in prices, and not since 1984 had prices declined in so many product areas.

The aggregate index for machinery and transport equipment increased in the first and fourth quarters of 1989 and decreased during the middle two. The 0.7-percent second-quarter decline and 0.9-percent fourth-quarter rise were the index's largest quarterly movements. The trade-weighted value of the dollar for such commodities showed the most volatility during these two periods, appreciating 5.6 percent in the second quarter and depreciating 2.9 percent in the fourth quarter.

It is important to note that the BLS International Price Program accepts import price data reported in terms of both foreign currency and U.S. dollars. For the purposes of index calculation, prices stated in foreign denominations must be converted to dollars. Prices for as many as 37 percent of all metalworking machinery products and 33 percent of all general industrial machinery products were reported in foreign currencies, thus making the indexes in those

In 1989, spending for construction posted its lowest increase since 1982.

Import and Export Prices in 1989

areas more susceptible to exchange rate fluctuations. Consequently, these two subcategories of the machinery and transport equipment index showed the most sensitivity to the appreciation of the dollar in the second quarter.

Although fluctuations in the value of the dollar affected the direction of quarterly index movements, many other factors contributed to lower import prices in 1989. Among these were the sharp drop-off in consumer demand for automobiles and computers, an easing of supply constraints in such areas as semiconductors, and a leveling-off of production in machinery industries as a result of negligible growth of construction projects.

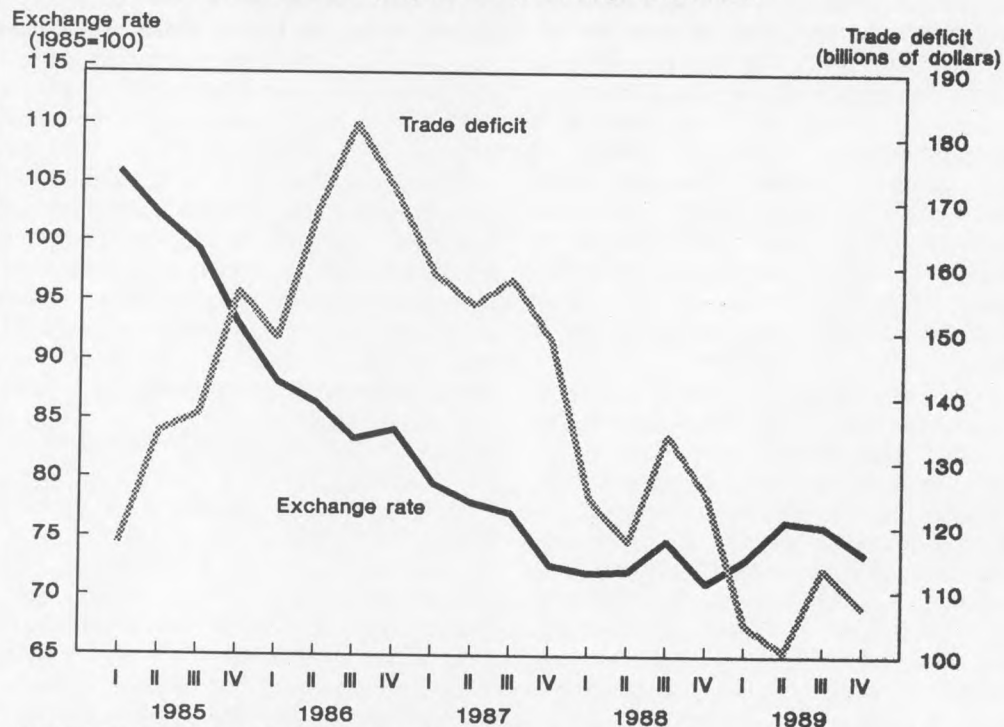
Prices for road vehicles and parts, which is the largest subcategory within the machinery and transport index and accounts for more than 18 percent of the all-import index, increased 0.8 percent for the year. That figure represents the lowest price advance in this area since 1982, at which time the U.S. economy was experiencing a recession. In 1989, the index decreased in each of the first three quarters, while the 1.9-percent advance in the fourth quarter, which reflected the introduction of the new 1990 model cars into the index, was lower than the

2.4-percent mean increase for all fourth quarters between 1982 and 1988. On average, the road vehicles and parts index had increased 7.5 percent annually between 1985 and 1988.

Prices for imported passenger automobiles rose 0.4 percent during 1989, the smallest annual increase since 1982, while those for automotive trucks advanced just 0.1 percent, the smallest gain in that area since publication of the trucks and special purpose vehicles index began in 1984. Most of the fourth-quarter price growth was attributed to higher costs associated with the new passive restraint systems required on all 1990 model cars sold in the United States.

The slowdown in the automobile industry during 1989 followed more than 4 years of substantial growth and record or near-record sales and profits.⁷⁵ Demand for passenger cars, in particular, stalled during 1989. Consumers stopped buying a new car every 3 or 4 years as a result of the increasing costs of purchasing an automobile and the cyclical lull that followed the recent boom. The two concepts are related, in that the higher retail car prices have caused consumers to extend their financial liabilities over a greater timespan.

Chart 6. U.S. trade deficit and real exchange rate of the U.S. dollar, quarterly data, 1985-89



NOTE: The exchange rate is based on the International Price Program's nominal average exchange rate for all imports.

As a result, U.S. sales of both domestic and imported passenger automobiles declined considerably throughout the year, falling a combined 6.6 percent from 1988 levels.⁷⁶ While performance during the first 9 months of 1989 led to speculation that an industrywide downturn was a possibility, it did not become a reality until the final 3 months. From October through December, total U.S. sales of all passenger automobiles fell nearly 17 percent from year-earlier levels. In December alone, car sales were down more than 25 percent from December 1988. Meanwhile, as production facilities were shut down, inventories continued to increase despite massive incentive packages that offered discounts, rebates, and cash-back programs to prospective buyers.

Although sales of imported automobiles decreased 8 percent in 1989 and the import share of the U.S. market fell nearly 0.5 percent,⁷⁷ the impact that foreign competition has had on the domestic car industry continued to grow. Output of automobile "transplants"—cars built in the United States in factories owned by foreign manufacturers—surged, with U.S. sales from transplant firms and joint ventures increasing 30 percent in 1989.⁷⁸ By November, a record was set, as more than 1 million cars were produced in transplant facilities. In addition, the market share held by Japanese manufacturers reached an all-time high of 26 percent during the year.⁷⁹ Two Japanese companies sold more cars in the United States during December than one of America's "Big Three" automakers, a historic first. Finally, although the public's perception of the quality gap between foreign-made and American-made cars narrowed, as indicated by the J.D. Power and Associates Consumer Satisfaction Index,⁸⁰ the Honda Accord became the best-selling car in the Nation during 1989, a distinction never before held by a non-American manufactured automobile.⁸¹

The influx of Japanese transplant automobiles, which comprised about 10 percent of the U.S. market through September of 1989,⁸² has resulted from the decrease in manufacturers' distribution expenses; the depreciation of the dollar, which in theory makes imports more expensive; and the restriction of imports to a bilaterally agreed-upon level of 2.3 million units per year. Because transplants are manufactured in the United States, they are not considered imports and thus are not subject to trade restrictions.

Among all of the machinery and transport equipment subcategories, the index for electrical machinery and equipment, which accounts for nearly 6 percent of the all-import index,

showed the greatest reversal between 1988 and 1989. After increasing 9.4 percent in 1988, the largest gain in the history of the index's publication, prices for electrical machinery and equipment declined 0.3 percent in 1989. The contrasting movements followed the divergent annual trends noted in the electronic components area—consisting primarily of semiconductors—for which prices fell 4.1 percent last year after rising 16 percent in 1988.

Contributing to the downward movement was an easing of supply problems, combined with weak demand for semiconductors and other electronic components after a somewhat unanticipatedly strong year in 1988. The softening computer, telecommunications, and automotive markets in the United States all played a role in weakening demand, as did an increase in capacity. The electronic components index decreased in all four quarters of 1989, as the average price of a 1-megabit DRAM (Dynamic Random-Access Memory) chip fell from more than \$15 in January to less than \$11 by October.⁸³

Japan, which controls between 65 and 70 percent of the world market for memory devices, continues to hold an even greater share of the DRAM market.⁸⁴ The supply shortage of 1988 transpired as the result of a 1986 agreement between the United States and Japan whereby Japan would stop "dumping" semiconductors—that is, selling them below cost—on the U.S. market, while the United States would take measures to increase its own production. In June of 1989, U.S. Memories, a consortium of U.S. computer and semiconductor companies that included IBM and Digital Equipment Corporation, was established, with the goal of producing large quantities of memory chips inexpensively. (However, the group was disbanded in January 1990 because of reported financing problems and a lack of commitment on the part of many companies to invest in the long-term project.⁸⁵)

Developments in export prices

Food. Following 2 years of increases—including the drought-generated 20.7-percent rise in 1988—the index for exported food products, which accounts for nearly 10 percent of the all-export index, declined 5.2 percent in 1989. Whereas the grain category constitutes nearly 60 percent of the index and is customarily the most volatile food subdivision, large decreases in other areas such as exported meat, fish, and animal feeds edged the index down even further than did the modest 1.0-percent drop in grain prices.

The impact of foreign competition on the domestic car industry continues to grow.

Import and Export Prices in 1989

In all, export prices for four of the six major food categories fell, with only those for fruits and vegetables and miscellaneous food products showing slight over-the-year increases. The index for exported fish and crustaceans dropped 24 percent after having risen 80.7 percent since 1984. Like that for fish, the index for animal feeds, consisting largely of soybean meal, registered its first annual decline in 5 years, dropping 17.9 percent. The index for exported meat and meat preparations declined 10.4 percent, its first downturn since BLS began publication of the index in 1983.

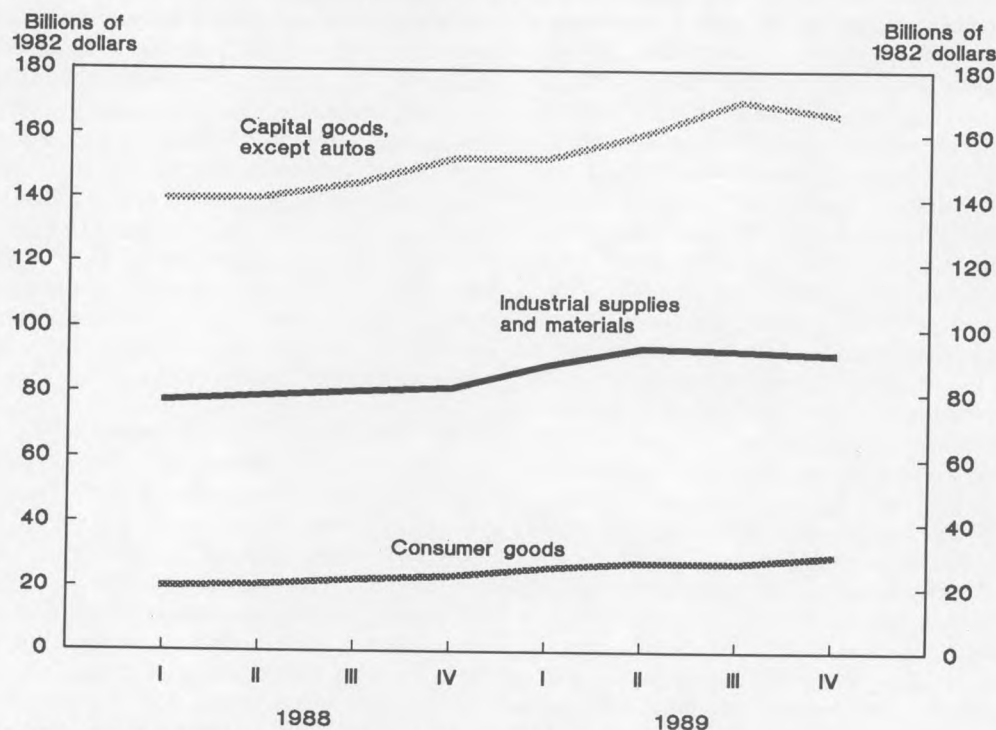
The slight dip in grain prices during 1989 marked the smallest change in the grain index since it was first published in 1980 and was a notable reversal from the cumulative 40.7-percent advance in the index over the years 1987–88. Prices were not pushed down substantially from inflated 1988 levels, primarily because beginning stock inventories were depleted as a result of the drought. That exported grain prices fell just 1 percent, as compared to the 12-percent annual drop in 1983—the year following the last domestic drought—tends to support claims that the 1988 drought was the worst since the mid-1930's.⁸⁶

Weather conditions around the country were considered adequate for food production during 1989. However, climatic effects of the 1988 drought lingered. The middle part of the country, including the Corn Belt and Northern Plains, was adversely affected during the growing season by already low ground moisture, a small rainfall, and other postdrought consequences. Cool summer temperatures and an increase in precipitation helped to offset those problems. The East, meanwhile, enjoyed a good year, as heavy rains helped the Southeast to its best crop in 5 or 6 years.⁸⁷ The western part of the country was dry once again.

Farmers tried to compensate for the effects of the drought by increasing acreage in 1989. For example, cropland idled in 1989 under the terms of annual Federal commodity programs was almost 50 percent below that in 1988.⁸⁸ The Federal Acreage Reduction Program's requirements, which make participating farmers reduce the amount of crop planted in order to qualify for price support assistance, were relaxed for wheat, corn, grain sorghum, and barley.

Declines in the aggregate exported *grain* index in the final three quarters offset the 6.3-percent increase registered in the first quarter.

Chart 7. Value of nonagricultural exports by end use category, quarterly data, 1988–89



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

The index for yellow corn, accounting for nearly 50 percent of the grain index, decreased 3.8 percent for the year, as sharp price drops during the harvest season more than compensated for increases in the first and fourth quarters. Wheat prices, however, continued to climb, rising 1.4 percent for the year as U.S. and world wheat supplies remained the tightest they had been in 20 years.⁸⁹ The wheat index constitutes nearly 32 percent of the grain index and almost 2 percent of the all-export index. The indexes for corn and wheat had increased 32.1 and 50.3 percent, respectively, during 1988. Rice prices, which were unaffected by the drought and had fallen 22.4 percent in 1988, rose 6.8 percent in 1989, primarily because of increased world consumption.

The decrease in corn prices subsequently proved to be the principal factor in lower grain prices. Corn production and yields for 1989 rebounded sharply from those achieved in 1988, reaching levels more in line with nondrought years. Production was estimated at 7.5 billion bushels, up from 4.9 billion, and the number of bushels harvested per acre jumped from 84.6 to 116.2.⁹⁰

Yields typically increase further the second year after a drought because the recovery year is often spent replenishing ground water and dealing with soil problems caused by unused fertilizer and chemicals. Following the droughts in 1970, 1974, 1980, and 1983, yields averaged 6.7 percent higher in the second postdrought year than in the recovery year.⁹¹ This past performance gives farmers high expectations for crops set to be harvested in 1990.

Corn stocks at the beginning of the 1989–90 marketing year—September 1989 through August 1990—were well below year-earlier levels as a result of the poor 1988 harvest and export expansion during the 1988–89 marketing year. (Grain and other agricultural statistics are often quoted in marketing year terms in order to reflect the 12 months between harvests.) September 1989 stocks numbered only 1.9 billion bushels, down substantially from the nearly 4.3 billion bushels available to start the 1988–89 marketing year.⁹² The United States, which became the world's largest exporter of corn in 1972–73⁹³ and accounted for 80 percent of the world's exports in fiscal year 1989 (October 1988–September 1989),⁹⁴ has started to sell abroad in volumes not seen since early in the decade. During the 1988–89 marketing year—the marketing year immediately following the drought—2.1 billion bushels of corn were exported.⁹⁵ This represents an 18.9-percent increase over the 1987–88 level.

The movements in corn export prices during the 1989 calendar year reflected the increased production but also stronger world demand. After a 7.0-percent drought-induced increase in the first quarter, the corn index fell 13 percent between March and September. The index was down 9.4 percent in the third quarter alone, due to seasonal decreases that are common with the fall harvest. The 3.3-percent turnaround in the fourth quarter was a result of the increased demand from the Soviet Union, which purchased nearly 8 million tons of U.S. corn during a 3-week period in October. That amount was equal to almost 50 percent of the Soviet Union's total corn purchases from the United States in 1988.⁹⁶ The increased Soviet demand resulted in revisions to the U.S.-Soviet Long Term Grain Agreement, which originally stated that the U.S.S.R. could buy as much as 12 million tons of grain each marketing year. In November, with Soviet purchases increasing, the limit was raised to 16 million tons, and later, to 20 million tons.⁹⁷

The wheat index increased 1.4 percent for the year, the smallest annual movement since 1984. The 6.8-percent advance in the first quarter was caused by poor growing conditions for winter wheat. Strong winds and an arctic flow of cold air in the Plains States preceded warmer-than-normal spring temperatures to reduce production. Output levels for Hard Winter Ordinary Wheat (HRW), which represents 45 percent of all U.S. exported wheat, posted 20-year lows and were down 18 percent from the 1988 crop.⁹⁸ Stocks of HRW were estimated at 300 million bushels on June 1, nearly 50 percent below year-earlier levels and the lowest since 1975.

Wheat exports decreased an estimated 3 million tons during the 1989 fiscal year. The Soviet Union purchased more than one-third fewer tons than their record 9 million tons in fiscal 1988 because of a better domestic crop.⁹⁹ Exports to Eastern Europe and Latin America also were estimated to be lower, offsetting larger exports to Pakistan and China.

The value of all agricultural exports, as well as the agricultural trade surplus, increased in fiscal 1989 as a result of higher prices for most agricultural products and the greater value of the dollar at the beginning of the year. U.S. exports were valued at \$39.7 billion, the highest total since 1981,¹⁰⁰ a 12-percent increase over fiscal 1988 performance, and the third consecutive yearly rise.¹⁰¹ Japan was the leading market, importing \$8.2 billion worth of U.S. products. The European Community and the U.S.S.R. followed at \$6.5 billion and \$3.2 billion, respectively. In unit terms, however, agricultural

The Soviet Union purchased nearly 8 million tons of U.S. corn during a 3-week period in October.

exports declined about 1 percent from the previous year in fiscal 1989. The trade surplus for U.S. agricultural products reached its highest level since fiscal 1984 at \$18.2 billion, \$3.8 billion greater than the 1988 mark.¹⁰²

The 24-percent decline in the *fish and crustaceans* index, which accounts for slightly more than 5 percent of the aggregate food index, represented the largest annual movement among the food subcategories. The index for fresh fish, accounting for 64 percent of all U.S. exported fish, was chiefly responsible for the drop, falling 27.1 percent. After having risen 25.2 and 29.0 percent in 1987 and 1988, fresh fish prices at the end of 1989 stood at their lowest levels since the middle of 1987.

Lower world salmon prices, the result of an oversupplied market, spurred the downturn. The total Alaskan salmon catch for the year reached a record 152 million,¹⁰³ up 21 percent from the March estimate of 125.6 million,¹⁰⁴ and 131 percent greater than the 1988 catch.¹⁰⁵ Alaska is the biggest supplier of the world salmon market, and the larger catch marked the first major U.S. production increase since 1985.¹⁰⁶

The Exxon Valdez oil spill in March of 1989, in which 11 million gallons of crude oil spilled into Alaska's Prince William Sound, had only minor impact on the salmon fishing industry. Although many fishing areas were forced to close and more than 1,000 fisherman claimed damages from Exxon Corp.,¹⁰⁷ the distant fishing waters in southeast Alaska and Bristol Bay were uncontaminated and extremely productive. Even in the well-harvested area surrounding Prince William Sound, salmon fishing was quite strong, with the catch nearly doubling the previous year's level.

The catch increase exacerbated an oversupply on the salmon market that had existed before the 1989 harvest began. The glut was actually caused during 1988 when demand grew, the fish catch was expected to be poor, and prices rose. Consumer demand subsequently fell, and prices began slipping in the fourth quarter of 1988 as sellers tried to move the old supplies. However, Japan, the United States' largest export fish market, apparently believed the leftover inventories were overpriced and slowed its purchases of salmon.

The United States was not the only fish producer to have a strong year. Norway doubled its production of farmed salmon in 1989 to 160,000 tons.¹⁰⁸ In addition, British Columbia, eastern Canada, Chile, Scotland, Ireland, and the Shetland Islands all registered productive years.

Prices for exported fish declined in all four quarters of 1989, with the third quarter's 13.7-

percent drop being the largest as it became apparent that production levels were going to be higher than anticipated. In response to the oversupplied market, Norway and British Columbia, as well as other countries, started advertising campaigns designed to increase salmon consumption. Attempts to do the same in the United States were rejected by the International Salmon Farmers Association early in the year, with talks set to resume in February 1990.¹⁰⁹ U.S. wholesalers have generally neglected the chance to introduce lower salmon prices at the retail level, preferring instead to realize larger profit margins.

Crude materials. Exported crude materials prices rose 0.7 percent in 1989, following gains of 22.3 percent in 1987 and 8.5 percent in 1988. Last year's rise was the smallest annual increase since the crude materials index was first published in 1983, and can be attributed to offsetting price movements among major components of the index. For example, annual increases were registered for wood (19.4 percent), textile fibers (12.4 percent), and pulp and wastepaper (6.7 percent), while decreases were recorded for oilseeds (19.3 percent) and metal ores and scrap (8.0 percent).

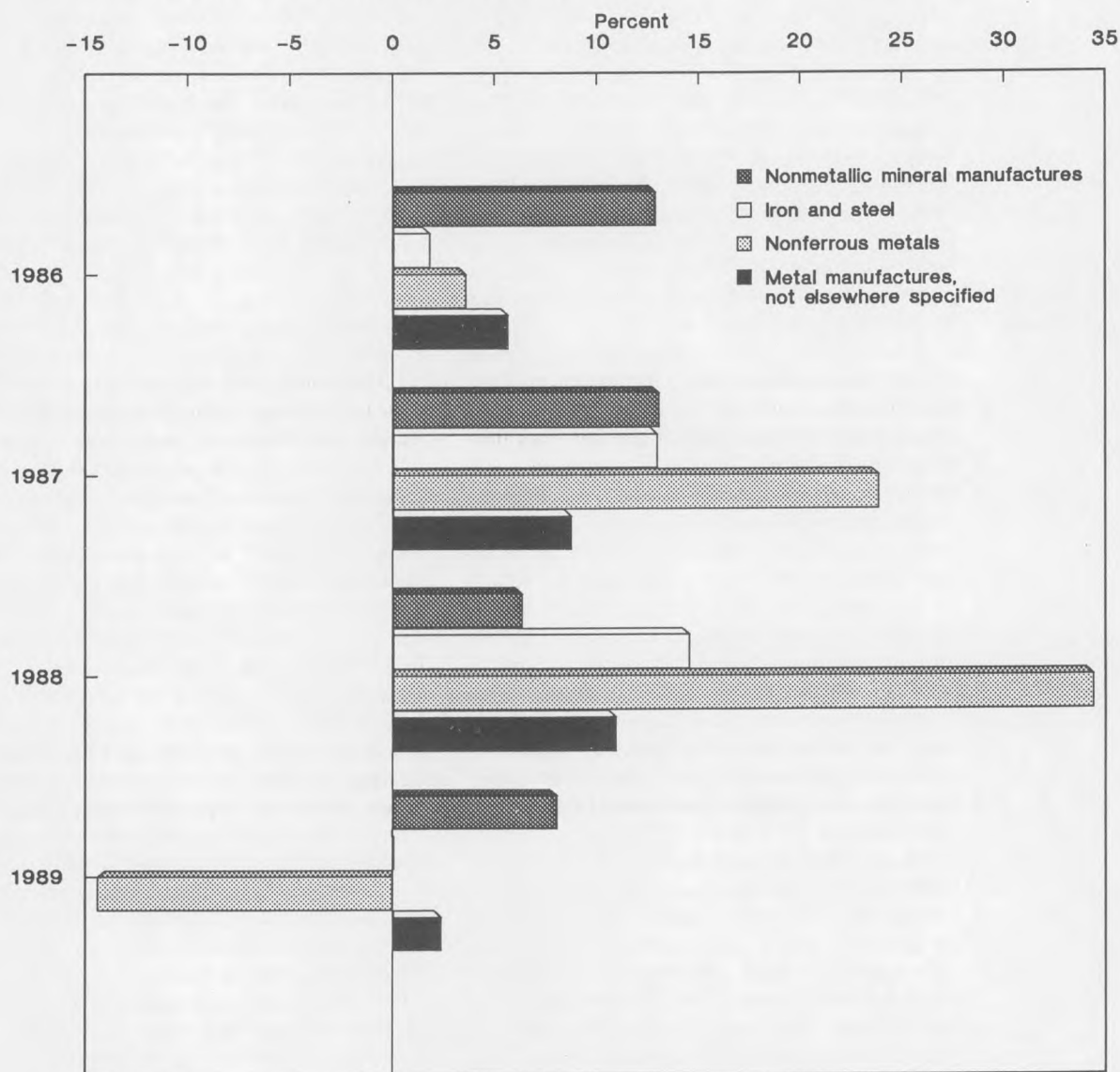
After rising only 1.8 percent in 1988, prices for exported *wood* climbed 19.4 percent, the year's largest advance within the crude materials category. Much of the increase occurred between March and September, with a peak in the second quarter. Tightened supplies within the United States and an export surge early in the year were the two primary forces driving up wood prices in 1989.

Wood supplies were restricted in March of last year when U.S. environmentalists blocked the logging of old-growth timber on Federal lands in the Pacific Northwest in order to protect the nesting sites of the threatened Northern Spotted Owl.¹¹⁰ The resulting 14.1-percent reduction in the total supply of forest land in Washington and Oregon forced many small independent sawmills, which depend heavily on Federal timber, to shut down. As court injunctions continued to restrict timber supplies throughout the spring and summer, the remaining larger forest product companies found it increasingly difficult to supply the market.

Growth in wood exports, especially to Japan, put further pressure on those U.S. producers still in business. Japan increased its purchases of softwood logs by 25.3 percent and of softwood lumber by 14.0 percent in 1989.¹¹¹ At the same time, U.S. lumber exports to the Middle East rose 39.4 percent. To avoid overcutting their

Prices of wood exports posted the largest advance within the crude materials category.

Chart 8. Annual percent price changes for selected categories of Imported metals manufactures, 1986-89



own future supplies, U.S. landholders used most of their private timber for export because, by law, logs cut from Federal land cannot be exported. As a result, prices were bid up for the already scarce and increasingly expensive Federal timber to supply the domestic market.

In Japan, the destination for over 60 percent of U.S. softwood exports in 1989, increased demand resulted in the payment of higher prices by the Japanese than by U.S. consumers. Strong levels of housing starts in Japan over the past 3 years, averaging 1.6 million to 1.7 million units

compared to 1.1 million units in the early 1980's, have kept wood consumption in that country high.¹¹² In the case of U.S. lumber, yen prices historically have been low, but they stood at or near record levels in dollars in 1989.¹¹³ This reflects cost advantages enjoyed by U.S. sawmills over Japanese sawmills gained through the declining value of the dollar against the yen during the past 3 years. The cost difference was reportedly large enough that the dollar's rebound in 1989 had little effect on the U.S. marketing edge.

Spurred by a 15.4-percent increase in *cotton* prices, the index for exported textile fibers climbed 12.4 percent in 1989, reversing the previous year's decline of 7.2 percent. Most of this increase was the result of an 11.2-percent rise in cotton prices in the second quarter of 1989.

The strength of the world cotton market in the spring was a principal factor in rising U.S. cotton export prices. World cotton production was up 4 percent in the 1988-89 marketing year (August 1988-July 1989), but estimates for 1989-90 are down 5.1 percent, to 80.1 million bales, as crops worldwide suffered from poor weather conditions.¹¹⁴ Furthermore, world consumption in 1989-90 is projected at 85.6 million bales, up 800,000 bales over 1988-89. Many of the leading suppliers of cotton, such as China, Pakistan, and the U.S.S.R., are facing growing domestic demand and have pulled their crops from the world market for lack of exportable supplies.¹¹⁵ China, the largest cotton producer, became a net importer of cotton in 1989 for the first time since the early 1980's, as the country's total consumption, driven by an expanding textile industry's needs, outweighed production.

In 1989, the U.S. cotton industry was in a position to take advantage of the tightness in foreign supplies, which led to higher prices abroad and thus made the U.S. cotton price more competitive. As a result, projected exports for 1989-90 are estimated at 7.7 million bales, a 25.2-percent increase over 1988-89 levels, as the U.S. share of global cotton trade grows from 24 percent to 30.1 percent.¹¹⁶

Exported *oilseeds* prices fell 19.3 percent in 1989 following two consecutive yearly increases of 15.1 percent and 23.8 percent. The decline was led by a 21.8-percent drop in soybean prices, most of which occurred in the second and third quarters. The 1988-89 production year (September 1988-August 1989) marketed the crop from the U.S. drought, which had driven production down 20.1 percent from the previous year to the lowest level for the decade.¹¹⁷ The drought-induced price effects, however, peaked in September of 1988, when low crop yield expectations forced prices 66.8 percent above year-earlier levels. Later projections for a 26.7-percent increase in the U.S. crop for the 1989-90 marketing year began to ease pressure on soybean prices, which fell in the second quarter.¹¹⁸

The size of the Brazilian crop, second only to that of the United States, also influenced soybean prices in 1989. In March of 1989, the U.S. Department of Agriculture predicted that Brazil's crop, which is harvested in February, would reach a record 21 million metric tons, a

16.3-percent increase over the previous marketing year.¹¹⁹ Brazilian soybean exports for the 1989-90 marketing year (February 1989-January 1990) were estimated at 4.2 million metric tons, up 39.5 percent from a year earlier. This increase might not have had a large effect on U.S. prices if, as in previous years, Brazil's crop had hit the market soon after harvesting. However, as of June, only 30 percent of the crop had been marketed,¹²⁰ as Brazilian farmers held back stocks because soybean export prices offered to them by their Government failed to match world prices adjusted for Brazilian inflation.¹²¹ (Unlike farmers in the United States, those in Brazil must sell their crop on the global market through the Government.) The marketing delay was exacerbated by a dock workers strike begun in April at Santos, the largest port in Brazil, through which 40 percent of last year's soybean exports passed.¹²²

When the Brazilian crop finally did enter the market late in the summer, the United States faced stiff competition for sales and prices fell further. As a result, the volume of U.S. soybean exports for 1989-90 is expected to increase only 11.9 percent over that posted for the drought year—which is still 26.6 percent below the 1987-88 level, despite an increase in exportable supplies of 29.7 percent over year-earlier levels.¹²³ Ending stocks are projected to be 81.3 percent higher for 1989-90 than for the previous year, but will still remain below the extremely high levels of 1985-86 and 1986-87.

Prices for exported *metal ores and scrap* also experienced a downturn in 1989. After 3 years of uninterrupted gains, the index for these exports fell 8.0 percent for the year, with the sharpest drop occurring in the final quarter. A 10.6-percent price decline for waste and scrap metal of iron or steel, together with a 15-percent reduction in nonferrous base metal waste and scrap prices, accounted for most of the drop.

The bearish trend in 1989 was primarily the result of a slowing U.S. economy, as well as increased supplies in the nonferrous metal markets. Demand for metals flattened out in 1989, and fell in the key construction and auto markets. At the same time, new capacity began to come online in late 1988 and early 1989 in response to rising prices over the past 3 years. This triggered price declines for the nonferrous base metals as well as for nonferrous scrap, which, pricewise, trend similarly to the primary metal markets.

Much of the downward impetus for ferrous scrap prices in 1989 was provided by stainless steel scrap. The primary end use for this material is as a source of nickel and chromium in the

U.S. soybean exporters faced stiff competition from their Brazilian counterparts in 1989.

production of cold rolled stainless steel products, and its price therefore trends with those of both metals. A sharp decline in output of stainless steel, which is the most important use of refined nickel, in the United States, Europe, and Japan, depressed prices for nickel, and consequently those for stainless steel scrap.¹²⁴

Chemicals. Prices for exported chemicals and related products fell 8.4 percent in 1989, after increases of 18.6 and 11.2 percent in 1987 and 1988. The year's decline was the largest for this index since initial publication in 1983, with indexes for most of the major subcategories falling in 1989. Those for manufactured fertilizers and for artificial resins, plastics, and cellulose recorded the largest declines, at 20.9 and 16.2 percent, respectively. Organic chemicals prices decreased 15.6 percent, while prices for inorganic elements, oxides, and salts edged down 3.6 percent.

The lower prices largely reflected a downturn in the U.S. chemicals industry, as well as a decline in orders from China, a big market for thermoplastics and basic chemicals. After a 3-year boom, activity in the U.S. chemicals industry began to ease in 1989. Operating rates fell to 88.3 percent after rising to 90.5 percent in the final quarter of 1988, the highest in 37 years.¹²⁵ Production growth slowed to an estimated 5 percent in 1989, compared to 7- and 8-percent increases in 1987 and 1988,¹²⁶ while industry capacity rose as nominal spending in the chemicals sector climbed 13.3 percent for the year.¹²⁷

Because China has become increasingly important to the U.S. chemicals industry, an unexpected reduction in chemicals exports to that country caused export prices to fall further. In each of the 2 previous years, exports of U.S. chemicals and related products to China grew by more than 70 percent.¹²⁸ In 1989, however, U.S. exports destined for China fell 13.1 percent. The decline in shipments can be attributed to an overheated Chinese economy, a lack of foreign currency reserves in that country precipitated by problems encountered in the transition to a more market-oriented economy, and to political upheaval.

Lower domestic prices for ethylene, the petrochemical produced in largest volume and the raw material for many other chemicals products, contributed significantly to the 15.6-percent decline in the index for organic chemicals exports. U.S. wholesale prices for ethylene fell 26.7 percent in 1989 after fears of a shortage had driven prices up 69 percent in 1988.¹²⁹ Excess capacity during 1989 was partly the reason for the price decline. In response to tight supplies in 1988,

producers brought approximately 1.4 million metric tons of additional capacity online in 1989.¹³⁰ At the same time, however, ethylene demand fell as purchasers tried to work off high inventories stockpiled during the previous year's shortage. In addition, U.S. exports of ethylene and its derivatives were hard hit by the curtailment of shipments to China in 1989, which furthered the decline in export prices.

The plastics industry, which uses ethylene as an input for many of its products, was similarly affected by depressed ethylene prices. Export prices for artificial resins, plastics, and cellulose fell 16.2 percent in 1989, following 25.4- and 6.2-percent increases in 1987 and 1988. Domestic wholesale prices for plastic resins and materials, which trend with export prices, declined 12.4 percent for the year.

In 1987 and 1988, prices for exported plastic materials rose sharply as U.S. operating rates were driven to near-capacity levels, the result both of capacity cutbacks in the early 1980's and vigorous demand. The trend was reversed last year when additional U.S. capacity came online and, as was the case for ethylene, purchases of many plastics materials by all levels of consumers were reduced as inventories were drawn down. Export prices were pulled down further by the sudden decline in shipments to China late in 1988 and throughout 1989. As a leading plastics products producer, China's purchases of polyethylene and polypropylene usually total 1 billion pounds of each a year.¹³¹

The fertilizer industry also suffered a disappointing year in 1989, as a 20.9-percent drop in export prices followed annual increases of 37.6 percent in 1987 and 12.6 percent in 1988. In the United States, excess production was precipitated by a projected 8- to 10-percent increase in domestic fertilizer demand for 1989 as farmers were expected to increase their crop acreage and replenish the soil to recoup losses from the drought of 1988.¹³² This did not prove to be the case, however, and domestic demand increased by only 4 to 5 percent.

Furthermore, the U.S. phosphate fertilizer industry, which exports approximately half of its production, has been losing market share to Morocco, the second largest producer of phosphate fertilizers.¹³³ Although the U.S. fertilizer industry has relatively low fixed costs compared to Third World countries such as Morocco, it has higher variable costs due to its dependence on higher priced raw materials. Because Morocco prices its fertilizers on the basis of variable costs, that country has enjoyed a competitive advantage over the United States. Restructuring of the U.S. fertilizer industry is

After a 3-year boom, activity in the U.S. chemicals industry began to ease in 1989.

currently under way to reduce costs and regain market share.

In spite of the fall in chemicals export prices, the U.S. chemicals trade surplus reached \$16 billion in 1989, up 33 percent over 1988's level.¹³⁴ Chemicals exports climbed 14.3 percent over 1988 to \$36.5 billion, despite the aforementioned loss of a significant portion of the Chinese market. In contrast, imports rose just 3.1 percent, to \$20.5 billion, in 1989.

The improvement in the chemicals trade surplus occurred despite the appreciation of the dollar in 1989. When measured against a trade-weighted basket of currencies representing the major markets for U.S. chemicals and related products, the dollar rose 3.1 percent for the year, causing prices for U.S. chemicals exports in foreign currencies to fall only 5.5 percent,¹³⁵ considerably less than the 8.4-percent decline in U.S. dollar prices for the year. The recent strength of the dollar is in sharp contrast to the experience of the previous 3 years, during which the dollar fell, greatly enhancing U.S. chemicals export competitiveness. The year's exchange rate reversal did not adversely affect the chemicals industry, however, given that, at the end of 1989, the value of the dollar remained 28.4 percent below that in March of 1985.

Machinery and transport equipment. Reacting to continued strong demand for U.S. products overseas, prices for exported machinery and transport equipment increased 2.6 percent in 1989. The upward movement marks the 11th consecutive annual advance in this index, yet the rise in prices slowed slightly from the 3.3-percent hike of the previous year, during which exports surged significantly as a result of the lower value of the dollar and economic expansion abroad.

All but one of the subcategories within the machinery and transport equipment index, which accounts for more than 45 percent of the all-export index, increased during the year. Only the index for office machines and automated data processing equipment fell in 1989, declining 2.0 percent. Among the major index subcategories, the index for road vehicles and parts climbed 3.0 percent in 1989 and that for power generating machinery and equipment rose 4.6 percent. The index for electrical machinery and equipment gained a modest 1.2 percent.

The index for specialized machinery showed the strongest movement among the subcategories, rising 5.0 percent during 1989 following a 5.1-percent increase for the previous year. Prices for construction machinery and construction machinery parts, which together comprise

nearly half of the specialized machinery index, experienced the largest increase, rising 7.3 percent in 1989 after a 5.5-percent jump in 1988. The continued price gains in 1989 were partially a result of higher raw materials costs that were prevalent in 1987 and 1988. In addition, strong demand, which has led to lower transaction lead times and smaller, yet more frequent, orders, has boosted shipping and distribution costs, which have subsequently been passed along to the foreign buyer. Most significantly, however, is the transformation within the industry that began in the mid-1980's and resulted in more competitive U.S. products. This has enabled domestic producers to realize larger profit margins by increasing prices without losing market share.

From 1982 through 1987, prices for construction machinery and parts were relatively stable, with 3 years of modest increases countering 3 years of modest decreases. Price developments reflected a sagging U.S. construction industry that failed to respond to worldwide technological innovations and to a loss of domestic market share to foreign imports.

The improved trade position for construction machinery in recent years is a result of the concerted effort by domestic producers to upgrade plants, retool aging manufacturing facilities, and implement more effective worldwide distribution and service. The consolidation of companies within the industry has led to an increase in expenditures for research and development. As a result, U.S. products have improved to a level of quality comparable to that of products manufactured abroad.

Exports of construction machinery and parts, which currently account for as much as half of all shipments for some U.S. producers,¹³⁶ have surged in the last 2 years. Favorable exchange rates, for which the construction industry lobbied intensely, and strong global demand caused the value of exports to increase 32 percent in 1988 and an estimated 30 percent in 1989, after falling nearly 12 percent in 1985 and rising slightly less than 6 percent in 1986.¹³⁷ The U.S. Department of Commerce, in an attempt to calculate 1988 figures using the Harmonized classification, estimated that the value of exports for 1989 increased just 7 percent.¹³⁸

The 2-percent decrease in prices for office machines and automated data processing equipment followed a relatively strong year in 1988, during which prices rose for the first time since 1981. In 1989, the U.S. computer industry fell back into the lull that was evident in the market earlier in the decade. Prices for all categories within the index, which accounts for slightly more than 7 percent of the all-export index,

The lull in U.S. exports of computers reflected weak global demand and intense foreign competition.

declined during the year, except for the parts component, which showed no change. Weak global demand for the larger mainframe and minicomputer systems has combined with increased competition in the more popular workstation and personal computer markets to force manufacturers to cut prices. Excess capacity, which has also led to lower prices, has resulted from the rapid pace of technology and product changes, standardization, and advances in manufacturing productivity. The United States, once the major worldwide supplier of computer equipment, has continued to lose market share

in each of its five major foreign markets—France, Italy, the United Kingdom, West Germany, and Japan.¹³⁹

The potential for export growth for the U.S. computer industry lies in the political and economic opening of Eastern Europe and the development of a single integrated market in the European Community by the end of 1992. Within the European Community, the restructuring of financial and insurance industries should boost demand for information systems, and to that end, many U.S. companies have already built, or plan to build, plants in the region. □

Footnotes

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¹ Price developments discussed in this article are based on data from the Bureau of Labor Statistics International Price Program (IPP). That program produces import and export price indexes based on the Standard International Trade Classification (SITC) scheme. Both indexes use a modified Laspeyres formula. Price data are collected for more than 22,000 products, and are not seasonally adjusted. Beginning with data for the first quarter of 1988, released in April of that year, IPP indexes were weighted by the value of trade in 1985. (Formerly, the indexes had been weighted by the value of trade in 1980.) In addition, the indexes were recalculated from 1985 forward using the new weights. The Bureau also publishes these series by Standard Industrial Classification (SIC), as determined by the U.S. Office of Management and Budget, and end-use classifications as developed by the U.S. Department of Commerce's Bureau of Economic Analysis (BEA).

² These results are based on the International Price Program's nominal average exchange rate index. The average exchange rate indexes measure the change in the price of trade-weighted baskets of currencies against the dollar and are designed to match the import and export price index series published by BLS at the 2-digit, 1-digit, all-import, and all-export levels as defined by the Standard International Trade Classification, Rev. II system.

³ See "Foreign Exchange Rates," *Federal Reserve Bulletin*, selected issues, table 3.28.

⁴ *Ibid.*

⁵ The Group of Five (G-5) consisted of Japan, West Germany, Britain, France, and the United States. In 1986, Canada and Italy endorsed the G-5 program, and the organization has since been known as the Group of Seven (G-7).

⁶ "Treasury and Federal Reserve Foreign Exchange Operations, February–April 1989," *Quarterly Review* (Federal Reserve Bank of New York), Summer 1989, p. 71.

⁷ *Ibid.*, p. 72.

⁸ "Foreign Exchange Rates," *Federal Reserve Bulletin*, selected issues, table 3.28.

⁹ Alan R. Zimmerman, "Analysts Expect Dollar to Dip Near '89 Lows," *Journal of Commerce*, Nov. 24, 1989, p. 3A.

¹⁰ "Treasury and Federal Reserve Foreign Exchange Operations, August–October 1989," *Quarterly Review* (Federal Reserve Bank of New York), Autumn 1989, p. 54.

¹¹ *Ibid.*

¹² "Interest Rates, Money and Capital Markets," *Federal Reserve Bulletin*, July 1989, p. A24, and February 1990, p. A24.

¹³ "Foreign Exchange Rates," *Federal Reserve Bulletin*, selected issues, table 3.28.

¹⁴ Jonathan Fuerbringer, "Canada's Dollar Defies the Trend," *The New York Times*, Nov. 20, 1989, p. D10.

¹⁵ Michael R. Sesit, "Dollar's Moves Defied Predictions," *The Wall Street Journal*, Jan. 2, 1990, p. R6.

¹⁶ "The Dollar Comes Roaring Back," *Business Week*, May 27, 1989, p. 27; and "What's Really Driving U.S. Dollar Higher?" *Futures*, July 1989, p. 20.

¹⁷ "Foreign Exchange Rates," *Federal Reserve Bulletin*, selected issues, table 3.28.

¹⁸ *Ibid.*

¹⁹ Craig R. Whitney, "British Cabinet in a Flurry; Minister and Rival Both Out," *The New York Times*, Oct. 27, 1989, p. 1; and Craig R. Whitney, "Thatcher Skeptical on Europe Money Ties," *The New York Times*, Nov. 30, 1989, p. D1.

²⁰ Table 4.4—"Merchandise Exports and Imports by Type of Product and by End-Use Category in Constant Dollars," *Survey of Current Business* (U.S. Department of Commerce, Bureau of Economic Analysis), March 1990. These data, along with those in table 4.3, are on a GNP basis.

²¹ *U.S. Department of Commerce News*, FT-900 (Bureau of the Census), December 1989.

²² Table 4.4, *Survey of Current Business*, March 1990.

²³ Table 1.6—"Relations of Gross National Product, Gross Domestic Purchases, and Final Sales to Domestic Purchases in Constant Dollars," *Survey of Current Business* (U.S. Department of Commerce, Bureau of Economic Analysis), March 1990.

²⁴ Table 1.4—"Gross National Product by Major Type of Product in Constant Dollars," *Survey of Current Business* (U.S. Department of Commerce, Bureau of Economic Analysis), March 1990; and table 4.4, *Survey of Current Business*, March 1990.

²⁵ *Main Economic Indicators* (Organization for Economic Cooperation and Development), January 1990, p. 11.

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- ²⁶ Table 4.4, *Survey of Current Business*, March 1990.
- ²⁷ *Ibid.*
- ²⁸ Table 4.3—"Merchandise Exports and Imports by Type of Product and by End-Use Category," *Survey of Current Business* (U.S. Department of Commerce, Bureau of Economic Analysis), March 1990.
- ²⁹ *Ibid.*
- ³⁰ Table 4.4, *Survey of Current Business*, March 1990.
- ³¹ Table 4.3, *Survey of Current Business*, March 1990.
- ³² Table 4.4, *Survey of Current Business*, March 1990.
- ³³ Table 1.6, *Survey of Current Business*, March 1990.
- ³⁴ Table 1.4 and table 4.4, *Survey of Current Business*, March 1990.
- ³⁵ The pass-through rate is defined as the proportion of a given exchange rate shift that an exporter allows to be reflected in the foreign currency price of a product (that is, the price denominated in the currency of the country of destination or importing country). For example, a 100-percent pass-through rate indicates that the home currency price of a particular product (the price denominated in the currency of the exporting country) remained unchanged, while the change in the foreign currency price fully reflected the exchange rate shift. Conversely, a pass-through rate of 0 percent signifies that the foreign currency price of a product remained unchanged while the change in the home currency price fully compensated for the shift in exchange rates.
- ³⁶ These results were obtained by dividing the change in U.S. dollar prices of all imported products except fuels for the appropriate period by the change in the reciprocal of the average exchange rate index for this category of products during the same period. This demonstrates the method for calculating pass-through rates for any given category of imported products using these data.
- ³⁷ *Monthly Energy Review*, DOE-EIA-0035 (89-10) (U.S. Department of Energy, Energy Information Agency), October 1989, p.113.
- ³⁸ *Ibid.*
- ³⁹ *Ibid.*, p.12.
- ⁴⁰ The Organization for Economic Cooperation and Development comprises Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States and its territories, and West Germany.
- ⁴¹ *Monthly Energy Review*, October 1989, p.117.
- ⁴² *Ibid.*, p.113.
- ⁴³ *Ibid.*
- ⁴⁴ *Ibid.*, p.112.
- ⁴⁵ Joanne Legomsky, "Oil-Gas Basic Analysis," *Standard and Poor's Industry Surveys*, Aug. 3, 1989, p. O-20.
- ⁴⁶ *Weekly Petroleum Status Report*, DOE-EIA-0208 (90-12) (U.S. Department of Energy, Energy Information Agency), Mar. 30, 1990, p.16.
- ⁴⁷ *Monthly Energy Review*, December 1989, p. 21.
- ⁴⁸ *Ibid.*, p. 46.
- ⁴⁹ *Monthly Energy Review*, December 1989, p. 50.
- ⁵⁰ *Monthly Energy Review*, November 1989, pp. 66-67.
- ⁵¹ Hilary Stout, "Leading Index Rose Sharply in December," *The Wall Street Journal*, Feb. 1, 1990, p. A2.
- ⁵² *1990 United States Industrial Outlook* (U.S. Department of Commerce, International Trade Administration, January 1990), p. 4.
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Measuring union-nonunion earnings differences

Although wages and salaries have risen faster for nonunion workers than for union workers in recent years, three BLS statistical series suggest that the union edge persists; estimates of its magnitude depend on the data analyzed

Kay E. Anderson,
Philip M. Doyle,
and
Albert E. Schwenk

Union workers historically have earned more than nonunion workers. Recently, however, wages and salaries of nonunion workers have been rising faster than those of union workers. What has this trend done to the union-nonunion earnings differential? And, what happens to the union advantage when total compensation (wages and benefit costs) is taken into account?

This article discusses recent data from three Bureau of Labor Statistics programs that provide employee compensation and earnings information for union and nonunion workers. These programs are the Current Population Survey, Industry Wage Surveys, and the Employment Cost Index. After summarizing earlier research in this area, the article describes the three BLS programs and examines what the data show about union-nonunion pay differences—how large they are now, how they have changed during recent years, and how both the size of the difference and the amount it changes have varied. The discussion demonstrates how different types of published data can be used to gain a variety of perspectives on the complex issue of union-nonunion compensation and earnings differentials.

Background

Many economists have conducted research in efforts to estimate how much of the difference between union earnings and nonunion earnings is due to union membership status and how

much is due to other worker characteristics. (Union workers, for example, tend to be concentrated in large firms, which are often higher paying than small ones; they typically are employed in urban areas, which have higher pay levels than rural areas; and a larger proportion of union than of nonunion workers is employed in the higher paying manufacturing and public utilities industries.) The results of the research have varied, depending on the data used and the method by which they were analyzed.

One of the more prominent works on this topic is H. Gregg Lewis' *Unionism and Relative Wages in the United States*, published in 1963. In this book, Lewis reviewed 20 empirical studies conducted between 1945 and 1961, deriving a set of estimates of relative wage differentials traceable to unionization. Although his estimates varied by worker category and period, one of his most notable findings was that, in 1957–58, the average union wage advantage was between 10 and 15 percent.¹

In 1980, Daniel Mitchell suggested that, by the mid-1970's, the union-nonunion wage gap had widened to between 20 and 30 percent for production and nonsupervisory workers. This estimate was supported by results from other studies, which indicated that earnings had grown more rapidly in the union sector than in the nonunion sector over the preceding two decades.²

Richard B. Freeman and James L. Medoff concurred with this new estimate, referring to it as the standard estimate of the union wage

Kay E. Anderson, Philip M. Doyle, and Albert E. Schwenk are economists in the Office of Compensation and Working Conditions, Bureau of Labor Statistics. Mary Kay Rieg of the *Review* staff provided special editorial assistance.

effect during the 1970's in their 1984 book, *What Do Unions Do?* In this look at the effects of unions on wages, Freeman and Medoff estimated union-nonunion wage differentials using different data sets, controlling for wage-determining factors other than unionism. Their estimates of the wage advantage attributable to unionization included 21 percent using the Current Population Survey for May 1979, 26 percent using the University of Michigan Panel Study of Income Dynamics for 1970-79, and 27 percent using the BLS Expenditures for Employee Compensation Survey for 1972-76.³

Freeman and Medoff noted that analyses were becoming more detailed and sophisticated with the advent of computerized data processing. In addition to enjoying access to mass quantities of data, researchers could now compare the wages of union and nonunion workers while controlling for their demographic characteristics, industry, occupation, and location. Establishment data also were available in which establishment size, location, and industry could be controlled. The authors added, however, that the use of more data in analyses did not eliminate the errors that arose from the inability to conduct controlled laboratory experiments, varying one factor (unionism) while holding all others fixed.

Lewis discussed the differences in estimates that arise from data imperfections in *Union Relative Wage Effects: A Survey*, which appeared in 1986. He pointed out that many surveys, particularly household surveys, do not include employer-paid benefits in their wage measures, thereby excluding such benefits as independent factors in wage determination.⁴ This omission is important to remember when considering the union wage effect, because benefits make up a larger percentage of total compensation for union than for nonunion workers.⁵

Lewis also noted that estimation differences arise from differing definitions of union status. In some surveys, a worker must be a union member to be classified as "union." In others, the worker is classified as "union" if the job is covered by a collective bargaining agreement, regardless of the worker's actual union membership status.

Lewis reviewed nearly 200 post-1963 studies for this follow-up to his earlier survey. From the results of these studies, he derived a set of estimates of the union wage effect and found that the differential between union and nonunion wages had not changed much from his earlier estimates. For the period 1967-79, his yearly estimates ranged from 12 to 20 percent, with a mean of 15 percent for the 13-year period.

Unlike these and similar studies, this article does not attempt to measure the effect of union status on earnings. However, it does describe BLS programs that provide data used in research to measure the effect.

CPS data examined

One program that produces estimates for union and nonunion workers is the monthly Current Population Survey (CPS), conducted by the Bureau of the Census for BLS. The CPS is a major source of data on the Nation's labor force. Because it is a household-based survey, the CPS can obtain data on employee demographic characteristics—sex, race, and ethnicity, for example—that are not readily obtained through an establishment survey. However, CPS data on union and nonunion earnings are published for broad industry and occupational groups, and thus do not allow for the level of comparison between union and nonunion earnings that would be possible with more detailed categories. With broad categories, the earnings differentials between union and nonunion workers will also be affected by differences in occupation and industry among the workers in each group. It should be noted, however, that most of the studies discussed in the background section of this article were based on unpublished CPS data, which offer greater detail than published data.

BLS publishes CPS average annual data on median usual weekly earnings of full-time wage and salary employees by demographic and employment characteristics according to union membership status. Usual weekly earnings are what the household respondent reports as the employed person's usual earnings per week before deductions and including overtime pay, commissions, or tips usually received. Median earnings are the midpoint of the frequency distribution of workers by earnings: one-half the workers have earnings above the median, the other half have earnings below the median. Data are published for wage and salary employees (except the incorporated self-employed) who usually work full time (at least 35 hours per week) at their sole or primary job.⁶

CPS data show that the union-nonunion earnings differential ranged between 34 and 39 percent during the period from 1983 (when annual median weekly earnings data by union affiliation were first published) to 1989. When data were grouped by various employee characteristics (race, sex, occupation, and industry), the union-nonunion differential varied among the groups. The differential tended to be greater for women than for men. It was also higher for

Analyses have become more sophisticated with the advent of computerized data processing.

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minorities than for whites. In each of these cases, differences in the occupational and industrial characteristics of these workers contributed to the differential.⁷

Estimates from industry surveys

A second source of estimates of earnings by union membership status is the Industry Wage Survey (IWS) program. This program surveys establishments in 25 manufacturing and 15 non-manufacturing industries, accounting for about 22 million workers. Individual industries typically are surveyed every 2 to 6 years. Data on straight-time hourly earnings are collected dur-

ing the survey reference period for narrowly defined occupations selected as representative of the range of activities performed by workers in the industry.⁸

The IWS produces data on wages only, but among the three BLS programs discussed in this article, it provides them for the most narrowly defined groups of workers, by occupation. These data are often disaggregated geographically as well. With this narrow focus, the union-nonunion wage differentials computed from IWS data are less affected by workers' occupation and industry than are differentials computed from more aggregate data. Although they cover a smaller part of the work force than the Current

Table 1. Average straight-time earnings of production workers in union establishments¹ as a percent of those in nonunion establishments, selected Industry Wage Survey manufacturing industries

[Average earnings in nonunion establishments = 100]

Industry	1984-88 surveys					1979-83 surveys				
	Survey year	Number of production workers (in thousands)	Percent unionized ²	Union pay relative ³		Survey year	Number of production workers (in thousands)	Percent unionized ²	Union pay relative ³	
				U.S. average	Regional average ⁴				U.S. average	Regional average
Food and kindred products:										
Meatpacking	1984	83.0	71	124	123	1979	104.3	80	143	139
Prepared meat products	1984	50.9	57	149	135	1979	48.8	71	159	148
Flour and other grain mill products	1987	8.3	81	138	—	1982	8.1	79	148	145
Textile mill products:										
Cotton and manmade fiber textile mills	1985	199.7	12	107	112	1980	251.8	11	105	111
Textile dyeing and finishing	1985	36.3	26	119	121	1980	48.9	24	110	108
Apparel:										
Men's and boys' suits and coats	1984	46.7	78	132	—	1979	61.4	81	132	—
Men's and boys' shirts and nightwear	1987	59.4	21	117	114	1981	65.0	30	112	111
Lumber and wood products:										
Millwork	1984	50.4	32	125	120	1979	43.9	46	123	110
Furniture and fixtures:										
Nonupholstered wood household furniture	1986	79.2	14	115	113	1979	137.2	30	122	113
Upholstered wood household furniture	1986	59.6	14	115	115	1979	61.9	25	120	114
Paper and allied products:										
Corrugated and solid fiber boxes	1987	67.8	70	119	118	1981	57.3	82	126	119
Chemicals and allied products:										
Industrial chemicals	1986	89.2	61	102	102	1981	115.2	75	100	102
Stone, clay, glass, and concrete products:										
Structural clay products	1986	23.5	52	127	120	1980	26.3	69	131	121
Primary metals industries:										
Basic iron and steel	1988	178.9	89	110	107	1983	184.1	92	124	—
Iron and steel foundries	1986	84.1	66	129	116	1979	177.4	83	132	114

¹ Excludes premium pay for overtime and for work on weekends, holidays, and late shifts; union establishments are those with a majority of their production workers covered by a labor-management agreement.

² Percent of workers employed by establishments reporting labor-management agreements covering a majority of their production workers.

³ Average hourly earnings in unionized establishments divided by hourly earnings in nonunion establishments.

⁴ Unweighted average of relative differences of individual regions.

NOTE: Dashes indicate that data did not meet publication criteria.

Population Survey and the Employment Cost Index (ECI), the IWS data allow a more detailed examination of the relationship between wage differences and unionization.

Fifteen industry surveys were chosen for this analysis because they include nationwide estimates of earnings of all production workers combined and report a sufficient mix of union and nonunion establishments to make valid comparisons possible.⁹ The industries cover a cross-section of the manufacturing sector, including food processors and garment makers, as well as such durable goods producers as steel mills and furniture factories.

Pay comparisons by industry. Among the industries, the union wage advantage ranged from 2 percent for industrial chemicals producers and 7 percent for textile mills to 49 percent for prepared-meat-products plants. (See table 1.) In nine industries, however, the differences ran between 15 and 30 percent. Basic iron and steel mills, the largest industry surveyed, reported that wages for unionized workers exceeded those of nonunion counterparts by 10 percent in October 1988.

Pay differentials for the six durable goods-producing industries studied (basic iron and steel, iron and steel foundries, millwork, structural clay products, upholstered furniture, and nonupholstered furniture) ranged from 10 percent to 29 percent. However, nondurable goods producers reported much more dispersed results, as differentials ranged from 2 percent for industrial chemicals to 49 percent for prepared meat products.

In terms of straight-time earnings, differentials exceeded \$1 an hour in 10 of the 15 industries and topped \$2 in 3 surveys. The smallest differentials were reported in the chemicals industry (29 cents per hour) and in textile mills (43 cents). The food and kindred products industries accounted for some of the largest differentials: earnings of production workers in unionized prepared-meat-products plants exceeded those of their nonunion counterparts by \$2.90 an hour; in flour mills, the union advantage was \$2.85 an hour.

Extent of union coverage. The proportion of workers in unionized plants ranged from 12 percent in textile mills to 89 percent in steel mills. In nine of the industries, more than half of the production workers were in establishments reporting union contracts covering at least a majority of their production work force.

The union-nonunion differential was typically higher in those industries reporting a greater proportion of union workers. In six of

Table 2. Union pay as a percent of nonunion pay, numerically important occupations, selected Industry Wage Survey manufacturing industries, 1984-1988

Industry and occupation	Percent
Meatpacking:	
Boners (boxed beef)	99
Prepared meat products:	
Ham boners	142
Flour and other grain mill products:	
Processors	121
Textile dyeing and finishing:	
Dyeing machine tenders (cloth)	135
Men's and boys' suits and coats:	
Sewing machine operators (coats) . .	131
Men's and boys' shirts:	
Sewing machine operators	113
Millwork:	
Assemblers	107
Nonupholstered furniture:	
Assemblers (except chairs)	113
Upholstered furniture:	
Upholsterers	109
Corrugated and solid fiber boxes:	
Flexographic printer operators	106
Industrial chemicals:	
Chemical operators	99
Structural clay products:	
Tunnel kiln firers	122

the nine industries in which a majority of the workers were covered by labor-management agreements, the union pay advantage exceeded 20 percent, compared with only one of the six industries in which unions covered a minority.¹⁰ Significant exceptions, however, were noted. For example, although 61 percent of the production workers in industrial chemicals plants were unionized, the industry's differential was the smallest reported—2 percent. Similarly, the steel industry reported the highest level of unionization among the 15 industries (89 percent), but the third smallest differential (10 percent).

Earnings of production workers in the industries studied tended to be somewhat lower than those reported for all manufacturing industries combined in the BLS Current Employment Statistics series. Industry pay levels ranged from 50 percent of the overall average in the men's shirt industry to 98 percent in foundries and flour mills. Pay rates in two industries, basic iron and steel and industrial chemicals, exceeded the manufacturing average by 18 and 32 percent, respectively.

The relationship of a particular industry to the all-manufacturing-industries pay level, how-

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ever, appeared to have little effect on the union-nonunion differential. The two industries reporting pay higher than the all-manufacturing-industries level had some of the smallest differentials, as did such relatively low-paying industries as textile mills. Conversely, in both the relatively low-paying suit industry and high-paying foundries, unionized workers enjoyed a comparatively large pay advantage.

The Industry Wage Survey program also permits an examination of union-nonunion pay differences for specific occupations. Most of the surveys obtained detailed earnings data for two types of occupations—intraindustry jobs, such as sewing machine operators in garment plants; and interindustry jobs, such as maintenance and custodial occupations.

To compare union and nonunion pay for industry-specific occupations, the most numerous occupation in an industry was studied. (See table 2.) Among the 12 industries permitting such comparisons, differentials ranged from a 42-percent advantage for unionized ham boners in prepared-meat-products plants to a 1-percent nonunion edge for boxed beef boners in meatpacking and chemical operators in the industrial chemicals survey. In general, the union-nonunion pay gap for the numerically important occupations was slightly smaller than the industry's all-production-worker differential.

An analysis of the impact of varying skill levels on pay differentials within and among industries was possible for eight industries. Maintenance electricians were selected to represent a high-skilled occupation, while janitors represented lower skilled, often entry level, jobs. (See table 3.) In each industry, janitors in unionized plants enjoyed a substantially larger pay differential than did electricians. In fact, the janitor differential was often 4 or 5 times that reported for electricians. These findings echo those of an analysis of Industry Wage Survey data from the 1960's.¹¹

Changes in unionization and pay. Data from the Industry Wage Survey program permit an examination of changes during the 1980's in the degree of unionization and relative pay levels among union and nonunion firms. In each of the industries chosen for analysis, a similar survey had been conducted between 1979 and 1983, approximately 5 to 7 years before the "current" round of surveys.

Changes in the relative wage advantage of unionized workers between survey rounds present a varied picture. The union-nonunion pay gap increased in 6 of the 15 industries, sometimes by a substantial amount. (See table 4.) For example, in textile dyeing and finishing plants, the pay of unionized workers was 19 percent higher than that of nonunion workers in June 1985, nearly double the 10-percent differential reported in August 1980. In men's shirt manufacturing, the difference increased from 12 percent in June 1981 to 17 percent in June 1987.

Among the nine industries reporting declines in the union wage advantage, changes also were often substantial. The largest decrease was reported in steel mills, where pay in unionized plants was 10 percent higher than that in nonunion plants in October 1988, compared with a difference of 24 percent in August 1983. Among meatpackers, the pay differential fell from 43 percent in May 1979 to 24 percent in June 1984.

The narrowing of steel pay differentials resulted from a 14-percent increase in the wages of nonunion workers between August 1983 and October 1988, while unionized workers' earnings were virtually unchanged. In the union sector, contract negotiations in 1983 and again in 1986-87 led to wage rate reductions aimed at helping the industry meet foreign and domestic competition. The decreases were partly offset by payouts from profit-sharing, stock ownership, and nonwage payment plans.¹² In addition, during the life of each agreement, deferred wage adjustments typically raised wage rates to about the level in effect prior to the initial cuts.

Table 3. Union pay as a percent of nonunion pay for selected occupations, selected Industry Wage Survey manufacturing industries, 1984-1988

Industry	Janitors	Maintenance electricians
Meatpacking	128	118
Prepared meat products ..	171	119
Flour and other grain mill products	141	—
Textile dyeing and finishing	131	106
Men's and boys' suits and coats	130	—
Men's and boys' shirts ...	130	—
Millwork	130	—
Nonupholstered furniture .	118	99
Upholstered furniture	119	109
Corrugated and solid fiber boxes	108	99
Industrial chemicals	126	105
Structural clay products ..	130	104

NOTE: Dash indicates insufficient number of observations for comparisons.

Negotiated wage reductions also contributed to the narrowing of the union-nonunion pay gap in the meatpacking industry. To help compete with newer facilities, unions representing employees of long-established meatpacking firms agreed to reductions of \$2 an hour in base pay between 1979 and 1984.¹³ The effect of these concessions was to dampen the rate of wage increase for all unionized meatpackers: over the 5-year span, the pay of unionized workers rose by 11 percent, compared with a 28-percent gain at nonunion plants.

A clearer pattern emerges when the industries are arrayed by the level of the relative wage advantage reported during the earlier round of surveys. Among the eight industries reporting union wage differentials of less than 25 percent during the 1979–83 period, five reported increases in this measure during the 1984–88 survey round. Conversely, of the seven industries with the largest union pay advantages in the earlier period, six reported decreases in the later round.

Since the earlier round of surveys, each of the industries reported relatively small increases in average wage rates, ranging from less than 1 percent a year in the steel industry to about 5 percent a year in textiles, furniture, millwork, and chemical plants. (See table 4.) (By comparison, the Bureau's Employment Cost Index for manufacturing industries showed an average increase in wages and salaries of 5.4 percent a year from December 1978 to December 1988.) The overall rate of wage change in an industry, however, was somewhat correlated with changes in the union-nonunion pay gap: those industries that reported an increase in pay differential typically also reported some of the faster rates of wage increase. The converse—slow growth in earnings accompanied by a decrease in the pay gap—also generally held true.

Employment declines. Employment of production workers in 11 of the 15 industries decreased between the two survey rounds, typically by about 10 to 25 percent. Four industries (prepared meat products, flour, millwork, and boxes) reported employment gains of 2 to 18 percent. In four of the seven industries reporting employment declines of more than 20 percent, the union-nonunion pay gap widened. Conversely, an increase in the differential was noted in only one of four industries in which employment grew.

The proportion of workers covered by a union contract increased between the two survey rounds in only three industries. These increases were 1 or 2 percentage points in flour mills, textile mills, and dyeing and finishing

Table 4. Percent change in selected characteristics between "earlier round" and "later round" surveys, selected Industry Wage Survey manufacturing industries

Industry	Production worker employment	Average hourly earnings ¹	Union-ization ²	Union pay differential ³
Meatpacking	-21	2.2	-11	-44
Prepared meat products	4	3.1	-19	-17
Flour and other grain mill products	2	2.7	2	-21
Textile mills	-21	4.7	9	45
Textile dyeing and finishing	-26	5.2	9	92
Men's and boys' suits and coats	-24	4.8	-3	1
Men's and boys' shirts	-9	2.5	-29	36
Millwork	15	5.6	-30	7
Nonupholstered furniture	-42	4.8	-54	-33
Upholstered furniture	-4	5.0	-45	-24
Corrugated and solid fiber boxes	18	3.5	-15	-26
Industrial chemicals	-23	5.3	-18	(4)
Structural clay products	-10	3.9	-24	-12
Basic iron and steel	-3	0.4	-3	-57
Iron and steel foundries	-53	4.1	-21	-10

¹ Annualized rate.

² Change in proportion of workers employed by establishments reporting labor-management agreements covering a majority of their production workers.

³ Change in the percent differential in

average hourly earnings between unionized establishments and nonunion establishments.

⁴ The 2-percent union advantage reported in 1986 compares with a nonunion advantage of less than 1 percent in 1981.

plants. The union pay advantage increased in the two textile industries, while flour mills reported a substantial decrease. Eight of the twelve industries reporting a decline in the proportion of production workers covered by union agreements also reported a decrease in the union pay advantage. However, there appeared to be little correlation between the magnitudes of the changes of these two measures. For example, manufacturers of men's suits and of steel both recorded a small decrease in unionization, but the suit industry pay advantage grew slightly, while that of steel mills declined by more than half.

Factors influencing pay levels. There are, of course, a number of factors that influence pay levels besides the presence or absence of a labor-management agreement. The Bureau's occupational wage surveys typically report higher pay rates for workers employed in larger establishments than for those in smaller plants; for those working in metropolitan areas than for those in rural settings; and so on. Often, these factors are also associated with varying levels of unionization, making it difficult to isolate the effect of each factor.

Published data from the Industry Wage Survey program, however, make it possible to estimate the influence of one important determinant of wage levels—region. For a variety of reasons, including differences in living costs and the mix

of urban and rural work sites, Industry Wage Surveys typically report regional variations in pay levels. Therefore, some of the difference between union and nonunion pay levels may be traced to the varying proportions of workers in geographic regions with differing pay rates and degrees of unionization.

For example, wage rates for both union and nonunion workers tend to be lower in the South than in the Northeast. In addition, workers in the South generally are less likely to be covered by a union agreement. Therefore, lower paid workers in the South may significantly affect the nationwide estimate of nonunion earnings, while their higher paid counterparts in the Northeast may dominate the union averages.

Union-nonunion pay differentials were computed for each of the regions for which data met publication criteria. The regional pay gap was smaller than the corresponding nationwide differential in 47 of 74 comparisons. Among individual regions, however, wide variations were reported. For example, in the prepared-meat-products industry, pay of unionized workers exceeded that of nonunion employees by as little as 19 percent in the Mountain region and by as much as 53 percent in the Southwest.

By computing a simple average of the regional results, a nationwide pay differential can be prepared in which the impact of varying geographic employment patterns is minimized. Nationwide pay differences measured in this manner were slightly smaller than those produced by comparing national pay averages. The

narrowing of the pay gap, however, typically amounted to less than 4 percentage points.

In the late 1970's, multiple regression analysis techniques were applied to data from a limited number of Industry Wage Surveys in an attempt to isolate the independent effect on wages of various establishment and worker characteristics. Use of this technique permitted the impact of each of a variety of factors influencing wage levels to be measured separately.

Results of these analyses typically confirmed that the union status of the production work force was a significant determinant of wage levels. For example, simple comparison of union and nonunion averages from a May 1978 survey of men's and boys' shirts producers showed that earnings of union workers exceeded those of nonunion workers by 51 cents per hour.¹⁴ When other factors, such as plant size, region, and city size, were held constant by use of multiple regression techniques, the pay gap narrowed to 42 cents per hour. Unionization, however, remained the largest influence on pay levels in this industry.

The Employment Cost Index

A third program that yields data on earnings by union membership status is the Employment Cost Index (ECI) survey, providing two types of information on union-nonunion differences—indexes of change and compensation cost levels. The ECI is an employment-weighted measure of change over time in the cost of employing a fixed set of labor inputs.¹⁵ It is a quarterly series that relates to payroll periods including the 12th of March, June, September, and December. The survey covers all nonfarm establishments (except private households and the Federal Government), regardless of size, and provides detail by industry, occupation, region, union status, and occupational group within industry category.¹⁶

A special advantage of the ECI program is that it publishes data on cost levels¹⁷ and changes for total compensation as well as for its components, wages and salaries and benefit costs. The ECI thus addresses Lewis' concern, noted earlier, that both wages and benefits should be considered to get a more complete estimate of union-nonunion differentials.

In the ECI, the basic unit of observation is the occupation within an establishment.¹⁸ An occupation in an establishment is considered to be union if the workers are covered by a union contract; otherwise, it is nonunion.¹⁹ Because both establishments and occupations are selected on a probability-proportionate-to-size basis, the sample reflects the distribution of

Table 5. Cumulative percent changes in the Employment Cost Index of wages and salaries for union and nonunion workers, selected periods, 1975-89

Period and worker group	Union	Non-union
September 1975-December 1983:		
All private industry	89.5	76.7
Goods-producing	87.3	75.2
Service-producing	93.5	77.1
Manufacturing	90.1	75.7
Nonmanufacturing	89.0	76.8
December 1983-September 1989:		
All private industry	16.5	27.0
Goods-producing	16.7	24.1
Service-producing	16.1	28.7
Manufacturing	17.7	25.0
Nonmanufacturing	15.3	27.8
September 1975-September 1989:		
All private industry	120.7	124.4
Goods-producing	118.6	117.4
Service-producing	124.7	127.9
Manufacturing	123.7	119.7
Nonmanufacturing	118.0	125.8

Chart 1. Percent wage and salary changes from the Employment Cost Index for 12-month periods ending March, June, September, and December, private industry workers by union status, 1976-89

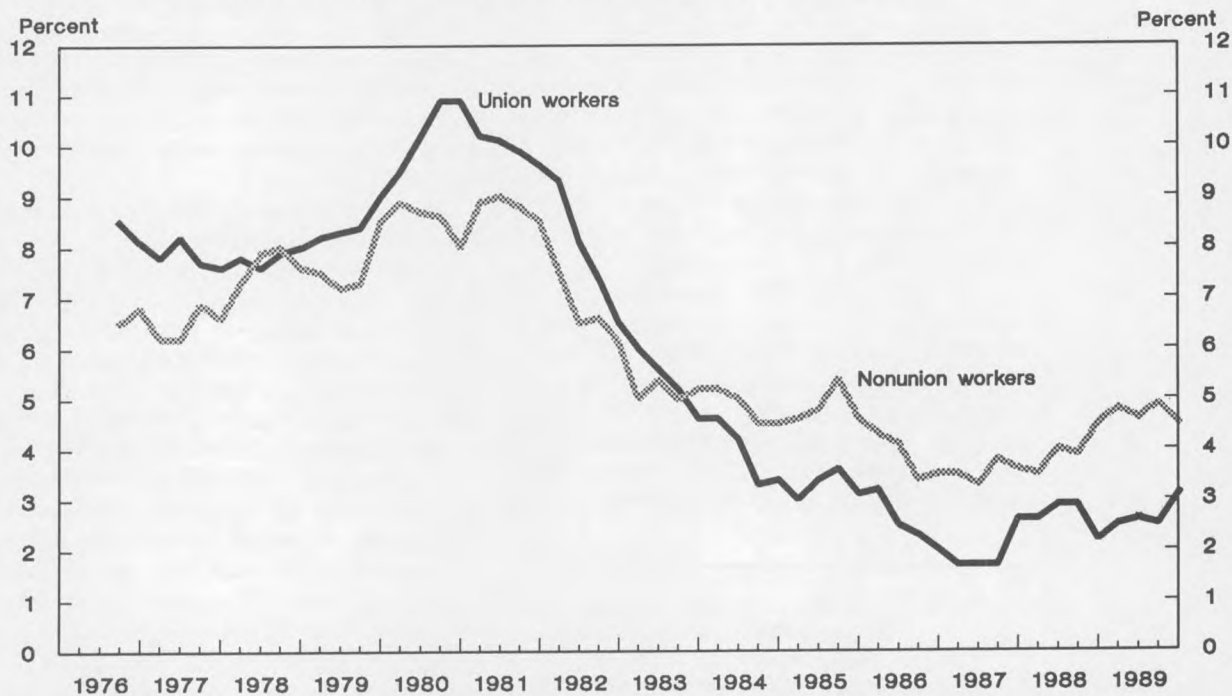
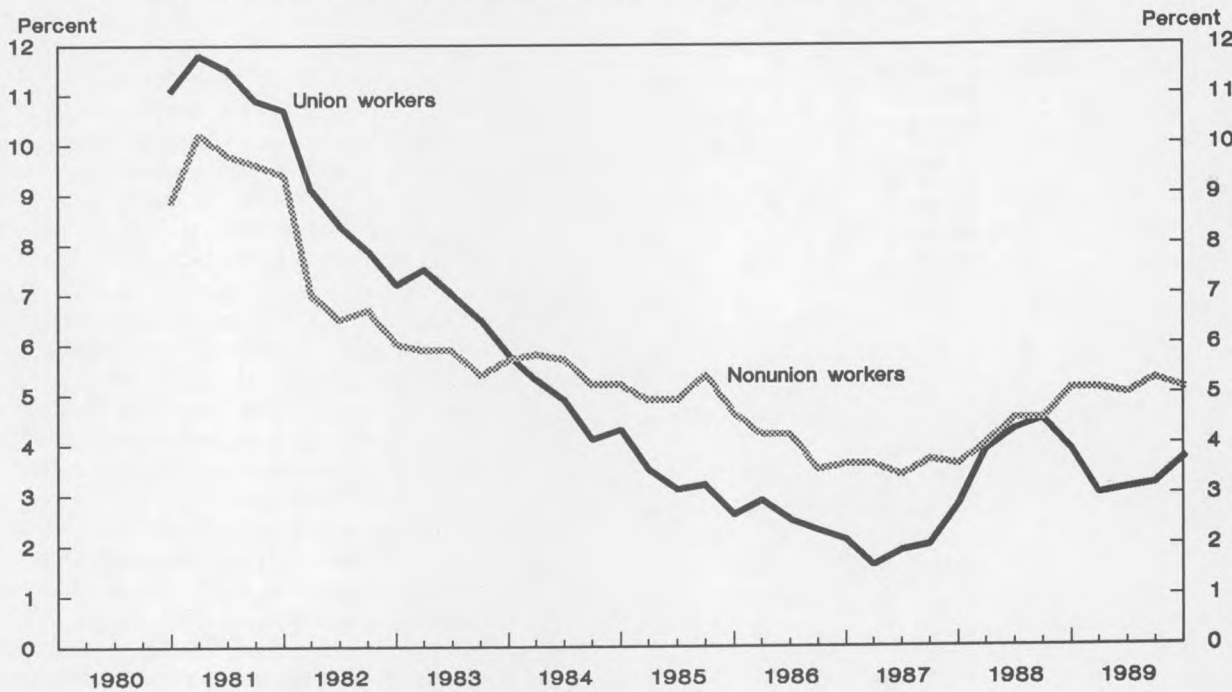


Chart 2. Percent changes in compensation from the Employment Cost Index for 12-month periods ending March, June, September, and December, private industry workers by union status, 1980-89



Union-Nonunion Pay Differences

union and nonunion workers in the private economy.

Trends in wages and salaries. From 1975, when wage change data from the ECI were first available, until the early 1980's, the union-nonunion wage differential grew steadily as wage increases for union workers almost always exceeded those for their nonunion counterparts. (See chart 1.) Other BLS data suggest that, in manufacturing at least, the long string of years with relatively large union pay gains began in 1969 and that, by 1983, the union-nonunion differential was at a historic high.²⁰

During the early 1980's, pay increases for both union and nonunion workers dropped sharply. Factors contributing to the decline were the 1981-82 recession, which led to wage freezes and pay cuts, and the lower rate of price increase. Pay gains in the union sector continued to exceed those in the nonunion sector through the end of 1982, but the drop in the rate

of pay increase was sharper for union workers, due in part to the growing importance of lump-sum payments offered in lieu of wage increases in union contracts.

In 1983, there was a dramatic break in the pattern of larger pay gains for union workers. Since that time, nonunion wage increases have consistently exceeded those for union workers. By September 1989, the union-nonunion differential in wage rates was smaller than it had been in 1975.²¹ (See table 5.)

This same pattern of a widening of the union-nonunion wage differential during 1975-83 and of a narrowing of the differential since 1983 is evident in data for the major industrial sectors within private industry. As shown in table 5, over the September 1975-December 1983 period, wage increases for union workers exceeded those for nonunion workers in both goods-producing and service-producing industries and in both manufacturing and nonmanufacturing. Over the December 1983-September 1989 period, in contrast, nonunion pay increases exceeded those for union workers by roughly the same proportion in all four of those industry categories. Over the entire September 1975-89 period, union pay increases exceeded nonunion gains in manufacturing, but trailed them in nonmanufacturing, although the differences were not great.

Union-nonunion comparisons of wage change for major industry groups, such as construction, cannot be made from the ECI because of insufficient sample sizes. However, it is possible to make rough comparisons for those industry groups by using data on effective wage adjustments from the Bureau's major bargaining settlements program²² in conjunction with ECI data. For example, if the effective wage adjustments for union workers are lower than the ECI change for all workers in the industry group, this would suggest that nonunion increases are larger than union gains. (See table 6.)

Effective wage adjustments are not strictly comparable to ECI wage and salary changes for union workers. A major difference is that effective wage changes are based on data for all bargaining agreements covering 1,000 workers or more, whereas ECI union data are based on a sample of all bargaining situations, regardless of number of workers covered.²³

Despite differences in the two series, the sizes of effective wage adjustments are very similar to ECI union wage changes where comparison is possible—for all private industry workers and for manufacturing and nonmanufacturing. This similarity provides support for using the effective wage adjustments as an in-

Table 6. Cumulative percent changes in wages and salaries from the Employment Cost Index (ECI) and effective wage adjustments from major bargaining agreements, selected periods, 1975-88

Series	December 1975-83	December 1983-88	December 1975-88
Total private industry:			
ECI, total	77.6	20.3	113.7
ECI, union	85.3	14.1	111.4
Effective wage adjustments	84.5	15.9	113.9
Manufacturing:			
ECI, total	78.3	19.0	112.1
ECI, union	85.8	15.1	113.8
Effective wage adjustments	83.0	15.9	111.7
Nonmanufacturing:			
ECI, total	77.3	20.9	114.3
ECI, union	84.9	13.2	109.3
Effective wage adjustments	85.3	16.1	115.2
Construction:			
ECI, total	68.8	14.6	93.4
Effective wage adjustments	82.1	15.8	110.9
Transportation and public utilities:			
ECI, total	89.6	14.2	116.6
Effective wage adjustments	88.8	14.9	117.0
Trade:			
ECI, total	70.2	21.9	107.4
Effective wage adjustments	77.8	14.7	103.9
Services:			
ECI, total	77.7	26.7	125.1
Effective wage adjustments	77.2	22.8	117.7

indicator of union wage changes to compare with changes for all workers from the ECI in industries for which ECI measures of union wage changes are not available.

Comparisons of overall ECI wage changes with effective wage adjustments by industry sector outside manufacturing generally support the finding of relatively large union pay gains during 1975–83 and relatively small gains during 1983–88. The exceptions are services during 1975–83, construction during 1983–88, and transportation and public utilities over the entire period. For transportation and public utilities, the effective wage changes for all periods are very similar to ECI changes; this pattern may be due to the fact that the industry has a far higher proportion of workers covered by union contracts than any other.²⁴

Compensation cost changes. Data on wage and salary changes, the focus of discussion to this point, tell only part of the story. Comprehensive analysis of labor cost trends requires data on compensation costs, which include benefit costs as well as wages and salaries. Compensation cost changes by union status for the major industry sectors are available from the ECI, beginning with data for June 1981. (See chart 2.)

In addition to wages and salaries, compensation costs as measured by the ECI include paid leave, employer outlays for private insurance and retirement plans, costs of legally required programs, supplemental pay, and other benefits. The supplemental pay category includes premium pay for work on weekends and holidays, shift pay, and nonproduction bonuses, including lump-sum payments made in lieu of wage adjustments.

Benefits differ widely in the degree to which they are related to wages. The cost of some benefits, such as paid vacations or holidays, is directly related to wages because the benefits are paid for at the wage rate. Costs of other benefits, such as Social Security, are related to wages but also can be affected by factors outside the control of parties in negotiations, such as legislated changes in tax rates or ceilings on taxable earnings.

Still other benefits, such as health insurance and pensions, show cost changes that are almost totally unrelated to wage movements.²⁵ Consider, for example, insurance costs. During 1980–84, employer insurance costs rose much more rapidly than wages and salaries. During 1985–87, insurance cost increases dampened dramatically, due to lower rates of increase in medical costs and cost containment efforts by

Table 7. Cumulative percent changes in the Employment Cost Index of compensation costs for union and nonunion workers, selected periods, 1981–89

Category	Compensation costs		Wages and salaries	
	Union	Nonunion	Union	Nonunion
June 1981–December 1983:				
All private industry	18.8	15.9	16.9	15.2
Goods-producing	17.3	14.6	15.0	13.7
Service-producing	21.3	16.7	20.0	16.0
Manufacturing	17.2	14.9	14.8	14.2
Nonmanufacturing	20.4	16.4	18.9	15.6
December 1983–September 1989:				
All private industry	19.8	29.2	16.5	27.0
Goods-producing	19.9	26.5	16.7	24.1
Service-producing	19.6	30.8	16.1	28.7
Manufacturing	21.6	27.5	17.7	25.0
Nonmanufacturing	18.0	29.9	15.3	27.8
June 1981–September 1989:				
All private industry	42.3	49.8	36.2	46.3
Goods-producing	40.6	45.0	34.2	41.1
Service-producing	45.1	52.7	39.3	49.3
Manufacturing	42.5	46.5	35.1	42.8
Nonmanufacturing	42.1	51.2	37.1	47.7

employers. Over the past 2 years, insurance costs have once again been increasing more rapidly than wages and salaries.

Another benefit for which cost does not rise at the same rate as wages and salaries is lump-sum payments, which often are provided in lieu of wage increases. Lump sums are popular among employers because they do not alter base wages and may more easily be discontinued in future contract negotiations than wage changes.²⁶

The relative importance of benefits differs substantially between union and nonunion workers. In March 1989, for example, benefits made up 27.3 percent of total compensation for all private industry workers, 33.6 percent for union workers, and 25.6 percent for nonunion workers. Furthermore, the union advantage in terms of benefit costs as a percentage of compensation costs was greatest for those benefits whose costs were least closely related to wages—insurance, supplemental pay, and pension and retirement costs. This pattern suggests that the union-nonunion relationship will be different for compensation cost changes than for wage and salary changes.

Although both wage and salary changes and compensation cost changes show the same general pattern of relatively large union gains until 1983 and relatively small gains thereafter, there are important differences between the two measures. A major difference is that, since 1983, union gains relative to nonunion gains have been larger for compensation costs than for wages and salaries; that is, the union-nonunion differential in compensation costs is narrowing more slowly than is the differential in wages and salaries.²⁷

Union-Nonunion Pay Differences

Table 7 summarizes the union-nonunion compensation comparison for the period over which data for all of the categories shown are available. When one compares union and nonunion compensation trends, it is clear that the period prior to 1983 differs from the period since. This pattern holds whether the comparison is made for all private industry or for major industry sectors.

When the union-nonunion comparisons are restricted to blue-collar workers in manufacturing, which is possible only for the short period since 1987, the pattern is not as clear-cut. For the period June 1987–September 1989, the relationships between the cumulative increases for the union and nonunion groups are as shown below:

	<i>Compensation costs</i>		<i>Wages and salaries</i>	
	<i>Union</i>	<i>Non-union</i>	<i>Union</i>	<i>Non-union</i>
All workers	8.5	11.3	6.2	10.2
Blue-collar	8.9	10.6	6.6	9.2
Manufacturing	10.7	10.0	7.1	8.6
Blue-collar	11.0	10.4	7.2	8.7

For wages and salaries, the pattern of smaller increases for union than for nonunion workers holds for all of the categories. For compensation, however, the pattern holds for all workers and for blue-collar workers, but not for manufacturing overall or for blue-collar workers within manufacturing. The reason for the differ-

ence is that health insurance costs, which have been rising rapidly since 1986, make up a higher proportion of compensation for union workers than for nonunion workers in manufacturing. Thus, the table also illustrates the point that compensation cost changes may differ from wage and salary changes.

There are a number of explanations for the more rapid rise in nonunion than in union pay over the past 6 years. Most are related to the characteristics of the industries in which unions are strongest. Highly unionized manufacturing industries, such as automobiles and steel, have been strongly affected by foreign competition. Highly unionized transportation industries, such as trucking and airlines, have been affected by deregulation. However, a recent study of wage settlements found that, by 1985, concessionary wage adjustments had spread from a few troubled industries to nearly all.²⁸

Another factor in the decline in the differential is the difference in occupational composition of union and nonunion worker groups. White-collar workers are more likely to be nonunion, and their pay has been rising more rapidly than that of blue-collar workers, who are more likely to be unionized. Yet another factor partly explaining the decline in the union-nonunion differential is the continuing drop in the percent of the work force that is unionized.

Compensation cost levels. Even though the union pay advantage has been narrowing over the past 6 years, a gap remains. This is shown by a review of information available from the ECI on compensation cost levels—employer costs for employee compensation.²⁹

As noted in the discussion of compensation change, benefits made up a larger percentage of compensation costs for union than for nonunion workers in March 1989:

	<i>Total benefit costs</i>		<i>Insurance costs</i>	
	<i>Union</i>	<i>Non-union</i>	<i>Union</i>	<i>Non-union</i>
Private industry workers	33.6	25.6	8.3	5.3
Blue-collar	35.2	27.2	8.7	5.6
Manufacturing	36.4	29.3	10.0	7.2
Blue-collar	36.4	30.2	10.0	7.5
Nonmanufacturing	31.6	24.5	7.1	4.8

A major difference between the two sectors is in employers' costs for insurance, which account for 8.3 percent of compensation cost for union workers, compared with 5.3 percent for nonunion workers. This same pattern is found even when the comparison is restricted to more narrow categories. For blue-collar workers in

Table 8. Employment Cost Indexes of wages and salaries, benefits, and compensation costs of union workers relative to nonunion workers, March 1988–89

[Nonunion = 100]

Series	Wages and salaries	Benefit costs	Compensation costs
Private industry workers:			
1988	125.3	186.0	140.8
1989	120.7	178.0	135.4
Blue-collar:			
1988	150.0	224.9	169.9
1989	148.2	214.4	166.2
Manufacturing:			
1988	98.2	131.1	107.9
1989	100.9	139.0	112.1
Blue-collar:			
1988	134.8	176.7	147.3
1989	136.1	180.0	149.4
Nonmanufacturing:			
1988	134.1	195.4	149.2
1989	127.7	181.8	141.0

manufacturing, for example, insurance costs made up 10 percent of compensation costs for union workers and 7.5 percent for nonunion workers.

Table 8 shows that wage, benefit, and compensation costs typically are higher for union than for nonunion workers, but the difference depends on the measure of compensation and the group of workers examined. For all private industry workers in March 1989, wage and salary costs were one-fifth higher for union than for nonunion workers, whereas compensation costs were more than one-third higher. And in manufacturing, the union compensation cost advantage was 12 percent for all workers and nearly 50 percent for blue-collar workers. Clearly, when making union-nonunion comparisons, it is important to look at total compensation rather than simply wages and salaries, and at narrowly defined occupations rather than all workers combined.

Some final observations

As indicated throughout this article, it is difficult to draw simple conclusions about the size of the pay gap, the rate of change in this measure, or even the direction of the change.

Data from all three BLS programs support the presence of an overall union wage advantage, but estimates of its magnitude vary. As one

might expect, the differences in the results stem in large measure from the differences in the data used. The three surveys differ in scope, definition, and method. The CPS, for example, includes farm workers and Federal employees; these groups are not included in the Industry Wage Surveys or the ECI survey. The ECI and Industry Wage Surveys include part-time workers (although the latter exclude them from data on individual jobs), while the CPS data are for full-time workers only.

The Industry Wage Surveys classify a worker as union if a majority of the production workers in the establishment are covered by a collective bargaining agreement; the ECI bases the worker's classification on the contract coverage of the worker's occupation. In both surveys, the worker's actual union membership status is not considered. In the CPS, on the other hand, the worker is classified as union only if the household respondent indicates that the worker is a member of a union on the job. Both the ECI and Industry Wage Surveys collect data from employers' establishments; the CPS is a household-based survey. And finally, the Industry Wage Surveys provide union-nonunion data by detailed occupation and industry; the ECI provides such data for all workers classified by broad occupational and industry groups; and the CPS yields publishable data at only the most aggregate levels. □

Footnotes

¹ H. Gregg Lewis, *Unionism and Relative Wages in the United States* (Chicago, University of Chicago Press, 1963), p. 193.

² Daniel Mitchell, *Unions, Wages, and Inflation* (Washington, The Brookings Institution, 1980), p. 99.

³ Richard B. Freeman and James L. Medoff, *What Do Unions Do?* (New York, Basic Books, Inc., 1984), pp. 44-46.

⁴ H. Gregg Lewis, *Union Relative Wage Effects: A Survey* (Chicago, University of Chicago Press, 1986), pp. 9, 174-87.

⁵ A discussion of union-nonunion differences from compensation data appears later in this article.

⁶ For more information about the Current Population Survey, see *Measures of Compensation*, Bulletin 2239 (Bureau of Labor Statistics, 1986), pp. 34-47; and *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988), pp. 3-12.

⁷ Annual data on median weekly earnings by union affiliation are published in January issues of *Employment and Earnings*, a BLS monthly periodical. The first data, for 1983 and 1984, were published in the January 1985 issue.

⁸ For more information about the Industry Wage Surveys, see *Measures of Compensation*, pp. 7-21; and *BLS Handbook of Methods*, pp. 41-48.

The surveys also commonly provide information on establishment practices such as weekly work schedules and shiftwork provisions and a variety of employee benefits,

including holiday and vacation schedules and the incidence of health, insurance, and retirement plans.

⁹ In the Industry Wage Survey program, establishments and their workers are classified as "union" if a majority of the production work force is covered by terms of a labor-management agreement. Thus, the proportion of workers reported as unionized, as well as estimates of their earnings, may include some employees who were not covered by a contract. For example, if unionized assembly-line employees constituted a majority of a plant's production work force, all production workers in the plant were recorded as unionized, including shipping and maintenance workers who, in fact, were not covered by an agreement. Although no estimates of the number of workers "misclassified" in this way are available, it is believed that the effect on the analysis is small. This is because union agreements tend to be broad-based, limiting the number of nonunion workers in "union" establishments, and because wage levels of these workers are likely to be heavily influenced by those of the predominant (that is, union) group.

¹⁰ As explained in footnote 9, the labor-management agreement coverage status of each establishment is determined by the status of a majority of its production work force. The status of an industry reflects the relative employment of establishments reporting majority coverage and those reporting minority (or no) coverage.

¹¹ See Sandra L. Mason, "Comparing union and non-union wages in manufacturing," *Monthly Labor Review*, May 1971, pp. 20-26.

Union-Nonunion Pay Differences

¹² For an analysis of the collective bargaining issues, plus an account of the terms of the final 1986 and 1987 agreements, see the following issues of the BLS periodical *Current Wage Developments*: May 1986, pp. 1-2; July 1986, p. 1; October 1986, p. 2; and March 1987, pp. 1-2.

¹³ See *Industry Wage Survey: Meat Products, June 1984*, Bulletin 2217 (Bureau of Labor Statistics, 1985).

¹⁴ See *Industry Wage Survey: Men's Shirts and Separate Trousers, May 1978*, Bulletin 2035 (Bureau of Labor Statistics, 1979).

¹⁵ Although the ECI is designed to be a fixed-weight Laspeyres index, indexes for series related to union status are more like Laspeyres chain indexes. See G. Donald Wood, "Estimation procedures for the Employment Cost Index," *Monthly Labor Review*, May 1982, pp. 40-42.

¹⁶ For more information about the ECI, see *Employment Cost Indexes and Levels, 1975-89*, Bulletin 2339 (Bureau of Labor Statistics, 1989).

Separate data for union and nonunion workers were not available until 1988.

¹⁷ See Felicia Nathan, "Analyzing employers' costs for wages, salaries, and benefits," *Monthly Labor Review*, October 1987, pp. 3-11.

¹⁸ An establishment generally is a single physical location where business is conducted or where services or industrial operations are performed.

¹⁹ If some workers in an occupation in the establishment are covered by a union contract and others are not, the two groups of workers are considered to be in different occupations, and one occupation is selected on a probability-proportionate-to-size basis.

²⁰ See Robert J. Flanagan, "Wage Concessions and Long-Term Union Wage Flexibility," *Brookings Papers on Economic Activity*, 1984:1, p. 187. The pre-ECI data on union and nonunion wage changes were from the Bureau's Wage Developments in Manufacturing program, which was discontinued in the late 1970's.

²¹ In "Wage Concessions," Flanagan observed that "It would take another decade of differences in union and nonunion wage growth of the size observed in 1983 to restore the relative union wage in manufacturing to its 1969 level."

²² Effective wage adjustment data are obtained from all union contracts covering 1,000 workers or more. They measure all adjustments in the reference year, regardless of the settlement date. For a more complete discussion, see *BLS Handbook of Methods*.

²³ Because ECI data are based on a sample, wage and compensation change estimates from the survey have sampling errors associated with them; because they are based on data for the universe, effective wage adjustments do not have sampling error.

²⁴ In 1988, about one-third of all employees in transportation and public utilities were covered by union contracts. See *Employment and Earnings*, January 1989, p. 226. Of course, a somewhat smaller proportion of workers would be covered by major bargaining agreements in the industry.

²⁵ See Bradley R. Braden, "Increases in employer costs for employee benefits dampen dramatically," *Monthly Labor Review*, July 1988, pp. 3-7.

²⁶ See Linda A. Bell, "Union Concessions in the 1980's," *Quarterly Review* (Federal Reserve Bank of New York), Summer 1989, pp. 44-58.

²⁷ The chief exception to this pattern is for the year ended December 1985, during which compensation cost increases in the nonunion sector exceeded those in the union sector by 2.0 percentage points, and nonunion wage and salary increases were 1.5 percentage points greater. The apparent reason for this anomaly is that health insurance cost containment was implemented during that period, and health insurance costs are relatively more important for union than for nonunion workers.

²⁸ Reasons for the relative decline in the rate of wage and benefit increases for union workers are explored in Bell, "Concessions," pp. 44-58.

²⁹ ECI data on compensation costs by union status are available only for 1988 and 1989. Note that union and nonunion cost levels reflect a variety of influences, including coverage by a collective bargaining agreement and variation in distribution of union and nonunion workers among occupations and industries.

Productivity trends in the photographic equipment and supplies industry

The introduction of computers and automated equipment, along with modifications in corporate strategy, inventory control, and employee training, was a significant factor in productivity growth during the 1980's

Stuart Kipnis
and
Clyde Huffstutler

Prior to World War II, the photographic equipment and supplies industry primarily manufactured cameras, film, and projectors. In the postwar years and especially since the late 1950's, the industry has helped to develop and refine several products that have had a substantial impact on our lives. Photocopiers, which have become the largest item produced in the industry during the last 20 years, have greatly boosted office productivity. Advances in x-ray technology have led to significant improvements in health care. Micrographics, "instant" photography, and audiovisual communications are other examples of important product developments.

By responding to user demands for new and innovative products, the industry experienced strong growth throughout the 1960's and 1970's. However, as in the case of other advanced electronic industries, intense competition from foreign manufacturers dampened output growth during the 1980's. To regain a competitive edge, a number of the major U.S. manufacturers of photographic products have recently implemented broad, corporate-wide restructuring plans.

This study introduces a new Bureau of Labor Statistics measure of productivity in this industry. It seeks to capture the dynamics of an industry that has gone from a period of strong output growth to one of slower growth and is currently attempting to recover.

Output per employee hour in the photographic equipment and supplies industry increased at an average annual rate of 4.3 percent

between 1967 and 1987, compared with 2.7 percent for all manufacturing.¹ Over this period, output rose 4.9 percent a year while employee hours rose 0.6 percent. Average annual growth rates between the two subperiods defined below differ markedly with regard to output and employee hours:

Period	Output per employee hour	Output	Employee hours
1967-87	4.3	4.9	0.6
1967-79	5.5	7.5	2.0
1979-87	3.8	1.0	-2.7

Between 1967 and 1979, output per employee hour increased at an average annual rate of 5.5 percent, more than double the 2.6-percent rate for all manufacturing. Strong demand for such products as plain paper copiers, cartridge-loading cameras, and photographic film caused output to rise 7.5 percent a year. This strong demand was fueled by favorable demographic trends, increases in personal disposable income and leisure time, and a diverse market for photographic equipment and supplies. To meet this demand, manufacturers added production capacity and increased the number of production workers by 1.4 percent a year.

By contrast, in the 1979-87 period, output per employee hour rose 3.8 percent a year, equal to the rate for all manufacturing. With strong competition from imports of photographic products, industry output rose only moderately. The dominant factor behind this growth in produc-

Stuart Kipnis and Clyde Huffstutler are economists in the Division of Industry Productivity and Technology Studies, Bureau of Labor Statistics.

tivity was a decline in employee hours. This reduction in employee hours was part of a restructuring that a number of the major manufacturers undertook in the 1980's to become more productive and cost effective. Along with a reduction in employment, these manufacturers adopted the latest automation and manufacturing techniques, improved inventory methods and supplier relations, and streamlined their corporate structures to expedite decisionmaking. These changes, though not yet fully implemented, have led to a substantial decline in the manufacturing cost and development time for a number of new products.

Output

The photographic equipment and supplies industry manufactures products which may be classified into two categories: equipment and sensitized materials. Photographic equipment consists of such items as still and motion picture cameras and accessories, audiovisual projectors and screens, and photocopying and micrographic equipment. Sensitized materials include still and motion picture film, photographic paper and chemicals, and x-ray film.

With its array of products, this industry serves a wide range of markets. The consumer market for equipment and sensitized materials—mainly still cameras and film—is enormous, as more than 85 percent of all families own at least one camera.² Likewise, demand from the more than 100,000 professional photographers for still and motion picture equipment, and for film, paper, and chemicals, is substantial.³ Photocopying equipment, once considered a luxury purchase, is found in virtually every office. Other business and industrial uses include storage and retrieval of documents by micrographics and medical and dental diagnostics by x-ray.

Output in the industry rose at an average annual rate of 4.9 percent between 1967 and 1987, compared with 2.4 percent for all manufacturing. This single rate, however, masks the substantial difference in growth rates between the subperiods 1967–79 and 1979–87. Furthermore, year-to-year rates vary considerably due to cyclical swings in the economy and new product introductions.

From 1967 to 1979, output in the photographic industry rose at an annual average rate of 7.5 percent, nearly triple that of all manufacturing. There were a number of factors behind this strong growth. An increase in the percent of the population ages 25 to 44, the most active picture takers, along with a rise in real disposable personal income, contributed to the high demand for amateur camera equipment and film. During

this period, the industry was successful in making photography appealing to the mass market with the introduction of inexpensive and easy to operate cameras. This greatly expanded the base of camera owners, leading to an increase in demand for photographic supplies such as film and paper.⁴

Photocopying equipment was the fastest growing product in this industry during the period 1967–79. The demand for copiers, and in particular plain paper copiers (PPC's), was fed by the need for quick, inexpensive, and high-quality reproductions of documents. A major problem that photocopier manufacturers faced in capturing the enormous market for their products was the prohibitive cost of the equipment. This was overcome by liberal rental policies. PPC's became standard equipment for medium- and large-size offices during the 1960's and 1970's, while either PPC's or the less-expensive but poorer quality coated paper copiers were found in an increasing number of small offices.⁵

Growth in output slowed considerably after 1979 to an average annual rate of 1.0 percent, only one-third of the rate for all manufacturing. The past success of the industry played a role in this slower growth. With so many high-quality, long-lasting products already in circulation, it was difficult to persuade businesses and consumers that new purchases were necessary. Against this market saturation, new product introduction was less effective than in the previous decade.⁶

Output growth was further limited by the intensification of competition from a number of sources. Certain consumer electronics products not included in the industry served as substitutes for photographic products. The most notable example of this trend was the 50-percent decline in motion picture cameras produced from 1979 to 1987 due to the popularity of the new video cameras.⁷ Furthermore, foreign manufacturers were able to capture a significant share of the domestic market in a number of product lines. Shipments of 35mm cameras, virtually all imported, rose from 2.6 million units in 1979 to 7.7 million in 1987.⁸ This was a major factor in the nearly 30-percent decline in still cameras manufactured domestically over this period. This same dominance by foreign manufacturers was evident in new photocopier placements (sales and rentals), especially in the low-cost, low-volume segment of the market where the majority of new placements have taken place since 1979.

Year-to-year movements in output fluctuated considerably throughout the 1979–87 period. In 4 of the years studied, output declined; in 6 of the years, output increased by double-digit per-

Employment cuts were part of the industry restructuring during the 1980's.

Table 1. Indexes of output per employee hour, output, and employee hours in the photographic equipment and supplies industry, 1967-87

[1977 = 100]

Year	Output per employee hour			Output	Employee hours		
	All employees	Production workers	Non-production workers		All employees	Production workers	Non-production workers
1967	63.6	58.5	70.2	51.2	80.5	87.5	72.9
1968	65.7	62.0	70.2	54.5	83.0	87.9	77.6
1969	70.0	67.1	73.4	60.7	86.7	90.4	82.7
1970	67.6	66.8	68.4	59.4	87.9	88.9	86.8
1971	72.3	73.8	70.6	62.4	86.3	84.5	88.4
1972	82.9	83.3	82.5	75.2	90.7	90.3	91.1
1973	89.8	87.2	92.8	86.5	96.3	99.2	93.2
1974	95.6	92.7	98.8	94.5	98.9	101.9	95.6
1975	92.9	95.7	89.9	84.6	91.1	88.4	94.1
1976	99.4	98.9	99.9	95.0	95.6	96.1	95.1
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	110.6	110.2	111.2	112.6	101.8	102.2	101.3
1979	120.6	122.3	118.8	124.7	103.4	102.0	105.0
1980	112.7	117.0	108.4	115.2	102.2	98.5	106.3
1981	111.2	115.8	106.5	116.5	104.8	100.6	109.4
1982	110.2	116.5	104.1	117.3	106.4	100.7	112.7
1983	124.8	135.9	114.6	121.1	97.0	89.1	105.7
1984	131.8	139.4	124.3	125.9	95.5	90.3	101.3
1985	131.1	142.3	120.4	124.4	94.9	87.4	103.3
1986	144.3	161.9	128.9	126.3	87.5	78.0	98.0
1987	153.4	176.4	134.0	128.4	83.7	72.8	95.8
	Average annual rates of change (percent)						
1967-87 ..	4.3	5.1	3.4	4.9	0.6	-0.2	1.4
1967-79 ..	5.5	6.1	4.8	7.5	2.0	1.4	2.6
1979-87 ..	3.8	5.2	2.4	1.0	-2.7	-4.0	-1.4

centages. These movements have roughly corresponded with the cyclical growth of the economy. Other factors that affected yearly output rates were the introduction of new products and the improvement of old products.

Three of the four years in which output declined were recession years. In these years, sales of photographic equipment, in particular, were adversely affected by the slowdown in economic activity. With disposable personal income and business profits down, many customers postponed buying new equipment and continued to use their old cameras or photocopiers. The use of either old or new equipment, however, still requires supplies such as film or paper. With the usage of photographic equipment only moderately affected by these economic downturns, demand for photographic supplies remained strong. This served to moderate the decline in industry output.⁹

Increased demand for photographic equipment and supplies brought about by upswings in the economic cycle partially explains the strong rate of growth in a number of years. While sales of new equipment declined during periods of slow economic growth, these purchases, along with those of sensitized materials,

increased when the economy strengthened. For example, from 1975 to 1979, real gross domestic product rose nearly 21 percent. Over the same period, output in this industry grew by 47 percent.

Besides the health of the economy, the strength of output growth in many of the years covered can be attributed to the industry being able to avoid the output-depressing effects of market saturation. The very nature of the industry, with its array of products manufactured and markets served, has kept output high. Slumps in demand for a particular product or from a single market, when not related to an economic downturn, have not affected output growth significantly. The continued high demand for *other* products or from other markets has prevented industry output from falling significantly.¹⁰

Introduction of new products, along with continuous improvement of old products, has been effective in countering market saturation and keeping demand high. The prime example of a completely new product leading to an increase in output was the pocket instamatic camera.¹¹ In 1972, the year this new product was introduced, output of still cameras increased by 59.1 percent. This was the dominant factor in the 20.5-percent increase in industry output. The next

year, with sales of this camera remaining high, still camera output and industry output rose by 28.7 percent and 15.0 percent, respectively.

Introductions of totally new products, however, are rare. More common is the ongoing process of product refinement. Plain paper copying machines and photographic film are excellent examples. The basic technology used in each product was developed prior to 1967: in copiers, electrostatic charges to transfer an image, and in film, light-sensitive silver halide crystals to form the image. To maintain user interest in an increasingly mature market, manufacturers of copiers have continually improved their product. This evolutionary process, using microprocessor, laser, and fiber optic technology, has changed photocopiers from basic copying machines to complex machines able to perform a number of functions, such as self-diagnostics, multiple-size duplication, and communications with computers and other office equipment.¹² Likewise, advances in film building technology have led to marked advances in film speed, fineness of grain, and sharpness of image, maintaining user interest in silver halide photography. The improvement of these and other photographic products and the introduction of new products have been key factors in keeping demand high for photographic equipment and supplies.

Employment

Employment in the photographic equipment and supplies industry increased at an annual average rate of 0.6 percent from 1967 to 1987, compared to a 0.1-percent decline for all manufacturing. Over the period 1967–79, industry employment rose from 103,600 persons to 134,200, an annual average increase of 2.1 percent. This growth continued until 1982, with employment peaking at 140,200 persons. Large-scale cutbacks in employment during 1983–87 reduced the number of employees to 107,800. Overall, from 1979 to 1987, employment declined by 2.8 percent a year. For all manufacturing, employment rose by 0.3 percent a year in the 1967–79 period and fell by 1.1 percent annually from 1979 to 1987.

Between 1967 and 1979, movements in industry employment followed fluctuations in output. Chart 1 shows the close relationship between employee hours and output. In all but one of the years in which output rose between 1967 and 1979, employee hours grew because of increases in average weekly hours along with the addition of new workers. In 1975, with output falling significantly, employee hours experienced a large decline as employers reduced

both hours worked per week and numbers of workers employed.

In 1970 and 1971, the only years in which output and employee hours moved in opposite directions, a substantial number of hours were being devoted to the development of new products. Manufacturers hired more nonproduction workers, such as engineers, than production workers. This was reversed in 1972 with the introduction of the 110 still camera system, requiring large-scale increases in production worker hours.

A sharp reduction in the level of employment, rather than changes in output, was the dominant factor influencing employee hours during 1979–87. The major manufacturers viewed work force reductions as a necessary step in the successful implementation of sophisticated manufacturing technologies. Thus, this reduction in industry employment was an integral element in the overall effort to boost productivity and lower manufacturing costs.¹³

These cutbacks affected both production and nonproduction workers. With the introduction of automated equipment and computer integrated manufacturing, production worker hours fell by 28 percent from 1982 to 1987, an annual average decline of 5.7 percent. While production worker hours in this industry have historically been volatile, rising and falling with changes in output, *nonproduction* worker hours rose every year but one between 1967 and 1982. Therefore, the 15-percent reduction in nonproduction workers from 1982 to 1987 is significant. During the 1980's, a number of the major manufacturers reorganized their corporate structures, leading to a decline in managerial and administrative positions. Lower level management, closer to the manufacturing process, was given more responsibility for product decisions. The resulting decrease in the time to bring new products to market was necessary to improve competitiveness.¹⁴

In 1967, production workers accounted for 55 percent of all employees in the industry. From 1967 to 1987, production workers declined by 0.3 percent a year while nonproduction workers increased by 1.5 percent. Thus, by 1987, the proportion of employees classified as production workers was only 43 percent. The corresponding ratio for all manufacturing also fell during this period, but remained substantially greater than that for the photographic industry: 74 percent in 1967 and 68 percent in 1987.

Table 2 compares employment by occupation in the photographic equipment and supplies industry and in all manufacturing for 1986. The industry's particularly high proportion of engi-

Introduction of new products and refinements of existing ones have helped keep demand high.

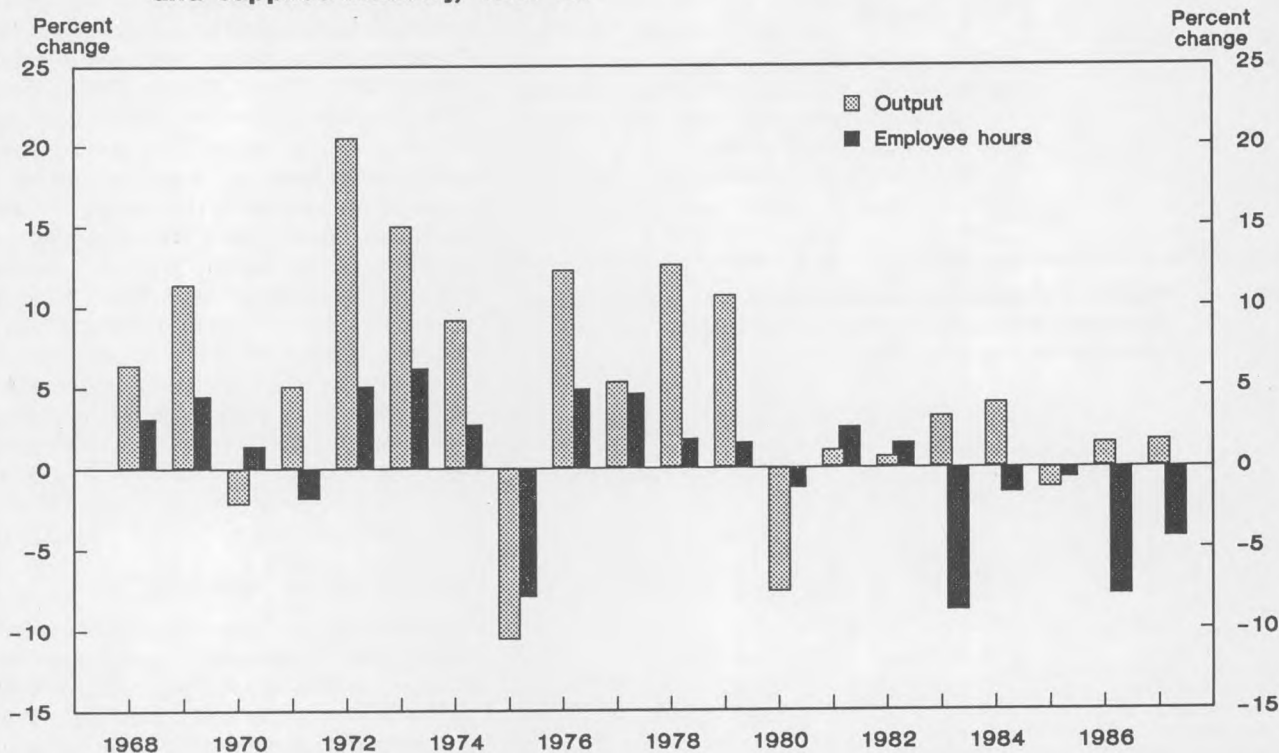
neers, scientists, and technicians—over twice the percentage for all manufacturing—reflects the highly technical nature of the development and manufacture of photographic products. Despite reductions during the 1980's, managerial and administrative workers remain a major component of all employees. While retail outlets sell much of this industry's output, there are notable exceptions. In the highly competitive photocopying and micrographic equipment market, domestically manufactured products, unlike most imports, are usually sold directly to the customer. Therefore, marketing and sales personnel, although only 2.5 percent of employment, are very important in this industry.

The comparatively low proportion of production workers reflects the high capital intensity of the industry, especially in the manufacture of sensitized materials.¹⁵ Another factor lessening the need for machinists and other production workers is the industry's substantial level of outside purchases of such goods as plastic and metal parts. However, the industry does employ many assemblers and other handworkers, as the manufacture of photographic equipment involves a great deal of manual assembly. In comparison with all manufacturing, there is a

higher percentage of skilled employees, such as precision assemblers and product inspectors, employed in the industry.¹⁶ This is due to the advanced technology used as well as the need for extreme accuracy in the manufacture of photographic film and paper. The relatively small physical size of the material inputs and of the final products contributes to the low percentage of material movers employed.

During the 1980's, the adoption of sophisticated technology by the major manufacturers had an impact not only on the number of production workers but also on their function. For example, the industry traditionally has had a separate staff responsible for inspection. Now, however, workers using computers are increasingly involved in their own quality control. In addition, the use of computers in the design and the manufacture of products has made it even more important for workers to become computer literate. Automated equipment has reduced the direct involvement of workers in the manufacturing process. Instead, workers must ensure that this complex equipment functions properly. Furthermore, the input of production workers has become a vital element in the effort by research and development personnel to design

Chart 1. Changes in output and employee hours in the photographic equipment and supplies industry, 1967-87



products for easy assembly.¹⁷ While only recently having an impact on the role of workers, it is apparent that these changes will eventually affect a majority of the industry's work force.

Industry structure

The two categories of products manufactured in the industry, sensitized materials and photographic equipment, require vastly different technologies in their production. These differences have important effects on industry structure. The manufacture of sensitized materials, requiring extreme precision, is highly capital intensive. The great initial expense of the capital equipment, along with the long lead time from product development to manufacture, precludes entry into this field for all but the largest companies. In 1982, the eight largest companies in the industry accounted for 97 percent of the total value of shipments of photographic film, the largest component of sensitized materials. By contrast, hundreds of companies are active in the more labor-intensive manufacture of equipment. Still, the major innovators of photographic equipment are the few very large companies, reflecting the need to commit large expenditures to research and development. Furthermore, due to the technological interdependence between photographic equipment and sensitized materials, most of the large companies are active in both fields.¹⁸

In comparison to all manufacturing, the photographic equipment and supplies industry is characterized by a high degree of manufacturing concentration among a few very large companies. This is illustrated in table 3, which shows the 1982 percent distribution of establishments, employment, and value of shipments in the

industry and in all manufacturing by establishment size.

From 1967 to 1982, the photographic industry increased from 505 companies to 723. Over the same period, the number of physical establishments grew from 557 to 795. This growth was reversed between 1982 and 1987, as the number of establishments fell to 779. The reorganization of many of the major manufacturers, along with lower than expected demand and strong foreign competition, resulted in a sharp drop in employment levels.

With only 17 percent of the establishments, the State of New York accounted for 54 percent of industry employment, 59 percent of value shipments, and 65 percent of value added in 1977. Other major manufacturing centers are located in California, Illinois, Massachusetts, and New Jersey.

Capital structure

The manufacture of photographic products, especially sensitized materials, requires a high degree of mechanization and automation. Increases in production capacity as well as improvements in manufacturing efficiency have required large expenditures for new plants and equipment. The high level of capital asset accumulation over time is an indication of the capital intensity of this industry. For example, the ratio of fixed assets per production worker was at least 1.5 times the corresponding level for all manufacturing in every year but one from 1967 to 1986.

Much of the expenditure on new plant and equipment during the 1970's went to expand manufacturing capacity. There was little pressure to introduce new production technology. This changed during the 1980's, as competition from foreign manufacturers in such product lines as photographic film and paper and photocopiers intensified. To remain competitive, it became necessary for domestic producers to introduce advanced automated equipment and computers into the production process. These expenditures on sophisticated equipment were a major component of the restructuring undertaken by a number of the very large manufacturers in the 1980's.¹⁹

Research and development

Expenditures on research and development have been extremely important in maintaining strong growth in the photographic industry. The introduction of new products and the improvement of old products have helped maintain user interest in an increasingly mature market. Some innovations, such as the instant camera, were

Table 2. Percent distribution of employment by occupation for all manufacturing and for the photographic equipment and supplies industry, 1986

Occupation	All manufacturing	Photographic equipment and supplies
Total	100.0	100.0
Managerial and management related occupations .	8.1	13.8
Engineers, scientists, and technicians	7.6	16.6
Marketing and sales occupations	3.0	2.5
Administrative support occupations	11.8	16.9
Blue-collar worker supervisors	4.2	4.2
Mechanics, installers, and repairers	4.2	3.1
Precision production occupations	9.2	7.6
Machine setters, operators, and tenders	22.9	14.6
Assemblers and other handworking occupations .	12.1	11.8
Various material movers and other laborers	11.4	3.2
All other occupations	5.5	5.7

developed within the industry. Other technologies have been developed elsewhere and adapted for industry use. These include microprocessors, fiber optics, and lasers used in micrographic and photocopying equipment.²⁰ To improve competitiveness, product designers have begun to interact with engineers, shop-floor managers, and assembly workers to create products designed for assembly.²¹ Because of the expense of developing and manufacturing new and improved products, as well as the sophistication of the technology used, the major manufacturers perform most research and development. That 2 of the 12 domestic manufacturers with the largest research and development budgets are in the photographic industry is an indication of the importance of such expenditures in the development of photographic products.²²

Technology

The technologies used in the manufacture of photographic equipment and of sensitized materials differ greatly. The production of photographic equipment is a labor-intensive process in which manufacturers have only recently adopted automation and other advanced technologies. On the other hand, manufacture of sensitized materials is highly capital intensive due to the exacting standards required. While these differences in methods of production require covering the two product categories separately, it is important to remember their interdependence in the overall photographic system from product development to final usage.

Sensitized materials. The two major components of sensitized materials, film and paper, are manufactured by very similar processes. The major difference is in the base used. Photographic paper base is made by a method similar to that used for other papers.²³ However, the need for a chemically pure final product requires special care to ensure freedom from any impurities and contaminants such as metals, bark, and wood dirt.²⁴

Cellulose acetate is the most common foundation for film base. Solvents are mixed with cellulose acetate to form a honey-like substance called "dope." After being purified, the dope is piped in a constant flow through a very narrow slot onto a large coating wheel. The need for uniformity of thickness in the extremely thin film base is paramount. The solvents either evaporate as the wheel rotates or are removed by circulating air around the drying sheet. The film base is then rolled and is ready for coating.

The film emulsion consists of gelatin containing suspended crystals of silver halide. Gel-

atin, made from animal bones and hides, is dissolved in purified water and then agitated in large vessels. During this agitation, a light-sensitive silver halide solution and other chemicals are introduced in very precise increments. Any variations from the desired mix will affect the characteristics of the final product. In the past, obtaining uniformity between batches has been a costly problem. Defective mixes have resulted in labor time being expended to extract the silver from the emulsion and repeat the procedure. Process control computers are now increasingly being used to regulate the manufacture of emulsion and should lead to a reduction in defects. After additional steps, in which the emulsion is further treated to obtain the desired photographic properties, it is ready to be coated onto the base.

Before the application of the emulsion, both film and paper base must be treated to improve the adhesion of the emulsion. This also increases the wet strength of the final product, which is important to its being able to withstand rigorous treatment in photoprocessing solutions. The equipment used in this initial coating stage is similar to that used in the application of emulsion. Nearly all photographic paper is coated with layers of polyethylene, a polymer known for its chemical inertness, water impermeability, and adhesiveness. The chemical properties of the particular polyethylene applied determine the surface texture of the final print: glossy, semi-matte, matte, and textured.

Manufacturers coat film base on both sides with a substance that improves the strength of the film before and after processing. A gelatin layer is then applied to the underside of the base to prevent blurring of the exposed film caused by reflection of light through the emulsion. Also, the gelatin prevents the film from curling during and after processing.

The coating of both film and paper base with the light-sensitive emulsion is done in the dark. Operators unwind the base onto long machines where the melted emulsion is floated up to one side of the base and an airknife blows off excess emulsion. To ensure that the photographic film or paper has the proper properties, the emulsion layers must not deviate from the desired thickness by more than a tiny fraction of an inch. Film and paper manufacturers have recently installed a 100-percent testing procedure using infrared scanners to monitor coating accuracy. This replaces the time-consuming and labor-intensive process of checking a few feet from each roll. After being dried in a cooling chamber, the now sensitized film and paper is rewound and sent to be cut and packaged.

Today, integrated circuits and microprocessors are widely used in the more sophisticated products.

Productivity in Photographic Equipment and Supplies

Given the increased competition from foreign manufacturers, there has recently been extensive capital investment in sensitized materials manufacturing by U.S. producers. While the basic technology and process have remained the same for decades, the addition of process control computers and infrared scanners, for example, has made it possible for output to rise while employment is being cut. Quality control measures have led to significant declines in product defects. Furthermore, production of photographic film and paper has become more flexible, allowing for quick changeovers from one product to another and the cost-efficient production of low-volume runs. Material handling, traditionally the most labor-intensive activity in sensitized materials manufacturing, is just now being automated.²⁵

Equipment. The manufacture of photographic equipment involves a number of technologies found in other industries. Due to the great expense of acquiring the capital equipment used to manufacture the many diverse components of photographic equipment, it is common not only for small and medium, but also for large and very large manufacturers to purchase a high proportion of these parts from outside suppliers. These include the metal frames of photocopiers, the plastic bodies of cameras, and the microprocessors of the more advanced equipment.²⁶ Efforts to lower costs of production and improve productivity in the industry have focused on the manufacture of the components as well as on the final assembly of the equipment.

Product designers have worked closely in recent years with outside vendors, as well as with floor managers, assemblers, and engineers, to simplify equipment assembly. Input from these sources has led to a number of labor-saving modifications in equipment design. For example, a switch on a photocopier was simplified from seven parts to two, resulting in a reduction

in assembly time from 77 seconds to 7. Improved design also lowers material costs. A printer head with a new snap-fit design saved 50 percent in material costs and 40 percent in manufacturing time over the old design.²⁷

An aspect of product design that manufacturers implemented to improve the capacity of the final product and to simplify assembly was the use of integrated circuits and microprocessors in the more technologically advanced equipment. First used in photocopiers in the mid-1970's and later applied to other equipment, this technology replaced a multitude of mechanical parts. The result was an overall decline in the number of components used and a reduction in assembly time.²⁸

During the 1980's, the large manufacturers have used computer-aided design (CAD) extensively in the design and development of photographic equipment. The use of CAD has significantly reduced the time spent designing new products. Furthermore, revisions in design, either to correct an error or adapt a product to a specific market, are handled easily with CAD. Computers enable the designer to interact in the initial stages of product development with suppliers, whether external or internal. By using CAD, parts manufacturers can design production tools nearly simultaneously with the design of the product, further reducing the time required to bring a new product to market.²⁹

Manufacturers have also used computers in the production of equipment components and in the final assembly of these parts and sub-assemblies. The use of computers to track inventory levels, together with the adoption of automated material handling equipment, has allowed manufacturers to reduce the number of workers involved in material handling and the number of days that inventory is held. The application of statistical process control to the quality control process has led to large-scale reductions in product defects and a correspond-

Table 3. Percent distribution of firms in the photographic equipment and supplies industry and in all manufacturing, by selected characteristics, 1982

Average establishment employment	Establishments		Employment		Value of shipments	
	Photographic equipment and supplies	All manufacturing	Photographic equipment and supplies	All manufacturing	Photographic equipment and supplies	All manufacturing
Total	100.0	100.0	100.0	100.0	100.0	100.0
1 - 19	63.6	66.1	2.6	7.9	1.7	5.0
20 - 99	24.8	24.0	7.3	20.5	4.8	16.3
100 - 999	9.8	9.3	19.2	46.4	15.8	47.8
1000 or more	1.8	.6	70.9	25.2	77.7	30.9

ing decrease in labor time expended on reworks of poor quality output.³⁰ Computer-aided manufacturing (CAM) is used in the programming of automated machinery. In an integrated CAD/CAM system, manufacturers are able to use more-flexible manufacturing techniques, allowing for cost-effective, low-volume product runs. For example, a computer-controlled robot can now perform in just 15 minutes a die change-over that once took 6 to 10 hours.³¹

Use of computers and automated equipment has proven to be most successful when combined with a strategy to simplify the product, the process, and the organization. Therefore, the utilization of advanced technology by many large manufacturers of photographic equipment is not an isolated occurrence. Instead, these investments are an integral part of the broad restructuring plans adopted to improve productivity and competitiveness.³²

The high labor requirements of photographic equipment assembly have made this one area of the production process in which manufacturers have implemented a number of changes designed to boost productivity. For instance, manufacturers have concentrated on the simplification of product assembly, the improvement of quality through statistical process control, and the continuous tracking of inventory by computers. These changes have substantially improved the efficiency of equipment assembly, as well as that of parts manufacture. Still, assembly remains highly labor intensive, as automated equipment is not yet suitable for most of the delicate operations required in assembly. Instead, manufacturers have introduced a variety of assembly processes based on the multitude of products manufactured, ranging from disposable cameras with 21 parts to photocopiers with nearly 5,000.

Complex equipment, such as photocopiers and microfilmers, is increasingly being assembled using a series of workstations. Rather than having each assembler perform discrete steps as in a traditional assembly line, workers at these stations execute a number of assembly, as well as nonassembly, tasks. For example, at each station, workers attach various subassemblies and components to the mainframe. Before sending the mainframe to the next station, the assemblers perform a quality check. This is important in locating problems immediately and at their source. The complex flow of components to the various workstations is handled by inventory control computers at each station. Unlike traditional lines, which are best suited for high-volume runs of a single product, assembly by workstations can accommodate changes in subassem-

blies or components without long delays. With the increasing need to adapt products to specialized markets, this flexibility is highly desirable.³³

Workstations have also proven effective in the assembly of less complex equipment, such as cameras and basic microfilmers. In the assembly of these machines, frequently only one workstation is needed. This focuses responsibility for all of the functions associated with assembly on a small group of workers or even on a single individual working unaccompanied. With this increased accountability, there has been a dramatic improvement in the quality of the output as well as a reduction in nonassembly workers involved in inventory control and product inspection.³⁴

The use of traditional assembly line techniques is most effective in high-volume production runs, where changes in parts and subassemblies are few. The final assembly of a still camera with 225 components involves 10 workers. Assembly takes only 18 minutes, with each worker executing a discrete step along the line. The assemblers perform quality control checks on a random basis at various points on the line. Design-for-assembly programs, which reduce the number of parts used and simplify assembly, have enabled assembly lines to remain a cost-effective technique.³⁵

Equipment manufacturers have adopted automated assembly techniques for a few products, the most notable being the disposable camera. Consisting of just 21 parts, this product was designed to be assembled by two automated assembly lines. There are no fasteners, which are difficult for automated equipment to handle. Instead, all parts are engineered to snap and fit together. The use of computers in the design and automated equipment in the manufacture of this camera has allowed for its low-cost production.³⁶ Still, despite the success of automation in the assembly of the disposable camera, the assembly of most equipment remains heavily labor intensive.

Outlook

Competition from electronic products not classified in the industry and from imports of photographic products should continue to affect output in the U.S. photographic equipment and supplies industry. Introduction of new products and improvement of existing products will remain essential in countering this strong competition. It is expected that significant product advances will include "intelligent" copiers with the capacity to communicate with other office products and photographic film with improved speed, grain, and sharpness.³⁷

Computer-aided design helps producers target specific markets.

One product expected to have a significant impact on the photographic industry in coming years is the electronic still camera. These cameras electronically record, on magnetic discs, images that may be viewed and transmitted instantly without chemical processing. At present, photojournalists are the primary users of these cameras, as the importance of their transmitting images quickly is paramount.

A number of obstacles must be overcome before electronic cameras are likely to be widely accepted in the important consumer market. These cameras are currently very expensive. The quality of the color hard-copy prints produced from the magnetic discs is much poorer than that of traditional 35mm prints. Furthermore, with the enormous base of conventional cameras in circulation, it will be difficult to persuade consumers to purchase an entirely

new system. Thus, many experts feel electronic photography will not replace conventional photography. Instead, the dominant view is that the two systems will coexist in the form of combination units, with aspects of both formats.³⁸

The ability of manufacturers to continue to lower production costs will be essential in order to compete successfully with photographic imports and with substitute products. The introduction of computers and automated equipment, in combination with important modifications in such areas as corporate decisionmaking, inventory control, and employee training, was a significant factor in productivity growth during the 1980's. That manufacturers implemented these changes as part of broad, corporate-wide restructuring plans, rather than in isolation, should allow for the efficient use of advanced technology in the future. □

Footnotes

¹ The 1987 *Standard Industrial Classification Manual* of the U.S. Office of Management and Budget defines the Photographic Equipment and Supplies Industry and classifies it as SIC 3861. The major products included are (1) photographic apparatus, equipment, parts, attachments, and accessories, such as still and motion picture cameras and projection apparatus; photocopy and microfilm equipment; blueprinting and diazotype (white printing) apparatus and equipment; and other photographic equipment; and (2) sensitized film, paper, cloth, and plates, and prepared photographic chemicals for use therewith.

Average annual rates of change shown in the text and tables are based on the linear least squares trend of the logarithms of the index numbers. The indexes for productivity and related variables will be updated annually, and published in the annual BLS bulletin, *Productivity Measures for Selected Industries and Government Services*.

² 1986-87 *Wolfman Report on the Photographic and Imaging Industry in the United States* (New York, ABC Leisure Magazines, Inc., 1987), p. 46.

³ 1986-87 *Wolfman Report*, p. 85.

⁴ Richard M. Blassey and Jerome Deitch, *The U.S. Photographic Industry: 1963-73, an Economic Review* (U.S. Department of Commerce, 1976), pp. 8-9.

In 1980, 47 percent of amateur still film was used by people ages 25 to 44, according to the 1981-82 *Wolfman Report*, p. 32.

In 1965, 24.1 percent of the population was between 25 and 44 years old. This proportion fell slightly to 23.6 percent in 1970 and then rose steadily to 27.8 percent by 1980. See U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 1970* (Washington, Government Printing Office, 1970), p. 8; and *Statistical Abstract 1986*, p. 26.

Real disposable personal income in 1982 dollars rose from \$1,668 billion in 1970 to \$1,932 billion in 1975, and to \$2,214 billion in 1979. See *Statistical Abstract 1987*, p. 423.

⁵ "Mature Market Forging Ahead," *Financial Times Survey: Reprographics*, Apr. 2, 1980, p. 27.

⁶ Mike Antoniak, "Industry to Roll with the Changes," *Photographic Trade News*, Sept. 5, 1988, p. 12; Thomas D. Henwood, "Henwood Analyzes Industry Performance, Fu-

ture Trends," *Photo Weekly*, Apr. 30, 1984, p. 1; and U.S. Department of Commerce, International Trade Administration, *1986 U.S. Industrial Outlook* (Washington, U.S. Government Printing Office, 1986), p. 35-1.

⁷ Video camera shipments rose from 61,000 units in 1979 to 448,000 in 1984. Shipments of the more versatile camcorders, also classified in SIC 3651, were 517,000 in 1985 and 1,604,000 in 1987. Source: Electronic Industry Association.

⁸ 1988-89 *Wolfman Report*, p. 22.

⁹ Blassey and Deitch, *The U.S. Photographic Industry*, p. 12; and 1976 *U.S. Industrial Outlook*, p. 271.

¹⁰ 1989 *U.S. Industrial Outlook*, p. 33-1.

¹¹ Blassey and Deitch, *The U.S. Photographic Industry*, p. 11.

¹² Robert Anderson, "The Revolution in Reprographics," *Modern Office Procedures*, November 1982, p. 61.

¹³ "The New Lean, Mean Xerox: Fending Off the Japanese," *Business Week*, Oct. 12, 1981, pp. 126-28; and Thomas Moore, "Old-line Industry Shapes Up," *Fortune*, Apr. 27, 1987, p. 23 and pp. 26-28.

¹⁴ "The Shrinking of Middle Management," *Business Week*, Apr. 25, 1983, p. 54.

¹⁵ The manufacture of sensitized materials has traditionally been capital intensive due to the exacting standards required. Equipment manufacture, on the other hand, is labor intensive. Only in the last decade have automation and other advanced technologies such as CAD/CAM been applied to the manufacture of components for photographic equipment. Final assembly remains highly labor intensive. See sections on industry structure and on technology for more detailed coverage.

¹⁶ The percentages of precision assemblers and product inspectors in the photographic industry are 3.95 and 3.97, respectively. For all manufacturing, these figures are 1.81 and 3.05.

¹⁷ Halbert Harris, "Design for Profitable Manufacturing," *Appliance Manufacturer*, September 1987, p. 21; "Leadership Through Quality," *Appliance Manufacturer*, November 1988, p. 43; and industry source.

¹⁸ Blassey and Deitch, *The U.S. Photographic Industry*, pp. 14–17.

¹⁹ "Kodak plans 46% Rise in '85 Outlays, Seeks to Boost Productivity," *The Wall Street Journal*, Dec. 21, 1984, p. 26; Michael C. Gabriele, "Kodak Shoots for Competitive Niche," *Metalworking News*, Mar. 28, 1988, p. 4; and "From Womb to Tomb," *Appliance Manufacturer*, November 1988, pp. 40–42.

²⁰ "The Chip is Only Half the Story," *Financial Times Survey: Reprographics*, Apr. 2, 1980, p. 28; and Anderson, "The Revolution in Reprographics," p. 61.

²¹ Harris, "Design for Profitable Manufacturing," p. 21; "Copiers More Productive—by Design," *Appliance Manufacturer*, November 1988, pp. 39–40; and John Holusha, "Beating Japan at Its Own Game," *The New York Times*, July 16, 1989, sec. 3, p. 1.

²² "The R&D Elite," *Business Week Special 1989 Bonus Issue: Innovation in America*, pp. 66–67.

²³ For information on the technology used in the manufacture of paper, see *The Impact of Technology on Labor in Four Industries*, Bulletin 2228 (Bureau of Labor Statistics, May 1985), pp. 9–19.

²⁴ Elliott Novak, "Color Paper Sales Grow, Despite Market Maturity," *Photo Marketing*, November 1984, p. 28; and Peter Krause, "Outlook for the Photo Paper Industry Is Good," *Photo Marketing*, December 1980, p. 34.

Due to the exacting specifications required in the manufacture of the ultra-high grade paper base, there were only six main base paper producers in the non-Communist world as of 1984, two of which were located in the United States. Three of these companies, and one in the United States, coat the paper base with light-sensitive emulsion and market the final product. The other manufacturers act as suppliers of unsensitized paper base to companies engaged in the sensitizing of photographic products.

²⁵ Industry sources.

²⁶ Information on a number of the technologies used to manufacture components for photographic equipment can be found in the following *Monthly Labor Review* articles: James D. York, "Productivity growth in plastics lower than all manufacturing," September 1983, pp. 19–21; Barbara Bingham, "Instruments to measure electricity: industry's

productivity growth rises," October 1983, pp. 14–15; and Horst Brand and Clyde Huffstutler, "Trends in labor productivity in metal stamping industries," May 1986, pp. 16–17.

²⁷ "Xerox Design Institute Cuts Product Development Time," *Appliance Manufacturer*, November 1987, pp. 25–26.

²⁸ Ted Wirth, "Three Good Reasons for the Boom in Copying Machine Use," *The Office*, July 1982, p. 129; and "Innovation in the Camera Industry," *Photo International*, November 1984, p. 25.

²⁹ Gabriele, "Kodak Shoots for Competitive Niche," p. 4; "Copiers More Productive—by Design," pp. 39–40; and "From Womb to Tomb," pp. 40–42.

³⁰ "How Xerox Speeds Up the Birth of New Products," *Business Week*, Mar. 19, 1984, pp. 58–59; Norm Alster, "An American Original Beats Back the Copycats," *Electronic Business*, Oct. 1, 1987, pp. 56–59; and "Leadership Through Quality," p. 43.

Statistical process control is used at each stage of the manufacturing process to continuously monitor quality control. Workers subject randomly selected parts and components to a series of performance criteria. Computers analyze the results and determine if quality standards are met. Statistical process control allows manufacturers to pinpoint trouble areas at the source.

³¹ "From Womb to Tomb," p. 42; and an industry source.

³² "Smart Factories: America's Turn?" *Business Week*, May 8, 1989, pp. 142–48.

³³ Industry source.

³⁴ Holusha, "Beating Japan at Its Own Game," p. 1 and p. 8; and an industry source.

³⁵ Gabriele, "Kodak Shoots for Competitive Niche," p. 4 and p. 46.

³⁶ *Ibid.*

³⁷ "Copiers '86," *Administrative Management*, December 1985, pp. 34–36.

³⁸ Stephen Booth, "See, No Film," *Rolling Stone*, Mar. 9, 1989, p. 113; George Berkowitz, "Electronic Photography Will Not Displace Film," *Photo Weekly*, May 21, 1984, p. 1; and 1988 *U.S. Industrial Outlook*, p. 37–2.

APPENDIX: Measurement techniques and limitations

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

The preferred output index for manufacturing industries would be obtained from data on quantities of the various goods produced by the industry, each weighted (multiplied) by the employee hours required to produce one unit of each good in some specific base period. Thus, those goods that require more labor time to produce are given more importance in the index.

In the absence of adequate physical quantity data, the output indexes for the industries discussed here were developed using a deflated value technique. The value of shipments of the various product classes was adjusted for price changes by appropriate Producer

Price Indexes to derive real output measures. These, in turn, were combined with employee hour weights to derive overall output measures. The result is a final output index conceptually close to the preferred output measure.

The employment and employee hours indexes used to measure labor input were derived from data published by the Bureau of Labor Statistics. Employees and employee hours are each considered homogeneous and additive, and thus do not reflect changes in the qualitative aspects of labor, such as skill and experience.

The indexes of output per employee hour do not measure any specific contributions, such as that of labor or capital. Rather, they reflect the joint effect of such factors as changes in technology, capital investment, capacity utilization, plant design and layout, skill and effort of the work force, managerial ability, and labor-management relations.

Recollections of a former editor

*During 22 years as MLR editor-in-chief,
the author changed the magazine
from a staid, sober, reliable journal
to an innovative, exciting, sober,
reliable journal*

Lawrence R. Klein

Lawrence R. Klein became something of a BLS legend during his 22 years as editor-in-chief of the Monthly Labor Review and director of publications in the Bureau of Labor Statistics. When he retired in 1968, he established an annual award to recognize good writing in the MLR. To do this, he matched the funds his friends collected to buy him a retirement gift and donated the total — the latter matched by his friend, then Assistant Labor Secretary John W. Gibson. As a trustee of the Lawrence R. Klein Award Fund, Klein not only participates annually in selecting the best articles published in the MLR, but also continues to contribute to the fund each year.

To help mark the Review's 75th year, the current editor invited Klein, now 82, a resident of Tucson, Arizona, and still engaged in teaching writing, to reminisce about his 22 years at BLS.

The day I left the *Monthly Labor Review* is fuzzy, lost behind a turn in the road, but the events of that first chilly day in March 1946 when I came to the *Review* are frozen in time. I had come to town very early in the morning, by train, a stranger, and carried my luggage to the BLS offices, which then were in the old and ornate Labor Department building at 14th and Constitution, a latter-day Horatio Alger character carrying his possessions, only this time not as a bundle on a stick.

Charles D. "Chuck" Stewart, a friend from college days at The University of Michigan, was the only staff member I knew, and so it was with

a feeling of insecurity that I reported at the Commissioner's office. Isador Lubin was the Commissioner, but he hadn't been around the Bureau in almost 6 years because President Roosevelt had dragooned him for defense and war work at the White House. A. Ford Hinrichs was the acting commissioner. As he wasn't in, Aryness Joy Wickens, his deputy, received me. After a briefing, I was taken to my office, which consisted of three rooms: A reception room where my secretary and a typist sat, a connecting office for a leading editorial staff member, and another connecting office for me. Leading off the reception room was a huge bathroom, tiled from floor to ceiling, complete with glassed-in shower. This suite had been used by Hugh S. Hanna, my predecessor, who had retired 2 years previously. When the building was designed, the suite had been intended as the Commissioner's office. But Commissioner Lubin wanted a corner office, so one was assigned to him with a newly-installed bath. An ironical footnote: My stay in the royal suite lasted only about 2 years. I was ousted to make room for the departmental information director who insisted on a private bath. *Sic transit gloria mundi.*

The first staff meeting

After I greeted the new secretary (who was a jewel), I asked her to call a staff meeting. To my amazement and no little consternation, my new office was bare—not a stick of furniture.

The telephone on the floor bore the extension 327, which I had for 22 years and which still is the number of the publications office, except that the prefix 1 has been added.

The staff trooped in. Another surprise: There were 23 members—all women. Except for a couple of youthful clerk-typists, they were all middle-aged or older, and all—I could tell from their expressions which ranged from skepticism to apprehension—wanted to size up the new kid on the block. There was no question of equal rights: they had no place to sit, nor did I.

After a few conventional remarks—“cooperation . . . open door . . . part of a renowned venture”—they told me what they did. The division consisted of 3 units: The *Monthly Labor Review* (5 staff members), Bulletins (12), and Inquiries and Correspondence (4). My immediate staff numbered two. The *Review* was headed by a very competent person who had been the acting editor-in-chief; she was an expert on cooperatives and a national figure in that movement. Another senior *MLR* staffer was a longtime employee, scholarly and wise. There was a book review editor, and I listened to her remarks carefully because I thought a reorganized book review section was high on the list of new projects. I noted with some surprise that even in 1946 she wore high-button shoes. Proofreading for the *MLR* apparently was shared with the Bulletin staff. The Bulletin series had begun almost with the establishment of the Bureau under Carroll D. Wright. The Correspondence group handled routine requests for information and reviewed all letters from around the Bureau requiring the Commissioner's signature.

I learned that none of the staff had previous editorial experience. Some were close to the then compulsory retirement age of 70. There were the usual feuds and jealousies and an attitude of “do-not-encroach-on-my-territory.” I asked each person's opinion on what the office needed, and some responses suggested good thinking. Later in a session with my top staff, I sounded them out on a few specific plans. They were enthusiastically supportive and promised to help guide me through the mine fields.

I ended the day with trepidation, much as I had begun it. I was tired, I had not yet found a place to stay, my family had remained in Michigan, and after becoming acquainted, during afternoon interviews, with the professional competence of all the top Bureau staff members and the unquestionable brilliance of many, I began to have a quavering doubt about my own ability to accomplish what the Commissioner and the Secretary's office had in mind for the development of the BLS publications program.

But when day two dawned, I awoke with restored energy and fresh enthusiasm. But breakers lay ahead.

New goals

Although somewhat lacking in specificity, a general goal for BLS publications was made known to me. The *Review* should be brightened up, in substance, writing, and appearance. Refurbished, the *Review* was to become a sparkling window on the Bureau and the Department. Other publications also were to be spruced up. We were to make a determined effort at a press and public relations program.

It all seems like fun now; at the time, the first couple of years exuded agony—frustrations, opposition, a search for talent. Our first step, while apparently superficial, was very important psychologically: it was to start work on a new format for the *Review*. I sidestepped the Government Printing Office's Typography and Design section because of its reputation for stodginess, and engaged the late Charles Pollock, professor of design at Michigan State University and the brother of the famed artist Jackson Pollock. While this innovation was in progress, we set about drafting three BLS administrative orders. One—written by Charles Stewart, later to become a deputy assistant secretary—formally established the *Review* as a Bureau program, set the boundaries of the editor's prerogatives, created a *Monthly Labor Review* Planning Advisory Committee, and explicated *Review* standards. The second created a Special Publications Division within the Office of Publications and gave it a role in planning as well as editing the Bulletin series and other publishing ventures. The third order placed authority within the Office of Publications to administer press and public relations.

After some difficulty, the three orders were approved. The major objections were to the proposals for more autonomy for the *Monthly Labor Review* and to the authority given to the Director of Publications for press release clearance. I was green when it came to coping with internecine warfare. Around the Bureau and Department a frequent question was: “Upon what meat doth this our Caesar feed?” In retrospect, I recognize I was pretty brash. But one learns. And there is no better teacher than a bloody nose.

But there was also support from both the Secretary (former Federal Judge Lewis B. Schwollenbach) and Assistant Secretary John W. Gibson, from newly-appointed Commissioner Ewan Clague, and from Aryness Wickens. Hugh Hanna, cognizant of the prob-

There is no better teacher than a bloody nose.

lems with the *Review*, was helpful from the beginning. When plans became known, there was growing support from a number of influential staff members, both newcomers and veterans—Edward Hollander, Witt Bowden, Duane Evans, Dorothy Brady, Henry Fitzgerald, Max Kossoris, Wendell MacDonald, Phil Arnow, and other resourceful and creative people. It was all going to take time and patience to achieve the goals, and I had little of the latter.

Editorial problems

The manuscripts I reviewed and the galley proofs of a current issue revealed some of the problems that had to be solved, but only the superficial problems. Apparently, there was no real concept that editing went beyond copy reading. The editing staff needed training and a blood transfusion. Though not an issue of gender, it was emblematic of the inertia that abounded that I was still the lone male in residence.

The editorial problems were embedded in the *Review's* history. The journal had been virtually unchanged for more than three decades, in content and style, in its kind of bland, stilted, and even monotonous way of dealing with material—the “good, gray *Monthly Labor Review*.” It had a paid (\$3.50 per year) circulation of about 3,000. It was laid out in a 6 x 9-inch page format that didn't lend itself to good layout and design. More important, its contents were organized with no set scheme. Statistical series were scattered helter-skelter. The books section consisted of a listing of Government documents and volumes recently received by the Labor Department Library. The only continuing indication of emerging events was a Chronology of Recent Labor Events and brief summaries of significant court decisions in labor-related cases. For example, in the issues published from 1929 to 1940, there had been no serious examination of that personal and public tragedy known as The Great Depression and little more than passing mention of the crisis engendered by mass unemployment or of the dramatic new concepts of government relief programs.

In all candor, the *Review* little resembled a professional journal circulating almost without competition in a vital part of the social sciences.

But wait, there was a positive side: The *Review* enjoyed a nationwide reputation for integrity and reliability. The desideratum of the whole Department was to enhance these qualities, to broaden their influence, and to make them more useful. The rub was, how to go about achieving all this.

I could see in the offing the grail, But I was no Galahad. Many a lance was broken and many a rule of chivalry was ignored by me in the pursuit.

Lights, camera, renewal

First we changed the page size to the present format. Our first cover design was rejected by GPO because of a ukase against two-color printing. So we settled for a cover design in one color of ink, using Century Bold, a clean assertive type face, in up to 60-point size. Interior page heads used the same face with a compatible body type. Great care was taken with page layout. We tried mightily, but for many years did not succeed, to spruce up, simplify, and make more meaningful our chart work.

How well was the *Review* serving the needs of readers? No one really knew. Yet here we were, a part of one of the world's greatest survey institutions—BLS—with superb skills in devising questionnaires and selecting samples for surveys. The *Review* staff enlisted the best talent BLS had on tap to create a reader survey. Aesthetically, the survey form was beautiful—a colorful four-page fold, with a brief letter comprising the first page, promising the respondent that the nine or so questions could be “check-mark answered” in “less than four minutes.” To encourage readers to respond, the questions were in large type with lots of white space. The back of the form contained only a block for the address and a note “To Library or Mail Room,” pointing to a facsimile of the *MLR* cover, asking that the form be given to “the usual first reader” of the magazine. By this, we discovered who read the *MLR*, what they read first, what they liked best, which of their interests weren't covered, what was in it that they didn't like, how long they had been subscribers, and so on. In the end, we had an amazing 83-percent response rate.

Blood transfusion

Meanwhile, the publications staff received a blood transfusion in the form of some new staff members and reorganized operations. A managing editor and an executive editor for the *Review* were appointed. Three staff writers were hired to write articles based on their own investigations of subjects that were not the province of the operating divisions. A superb staff addition was acquired by opportunism on my part. Mary S. Bedell, administrative assistant to the Deputy Commissioner, was a good writer and alert to faults in writing and reasoning. She was conversant with all the operational facets of BLS. She

The MLR had been virtually unchanged for more than three decades.

was sharp as an eagle in her knowledge of economic analysis. In short, she had all the attributes of a *Review* editor. The deputy commissioner happened to be away for a few weeks. I offered Bedell a better job. She accepted. The Personnel Office was in a tizzy, bracing itself (as did I) for the inevitable wrath and cry of "foul" from the deputy commissioner. We won, and thus achieved the greatest assist the staff ever had. Within a half dozen years, she was executive editor.

John Thurber, who held a doctorate in labor economics from Cornell, headed up the special publications branch (succeeded by Marjorie Egloff). Mead Smith, Phyllis Groom, George Kotrosios, and Robert Fisher (currently executive editor) served as staff writers.

There was other great staff support. The *Monthly Labor Review* Planning Advisory Committee did what its name suggested. It consisted of about a dozen members representing BLS, the Department, and a couple of other Departments—all chosen for imagination and planning acumen. (The committee also had other talents: It may still be remembered by oldtimers for the rather reclusive and exclusive and raucous Christmas parties it put together.)

A flurry of persons (and their talents) come to mind as I think back to the publications staff members of yesteryear: Margaret Schoenfeld (fighter for high standards), Jack Strickland (innovator with high-voltage energy), Elizabeth Black, my first managing editor, Gladys Wash and Marie Pryor (invaluable connections with the Government Printing Office), Olivia Amiss (still aboard and now engaged in general editing as well as handling book reviews), Glenn Tibbott (who ruled the Inquiries and Correspondence Section with a brook-no-nonsense approach and terrorized many an operating-division chief), Irene Reedy (she worked her heart out on the *MLR*), Gene Skotzko (the fiery-tempered Ukrainian emigre), and Ago Ambre. Two of the best were Alma St. Clair and Vivian Hogans (my first and last secretaries), and surely a score of others, performing importantly, loyally, and competently.

I dwell on these persons to thwart any notions that the progress of the *Review* and of other programs of the Publications Office was the work of a one-man gang.

The payoff

After all these preparatory moves—format and design, reader survey, planning committee, augmented staff, reorganized contents—what was accomplished? By the 1950's, all things were in place. I recall how astounded the Bureau was—

and proud—when the American Institute of Graphic Arts at its magazine show of 1950 gave the *MLR* a Certificate of Excellence award, the first ever to a Government magazine. The award was repeated in 1952.

Paid circulation went up fast, due partly to some persistent promotion by circular, exhibits at meetings, and a lot of publicity. *Business Week*, in a two-page spread in its December 11, 1954 issue, gave the *Review* a kind of rave review, reported our paid circulation at 8,000, and noted our readers' survey response rate, most of it from top management.

I have vivid memories of the struggle to build a solid, professional-journal type book review section which the planning advisory committee and the division chiefs approved. After we convinced publishing houses that we had an affluent and quality-conscious readership and expert reviewers from the Bureau, the Department, and throughout the country, the books poured in. Each month, we ran seven or eight full-scale signed reviews, a page or so of brief notes, and up to four pages of listings. I believe the improvement in this section gave me more satisfaction than anything else we did in the whole constellation of changes.

Regular promotional meetings with potential authors in each area were held in the regional offices, with enthusiastic help from regional directors.

The special issues

Beginning in 1947, and throughout the years, the *MLR* has published specialized issues based on regions or specific themes. A disclaimer is in order here. I have been credited with conceiving the idea. Not true. The first one was fortuitous. We had a New England employment article. Later a second New England article on wage patterns came in, scheduled to be published at a later date. On request, the regional director dug up or contrived to have written two more. And lo, the first special issue was born—published in July 1946.

We did, however, do serious planning for subsequent special issues, close to a dozen of them through 1968. My favorites were *Fifty Years' Progress of American Labor* (July 1950, celebrating the *Review's* 35th birthday); *Seventy Years of Service, the Story of BLS* (January 1955); *Fifty Years of the MLR* (July 1965); and *Labor in the South* (March 1968).

The 1950 issue celebrated two anniversaries: the 35th of the *Review* and the 100th of Samuel Gompers' birth. There were 24 special pieces representing the best possible authors from BLS, and from outside notables, fashioning a broad

The Monthly Labor Review Planning Advisory Committee lived up to its name.

spectrum of thought and expertise “to plot those currents of American development upon which our labor progress has been borne and to measure some of labor’s aspirations against the results. . . .”

The book review section of that issue proved to be particularly well-received. It was developed by Merlyn S. Pitzele, then labor editor of *Business Week*, and contained evaluations by 10 experts of 13 books (published since the turn of the century) to interpret “what meaningful things do these books tell us today.” Taken as a whole, the issue was a painstaking endeavor that involved almost a year of effort from conception to birth.

Almost as arduous a task was the conception and development of the 50th anniversary issue of the *MLR* (July 1965). The plan was to sum up accomplishments and to invoke, through a special section called “Future Assignments,” in the form of essay-letters from highly-respected users of the *Review* (ominously 13 in number), a mandate as to the form in which the *Review* should endure in the face of faster and more complex social changes. There were widely (and wildly) differing admonitions, from George Shultz to George Brooks to George Taylor, and from John Dunlop to John Post. Even today, people who have more than a passing interest in the *Review* might do well to reread them. The institutional setting of the *Review* and the manner in which it is flexible enough to adapt to changing social conditions and needs was admirably and perceptively delineated by H. M. Douty, then a BLS associate commissioner.

I recall the work and devotion to purpose that resulted in major articles by two of our staff writers. One by Phyllis Groom, called “From Model-T to Medicare—Paragraphs from History,” attempted to show, by means of extensive quotes and ample commentary, how the *Review* had, over the years, covered, analyzed, and anticipated emerging problems and events. The other, by Marjorie C. Egloff, titled “From the Best of the *Review*,” was based on a selection of nine articles from among the scores published over the 50 years. Brief notes explained the reasons for each choice, although the main criteria were excellence of writing and relevance.

Other changes, other publications

Life picked up for the Special Publications Branch as well. We started a monthly catalogue of all BLS publications and press releases and initiated a continuing series of the *Handbook of Labor Statistics*. Notable in my recollection was *The Gift of Freedom*, produced in 1949 under

the supervision of Witt Bowden, one of the all-time great BLS analysts and authors. Nearly a million copies of this volume were distributed in this country and in a German edition by the U.S. State Department. It had a large propaganda slant, designed to counter Communist activity among workers in postwar Germany, but it was an accurate report on labor conditions in America through statistics and well-written commentary.

A grimly amusing footnote to the publication of *The Gift of Freedom*, can be related after 40 years: I wrote an introduction to the book that interspersed quotations from Walt Whitman on the first page. The monitors of the book in the U.S. State Department objected to Whitman—they called him a radical—and wondered out loud who in Europe had ever heard of him? After a somewhat lengthy and spirited exchange, some scholars finally convinced them that Whitman today is more widely read in Europe than in this country.

I also recall the report, *How American Buying Habits Change*, written 10 years later by various Bureau authors (mainly from the Price Division, with major substantive editing and rewriting by Mary Bedell). It was a masterful and beautifully integrated cooperative effort. I was proud to have contributed a chapter.

You would have to be well into your seventies to remember the debut of these two volumes, but to contemporaries they were scintillating examples of old-time BLS imagination and consummate professional skill.

Treasured memories

Memorable moments can relate to pride, apprehension, and shame. During my years at BLS, I experienced all three types but happily not in equal proportions. In this memoir, we show mostly the silver lining: Like the time Secretary Maurice Tobin personally threatened to fire me for refusing to write a speech for him, until he first checked with Commissioner Ewan Clague; in counterpoint, the time when Secretary Arthur Goldberg presented me with the Career Service Award, permitting me to go to England to explore ways to improve Government writing—it didn’t improve; working on the report of that study, called *High Symmetry*, and relishing its editorial notices; receiving permission to work full time for about a year on the Department’s monumental work on *Collective Bargaining in the Basic Steel Industry*; having the *MLR* become the first publication to really analyze the role of the National Education Association as a true collective bargaining organization; recalling the interview with Lord Robens, Chairman of the

Memorable moments can relate to pride, apprehension, and shame.

National Coal Board in England, in which he said that the only two professional journals he looked at were the London *Economist* and the *Monthly Labor Review*; the fun I had in 1967 doing interviews around the country with professional baseball, football, basketball, and hockey players, coaches, and managers preparatory to a series of four articles for the *MLR* to be called "The Bargaining Practices of Professional Athletes"—alas, to my shame, I retired before I wrote the series; the sale of about 12,000 single copies of the July 1950 special issue of the *MLR*.

These and many more treasured memories pale before the golden memory of simply being part of that stately, tireless, resourceful, incorruptible institution known as the U.S. Bureau of Labor Statistics.

When I left in 1968, I made the point in a farewell editorial statement that editors develop an increasingly persistent sense of proprietorship in their publications. Now, after 22 years in absentia, I am glad to report this is no longer the case. Publications change and editors should but usually don't. I left because editorial senility had set in, and despite some mawkish comment

in that same statement about how much good the *MLR* had done for me, I had reached the point at which I was no longer much good for the *MLR*.

Those who know me recall that I have a penchant for quotations, so it is meet that I end this swan song with one. In the much-referred-to July 1950 issue, I wrote about integrity and usefulness, and that these qualities always have been and always should be the watchwords of the Bureau and the *Review*, and then I stuck in this quotation from Maeterlinck:

I have steadfastly resisted the temptation to enhance the marvel of reality by adding marvels that may be attractive but are not true. Being older, I have found the temptation less: for little by little, the years teach every man that truth alone is marvelous. Another thing they teach an author is that embellishments are the first of all to fade, and they age more quickly than he; and that only facts, strictly set forth, and reflections that are precise and sincere, will present the same appearance tomorrow as they do today.

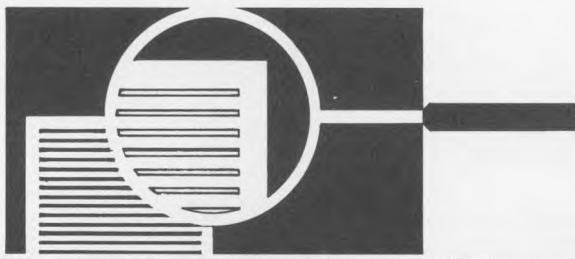
□

Migration from the South

Perhaps the most striking aspect of the labor-supply situation in the South is that the region not only provides labor for its own factories and farms, but it also contributes substantially to the labor supply of other regions of the Nation. The natural rate of population increase is considerably greater in the South than in the remainder of the country, owing to the higher fertility in the predominantly rural South than in the North and West. The pressure of population on economic opportunities in the South had been such, however, that large outward migration has taken place. During the 1920-30 decade, the number of migrants leaving the South exceeded the number entering by an average of 130,000 a year. During the depression of the 1930's, when job opportunities in northern and western cities were at low levels, the net out-migration continued but reached only 100,000 a year. With the growth of the defense program, and then of the war production program, the annual rate stepped up to the unprecedented figure of 300,000.

—Sophia C. Mendelsohn and Lester M. Pearlman

"Labor Supply in the South,"
Monthly Labor Review, October 1946, p. 484.



Consumer expenditures on travel, 1980–87

Geoffrey Paulin

With worldwide sales of \$2 trillion, travel and tourism are the world's largest civilian industry.¹ At the same time, Americans are apparently spreading their vacations more evenly throughout the year, thus smoothing the seasonal variation seen in patterns of travel.² The industry is expected to grow during the 1990's. For example, the Bureau of Labor Statistics projects strong increases in the employment of travel agents, pilots, and flight attendants.³ Given the importance of this industry and the changing habits of its consumers, it is interesting to compare recent patterns of expenditure with earlier patterns to determine whether other significant changes have occurred. This report is based on data collected in the 1987 Consumer Expenditure Survey.⁴

In an earlier study, Alice Lippert used results from the 1980–81 survey to examine travel spending of urban consumer units⁵ in 1972–73 and 1980–81. She found few differences in spending between the two periods.⁶ However, between 1980 and 1987, some differences were observed. Although consumers spent the same proportion of their total budgets on vacations, they allocated their dollars differently.

Tables 1 and 2 show demographic characteristics, travel expenditures, and detailed data by income quintile and age of reference person in 1980 and 1987.

Vacations and pleasure trips

The main components of the budget for vacations and pleasure trips⁷ to be dis-

cussed here are transportation, food and beverages, and lodging.

Americans chose nearly identical travel budgets in 1980 and 1987. Vacation and pleasure trips accounted for 3.6 percent of total expenditures for all families in 1980 and 3.7 percent in 1987. In 1980, ranked by income, Americans in the middle-income group⁸ allocated the lowest share (2.8 percent) of their spending to vacations and pleasure trips. The highest income group allocated the most (4.4 percent). In 1987, the two lowest groups spent the smallest share⁹ (2.8 percent); not surprisingly, the wealthiest group still spent the highest share (4.3 percent).

When classified by age of householder,¹⁰ average travel expenditures as a proportion of the budget ranged from 3.0 percent (for those 25 to 34) to 4.6 percent (for those 55 to 64) in 1980. In 1987, the range widened from 2.8 percent (for those 25 to 34) to 4.9 percent (for those 65 to 74).

Transportation

Of the four components of the travel budget, the largest percentage change—and only decline—in expenditures was in transportation. This was due to a large decrease in expenditures for gasoline and motor oil. Other transportation expenses increased.

For all families, transportation expenditures fell as a share of the travel budget from 47 percent in 1980 to 39 percent in 1987. The largest decline was for the middle-income group, whose share decreased from 52 percent to 40 percent, reflecting a decline in gasoline and motor oil expenditures. As expected, upper-income households allocated more for airfare expenditures than did middle-income households, but gasoline shares declined more for upper-income households.

Similarly, families ages 25 to 74 allocated between 6 percent and 10 percent fewer vacation dollars to trans-

portation in 1987 than they did in 1980. The decline for families under 25 was not statistically significant; the share spent by families over 75 was nearly identical in both years.

Gasoline. Gasoline and motor oil expenditures for travel decreased—not surprisingly—about 14 percent for all families. In 1979 and 1980, oil shocks sharply drove up gasoline and motor oil prices, resulting in large shares of travel expenditures being spent on transportation costs. In 1986, prices plummeted throughout the year and did not fully recover by 1987, resulting in lower transportation costs even for the same level of travel expenditures. According to the Consumer Price Index (CPI-U), prices of motor fuel, motor oil, coolant, and other products declined 21 percent from 1980 to 1987.

Although reductions were significant for households in all but the second income quintile, the sharpest declines occurred at the lowest and highest ends of the income distribution. In 1980, members of the lowest income quintile spent about 40 percent of their travel budget on gasoline and motor oil, compared with 26 percent in 1987. Consumers in the highest income group spent 36 percent of their travel budget for gasoline and motor oil in 1980 but only about 20 percent in 1987.

Similarly, gasoline and motor oil expenditures declined significantly for all households except those 75 and older, whose expenditures were far below average in both years. Householders 65 to 74 experienced the largest decline in gasoline share—from 43 percent to 22 percent. Those ages 55 to 64 showed the smallest decline, from 35 percent to 24 percent.

Airfares. As a result of Federal deregulation in 1978, the structure of the airline industry has changed dramatically. The consumer survey data for

Geoffrey Paulin is an economist with the Division of Consumer Expenditure Surveys, Bureau of Labor Statistics.

1987 suggest that some changes in expenditures have also occurred.

American families spent more of their travel budget for airfares in 1987 than in 1980, with the proportion rising from about 42 percent to almost 57 percent.

In almost every income group, airfares in 1987 took a higher share of transportation expenditures than in 1980. (The share for middle-income consumers appeared to increase, but the change was not statistically significant.)

For families in the highest income quintile, airfares increased from 48 percent of their transportation budgets to 60 percent in 1987.

Almost every age group spent more on airfares as a percentage of travel

Table 1. Annual travel expenditures of consumer units classified by quintiles of income before taxes, interview survey, 1980 and 1987

Item	All consumer units		Complete reporting of income												Incomplete reporting of income	
			Total reporting		Lowest 20 percent		Second 20 percent		Third 20 percent		Fourth 20 percent		Highest 20 percent			
	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987
Number of consumer units (thousands) . . .	82,052	94,150	69,817	81,070	13,902	16,187	13,983	16,215	13,953	16,215	13,477	16,214	14,002	239	12,235	13,080
Consumer unit characteristics																
Income after taxes ¹ . . .	\$15,956	\$24,871	\$15,956	\$24,871	\$2,308	\$4,494	\$8,456	\$11,424	\$13,862	\$19,500	\$20,203	\$30,373	\$34,845	\$58,477	(¹)	(¹)
Size of consumer unit . . .	2.7	2.6	2.7	2.5	1.8	1.8	2.3	2.2	2.8	2.6	3.2	2.9	3.5	3.2	2.7	2.7
Age of reference person	46.9	47.0	46.3	47.0	53.7	51.7	49.0	50.7	42.7	44.9	41.7	43.0	44.3	44.8	50.8	47.3
Number in consumer unit:																
Earners	1.4	1.4	1.4	1.3	.6	.6	1.0	.9	1.5	1.4	1.8	1.7	2.2	2.1	1.4	1.5
Children under 18 . . .	.8	.7	.8	.7	.4	.4	.6	.6	.9	.7	1.1	.9	1.0	.9	.7	.7
Persons 65 and over . .	.3	.3	.3	.3	.5	.4	.5	.5	.2	.3	.1	.2	.1	.1	.4	.2
Vehicles	2.0	2.0	2.0	2.0	.9	.8	1.4	1.5	2.0	2.0	2.6	2.5	3.1	3.0	1.0	2.0
Average annual expenditures	\$16,184	\$23,242	\$16,292	\$23,307	\$7,461	\$9,868	\$11,044	\$14,487	\$14,708	\$20,288	\$19,299	\$27,815	\$28,875	\$44,020	\$15,571	\$22,837
Vacation and pleasure trips total																
Transportation total	272	334	274	323	118	128	187	192	216	256	290	351	555	686	264	401
Gas and oil for own vehicles . .	112	90	115	92	48	33	73	63	101	92	151	117	202	153	93	76
Plane fares	115	189	112	176	46	66	70	98	85	121	92	182	268	410	129	273
Other ²	46	55	46	55	25	28	45	31	30	44	47	52	85	122	42	51
Food and beverages total																
Lodging	104	186	103	184	30	55	59	72	61	122	104	184	251	488	109	194
Entertainment, recreation, and other expenses ³	59	91	56	92	22	25	27	41	41	67	55	118	135	210	77	87
Allocation of expenditure shares⁴																
Vacation and pleasure trips total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Transportation total ⁵	46.8	**39.3	47.3	**38.7	50.9	45.9	53.1	45.9	51.9	**40.4	46.3	**37.7	43.8	**35.9	47.7	42.4
Gas and oil for own vehicles ⁶ . .	41.2	**26.9	42.0	**28.5	40.7	**25.8	39.0	32.8	46.8	*35.9	52.1	**33.3	36.4	**22.3	36.2	19.0
Plane fares ⁵	42.3	**56.6	40.9	**54.5	39.0	*51.6	37.4	*51.0	39.4	47.3	31.7	**51.9	48.3	*59.8	48.9	68.1
Other ⁶	16.9	16.5	16.8	17.0	21.2	21.9	24.1	*16.1	13.9	17.2	16.2	14.8	15.3	17.8	15.9	12.7
Food and beverages total ⁵	25.1	**28.1	25.4	**28.1	23.3	25.8	22.4	26.8	23.6	*29.5	28.1	29.8	25.7	27.6	23.9	27.8
Lodging ⁵	17.9	**21.9	17.8	**22.0	16.4	19.7	16.8	17.2	14.7	*19.3	16.6	*19.8	19.8	*25.5	18.4	20.5
Entertainment, recreation, and other expenses ⁵	10.2	10.7	9.7	**11.0	9.5	9.0	7.7	9.8	9.9	10.6	8.8	**12.7	10.7	11.0	13.0	9.2

¹ Income values are derived for "complete income reporters" only. The distinction between complete and incomplete income reporters is based in general on whether the respondent provided values for major sources of income, such as wages and salaries, self-employment income, and Social Security income. No significance tests were conducted for incomplete reporters; expenditures are reported for informational purposes only.

² Other includes trip expenditures for train, bus, and boat fares; taxis; tolls; rented motor vehicles; and other vehicle expenses.

³ Category includes expenditures for admission to movies, sporting events,

and other activities; fees for participant sports (for example, golf or bowling); other entertainment and recreation expenditures including souvenirs, passports and visas, and other expenses.

⁴ Shares may not add to 100.0 due to rounding.

⁵ Vacation and pleasure trips equal 100.0.

⁶ Transportation equals 100.0.

* Change in share is significant at the 95-percent confidence level.

** Change in share is significant at the 99-percent confidence level.

Table 2. Annual travel expenditures of consumer units classified by age of householder, interview survey, 1980 and 1987

Item	All consumer units		Under 25		25 to 34		35 to 44		45 to 54		55 to 64		65 to 74		75 and older	
	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987
Number of consumer units (in thousands)	82,052	94,150	8,130	7,811	18,840	21,345	13,480	18,747	11,907	13,395	12,666	13,080	10,751	11,578	6,278	8,194
Consumer unit characteristics																
Income after taxes ¹	\$15,959	\$24,871	\$9,517	\$11,693	\$16,696	\$25,322	\$20,340	\$32,666	\$22,554	\$33,064	\$17,544	\$28,137	\$9,566	\$17,637	\$7,929	\$12,280
Size of consumer unit	2.7	2.6	1.8	1.8	2.9	2.8	3.9	3.4	3.5	2.9	2.3	2.4	1.9	1.9	1.9	1.5
Age of reference person	46.9	47.0	21.6	21.6	29.5	29.6	39.2	39.1	49.6	49.2	59.3	59.6	69.3	69.1	80.3	80.2
Number in consumer unit:																
Earners	1.4	1.4	1.3	1.2	1.5	1.5	1.9	1.8	2.2	2.0	1.4	1.4	.5	.6	.3	.2
Children under 18	.8	.7	.4	.4	1.2	1.1	1.8	1.5	.9	.6	.3	.3	.1	.1	.0	.0
Persons 65 or over	.3	.3	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	1.3	1.3	1.4	1.3
Vehicles	2.0	2.0	1.3	1.2	2.0	1.9	2.4	2.4	2.9	2.7	2.2	2.3	1.4	1.6	.8	.9
Average annual expenditures	\$16,184	\$23,242	\$10,745	\$13,996	\$17,181	\$22,974	\$20,614	\$29,948	\$21,515	\$30,246	\$16,653	\$24,408	\$10,744	\$18,062	\$8,984	\$11,418
Vacation and pleasure trips total	581	850	394	481	514	668	705	1004	762	1127	763	1106	460	929	257	349
Transportation total	272	334	198	215	248	275	313	387	349	409	366	425	215	366	119	163
Gas and oil for own vehicles	112	90	96	68	112	87	129	101	142	118	129	106	93	82	34	31
Plane fares	115	189	72	119	96	155	131	225	158	227	169	250	78	203	61	82
Other ²	46	55	30	28	39	33	53	61	48	65	68	69	43	81	24	49
Food and beverages total	146	239	93	132	129	191	185	281	196	335	180	311	121	252	60	80
Lodging	104	186	41	78	76	124	133	222	140	257	153	259	89	219	62	83
Entertainment, recreation, and other expenses ³	59	91	61	55	61	78	75	114	78	126	63	110	35	91	15	24
Allocation of expenditure shares⁴																
Vacation and pleasure trips total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Transportation total ⁵	46.8	**39.3	50.3	44.7	48.2	*41.2	44.4	*38.5	45.8	**36.3	48.0	**38.4	46.7	*39.4	46.3	46.7
Gas and oil for own vehicles ⁶	41.2	**26.9	48.5	**31.6	45.2	**31.6	41.2	**26.1	40.7	**28.9	35.2	**24.9	43.3	**22.4	28.6	19.0
Plane fares ⁶	42.3	*56.6	36.4	**55.3	38.7	*56.4	41.9	*58.1	45.3	**55.5	46.2	**58.8	36.3	**55.5	51.3	50.3
Other ⁶	16.9	16.5	15.2	13.0	15.7	12.0	16.9	15.8	13.8	15.9	18.6	16.2	20.0	22.1	20.2	30.1
Food and beverages total ⁵	25.1	**28.1	23.6	27.4	25.1	*28.6	26.2	28.0	25.7	*29.7	23.6	*28.1	26.3	27.1	23.3	22.9
Lodging ⁵	17.9	**21.9	10.4	**16.2	14.8	*18.6	18.9	22.1	18.4	**22.8	20.1	23.4	19.3	23.6	24.1	23.8
Entertainment, recreation, and other expenses ⁵	10.2	10.7	15.5	11.4	11.9	**11.7	10.6	11.4	10.2	11.2	8.3	9.9	7.6	9.8	5.8	6.9

¹ Income values are derived for "complete income reporters" only. The distinction between complete and incomplete income reporters is based in general on whether the respondent provided values for major sources of income, such as wages and salaries, self-employment income, and Social Security income. No significance tests were conducted for incomplete reporters; expenditures are reported for informational purposes only.

² Other includes trip expenditures for train, bus, and boat fares; taxis; tolls; rented motor vehicles; and other vehicle expenses.

³ Category includes expenditures for admission to movies, sporting events,

and other activities; fees for participant sports (for example, golf or bowling); other entertainment and recreation expenditures including souvenirs, passports and visas, and other expenses.

⁴ Shares may not add to 100.0 due to rounding.

⁵ Vacation and pleasure trips equal 100.0.

⁶ Transportation equals 100.0.

* Change in share is significant at the 95-percent confidence level.

** Change in share is significant at the 99-percent confidence level.

expenses in 1987 than in 1980. (The share spent by those age 75 and older remained virtually unchanged.) Consumers ages 65 to 74 showed the largest percentage increase, airfares rising from 36 percent to 55 percent of transportation expenditures for travel.

Deregulation was accompanied by frequent special fares and inducements for air travel, such as family rates. These promotions probably stimulated travel by air, thereby increasing the share for air travel expenditures. Savings from lower gasoline and motor oil expendi-

tures may have also encouraged more air travel.¹¹

Food

Families spent 64 percent more on food on trips in 1980 than in 1987, increasing

average expenditures from \$146 to \$239. Middle-income families spent nearly 91 percent more in 1987 than in 1980, while those in the lowest income group increased their expenditures by one-third. Consumers age 75 and older spent one-third more on food while on vacation in 1987 than in 1980, while those ages 65 to 74 more than doubled their expenditures. Those under age 25 spent 42 percent more.

By comparison, the CPI-U shows that all food and beverage prices rose 31 percent between 1980 and 1987. Prices for food away from home¹² rose at a faster rate—increasing more than 40 percent during the same period.

However, family budget shares did not change appreciably. All families increased their allocation to food on trips from 25 percent in 1980 to 28 percent in 1987. Lower-income families spent 23 percent¹³ of total travel expenditures on food in 1980, while upper-income families spent 26 percent. In 1987, lower-income families spent 26 percent, while upper-income families spent 28 percent. Only middle-income families significantly increased their expenditures, with allocations rising from 24 percent in 1980 to 30 percent in 1987.

Families under age 75 spent about 25 percent of total vacation expenditures on food in 1980, and between 27 percent and 30 percent in 1987. Those age 75 and older allocated slightly less (23 percent) in both years. Changes were significant for consumers ages 25 to 34 and 45 to 64. (See table 2.)

Lodging

According to the CPI-U, prices for lodging while out of town increased faster than the general rate of inflation every year between 1980 and 1987. While the overall CPI-U rose 39 percent during this period, lodging prices advanced 66 percent. On average, prices for out-of-town lodging each year rose almost 3 percentage points faster than prices of all goods. At the same time, all consumer units spent a larger share of the vacation and pleasure trip budget on lodging, as the proportion increased from 18 percent to 22 percent in 1987. Expenditure shares for families in the middle- and upper-income quintiles increased between 3 percent and 6 percent. Consumers under

age 35 and those 45 to 54 increased shares between 4 percent and 6 percent.

Conclusions

Although households spent the same share of total expenditures on vacations, they allocated their travel dollars differently. Households spent less (fewer dollars and lower shares) on gasoline and motor oil in 1987 and more (dollars and shares) on airfares. Although most families continued to spend about the same amount on food while on vacation, some consumers spent more on lodging. □

Footnotes

ACKNOWLEDGMENT: Steve Montgomery of the Consumer Prices and Consumption Studies division provided tables from which the data presented here are derived.

¹ See "The Business of Going Away," *The Economist*, Apr. 15, 1989, p. 73.

² See Asra Q. Nomani, "Vacationers Rewriting the Travel Calendar by Taking Time Off Throughout the Year," *The Wall Street Journal*, Dec. 22, 1988.

³ See "1988-89 Job Outlook in Brief," reprinted from the Spring 1988 issue of *Occupational Outlook Quarterly* (Bureau of Labor Statistics), pp. 33-44.

⁴ Although travel expenditures are included in the survey, they are not published as separate items. They appear in broader categories (for example, "gasoline and motor oil" includes purchases both at home and on trips).

⁵ A consumer unit is a single person or group of persons in a sample household related by blood, marriage, adoption, or other legal arrangement, or who share responsibility for at least 2 out of 3 major types of expenses—food, housing, and other expenses. The terms "household" and "family" are used for convenience, although there may be more than one consumer unit in a household and one-person families are included.

⁶ See Alice A. Lippert, "Trip expenditure comparisons from 1972-73 to 1980-81," *Monthly Labor Review*, July 1985, pp. 46-48. Lippert's results and those shown here are not comparable because Lippert used only urban consumer data, and both urban and rural families are included in the data shown here.

⁷ The terms "travel" and "vacation and pleasure trips" are used interchangeably. The Consumer Expenditure Survey definition of "trips" includes all overnight trips and all-day trips of 75 miles or more. Trips fully reimbursed by an employer or a third party and commuting to work or school are not included in the "trip" definition.

⁸ Data are for consumer units defined as complete income reporters. The distinction between complete and incomplete income reporters is

based in general on whether the respondent, when surveyed, provides values for major sources of income, such as wages and salaries, self-employment income, and Social Security income. Even "complete" income reporters may not have provided a full accounting of all income from all sources.

⁹ Based on a weighted average of the first and second income quintiles.

¹⁰ Each consumer unit has a householder or "reference" person. This person is the first member mentioned by the survey respondent when asked by the interviewer to name the person or persons who own or rent the home. It is with respect to that person that consumer units are classified.

¹¹ Further proof that people flew more and drove less in 1987 comes from the *Statistical Abstract*. In 1980, the volume of domestic intercity passenger traffic totaled 1,558 billion. Private automobiles accounted for 1,494 billion passenger-miles (that is, the movement of one passenger for the distance of one mile). Private automobiles accounted for 1,300 billion (83 percent) of total passenger-miles, while domestic airways accounted for 219 billion (14 percent) of total volume. (The rest of the total was shared by buses and railroads.) Preliminary 1987 figures show that the volume of passenger-miles totaled 1,870 billion. Private automobiles accounted for 1,494 billion (80 percent) of the total, while domestic airways accounted for 341 billion (18 percent). Although these figures include business travel, it is probable that private vacation travel followed a similar pattern. (See *Statistical Abstract of the United States: 1989*, 109th edition (Bureau of the Census, 1989).

¹² This includes all food away from home, not just that purchased on trips.

¹³ Figures for lower- and upper-income families are based on weighted averages.

Appendix

The Consumer Expenditure Survey is the most comprehensive source of detailed information on household expenditures and income related to the socioeconomic and demographic characteristics of the U.S. population. Before 1980, the survey had been conducted about every 10 years, but now it is conducted on a continual basis.¹ The survey consists of two major components: the diary and the quarterly interview. The diary survey is designed to collect information on frequently purchased items, such as food and household products. Expenditures on trips are not recorded in the diary survey. The interview survey is designed to collect information on relatively large items such as housing, education, vehicles, and major appliances. In addition, data are collected for expenditures which occur at regular intervals, such as rent and utility bills. Expenditures on vacation and pleasure trips are included in the quarterly interview survey.

Research Summaries

The Bureau of the Census collects the data for the Bureau of Labor Statistics. Each survey contains its own independent sample of approximately 5,000 consumer units. The diary survey is completed by participating households over a 2-week period. The interview survey is conducted with rotating panels of consumers on a quarterly basis. Consumers are interviewed for 5 consecutive quarters; one-fifth of the sample is new to the survey each quarter.

Statistical test

The Z-test. When testing differences between means of two large samples,² a Z-test is often employed. The variable Z is defined as having a standard normal distribution around its mean (that is, a graph of its distribution is shaped like the familiar "bell-curve," where the "peak" value represents the mean). The probability of Z being greater than (or less than) any number is known: there is no uncertainty involved in determining this probability. If the large sample is known (or assumed) to have a standard normal distribution, then using the Z-test, the probability that the sample mean is greater than (or less than or not equal to) a predetermined value can be found. If the large sample is known (or assumed) to have a standard normal distribution, it can be transformed so that:

$$Z^* = (x-u) / (s / N^{0.5})$$

where:

- Z* = the computed value of Z;
- x = the mean of the test sample;
- u = some predetermined value;
- s = the (estimated) standard deviation of the test sample; and
- N = the size of the test sample. (Notice it is the square root of N that is actually used in the above equation.)

The above equation can be used to test, at any given level of probability, the hypothesis that X and U are equal. If the test is conducted at the 95-percent confidence level (that is, there is a 95-percent probability that any appearance of difference between the two values is because of random sampling error rather than "true" differences in the populations), the appropriate value of Z* is approximately 1.96. If the absolute value from the right-hand side of the equation is greater than 1.96, then the hypothesis that X and U are equal can be rejected at the 95-percent confidence level. If the absolute value is greater than 2.58, then the hypothesis can be rejected at the 99-percent confidence level. Obviously, the higher the absolute value of the right-hand side of the equation, the greater the confidence level at which the hypothesis of equality can be re-

jected, and the lower the probability of error in such a rejection. (The probability of error is 1 minus confidence level, or 5 percent at the 95-percent confidence level.)

Sometimes means of two populations are compared. In this way X now becomes the mean for the first sample (for example, mean expenditure by type of family in 1987), and U becomes the mean for the second sample (for example, mean expenditure by the same type of family in 1980). However, the denominator becomes a little more complicated. The new equation can be written as:

$$Z^* = (X_{mean} - U_{mean}) / (S_{x+u})^{0.5}$$

where the new denominator is the pooled standard error, characterized by the variable S_{x+u} , is specified as follows:

$$S_{x+u} = (S_x^2/N_x) + (S_u^2/N_u)$$

where:

- S_x = the standard deviation for the first sample;
- N_x = the size of the first sample;
- S_u = the standard deviation for the second sample; and
- N_u = the size of the second sample.

The present case is most like the test for differences in means just described, except that it is the size of expenditure shares, and not actual means, that is compared with the Z-test. The numerator consists of the 1987 share for a certain family type minus the 1980 share for the same type of family. To test for the difference between expenditures for transportation on trips as a share of total vacation expenditures in 1980 and 1987, then,

$$\begin{aligned} X_{shr} &= T_{1987} / V_{1987} \\ U_{shr} &= T_{1980} / V_{1980} \end{aligned}$$

where:

- T = transportation on trips; and
- V = total vacation expenditures.

In this case, S_{x+u} is a more complicated function. Now it is true that

$$\begin{aligned} S_{x+u} &= (X_{shr})^2 [CV^2(T_{1987}) \\ &\quad + CV^2(V_{1987}) \\ &\quad - 2(X_{shr})(CV^2(T_{1987}))] \\ &\quad + (U_{shr})^2 [CV^2(T_{1980}) \\ &\quad + CV^2(V_{1980}) \\ &\quad - 2(U_{shr})(CV^2(T_{1980}))] \end{aligned}$$

where:

- $CV_{(T_{1987})}$ = the coefficient of variation³ for 1987 transportation on trips expenditures;

- $CV_{(V_{1987})}$ = the coefficient of variation for 1987 total vacation expenditures;
- $CV_{(T_{1980})}$ = the coefficient of variation for 1980 transportation on trips expenditures; and
- $CV_{(V_{1980})}$ = the coefficient of variation for 1980 total vacation expenditures.

The formula for testing differences in shares still remains:

$$Z^* = (X_{shr} - U_{shr}) / (S_{x+u})^{0.5}$$

Footnotes to the appendix

¹For a complete discussion of the history and methodology of the Consumer Expenditure Survey, see *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988), ch. 18.

²For small samples, a *t*-test is usually used. As sample sizes grow large, the *t* distribution approximates the Z-distribution. When testing significance at the 5-percent level for a sample size of 120, the appropriate value of *t* is about 1.98. When testing significance for a sample whose size approaches infinity, the appropriate value of *t* is 1.96. Because most *t* tables show sample sizes skipping from 120 to infinity, a large sample size is defined here to lie somewhere between 120 and infinity. A single critical value below which the sample size is "small" and above which it is "large" is difficult to find. Interpolation yields an estimation of a possible critical range, but still some subjective criteria are undoubtedly used in determining values for critical range. Because the Consumer Expenditure Survey was composed of responses from several thousand consumer units of each type (for example, under age 25 or middle-income quintile) in both 1980 and 1987, defining the sample size as "large" presents no problem.

³The coefficient of variation is the standard error of a sample divided by the sample mean.

1989 employee benefits address family concerns

Cathy A. Cooley

Parental leave, typically unpaid, was one of several benefits provided to employees to assist in balancing work and family responsibilities, according to the Bureau of Labor Statistics' recently released 1989 Employee Benefits Survey. The survey presents information on the incidence and detailed characteristics of

employee benefits available to full-time workers in private-sector establishments employing 100 or more workers. Among the 1989 findings are that unpaid maternity leave was available to nearly two-fifths of employees, unpaid paternity leave to almost one-fifth; reimbursement accounts to help pay for medical and dependent care expenses were offered to about one-fourth of workers; and flexible work arrangements were provided to one-tenth of employees.

Parental leave plans provide time off for mothers and fathers to care for newborn or newly adopted children. Such plans, as defined in the survey, are separate from other leave benefits, such as short-term disability coverage and paid vacations, which may also be used for parenting purposes. In 1989, 37 percent of employees could take unpaid maternity leave, with the maximum leave available averaging 20 weeks. (See table 1.) Eighteen percent of employees could take unpaid paternity leave, with the maximum leave available averaging 19 weeks. Paid parental leave was rare.

The survey found that 5 percent of employees were eligible for child care benefits subsidized by their employer. These benefits include both on-site and near-site child care expenses. A more common means of assisting employees with child care expenses was through reimbursement accounts, from which employees pay for a variety of qualified expenses. Child care, elderly or dependent care, and other medical care expenses were the most common items covered. Twenty-three percent of employees were eligible for such accounts in 1989, up from 12 percent in 1988. Reimbursement accounts often are funded solely by employees seeking tax advantages through salary reduction arrangements.

For the first time, the survey included information on flexible work schedules. Eleven percent of workers studied had such arrangements available. Flexible schedules give employees the opportunity to begin and end work within a specified range of hours, thereby help-

Cathy A. Cooley is an economist in the Division of Occupational Pay and Employee Benefit Levels, Bureau of Labor Statistics.

Table 1. Full-time employees participating in selected employee benefit programs, medium and large private firms, United States,¹ 1989

[in percent]

Employee benefit program	All employees	Professional and administrative employees	Technical and clerical employees	Production and service employees
Paid:				
Holidays	97	97	96	97
Vacations	97	98	99	95
Personal leave	22	28	30	14
Lunch period	10	4	4	16
Rest time	71	57	69	80
Funeral leave	84	87	86	80
Jury duty leave	90	95	92	87
Military leave	53	61	57	45
Sick leave	68	93	87	44
Maternity leave	3	4	2	3
Paternity leave	1	2	1	1
Unpaid:				
Maternity leave	37	39	37	35
Paternity leave	18	20	17	17
Sickness and accident insurance ..	43	29	29	58
Long-term disability insurance	45	65	57	27
Medical care	92	93	91	93
Dental care	66	69	66	65
Life insurance	94	95	94	93
Defined benefit pension	63	64	63	63
Defined contribution plans	48	59	52	40
Retirement ²	36	43	39	31
Capital accumulation ³	14	18	14	11
All retirement ⁴	81	85	81	80
Flexible benefits plans	9	14	15	3
Reimbursement accounts	23	36	31	11

¹ Survey coverage excludes executives and employees on constant travel, such as airline pilots, as well as data for Alaska and Hawaii. Except for maternity and paternity leave and reimbursement accounts, benefits paid for entirely by the employee were excluded from the tabulations. Professional-administrative and technical-clerical workers are often discussed jointly as white-collar workers. Production-service workers are often called blue-collar workers.

² Includes money purchase pension, profit-

sharing, savings and thrift, stock bonus, and employee stock ownership plans in which employer contributions must remain in the participant's account until retirement age, death, disability, separation from service, age 59½, or hardship.

³ Includes plans in which participants may withdraw employer contributions from their accounts without regard to the conditions listed in footnote 2.

⁴ Includes defined benefit pension plans and defined contribution retirement plans. Many employees participated in both types of plans.

ing to accommodate family commitments. Limits on the amount of flexibility vary from plan to plan, but generally, employees must be at work during certain midday "core" hours. Fifteen percent of white-collar workers had flexible work schedules available, more than double the coverage for blue-collar workers.

Employers also offered a variety of health-related benefits outside of the traditional health care plans. Employee assistance programs, which provide counseling and referral services for substance abuse and family, financial, legal, and related problems, were available to 49 percent of workers. Wellness programs, designed to encourage health-

ier lifestyles, were available to 23 percent of employees. These programs typically include health screenings, smoking cessation classes, and guidance on healthier diets.

For the first time, the survey gathered data on the availability of long-term care insurance. Three percent of employees had such insurance plans available to them. Long-term care plans are designed to help pay for protracted nursing home care for employees or dependents, including elderly dependents. (Ordinary health care plans exclude such coverage from the benefits they provide.) Although long-term care plans are typically wholly employee paid, workers gain because coverage is

available through employers at group insurance rates.

Health care benefits

Ninety-two percent of full-time employees had medical care benefits fully or partially financed by their employer in 1989. Seventy-four percent of those with benefits were in traditional fee-for-service plans. Nontraditional plans, such as health maintenance organizations (HMO's) and preferred provider organizations (PPO's), accounted for 17 percent and 10 percent of medical care participants, respectively. Under PPO's, subscribers are provided health care services at a lower cost if they receive treatment from designated hospitals, physicians, or dentists.

Alcohol and drug abuse treatment coverage was provided to 97 and 96 percent of the medical care participants, respectively. Benefits may be provided for detoxification, rehabilitation services, or both. Detoxification involves supervised medical care to reduce or eliminate the symptoms of chemical dependency. Rehabilitation is designed to alter the behavior of substance abusers, once they are free of acute physical and mental complications. The number of medical care participants with alcohol and drug abuse treatment coverage reported by the survey increased by 21 and 30 percent, respectively, from 1988 to 1989. The increases reflect both a greater incidence of these benefits in medical care plans and a refinement of the survey's procedures for tabulating detoxification benefits.

The survey found a wide range of coverage for less costly alternatives to hospital stays. Three-fourths of the participants with medical care had coverage for home health care, and four-fifths had coverage in extended care facilities. In addition, hospice care, for the terminally ill, was available to approximately two-fifths of participants.

Defined benefit pension plans

Defined benefit pension plans, which specify a formula for determining an employee's annuity, covered 63 percent of full-time workers in 1989, unchanged from the figure in 1988, when the sur-

vey expanded to smaller establishments and more service industries.

The survey found that the most common type of defined benefit pension plan is the terminal earnings plan, which bases pension payments on an employee's average earnings in the last few years prior to retirement (usually a 5-year period). In 1989, terminal earnings plans covered 64 percent of participants in defined benefit pension plans. The average benefit formula in such plans was approximately 1.5 percent of annual earnings, multiplied by the number of years of service. More than half of the participants in these plans were subject to a limit on the number of years of service that could be applied toward pension benefits, commonly 30, 35, or 40 years. In addition, benefits were usually coordinated with Social Security payments.

Earnings-based pension formulas are more common among white-collar workers than among blue-collar workers, who often have plans calling for dollar amount benefits based on years of service. In 1989, the monthly benefit under dollar amount formulas averaged about \$20 multiplied by the number of years of service. Unlike earnings-based plans, dollar amount plans usually do not limit the number of years of service credited and rarely coordinate benefits with Social Security payments.

Defined contribution plans

Forty-eight percent of employees participated in one or more defined contribution plans in 1989, up from 45 percent in 1988. These plans, which usually specify the employer's contribution but cannot predetermine the employee's actual amount of benefits, include savings and thrift programs (covering 30 percent of full-time workers), profit-sharing plans (16 percent), money purchase pension arrangements (5 percent), and stock ownership plans (3 percent). Most defined contribution plans require employee contributions, but about 30 percent of participants were in plans wholly financed by the employer.

Forty-one percent of workers covered by the survey participated in 401(k) plans (also known as cash or deferred arrangements), which permit pretax employee contributions. Most of

these plans were salary reduction plans, allowing employees to reduce their taxable income by making voluntary contributions that are not taxed until withdrawn from the plan. For example, savings and thrift plans commonly allow participants to make pretax savings, some or all of which are matched by the employer.

Life insurance

Life insurance benefits were provided to 94 percent of employees in 1989, with the cost paid entirely by the employer for all but 13 percent of covered workers. For 68 percent of those covered, the amount of life insurance was based on earnings, typically one or two times annual pay. Most of the remaining participants were provided flat dollar amounts of coverage. Flat dollar amounts were most common among blue-collar workers, with the benefit averaging slightly more than \$11,000.

Disability income benefits

In 1989, almost all workers were covered by an income protection plan—either sick leave or sickness and accident insurance, or both—in the event of a short-term illness or injury. Sick leave plans, covering 68 percent of all workers studied, but mostly white-collar workers, commonly specified a set number of sick days per year. Workers in such plans who had 1 year of service had an average of 15.4 sick days available; at 20 years of service, the figure rose to 27.8 days.

Forty-three percent of workers surveyed received a sickness and accident insurance plan, and about half of these workers also received sick leave. Sickness and accident insurance, twice as prevalent among blue-collar workers as among white-collar workers, provides either a percentage of pay (commonly 50 percent) or a flat amount per week during a period of disability due to illness or accident. Payments are for a limited period of time, usually 26 weeks.

Forty-five percent of employees had long-term disability insurance coverage. Such coverage is intended to replace income lost during an extended or permanent period of disability. The ma-

majority of workers with long-term coverage would receive between 50 and 60 percent of predisability pay during a period of disability.

Paid time off

Time off with pay is available to employees in a variety of forms, from daily rest breaks to annual vacations lasting several weeks. Most types of paid leave were available to a majority of employees. Exceptions were paid lunch time, averaging 26 minutes a day, which applied to a tenth of workers, and personal (multipurpose) leave, averaging 3.1 days a year, which covered nearly one-fourth of workers. The number of paid holidays averaged 9.2 per year, and the amount of vacation, which commonly increased with length of service, averaged 9.1 days after 1 year, 16.5 days after 10 years, and 20.4 days after 20 years of service. Paid rest time averaged 26 minutes a day, funeral leave 3.3 days per occurrence, and military leave 11.9 days a year. Paid time off for jury duty was usually provided as needed.

Availability of survey results

The Employee Benefits Survey provides data on 32 million full-time employees in 48 States and the District of Columbia. Data represent benefit provisions for workers in about 109,000 establishments employing 100 or more workers in private nonfarm industries. A comprehensive report on the survey, *Employee Benefits in Medium and Large Firms, 1989*, may be purchased this summer from the Superintendent of Documents, Government Printing Office, Washington, DC 20402, or from the Bureau of Labor Statistics Publications Sales Center, P.O. Box 2145, Chicago, IL 60690. □

Characteristics of households with discretionary income

About 26 million American households have some discretionary income, and this income accounts for more than 53 percent of total personal income, according to a 1989 joint study by the Consumer Research Center of The Conference Board and the U.S. Bureau of the Census.

Discretionary income was determined by cross-tabulating and classifying the 60,000 households in the March 1987 Current Population Survey by income, age, occupation, education, number of earners, and other demographic characteristics. After-tax, or spendable, income was then calculated. Households with spendable incomes at least 30 percent higher than average expenditures for their comparable group were considered to have discretionary income. The previous survey of discretionary income was in March 1983.

The total number of households in the United States increased by 5.4 million over the March 1983 to March 1987 period to a total of 89.5 million. The number of households with discretionary income rose by 2.1 million (from 28 percent to 29 percent of households). The mean amount of discretionary income was up 12 percent to \$12,330. This translates into a \$57 billion increase in aggregate discretionary income to \$319 billion, or a 22-percent rise from 1983. The study suggests that this significant increase in the size of discretionary income reflects both recovery from the 1980 and 1981-82 recessions and continued growth of the economy since that time. Mean income of all households rose 11 percent, which is reflected in the large increases in the discretionary income bracket.

The average after-tax income in 1987 was \$42,000 for households with discretionary income, compared with \$17,000 for all other households and \$30,800 for the Nation as a whole. Discretionary income was found largely in the 35-60 age group, and also was prevalent among those in professional and managerial positions. Blue-collar workers' incomes accounted for only 15 percent of discretionary income. A majority of those with discretionary income have college degrees. Almost one-third of white households have discretionary income; black households have 6 percent and Hispanic households have 2 percent of all discretionary income.

The study revealed other characteristics individuals in the discretionary income category share: most are homeowners who pay an average of 26 percent of their earnings in taxes. The homeowners have more discretionary income than do renters, as do those who live in the suburbs, compared with those who live in other areas. Furthermore, households with two or more workers make up 45 percent of all households but almost 65 percent of the country's households with discretionary income. Fewer than 25 percent of homes with discretionary income have only the husband working.

A Marketer's Guide to Discretionary Income also lists discretionary income according to salary, age, race, size of household, number of earners, education, occupation, region, metro and non-metro residence, and housing tenure. It is available from the U.S. Bureau of the Census. □

—Laurie Lande
Office of Publications

Significant decisions in labor cases



Arbitration

Does an employee give up the right to sue his or her employer for age discrimination by agreeing to arbitrate all employment-related claims? According to a divided Court of Appeals for the Fourth Circuit in *Gilmer v. Interstate/Johnson Lane Corp.*,¹ the answer to this question is yes because Federal policy, as expressed by the Federal Arbitration Act,² favors arbitration.

When Richard Gilmer was hired as a manager of financial services by the Interstate/Johnson Lane Corporation, he was required to register as a securities representative with the New York Stock Exchange. At the time he registered, Gilmer agreed that any employment-related dispute between himself and his employer would be subject to the stock exchange's arbitration procedures. Six years after entering into this agreement, Gilmer's job was terminated. Believing that his former employer had fired him because of his age, Gilmer chose to file suit in Federal court under the Age Discrimination in Employment Act,³ rather than submit his dispute to arbitration. The employer objected, claiming that the Federal Arbitration Act required Gilmer to abide by his agreement to arbitrate.

Writing for a 2-1 majority of the Fourth Circuit panel, Judge J. Harvie Wilkinson agreed that arbitration, not Federal court litigation, was required. Arbitration agreements, he wrote, should be enforced unless the party opposing arbitration can show that Congress, by enacting specific legislation, intended to limit or prohibit

parties from waiving a statutory right to judicial determination.⁴ Judge Wilkinson examined the text, legislative history, and purposes of the Age Discrimination in Employment Act and concluded that in enacting this law Congress had not provided the type of "affirmative guidance" that is needed to override the Federal Arbitration Act requirement that arbitration agreements ordinarily should be honored.⁵

Courts of appeals that addressed this issue before the decision in *Gilmer* was issued all had held that employees can file age discrimination suits despite the existence of an agreement to arbitrate.⁶ In the most recent of these decisions, *Nicholson v. CPC International Inc.*,⁷ the Court of Appeals for the Third Circuit held that arbitration agreements are inherently inconsistent with the Age Discrimination in Employment Act's enforcement scheme and should therefore not be enforced.⁸ The Third Circuit noted that primary enforcement authority under the Age Discrimination in Employment Act lies with the Equal Employment Opportunity Commission and that an individual's right to sue is subordinate to this authority. Thus, in the court's view, enforcing arbitration agreements would diminish the Commission's statutory role⁹ and encourage employers to prepare similar employment contracts so as to avoid that agency's scrutiny.¹⁰

The *Nicholson* court also was persuaded by the legislative history of the Age Discrimination in Employment Act, which showed that Congress had deliberately opted for Federal court enforcement rather than a less formal administrative scheme.¹¹ In the court's words, "[t]his suggests that Congress in-

tended that extrajudicial methods of seeking resolution of age discrimination claims should not impede ultimate resolution of those claims in a judicial forum when extrajudicial methods proved inadequate."¹²

Finally, the *Nicholson* court emphasized that an arbitrator's power to address workplace discrimination may be more limited than that of a Federal district court. As an example, the court noted that arbitrators are limited to resolving the disputes of particular grievants, whereas Federal court judges may address companywide discrimination by enjoining employers from committing future acts of discrimination.

The Supreme Court has not addressed the issue raised by the courts' decisions in *Gilmer* and *Nicholson*. Because the *Gilmer* decision creates a conflict between circuit courts, the High Court may now be more likely to consider this important issue.

Discrimination abroad

For the first time, a Federal appeals court has held that Title VII of the Civil Rights Act of 1964¹³ does not protect an American citizen working overseas for an American company against discrimination in employment. The case, *Boureslan v. Aramco*,¹⁴ came about after Ali Boureslan, a naturalized American citizen, complained to the Equal Employment Opportunity Commission that his American employer, Aramco, had harassed and fired him because of his race, religion, and national origin. Aramco disputed this claim and raised the additional argument that Title VII's protections do not extend to the company's opera-

"Significant Decisions in Labor Cases" is written by Craig Hukill, an attorney in the Office of the Solicitor, U.S. Department of Labor.

tions in Saudi Arabia, where Boureslan had been employed.

Judge W. Eugene Davis, writing for a 9-5 majority of the Court of Appeals for the Fifth Circuit, agreed with Aramco.¹⁵ Neither the language of Title VII, nor its legislative history, he wrote, supports the notion that Congress intended the law to apply outside the United States. As a result, he found no reason to override what he held to be a presumption that Federal laws apply only within the United States. In reaching this conclusion, he rejected Boureslan's argument that Title VII should be applied extraterritorially through its "alien exemption provision," which exempts employers from coverage "with respect to employment of aliens outside any State."¹⁶ Boureslan had argued that if Congress had intended that all employers in foreign lands be exempt from Title VII, it would not have enacted the alien exemption provision, which exempted only *some* employers. Thus, he had urged the court to infer that overseas employers not exempted by this provision—namely, those that employ American citizens—are covered by Title VII.

Judge Davis, however, refused to draw this inference. The alien exemption provision, he held, has nothing to do with the employment of American citizens overseas. Instead, he said, the provision "reflects a Congressional intent to provide Title VII coverage to aliens employed *within* the United States."¹⁷

Judge Davis noted two other reasons why Title VII should be limited to cases involving allegations of employment discrimination that occurred within the United States. First, he said that Title VII is "curiously silent in a number of areas where Congress ordinarily speaks if it wants to extend its legislation beyond our borders."¹⁸ For example, he suggested that if Congress had intended extraterritorial coverage, it most likely would have addressed the issue of whether foreign—but not American—companies employing American workers outside of the United States must comply with Title VII.

Next, he indicated that "when it desires to do so, Congress knows how to give extraterritorial effect to one of its statutes."¹⁹ As an example, he cited a 1984 amendment to the Age Discrimination in Employment Act in which Congress modified that act's definition of "employee" to include "a citizen of the United States employed by an employer in a workplace in a foreign country."²⁰ Because Congress failed to include similar language in Title VII, Judge Davis concluded that it did not intend to give this statute such broad coverage.

The decision by the court in *Boureslan* is contrary to the position taken by the Equal Employment Opportunity Commission, which is the Federal agency charged with enforcing Title VII.²¹ Moreover, the dissenting judge in *Boureslan* noted that the majority's decision conflicts with the decisions of all Federal district courts that have addressed the issue.²² Thus, this case will be watched closely to see whether other courts will follow it and whether the Supreme Court will agree to review it if an appeal is filed.

Severance payments

The Supreme Court recently held, in *Crandon v. United States*,²³ that lump-sum severance payments to five employees who intended to leave private employment for Government service did not run afoul of Federal criminal conflict-of-interest laws, even though the payments were an attempt to soften the expected financial losses occasioned by these employees' acceptance of less lucrative Federal employment. In this case, the departing employees were Boeing Company executives who left their jobs for high-level positions with the Defense Department and the North Atlantic Treaty Organization. They received a total of \$485,000 in severance pay, with individual payments ranging from \$40,000 to \$183,000.²⁴

The Government claimed that the severance payments were improper under 18 U.S.C. § 209, a Federal criminal law that prohibits Government employees from receiving, and

others from paying, supplemental compensation for the official services of those employees.²⁵ It argued that even though Boeing's payments had been made before the five executives began their Government service, the payments had been intended to supplement Government salaries and therefore were improper.

Justice John Paul Stevens, writing for six members of the Court, examined the language and legislative history of section 209 and concluded that payments to prospective Government employees are not prohibited.²⁶ In his opinion, "[d]espite...awkward drafting...[t]he text of §209(a)...indicates that employment status is an element of the offense."²⁷ Although he conceded that the payments might give rise to an appearance of impropriety, a concern addressed by section 209, Justice Stevens said that this concern was mitigated because Boeing's payments were unconditional and had been made on a lump-sum, rather than periodic, basis. In addition, he noted a policy "that counsel[ed] against reading [section 209] too broadly."²⁸ This policy of encouraging qualified employees to make their special skills available to the Government, he said, is a policy that President Kennedy identified when he sought to overhaul Federal conflict-of-interest laws in 1961. Justice Stevens concluded that his literal interpretation of section 209 was appropriate because it was consistent with that policy and because he was construing a criminal, not a civil, statutory provision. □

Footnotes

¹ 895 F.2d 195 (4th Cir. 1990).

² 9 U.S.C. § 1 (1988). This policy is expressed in section 2 of the Federal Arbitration Act, which provides that a "written provision in . . . a contract evidencing a transaction involving commerce to settle by arbitration a controversy thereafter arising out of such contract . . . shall be valid, irrevocable, and enforceable, save upon such grounds as exist at law or in equity for the revocation of any contract." 3 U.S.C. § 2 (1988).

³ 29 U.S.C. § 621 (1982 & Supp. V 1987).

⁴ This standard has been articulated by the Supreme Court in *Rodriguez de Quijas v. Shearson/Am. Express, Inc.*, 109 S. Ct. 1917, 1921 (1989); *Shearson/Am. Express, Inc. v. McMahon*, 482 U.S. 220, 226 (1987); and *Mitsubishi Motors Corp. v. Soler Chrysler-Plymouth, Inc.*, 473 U.S. 614, 627 (1985).

⁵ 895 F.2d at 203.

⁶ See *Nicholson v. CPC Int'l Inc.*, 877 F.2d 221 (3d Cir. 1989); *Cooper v. Aspludh Tree Expert Co.*, 836 F.2d 1544 (10th Cir. 1988); *Criswell v. Western Airlines, Inc.*, 709 F.2d 544 (9th Cir. 1983), *aff'd on other grounds*, 472 U.S. 400 (1985).

⁷ 877 F.2d 221 (3d Cir. 1989). The panel in *Nicholson*, like the panel in *Gilmer*, was divided 2-1.

⁸ Enforcement under the Age Discrimination in Employment Act is begun when the person claiming to be a victim of discrimination files a "charge," or complaint, with the Equal Employment Opportunity Commission. 29 U.S.C. § 626(d) (1982). The Commission investigates this charge and attempts to eliminate any alleged unlawful practice through conciliation and persuasion. *Id.* Sixty days after the charge is filed, the alleged victim of discrimination may file suit, but only if the Commission has not already done so. 29 U.S.C. § 626(c) (1), (d) (1982).

⁹ The *Gilmer* court disagreed on this point. In its view, the Equal Employment Opportunity Commission's role has never been to resolve all Age Discrimination in Employment Act claims. 895 F.2d at 197. Individuals, the court said, have always been free to enter into voluntary, non-supervised settlements. *Id.*

¹⁰ This consequence would be particularly troublesome in the age discrimination context, the *Nicholson* court held, given the "realities of the workplace," wherein "[o]lder employees who have invested many years of their careers with a particular employer may lack any realistic option to refuse to sign a standard-form arbitration agreement presented to them by their employers. New employees who need a job may be in a similar position." 877 F.2d at 229.

The employer in *Nicholson*, though, claimed that arbitration agreements in the age discrimination context do not merit heightened scrutiny, because persons with age discrimination claims are usually professional and managerial employees who are capable of making well-informed and voluntary decisions to arbitrate employment disputes. The court indicated, however, that employees like Mr. Nicholson, who was a highly paid attorney and vice-president of corporate financial services, are "particularly vulnerable" because "employers . . . have a greater incentive

to seek to replace them with younger employees earning lower salaries." *Id.* at 230.

¹¹ *Id.* at 226. The court in *Gilmer* was not persuaded by this analysis. 895 F.2d at 199. According to the *Gilmer* court, simply because Congress chose to allow suits to be filed in Federal district court does not mean that they may not be resolved in some other, mutually agreed-upon forum. *Id.*

¹² 877 F.2d at 226. Important to the court in reaching this conclusion was a case decided under the Fair Labor Standards Act, 29 U.S.C. § 201 (1982 & Supp. V 1987), *Barrentine v. Arkansas-Best Freight Sys., Inc.*, 450 U.S. 728 (1981). The Supreme Court held in *Barrentine* that an employee cannot waive the right to file suit under the Fair Labor Standards Act by signing an agreement to arbitrate employment disputes. The *Nicholson* court attached importance to this case not only because the Age Discrimination in Employment Act incorporates certain Fair Labor Standards Act enforcement provisions, but also because both of these statutes are concerned with situations in which the "disparity in bargaining power between an employer and an individual employee is well known." 877 F.2d at 229. Such situations, the court said, are different from commercial situations, in which arbitration agreements often have been given effect.

¹³ 42 U.S.C. § 2000e (1982).

¹⁴ 892 F.2d 1271 (5th Cir. 1990).

¹⁵ Ordinarily, cases in the Federal courts of appeals are heard and decided by three-judge panels. However, a majority of the circuit judges in regular active service may order an appeal to be heard by the entire court sitting en banc. Fed. R. App. P. 35. This order for a hearing or rehearing en banc may occur when consideration by the full court is thought to be necessary in order to secure or maintain uniformity of a circuit court's decisions or when the case presents an issue of exceptional importance. *Id.*

In *Boureslan*, a three-judge panel first heard and decided the case. *Boureslan v. Aramco*, 857 F.2d 1014 (5th Cir. 1988). The Fifth Circuit then decided that the case merited rehearing en banc, so it ordered the parties to prepare additional briefs and to reargue the case before the full court. Judge Davis wrote both the panel and the en banc majority opinions.

¹⁶ 42 U.S.C. § 2000e-1 (1982).

¹⁷ 892 F.2d at 1273. Judge Carolyn D. King, writing in dissent, strongly disagreed. *Id.* at 1274 (Judge King, dissenting). Aliens employed within the United States, she said, already fit within the statutory definition of "employee," meaning that they are already covered by Title VII. See 42 U.S.C. § 2000e(b), (e) (1982). Thus, in Judge King's opinion, providing coverage to these people through the alien exemption provision would have been unnecessary.

¹⁸ 892 F.2d at 1274.

¹⁹ *Id.*

²⁰ The Older Americans Act Amendments of 1984, Pub. L. 98-459, § 802(a), 98 Stat. 1767, 1792 (codified as amended at 29 U.S.C. § 630(f) (1982 & Supp. V 1987)).

²¹ See *Boureslan v. Aramco*, 892 F.2d 1274, 1277 n. 4 (5th Cir. 1990) (Judge King, dissenting).

²² *Id.* at 1281.

²³ 110 S. Ct. 997 (1990), *reversing* 845 F.2d 476 (4th Cir. 1988).

²⁴ *Id.* at 1000 n. 5.

²⁵ Section 209(a) states that:

Whoever receives any salary, or any contribution to or supplementation of salary, as compensation for his services as an officer or employee of the executive branch of the United States Government...from any source other than the Government of the United States...or [w]hoever... makes [a] contribution to, or in any way supplements the salary of, any such officer or employee...[s]hall be fined not more than \$5,000 or imprisoned not more than one year, or both. 18 U.S.C. § 209(a) (1988).

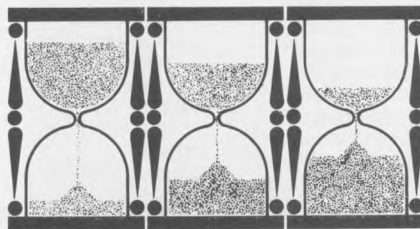
Although section 209 is a criminal provision, the Government did not seek to impose criminal penalties. Instead, it sought to recover the severance payments under the civil law theory that the employees, by violating section 209(a), had breached a fiduciary duty of undivided loyalty and should not profit from their actions.

²⁶ The three remaining justices agreed with the result, but for different reasons. 58 U.S.L.W. at 1007 (Justice Scalia, concurring).

²⁷ 58 U.S.L.W. at 1002.

²⁸ *Id.* at 1005.

Major agreements expiring next month



This list of selected collective bargaining agreements expiring in July is based on information collected by the Bureau's Office of Compensation and Working Conditions. The list includes agreements covering 1,000 workers or more. Private industry is arranged in order of Standard Industrial Classification. Labor organizations listed are affiliated with the AFL-CIO, except where noted as independent (Ind.).

Private industry

Construction

Air Conditioning Contractors of Arizona, Phoenix, AZ; Sheet Metal Workers, 1,000 workers

Associated General Contractors and others, southern California; Carpenters, 7,500 workers

Association of Mechanical Contractors, Atlanta, GA; Plumbers, 1,200 workers

Builders Association, southern Illinois; Carpenters, 3,700 workers

Contractors Association, southern Illinois; Laborers, 4,000 workers

Contractors Association and others, southern Illinois; Operating Engineers, 1,800 workers

Mechanical Contractors Association of Utah, Salt Lake City, UT; Plumbers, 1,200 workers

Painting and Decorating Contractors Association and others, central coast California; Painters, 1,500 workers

Sheet Metal and Air Conditioning Contractors Association of New York City, Inc., New York; Sheet Metal Workers, 4,500 workers

Food and kindred products

Amalgamated Sugar Co., Interstate; Grain Millers, 7,000 workers

American Crystal Sugar Co., Interstate; Grain Millers, 2,400 workers

Bay Area Soft Drink Bottlers Association, California; Teamsters, 1,250 workers

E. J. Brach and Sons, Inc., Illinois; Teamsters, 2,700 workers

Seagram Distilleries, Interstate; Distillery Workers, 1,400 workers

Furniture and fixtures

Association of Cabinet Manufacturers, southern California; Carpenters, 1,000 workers

Paper and allied products

Great Northern Paper Co., Millinock, ME; Paperworkers, 1,900 workers

Electrical and electronic equipment

Allen-Bradley Co., Milwaukee, WI; Electrical Workers (IBEW), 1,300 workers

Motor freight transportation

United Parcel Service, Interstate; Teamsters, 4,800 workers

United Parcel Service, Interstate; Teamsters, 110,000 workers

Water transportation

Pacific Maritime Association, Interstate; Longshoremen and Warehousemen, 9,075 workers

Transportation, public utilities

General Telephone Co., Ohio; Communications Workers, 1,800 workers

Retail trade

Food Employers Council, Inc., southern California; Food and Commercial Workers, 9,000 workers

Portland Food Employers Association, Oregon; Food and Commercial Workers, 4,200 workers

Greater St. Louis Automotive Association, Missouri; Machinists, 1,500 workers

Services

Alliance of Motion Picture and Television Producers, Los Angeles, CA; Theatrical Stage Employees, 25,000 workers

Association of Private Hospitals, New York, NY; Service Employees, 2,500 workers

Public activity

Florida

Alachua County Board of Education (teachers); American Federation of Teachers, 1,500 workers

Kansas

Topeka Unified School District (teachers); National Education Association (Ind.), 1,200 workers

Wichita Board of Education (teachers); National Education Association (Ind.), 3,300 workers

Michigan

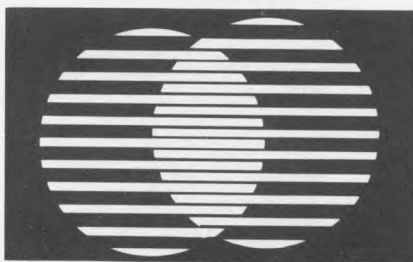
Wayne State University (faculty); University Professors (Ind.), 1,400 workers

Lansing School District (teachers); National Education Association (Ind.), 1,500 workers

Texas

Houston Metro Transit Authority (transit workers); Transit Workers, 2,250 workers

Developments in industrial relations



Railway emergency board

The White House announced its intention to appoint an emergency board to hear a dispute between 12 railway unions, representing some 320,000 workers, and the Nation's railroads. A deadlock was reached because of the carriers' proposal that their employees share the cost of health care which, according to an industry representative, has been increasing 15–20 percent annually. The carriers also proposed that their workers pay a \$100 deductible and absorb \$2,000 catastrophic (out-of-pocket) costs.

Contract negotiations in the railroad industry are conducted under the Railway Labor Act which provides a step-by-step process, including mediation and voluntary (but binding) arbitration to resolve labor disputes. Almost 2 years ago, the parties exchanged bargaining proposals covering wages, working conditions, and health and welfare benefits. One year later, when no progress had been made in negotiations, the parties asked the National Mediation Board, the Federal agency that administers labor relations in the railroad industry, to mediate the dispute. Neither bargaining nor mediation under the auspices of the National Mediation Board resulted in a settlement.

The emergency board will hear the health care portion of the dispute and make recommendations within 120 days after its appointment to resolve these issues (instead of the usual 30 days stipulated under the Railway Labor Act). The parties do not have to accept the emergency board's recommenda-

tions as a basis to settle the dispute. If one or both parties reject the board's report, there is an automatic 30-day cooling-off period during which management can not lock out its workers or unilaterally change the terms and conditions of employment, nor can the unions engage in a job action. Although the unions have agreed to grant the board "any reasonable request for an extension of time," September 15 has tentatively been set as the date the board will release its report.

Immediately after the emergency board members make their recommendations on the health issues, they will mediate the wage and work rules part of this dispute. The carriers are asking for work-crew reductions, more flexibility in assigning work, and rights to subcontract out more work. The unions are seeking semiannual 5-percent wage increases, elimination of some subcontracting, and job protection in "short-line" sales.

Cotton garment settlement

After a month of negotiations, an 18-month agreement was reached between the Clothing and Textile Workers Union, covering about 15,000 workers in production, distribution, and retail operations, and the Cotton Garment Negotiation Group. The Group bargained for 30 companies in the cotton garment industry nationwide, including Arrow, Hathaway, Manhattan, Jay Mar–Ruby, and Cotler. The settlement, which includes wage and benefit improvements, is expected to set the pattern for an additional 27,000 workers at other companies in the cotton garment industry. The key issue in contract talks was the companies' proposal to shift health care costs by requiring an employee copayment of health insurance premiums.

Contracts in the industry are negotiated industrywide by the national union.

The contract provides for a 20-cent-per-hour wage increase effective March 1, 1990, and 15 cents per hour effective March 1, 1991. (Average hourly wage under the previous contract was \$6–\$6.15 per hour.) Employer pension contributions were increased to 2.5 percent of gross wages (was 2 percent). Besides continuing the company-paid health care plan under the jointly administered health insurance fund, the pact provides for improvements in health insurance, including increased benefit levels for doctors' home and office visits, nonsurgical hospital visits, outpatient substance abuse therapy, and weekly disability payments, along with new coverage for well-baby care, prenatal care, and outpatient psychotherapy. The companies also agreed to increase their contributions to the jointly administered health benefit fund to 14.1 percent of gross wages (was 13.6 percent). In addition, the settlement calls for the creation of two new committees: a separate health and safety committee at each company, with committee members being paid for the time they spend in committee meetings; and an industry-wide labor-management committee which will lobby for the adoption of a national health insurance program.

No-strike contract at Armco Steel

Bargaining against a lockout deadline, negotiators for the Armco Steel Co. LP and the Armco Employees Independent Federation reached a 4-year agreement, retroactive to March 1, 1990, covering 4,300 production workers in Middletown, OH. The accord provides job security in exchange for a no-strike agreement. Armco is the Nation's fifth largest steel company.

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

Under terms of the so-called "customer assurance plan," the union agreed not to strike during the term of this agreement and the succeeding contract, guaranteeing Armco continuation of production and easing their customers' concerns about delivery. The pact restores the no-strike provision that was common in the steel industry, including Armco, during the 1970's and early 1980's. As part of the contract, Armco agreed to stop subcontracting certain work such as sandblasting and some refractory work and to use their floating pool of reserve employees to perform this work.

Other terms of the contract include a 75-cent-per-hour general wage increase retroactive to March 1, 1990, 50 cents on March 1, 1991, and 25 cents on March 1, 1992; a \$1 increase in incentive pay over the term; extension of the profit-sharing plan to hourly employees; establishment of a 401(k) plan; a minimum monthly pension rate of \$1,000 after 30 years of credited service; 5 additional vacation days; and eligibility for a comprehensive medical plan (HMO's). In addition, an "inflationary recognition program" was established with payments contingent upon both the company earning a profit in the quarter (payments can be delayed until the next profitable quarter) and an increase in the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) at an annual rate of 4 percent or more. Under the program, employees will receive quarterly lump-sum payments equal to 1 percent of their base pay if the CPI-W rises 4 percent a year, and an additional 1 percent for each additional full 1-percent rise over the initial 4 percent.

In addition, the parties will participate in mutual gains training prior to November 1993 in preparation for 1994 negotiations. This training will be conducted by a third party selected by the company and union negotiators and will deal with how to conduct bargaining sessions effectively. As part of a "win-win" approach to bargaining, the parties will use mediation-arbitration to resolve a bargaining impasse. Under "med-arb," a mediator will assist the parties in reaching a bargaining settlement. Fail-

ing that, the mediator will arbitrate any unresolved issues.

Airline update

Eastern Airlines pilots, represented by the Air Line Pilots Association, ratified an interim agreement with Eastern Airlines, retroactive to March 1, 1990, that calls for wage and benefit cuts. The pact, according to the union, was not "a product of negotiations," but "a good faith proposal made by the pilots to stabilize the critical economic status of Eastern Airlines." The agreement covers about 900 pilots who did not join in their union's sympathy strike in support of the Machinists union against the carrier or who returned to work before the strike ended. The Machinists had struck Eastern last March, and most of the pilots had honored their picket lines. Although the Air Line Pilots ended their sympathy strike last November, no pilots represented by that union have been recalled to work.

The pilots contract had expired August 31, 1988, and the parties had begun collective bargaining under the provisions of the Railway Labor Act. Because the union struck Eastern in support of the Machinists, the carrier had to continue negotiating with the union while keeping the pilots' labor contract in force.

According to the union, the agreement "offers substantial and immediate economic relief in all the areas sought by Eastern management." (Last March, Eastern filed for protection under Chapter 11 of the Bankruptcy Code.) Under terms of the agreement, negotiated wages under the 1988 collective bargaining agreement, averaging around \$72,000 a year, would be cut 25 percent, while pay for new pilots would remain at \$27,500. Eastern's contributions to the pilots' retirement fund would also be reduced. In addition, a copayment for medical and dental coverage will be introduced: pilots will pay \$50 monthly for one-dependent medical coverage and \$6 monthly for dental coverage.

Although neither Eastern nor the Air Line Pilots fully embraced the agreement, the pact is expected to benefit both parties. Eastern hopes that the interim pact, which is expected to save the

carrier \$10 million, will help get its reorganization plan approved by the bankruptcy court. To the contrary, the Air Line Pilots, which is the bargaining representative for the pilots, including replacements, wants to maintain an agreement with labor-protection provisions. (Labor-protection provisions are the noneconomic part of the collective bargaining contract that protects jobs in case of a merger or transfer of assets.)

The interim pact expires July 1, 1990. The parties indicated that they would continue bargaining under the auspices of the National Mediation Board to reach a permanent agreement. Eastern said the accord could "facilitate expedited mediation" and result in a permanent pact containing further cost savings. National Mediation Board Chairman Joshua Javits is serving as a "super-mediator" in the contract talks to assist the parties in reaching a permanent settlement.

Elsewhere in the airline industry, the UAL Corp. board of directors accepted a \$4.4 billion buyout of the company by United Air Lines' three unions, the Air Line Pilots Association, the Machinists, and the Association of Flight Attendants. The deal was put together by the unions and Coniston Partners, a New York investment group and United Air Lines' largest stockholder. If completed, the purchase would make the airline the largest employee-owned company in the United States. Air Line Pilots Association members would own 37.86 percent of United Air Lines; Machinists members, 35.68 percent; non-union employees, 14.26 percent; and Association of Flight Attendants members, 12.2 percent. The purchase apparently hinges on obtaining financing and selecting a new, acceptable management team to run the company.

As part of the buyout, the unions reportedly have agreed to 5-year concessionary contracts with 6-year no-strike pledges. The wage and benefits concessions reportedly amount to \$300 million in the first year and \$2 billion over 5 years.

Hawaii hotel accord

Ending a 21-day work stoppage, the Hotel Employees and Restaurant Em-

ployees Union Local 5 and the Council of Hawaii Hotels signed a 5-year agreement, covering some 7,500 workers at 11 hotels in Hawaii. The two issues creating a deadlock in negotiations were wages and subcontracting.

The pact calls for a 4-percent general wage increase for nontipped employees retroactive to March 1, 1990, and nine semiannual 3-percent increases beginning on September 1, 1990. Tipped employees receive 20 cents retroactive to March 1, 1990, 15 cents on March 1, 1991, 15 cents on March 1, 1992, and 20 cents on March 1, 1994. Bell porterage employees receive the same wage boosts on the same dates as the tipped employees, except for a 10-cent-per-hour wage increase instead of 15 cents on March 1, 1992.

Prior to the application of any wage increases, dining room stewards' pay is raised by 10 cents per hour, door attendants' by 50 cents, head banquet porters' by 47 cents, and housekeeping working supervisors' by 10 cents. These pay raises put the Island employees on pay parity with their counterparts on the Mainland, particularly San Francisco, CA. Under the contract, housekeepers' pay increases from \$7.62 an hour to \$10.29 over the term; bartenders', from \$10.84 to \$14.64; fry cooks', \$10.50 to \$14.20; and maintenance workers', \$13.28 to \$17.94.

Other terms included a 91-cent-per-hour increase over the term (to \$2.25) in the hotels' contributions to the health welfare plan to maintain medical, dental, drug, and vision care coverage; an 8-cent-per-hour increase in the employers' contributions to the pension fund; an immediate 25-cent-per-hour training differential and an additional 25 cents on March 1, 1992; a tightening in subcontracting language; a prohibition against lie detector tests and strip searches for potential drug offenders

(the union also defeated the companies' proposal to implement a drug-testing program); 30-day unpaid paternal leave to care for infants; the establishment of a 401(k) plan; dual seniority upon promotion to an on-call or part-time position until the employee gets regular status in the new position; and new arrangements to help ensure the safety of female housekeepers working on the night crew.

Play ball

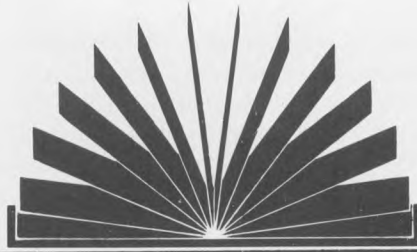
Ending a 32-day lockout, negotiators for the major league baseball players (Major League Baseball Players' Association) and for the 26 baseball club owners (Players Relations Committee) reached a 4-year agreement covering 1,040 ballplayers. The 26 clubs have 24 roster positions for major league players and 16 for minor league players covered under the contract.

The owners' original proposals included a revenue-sharing plan in which 48 percent of revenues from ticket sales and television and radio broadcast contracts (which reportedly constitute 80 percent of the owners' total revenues) would go to the players; a pay-for-performance plan, in which players with less than 6 years of experience would get 1-year, nonguaranteed contracts with their salaries determined by a statistical formula, while players with 6 years or more of experience would be free agents; free agent restrictions, under which teams over preset salary levels would not be able to sign another team's free agents; continuation of the current salary arbitration eligibility; and a \$90,000 minimum salary for major league players.

The players' original demands included salary arbitration for 50 percent of the most senior players with between

2-3 years of experience; \$100,000-\$125,000 minimum salaries, plus cost-of-living increases; \$57 million annual contribution by the club owners to the pension and benefit plan; a 25-man major league roster; more liberalized rules for free agents; continuation of the existing pension and benefit formula combining owners' contributions with revenues from television contracts covering the All-Star Game, the playoffs, and the World Series; and automatic penalties for, and future protection from, collusion by the owners in the signing of free agents.

The settlement came after the baseball owners abandoned proposals on two thorny issues, revenue sharing and minimum salaries, and a compromise was reached on a third and even more intractable issue, salary arbitration. The contract provides for salary arbitration for the top (based on service time) 17 percent of the players in the league (approximately 15 players) with between 2 and 3 years of service, provided they were on the team's roster for at least 86 days in the previous season. Minimum salaries were increased to \$100,000 (from \$68,000) for major league players, and to \$25,000 (from \$22,700) for minor league players. Other terms include a \$55 million (was \$39 million) owners' annual payment to the pension and benefit fund; an increase in the major league roster to 25 players effective in 1991 (currently 24); two new expansion teams for the National League; unspecified cost-of-living allowances in 1992 and 1993; automatic triple damages to players if intentional collusion is proven against at least five teams in the signing of free agent ballplayers; and a reopener on major issues after 3 years . □



Employee benefits in the 1990's

Corporate Benefit Plans: International and Domestic Perspectives. Edited by Mary E. Brennan. Brookfield, WI, International Foundation of Employee Benefit Plans, 1988. 192 pp. \$30.

During the 1980's, American businesses began to realize that they were no longer operating within the context of a solely domestic economy. Corporations were now playing on an international field complete with new rules and new boundaries. In the 1990's, this may become even more evident as American corporations continue their attempts to capture new markets.

The growth of the global marketplace has increased the number of demands placed upon American businesses. New technologies and new products will need to be developed. It may also become necessary to alter the benefit packages provided to employees as the needs of these employees change. The International Foundation of Employee Benefit Plans addressed the latter issue at their annual conference in 1988. The Foundation has now issued *Corporate Benefit Plans: International and Domestic Perspectives*, a compilation of 12 papers that were presented at the conference. These 12 papers explore the international and domestic benefits issues that will be among the most predominant as we approach the 21st century.

In "International Benefit Perils of the '90's," David J. D. McLeish outlines what he sees as the major dilemmas that will confront benefits managers in the 1990's. McLeish is primarily addressing the issue of retirement benefits, but his arguments present a proper starting point from which to address the entire benefits spectrum.

McLeish believes that the major problem with the present structure of benefits is that they were designed to match a social environment that no longer exists. Social changes have placed heavy burdens on the Social Security programs of many countries. These changes include increases in the life expectancy rate, the divorce rate, the number of single parents, and the number of dual-income families. Workers have also increased the frequency with which they change jobs during their worklife. These new factors have caused many governments to look to the private sector for help. As the cost of providing benefits to their employees has increased, the private sector is beginning to echo many of the complaints of the public sector. McLeish feels that legislation is needed to ensure that all members of society receive sufficient income and benefits during retirement.

In her essay, "Incentives From an International Perspective," Heather Bowker addresses the specific problems that can occur when an American multinational corporation attempts to develop incentive packages for its overseas operations. The major objectives of incentive programs are similar in all nations. These plans strive to reward exceptional performance, reduce fixed costs, and motivate employees. However, this is where the similarities end. As Bowker points out, American firms cannot make the mistake of assuming that employees of a foreign subsidiary either want or need the same benefits as their American counterparts.

Bowker suggests that multinational corporations must recognize the cultural, legal, and economic differences that exist across national borders before they attempt to implement an incentive plan. It may not be possible just to transport the plan that is currently in use in

the United States. For instance, a bonus that surpasses base pay (like those often awarded to top U.S. executives) would be seen as embarrassing in many foreign countries. Other foreigners are uncomfortable with individual performance bonuses, preferring team incentives instead. Large cash payments are also not of much use in countries with high tax brackets, where a significant bonus often just disappears with the taxman. Other perks, such as deferred compensation or use of a company car, might be more suitable. To prepare for these difficulties, Bowker recommends that benefits managers use the "Six C's": concept building, consistency, clarity, cultural sensitivity, continuous reinforcement, and constructive feedback.

Turning toward the domestic front, Karen B. Greenbaum suggests that the entire world of employee benefits could be transformed through the use of interactive communication in the workplace. Greenbaum explains this new procedure in her paper on "Interactive Communication Techniques." The term refers to the exchange of information that takes place between the computer and the employee. This technique allows the user to set the pace of the dialogue, to choose options, and to decide how much depth he or she desires.

Interactive communication has many possible applications that could be used in the field of employee benefits. It would allow the user to personalize benefit information to suit his or her needs. It ensures that the message that is delivered is consistent. It allows a steady stream of information about changes in benefit offerings and coverage. Finally, it could eliminate undue administrative burdens. Employees would be able to update their personal records when necessary, change their plan selections, and receive notice of the

status of defined contribution and defined benefit plans.

This book contains articles on many other topics of interest, including care of the elderly, AIDS in the workplace, regulatory developments in Japan, and an international overview of the escalating cost of health care. As these issues continue to come to the forefront both politically and economically, the search for solutions will intensify.

—Michael Bucci

Division of Occupational Pay and
Employee Benefit Levels
Bureau of Labor Statistics

Policies in the making

Child Care: Facing the Hard Choices.

By Alfred J. Kahn and Sheila B. Kamerman. Dover, MA, Auburn House Publishing Co., 1988, 273 pp. \$26.

According to the authors of this timely and insightful book, both of whom are professors of social policy and planning at Columbia University's School of Social Work, "the Federal Government has largely and deliberately abdicated its leadership role" regarding child care, and "a Federal 'presence' has disappeared." This was not an unreasonable conclusion to reach after their examination of Federal policies and programs until 1987. Few readers will dispute their well-documented charges that "Federal Government retreats and dismantling in this field [had] left serious shortages and leadership gaps."

But what a remarkable difference a few short years have made, with nearly 60 child-care bills now before the Congress! While most of these proposals originated in the Congress itself, from both sides of the aisle, one of the bills now being singled out for attention was sent up to the Hill by the Chief Executive, consistent with his pledge to address the child-care conundrum during his campaign for office. What will finally emerge from this spate of legislative proposals is by no means clear, with compromises between party leaders in the Congress and the White House still to be worked out. But the Federal Government obviously intends to resume a

leadership role, whether at its own initiative or as a necessary political response to the pressures for action that have rapidly mounted throughout the country.

Kahn and Kamerman, who have long been at the fore of the family advocacy movement, did not write this book as a self-help guide for perplexed parents. Rather, they address it to "those public officials, interested citizens, advocates, and academics who frame the policy debate and engage the choices." And, despite being outpaced in some respects by the changing tide, this is a book whose data and whose arguments have lost very little currency.

Indeed, to understand what is now taking place in our institutions of government and what fuels the still ongoing debate about child-care policy, the kind of detailed history of the 1981–86 period the authors present should be required reading. The policy hallmarks of this short but influential political era are described in the authors' words as "decentralization, privatization, and deregulation." To some, perhaps a large extent, these principles are still apropos today, although they might be considered less the established goals of government than three key considerations that continue to frame and guide the child-care debate.

Seemingly giving up on the Federal Government as the force for change, Kahn and Kamerman look mainly to States and local communities for leadership in developing new child-care policies and program initiatives. A number of these, unquestionably among the more promising ones, are described in some detail—perhaps more detail than a casual reader will care to digest. Three principal chapters, however, are also devoted to the roles of schools, employers, and family day-care providers, the last of which are both the major suppliers of care for preschool children and the cause of considerable concern regarding the quality of that care and the safety and health of their charges.

As in virtually every treatise on child care, there are some equivocal statements and interpretations. For example, the authors argue that employers are impelled to provide child-care assistance *not* as an aid in recruiting and

retaining female workers but as a response to felt "pressures from government, from the media, and from child-care advocates to do something more to respond to the child-care needs of their employees." Such pressures obviously are being experienced as a call for action. However, to dismiss impending if not already existing labor force shortages as a major stimulus is to ignore the realities of population and labor force demographics and to give short shrift to the acumen of employers in recognizing and devising ways of dealing with them.

But whatever more employers might do, this reviewer agrees with the authors that the shortages of affordable and quality child care, which impose a particularly onerous burden on poor and low-income families, are not going to be corrected by any simple reliance on market forces. It is not unreasonable to expect that, in time, "child care should evolve and become as much a part of the social infrastructure as schools, libraries, parks, highways, and transportation." But for the present at least, it remains to be seen how this Nation might best fashion child-care arrangements that artfully combine the efforts and resources of the public and private sectors in ways that meet the needs of working parents while protecting and promoting the interests of its next generation of citizens.

—Richard P. Shore

Bureau of Labor-Management
Relations
U.S. Department of Labor

Applying the right principles

Personal Productivity: How to Increase Your Satisfaction in Living.

By John W. Kendrick and John B. Kendrick. Armonk, NY, M.E. Sharpe, Inc., 1988. 194 pp., bibliography. \$35, cloth; \$14.95, paper.

John W. Kendrick, who has distinguished himself over the decades through his analyses of firm, industry, and economywide productivity, turns his attention in this excellent book to the productivity of the individual. He and his son, John B. Kendrick (an account

executive at an advertising agency), provide a plan for raising personal productivity both at work and in the use of leisure time. Inspiring the Kendricks to undertake this effort was the judgment that most people currently realize "only a fraction of the satisfaction they could be getting from their lives."

One of the major contributions of the book is the authors' index for measuring changes in personal productivity. The Kendricks' measure has two components—inflation-adjusted Full Personal Income ("Full," because it includes such items as the imputed value of unpaid work) and a "Satisfaction Quotient" that reflects changes in the degree of satisfaction that the individual receives from work, family, and recreation.

While the measure of personal productivity is a most useful concept, I disagree with the authors' formula for its calculation. According to the Kendricks, if one's income increased 1.8 percent and his or her satisfaction rose 2.9 percent, then personal productivity would have increased 4.7 percent. It seems to me that if there are two components of the productivity gauge, the overall increase should be a weighted average of the changes in the two elements—that is, somewhere between 1.8 percent and 2.9 percent. The authors acknowledge that "it is not essential to combine the indicators of the quantitative and qualitative aspects of personal-productivity growth." I believe that the indicators *should* be combined, but I disagree with the authors' method of combining them.

What advice does the book offer for increasing one's personal productivity? Some of the suggestions are what one might expect to find in any self-help book. Thus, the Kendricks exhort the reader to think positively, to exercise regularly, to "give yourself pep talks," and, when possible, to simultaneously do two things or more.

What is different in this book, however, and what makes it a valuable contribution, are the authors' ideas on how to apply principles of economics in order to increase one's effectiveness and satisfaction in life.

For example, the Kendricks urge the reader to apply the principle of comparative advantage both in the workplace

and in the home. On the matter of choosing a career, the authors advise: "People who are below par in everything can still benefit from choosing an activity in which they have the least comparative disadvantage."

How should one decide how much time to devote to work, and how much to reserve for leisure? The authors offer the answer of the microeconomist: "work for pay up to the point at which the additional income is worth no more to you than is the additional nonmarket time." Because such reasoning underlies much economic behavior, the Kendricks predict that the labor force participation rates of individuals age 60 and older may rise in the future, as a result of the tightening that has occurred in Social Security retirement provisions. It will be interesting to watch for such a development, which would represent a reversal of the long-term historic trend toward earlier retirement.

The authors turn to microeconomics again, in explaining how a consumer should allocate expenditures in order to maximize satisfaction: "buy. . . each of the commodities you consume up to the point at which the last dollar spent on each (including the value of your time) gives equal satisfaction." Also, as some items increase in price very rapidly, "you should try to shift some of your purchases away from those goods toward substitutes whose prices are rising less than the CPI, or are declining." I was appalled by the authors' suggestion that long-distance telephone calls are an expenditure item on which people may want to cut back. According to CPI data, the cost of interstate calls has fallen almost 30 percent in the past 5 years, and so the authors' satisfaction-maximizing principle implies that consumers should *increase* their use of long-distance service. As a candidate for cut-backs, long-distance calls would be a poor choice.

Among the many useful suggestions in the book are the setting of short- and long-term goals, the use of daily "to-do" lists, and the keeping of expenditure logs. I recommend the book most heartily.

—Edward Steinberg

Economist,
AT&T

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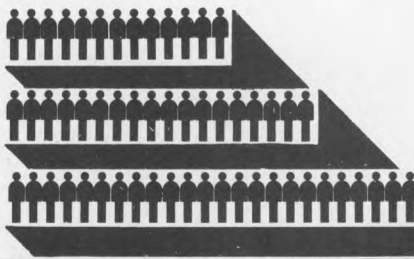
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Notes on Current Labor Statistics

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

General notes

The following notes apply to several tables in this section:

Seasonal adjustment. Certain monthly and quarterly data are adjusted to eliminate the effect on the data of such factors as climatic conditions, industry production schedules, opening and closing of schools, holiday buying periods, and vacation practices, which might prevent short-term evaluation of the statistical series. Tables containing data that have been adjusted are identified as "seasonally adjusted." (All other data are not seasonally adjusted.) Seasonal effects are estimated on the basis of past experience. When new seasonal factors are computed each year, revisions may affect seasonally adjusted data for several preceding years.

Seasonally adjusted data appear in tables 1-3, 4-10, 13-15, 17-18, 44, and 48. Seasonally adjusted labor force data in tables 1 and 4-10 were revised in the February 1990 issue of the *Review* and reflect the experience through 1989. Seasonally adjusted establishment survey data shown in tables 13-15 and 17-18 were revised in the July 1989 *Review* and reflect the experience through March 1989. A brief explanation of the seasonal adjustment methodology appears in "Notes on the data."

Revisions in the productivity data in table 44 are usually introduced in the September issue. Seasonally adjusted indexes and percent changes from month-to-month and 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 "real" earnings shown in table 15—are adjusted to eliminate the effect

of changes in price. These adjustments are made by dividing current-dollar values by the Consumer Price Index or the appropriate component of the index, then multiplying by 100. For example, given a current hourly wage rate of \$3 and a current price index number of 150, where 1977 = 100, the hourly rate expressed in 1977 dollars is \$2 ($\$3/150 \times 100 = \2). The \$2 (or any other resulting values) are described as "real," "constant," or "1977" dollars.

Additional information

Data that supplement the tables in this section are published by the Bureau in a variety of sources. News releases provide the latest statistical information published by the Bureau; the major recurring releases are published according to the schedule appearing on the back cover of this issue. More information about labor force, employment, and unemployment data and the household and establishment surveys underlying the data are available in *Employment and Earnings*, a monthly publication of the Bureau. More data from the household survey are published in the data books—*Revised Seasonally Adjusted Labor Force Statistics*, Bulletin 2306, and *Labor Force Statistics Derived From the Current Population Survey*, Bulletin 2307. 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 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 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

- n.e.c. = not elsewhere classified.
n.e.s. = not elsewhere specified.
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.

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 overall export and import price indexes are given. Measures of productivity (output per

hour of all persons) are provided for major sectors.

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

Notes on the data

Definitions of each series and notes on the data are contained in later sections of these notes describing each set of data. For detailed descriptions of each data series, see *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988), as well as the additional bulletins, articles, and other publications noted in the separate sections of the *Review's* "Current Labor Statistics Notes." Users may also wish to consult *Major Programs of the Bureau of Labor Statistics* (Bureau of Labor Statistics, 1990).

Employment and Unemployment Data

(Tables 1; 4–21)

Household survey data

Description of the series

EMPLOYMENT DATA in this section are obtained from the Current Population Survey, a program of personal interviews conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics. The sample consists of about 60,000 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 **non-institutional population** comprises all persons 16 years of age and older who are not inmates of penal or mental institutions, sanitariums, or homes for the aged, infirm, or needy, and members of the Armed Forces stationed in the United States. The **labor force participation rate** is the proportion of the noninstitutional population that is in the labor force. **The employment-population ratio** is total employment (including the resident Armed Forces) as a percent of the noninstitutional population.

Notes on the data

From time to time, and especially after a decennial census, adjustments are made in the Current Population Survey figures to correct for estimating errors during the intercensal 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*.

Labor force data in tables 1 and 4–10 are seasonally adjusted based on the experience through December 1989. Since January 1980, national labor force data have been seasonally adjusted with a procedure called *X-11 ARIMA* which was developed at Statistics Canada as an extension of the standard *X-11* method previously used by BLS. A detailed description of the procedure appears in the *X-11 ARIMA Seasonal Adjustment Method*, by Estela Bee Dagum (Statistics Canada, Catalogue No. 12–564E, February 1980).

At the end of each calendar year, season-

ally adjusted data for the previous 5 years are revised, and projected seasonal adjustment factors are calculated for use during the January–June period. In July, new seasonal adjustment factors, which incorporate the experience through June, are produced for the July–December period but no revisions are made in the historical data.

Additional sources of information

For detailed explanations of the data, see *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988), and for additional data, *Handbook of Labor Statistics*, Bulletin 2340 (Bureau of Labor Statistics, 1989). Historical unadjusted data from 1948 to 1987 are available in *Labor Force Statistics Derived from the Current Population Survey*, Bulletin 2307 (Bureau of Labor Statistics, 1988). Historical seasonally adjusted data appear in *Labor Force Statistics Derived from the Current Population Survey: A Databook*, Vol. II, Bulletin 2096 (Bureau of Labor Statistics, 1982), and *Revised Seasonally Adjusted Labor Force Statistics, 1978–87*, Bulletin 2306 (Bureau of Labor Statistics, 1988).

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 300,000 establishments representing all industries except agriculture. In most industries, the sampling probabilities are based on the size of the establishment; most large establishments are therefore in the sample. (An establishment is not necessarily a firm; it may be a branch plant, for example, or warehouse.) Self-employed persons and others not on a regular civilian payroll are outside the scope of the survey because they are excluded from establishment records. This largely accounts for the difference in employment figures between the household and establishment surveys.

Definitions

An **establishment** is an economic unit which produces goods or services (such as

a factory or store) at a single location and is engaged in one type of economic activity.

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

Production workers in manufacturing include working supervisors and non-supervisory workers closely associated with production operations. Those workers mentioned in tables 12-17 include production workers in manufacturing and mining; construction workers in construction; and non-supervisory 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 Earners and Clerical Workers (CPI-W).

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

The Diffusion Index represents the percent of industries in which employment was rising over the indicated period, plus one-half of the industries with unchanged employment; 50 percent indicates an equal balance between industries with increasing and decreasing employment. 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. Data are centered within the span. The March 1989 *Review* introduced an expanded index on private nonagricultural employment based on 349 industries, and a new manufacturing index based on 141 industries. These indexes are useful for measuring the dispersion of economic gains or losses and are also economic indicators.

Notes on the data

Establishment survey data are annually adjusted to comprehensive counts of em-

ployment (called "benchmarks"). The latest adjustment, which incorporated March 1988 benchmarks, was made with the release of May 1989 data, published in the July 1989 issue of the *Review*. Coincident with the benchmark adjustments, seasonally adjusted data were revised to reflect the experience through March 1989. Unadjusted data have been revised back to April 1987; seasonally adjusted data back to January 1984. These revisions were published in the *Supplement to Employment and Earnings* (Bureau of Labor Statistics, 1989). Unadjusted data from April 1988 forward and seasonally adjusted data from January 1985 forward are subject to revision in future benchmarks.

The BLS also uses the *X-11 ARIMA* methodology to seasonally adjust establishment survey data. Beginning in June 1989, projected seasonal adjustment factors are calculated only for the first 6 months after benchmarking, rather than for 12 months (April-March) as was previously done. A second set of projected factors, which incorporate the experience through September, will be produced for the subsequent period and introduced with the publication of data for October. The change makes the procedure used for the establishment survey data more parallel to that used in adjusting the household survey data. Revisions of historical data will continue to be made once a year coincident with the benchmark revisions.

In the establishment survey, estimates for the 2 most recent months are based on incomplete returns and are published as preliminary in the tables (13 to 18 in the *Review*). When all returns have been received, the estimates are revised and published as "final" (prior to any benchmark revisions) in the third month of their appearance. Thus, December data are published as preliminary in January and February and as final in March. For the same reasons, quarterly establishment data (table 1) are preliminary for the first 2 months of publication and final in the third month. Thus, fourth-quarter data are published as preliminary in January and February and as final in March.

Additional sources of information

Detailed national data from the establishment survey are published monthly in the BLS periodical, *Employment and Earnings*. Earlier comparable unadjusted and seasonally adjusted data are published in *Employment, Hours, and Earnings, United States, 1909-84*, Bulletin 1312-12 (Bureau of Labor Statistics, 1985) and its annual supplement. For a detailed discussion of the methodology of the survey, see *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988). For

additional data, see *Handbook of Labor Statistics*, Bulletin 2340 (Bureau of Labor Statistics, 1989).

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 2285 (Bureau of Labor Statistics, 1988).

Compensation and Wage Data

(Tables 1-3; 22-30)

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

Employment Cost Index

Description of the series

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

Statistical series on total compensation costs, on wages and salaries, and on benefit costs are available for private nonfarm workers excluding proprietors, the self-employed, and household workers. The total compensation costs and wages and salaries 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 4,200 private nonfarm establishments providing about 22,000 occupational observations and 800 State and local government establishments providing 4,200 occupational observations selected to represent total employment in each sector. On average, each reporting unit provides wage and compensation information on five well-specified occupations. Data are collected each quarter for the pay period including the 12th day of March, June, September, and December.

Beginning with June 1986 data, fixed employment weights from the 1980 Census of Population are used each quarter to calculate the civilian and private indexes and the index for State and local governments. (Prior to June 1986, the employment weights are from the 1970 Census of Population.) These fixed weights, also used to derive all of the industry and occupation series indexes, ensure that changes in these indexes reflect only changes in compensation, not employment shifts among industries or occupations with different levels of wages and compensation. For the bargaining status, region, and

metropolitan/nonmetropolitan area series, however, employment data by industry and occupation are not available from the census. Instead, the 1980 employment weights are reallocated within these series each quarter based on the current sample. Therefore, these indexes are not strictly comparable to those for the aggregate, industry, and occupation series.

Definitions

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

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

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

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

Notes on the data

The Employment Cost Index for changes in wages and salaries in the private nonfarm economy was published beginning in 1975. Changes in total compensation cost—wages and salaries and benefits combined—were published beginning in 1980. The series of changes in wages and salaries and for total compensation in the State and local government sector and in the civilian nonfarm economy (excluding Federal employees) were published beginning in 1981. Historical indexes (June 1981=100) of the quarterly rates of change are presented in the March issue of the BLS periodical, *Current Wage Developments*.

Additional sources of information

For a more detailed discussion of the Employment Cost Index, see the *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988); *Employment Cost Indexes and Levels, 1975-88*, Bulletin 2319 (Bureau of Labor Statistics, 1988); and the following *Monthly Labor Review* articles: "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 2340 (Bureau of Labor Statistics, 1989).

Collective bargaining settlements

Description of the series

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

Settlement data are measured in terms of future specified adjustments: those that will occur within 12 months of the contract effective date—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 straight-time hourly wage rate plus shift premium 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 of 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

Comparisons of major collective bargaining settlements for State and local government with those for private industry should note differences in occupational mix, bargaining practices, and settlement characteristics. Professional and white-collar employees, for example, make up a much larger proportion of the workers covered by government rather than by private industry settlements. Lump-sum payments and cost-of-living adjustments (COLA) clauses, on the other hand, are rare in government but common in private industry settlements. Also, State and local government bargaining frequently excludes items such as pension benefits and holidays, that are prescribed by law, while these items are typical bargaining issues in private industry.

Additional sources of information

For a more detailed discussion on the series, see the *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988). Comprehensive data are published in press releases issued quarterly (in January, April, July, and October) for private industry, and semiannually (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 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 di-

rectly involved in a stoppage. They do not measure the indirect or secondary effect of stoppages on other establishments whose employees are idle owing to material shortages or lack of service.

Definitions

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

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

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

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

Notes on the data

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

Additional sources of information

Data for each calendar year are reported in a BLS press release issued in the first quarter of the following year. Monthly and historical data appear in the BLS periodical, *Current Wage Developments*. Historical data appear in the *Handbook of Labor Statistics*, Bulletin 2340 (Bureau of Labor Statistics, 1989).

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 the incidence of health, insurance, and retirement plans. Reports are issued throughout the year as the surveys are completed. Summaries of the data and special analyses also appear in the *Monthly Labor Review*.

Area Wage Surveys annually provide data for selected office, clerical, professional, technical, maintenance, toolroom, powerplant, material movement, and custodial occupations common to a wide variety of industries in the areas (labor markets) surveyed. Reports are issued throughout the

year as the surveys are completed. Summaries of the data and special analyses also appear in the *Review*.

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

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

Price Data

(Tables 2; 31-43)

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 (1982 = 100 for many Producer Price Indexes or 1982-84 = 100 for many Consumer Price Indexes, 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 con-

sumer index (CPI-U), introduced in 1978, is representative of the 1982-84 buying habits of about 80 percent of the noninstitutional population of the United States at that time, compared with 32 percent represented in the CPI-W. In addition to wage earners and clerical workers, the CPI-U covers professional, managerial, and technical workers, the self-employed, short-term workers, the unemployed, retirees, and others not in the labor force.

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

Data collected from more than 21,000 retail establishments and 60,000 housing units in 91 urban areas across the country are used to develop the "U.S. city average." Separate estimates for 27 major urban centers are presented in table 32. The areas listed are as indicated in footnote 1 to the table. The area indexes measure only the average change in prices for each area since the base period, and do not indicate differences in the level of prices among cities.

Notes on the data

In January 1983, the Bureau changed the way in which homeownership costs are measured for the CPI-U. A rental equivalence method replaced the asset-price approach to homeownership costs for that series. In January 1985, the same change was made in the CPI-W. The central purpose of the change was to separate shelter costs from the investment component of homeownership so that the index would reflect only the cost of shelter services provided by owner-occupied homes. An updated CPI-U and CPI-W were introduced with release of the January 1987 data.

Additional sources of information

For a discussion of the general method for computing the CPI, see *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988). The recent change in the measurement of homeownership costs is discussed in Robert Gillingham and Walter Lane, "Changing the treatment of shelter costs for homeowners in the CPI," *Monthly Labor Review*, July 1982, pp. 9-14. An overview of the recently introduced revised CPI, reflecting 1982-84 expenditure patterns, is contained in *The Consumer Price Index: 1987 Revision*, Report 736 (Bureau of Labor Statistics, 1987).

Additional detailed CPI data and regular analyses of consumer price changes are provided in the *CPI Detailed Report*, a monthly publication of the Bureau. Historical data for the overall CPI and for selected groupings may be found in the *Handbook of Labor Statistics*, Bulletin 2340 (Bureau of Labor Statistics, 1989).

Producer Price Indexes

Description of the series

Producer Price Indexes (PPI) measure average changes in prices received by domestic producers of commodities in all stages of processing. The sample used for calculating these indexes currently contains about 3,100 commodities and about 75,000 quotations per month, selected to represent the movement of prices of all commodities produced in the manufacturing; agriculture, forestry, and fishing; mining; and 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. The industry and product structure of PPI organizes data in accordance with the Standard Industrial Classification (SIC) and the product code extension of the SIC developed by the U.S. Bureau of the Census.

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

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

Notes on the data

Beginning with the January 1986 issue, the *Review* is no longer presenting tables

of Producer Price Indexes for commodity groupings or special composite groups. However, these data will continue to be presented in the Bureau's monthly publication, *Producer Price Indexes*.

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

Additional sources of information

For a discussion of the methodology for computing Producer Price Indexes, see *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988).

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 2340 (Bureau of Labor Statistics, 1989).

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 1985=100, unless otherwise indicated.

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

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

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

Notes on the data

The export and import price indexes are weighted indexes of the Laspeyres type. Price relatives are assigned equal importance within each weight category and are then aggregated to the SITC level. The values assigned to each weight category are based on trade value figures compiled by the Bureau of the Census. The trade weights currently used to compute both indexes relate to 1985.

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 re-pricing of the item.

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

Beginning in 1988, the Bureau has also been publishing a series of indexes which represent the price of U.S. exports and imports in foreign currency terms.

Additional sources of information

For a discussion of the general method of computing International Price Indexes, see *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988).

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 2340 (Bureau of Labor Statistics, 1989). For further information on the foreign currency indexes, see "BLS publishes average exchange rate and foreign currency price indexes," *Monthly Labor Review*, December 1987, pp. 47-49.

Productivity Data

(Tables 2; 44-47)

Business sector and major sectors

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 combined labor and capital inputs). 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 value of goods and services in constant prices produced per combined unit of labor and capital inputs. 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 effort 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 at work. **Real compensation per hour** is compensation per hour deflated by the change in Consumer Price Index for All Urban Consumers.

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

Unit profits include corporate profits with inventory valuation and capital consumption adjustments per unit of output.

Hours of all persons are the total hours at work 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.

Combined units of labor and capital inputs are derived by combining changes in labor and capital input 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

The output measure for the **business sector** is equal to constant-dollar gross national product but excludes the rental value of owner-occupied dwellings, the rest-of-world sector, the output of non-profit institutions, the output of paid employees of private households, general government, and the statistical discrepancy. Output of the **nonfarm business sector** is equal to business sector output less farming. 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 manufacturing 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 44–47 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 2285 (Bureau of Labor Statistics, 1988). Historical data are provided in *Handbook of*

Labor Statistics, Bulletin 2340 (Bureau of Labor Statistics, 1989).

Industry productivity measures

Description of the series

The BLS industry productivity data supplement the measures for the business economy and major sectors with annual measures of labor productivity for selected industries at the 3- and 4-digit levels of the Standard Industrial Classification system. The industry measures differ in methodology and data sources from the productivity measures for the major sectors because the industry measures are developed independently of the National Income and Product Accounts framework used for the major sector measures.

Definitions

Output per employee hour is derived by dividing an index of industry output by an index of aggregate hours of all employees. Output indexes are based on quantifiable units of products or services, or both, combined with fixed-period weights. Whenever possible, physical quantities are used as the unit of measurement for output. If quantity data are not available for a given industry, data on the constant-dollar value of production are used.

The labor input series consist of the hours of all employees (production and nonproduction workers), the hours of all persons (paid employees, partners, proprietors, and unpaid family workers), or the number of employees, depending upon the industry.

Notes on the data

The industry measures are compiled from data produced by the Bureau of Labor Statistics, the Departments of Commerce, Interior, and Agriculture, the Federal Reserve Board, regulatory agencies, trade associations, and other sources.

For most industries, the productivity indexes refer to the output per hour of all employees. For some transportation industries, only indexes of output per employee are prepared. For some trade and service industries, indexes of output per hour of all persons (including self-employed) are constructed.

Additional sources of information

For a complete listing of available industry productivity indexes and their components, see *Productivity Measures for Selected Industries and Government Services*, Bulletin 2322 (Bureau of Labor Statistics, 1989). For additional information about

the methodology for computing the industry productivity measures, see the *BLS Handbook of Methods*, Bulletin 2285 (Bureau of Labor Statistics, 1988), chapter 11.

International Comparisons

(Tables 48–50)

Labor force and unemployment

Description of the series

Tables 48 and 49 present comparative measures of the labor force, employment, and unemployment—approximating U.S. concepts—for the United States, Canada, Australia, Japan, and several European countries. The unemployment statistics (and, to a lesser extent, employment statistics) published by other industrial countries are not, in most cases, comparable to U.S. unemployment statistics. Therefore, the Bureau adjusts the figures for selected countries, where necessary, for all known major definitional differences. Although precise comparability may not be achieved, these adjusted figures provide a better basis for international comparisons than the figures regularly published by each country.

Definitions

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

Notes on the data

The adjusted statistics have been adapted to the age at which compulsory schooling ends in each country, rather than to the U.S. standard of 16 years of age and over. Therefore, the adjusted statistics relate to the population age 16 and over in France, Sweden, and from 1973 onward, the United Kingdom; 15 and over in Canada, Australia, Japan, Germany, the Netherlands, and prior to 1973, the United Kingdom; and 14 and over in Italy. The institutional population is included in the denominator of the labor force participation rates and employment-population ratios for Japan and Germany; it is excluded for the United States and the other countries.

In the U.S. labor force survey, persons on layoff who are awaiting recall to their jobs are classified as unemployed. European and Japanese layoff practices are quite different in nature from those in the United States;

therefore, strict application of the U.S. definition has not been made on this point. For further information, see *Monthly Labor Review*, December 1981, pp. 8–11.

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

There are breaks in the data series for Germany (1983 and 1987), Italy (1986), the Netherlands (1983), and Sweden (1987). For both Germany and the Netherlands, the 1983 breaks reflect the replacement of labor force survey results tabulated by the national statistical offices with those tabulated by the European Community Statistical Office (EUROSTAT). The Dutch figures for 1983 onward also reflect the replacement of man-year employment data with data from the Dutch Survey of Employed Persons. The impact of the changes was to lower the adjusted unemployment rate by 0.3 percentage point for Germany and by about 2 percentage points for the Netherlands. The 1987 break for Germany reflects the incorporation of employment statistics based on the 1987 Population Census, which indicated that the level of employment was about 1 million higher than previously estimated. The impact of this change was to lower the adjusted unemployment rate by 0.3 percentage point. When historical data benchmarked to the 1987 census become available, BLS will revise its comparative measures for Germany.

For Italy, the break in series reflects more accurate enumeration of time of last job search. This resulted in a significant increase in the number of people reported as seeking work in the last 30 days. The impact was to increase the Italian unemployment rates approximating U.S. concepts by about 1 percentage point.

Sweden introduced a new questionnaire. Questions regarding current availability were added and the period of active work-seeking was reduced from 60 days to 4 weeks. These changes result in lowering Sweden's unemployment rate by 0.5 percentage point.

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. The statistics are also analyzed periodically in the *Monthly Labor Review*. Additional historical data, generally beginning with 1959, are published in the

Handbook of Labor Statistics and are available in statistical supplements to Bulletin 1979.

Occupational Injury and Illness Data

(Table 51)

Description of the series

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

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

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

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

Definitions

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

treatment (other than first aid).

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

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

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

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

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

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

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

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

Notes on the data

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

Most of the estimates are in the form of incidence rates, defined as the number of injuries and illnesses, or lost workdays per 100 full-time employees. For this purpose, 200,000 employee hours represent 100 employee years (2,000 hours per employee). 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 Safety, Health, and Working Conditions.

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 Safety, Health, and Working Conditions.

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 2285 (Bureau of Labor Statistics, 1988); *Handbook of Labor Statistics*, Bulletin 2340 (Bureau of Labor Statistics, 1989), 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	1988	1989	1988			1989				1990
			II	III	IV	I	II	III	IV	I
Employment data										
Employment status of the civilian noninstitutionalized population (household survey): ¹										
Labor force participation rate	65.9	66.5	65.8	66.0	66.1	66.3	66.5	66.5	66.5	66.5
Employment-population ratio	62.3	63.0	62.2	62.3	62.6	62.9	63.0	63.0	63.0	63.0
Unemployment rate	5.5	5.3	5.5	5.5	5.3	5.2	5.3	5.3	5.3	5.2
Men	5.5	5.2	5.4	5.5	5.3	5.2	5.1	5.2	5.3	5.2
16 to 24 years	11.4	11.4	11.2	11.5	11.1	11.2	11.1	11.4	11.8	11.0
25 years and over	4.2	3.9	4.2	4.2	4.1	3.9	3.9	3.9	4.0	4.1
Women	5.6	5.4	5.6	5.5	5.3	5.2	5.4	5.4	5.4	5.3
16 to 24 years	10.6	10.4	10.7	10.5	10.3	10.2	10.4	10.5	10.4	10.2
25 years and over	4.3	4.2	4.3	4.3	4.1	4.1	4.2	4.2	4.3	4.2
Unemployment rate, 15 weeks and over	1.3	1.1	1.3	1.3	1.2	1.1	1.1	1.1	1.1	1.1
Employment, nonagricultural (payroll data), in thousands: ¹										
Total	105,584	108,581	105,184	105,976	106,799	107,680	108,339	108,917	109,398	110,214
Private sector	88,212	90,854	87,851	88,577	89,288	90,104	90,661	91,110	91,550	92,191
Goods-producing	25,249	25,634	25,202	25,313	25,452	25,634	25,664	25,659	25,581	25,603
Manufacturing	19,403	19,612	19,360	19,435	19,550	19,659	19,663	19,617	19,514	19,410
Service-producing	80,335	82,947	79,983	80,663	81,346	82,047	82,676	83,258	83,816	84,611
Average hours:										
Private sector	34.7	34.7	34.7	34.7	34.7	34.7	34.7	34.7	34.6	34.6
Manufacturing	41.1	41.0	41.1	41.1	41.1	41.1	41.1	41.0	40.7	40.7
Overtime	3.9	3.8	3.9	3.9	3.9	3.9	3.8	3.8	3.7	3.7
Employment Cost Index										
Percent change in the ECI, compensation:										
All workers (excluding farm, household, and Federal workers)	4.9	5.0	1.1	1.4	1.0	1.2	1.1	1.6	1.0	1.7
Private industry workers	4.8	4.8	1.3	.9	1.0	1.2	1.2	1.2	1.1	1.6
Goods-producing ²	4.4	4.3	1.0	.6	.8	1.0	1.1	1.1	1.0	1.8
Service-producing ²	5.1	5.1	1.4	1.2	1.1	1.5	1.2	1.3	1.0	1.5
State and local government workers	5.6	6.2	.3	2.8	1.1	1.2	.6	3.3	1.0	1.4
Workers by bargaining status (private industry):										
Union	3.9	3.7	.9	.7	.5	.8	1.0	.9	.9	1.5
Nonunion	5.1	5.1	1.4	1.0	1.1	1.4	1.2	1.4	1.0	1.7

¹ Quarterly data seasonally adjusted.

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

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

Selected measures	1988	1989	1988			1989				1990
			II	III	IV	I	II	III	IV	I
Compensation data^{1, 2}										
Employment Cost Index--compensation (wages, salaries, benefits):										
Civilian nonfarm	4.9	5.0	1.1	1.4	1.0	1.2	1.1	1.6	1.0	1.7
Private nonfarm	4.8	4.8	1.3	.9	1.0	1.2	1.2	1.2	1.1	1.6
Employment Cost Index--wages and salaries										
Civilian nonfarm	4.3	4.4	.9	1.4	.9	1.1	.8	1.6	.8	1.2
Private nonfarm	4.1	4.1	1.2	.9	1.0	1.0	1.0	1.2	.8	1.2
Price data¹										
Consumer Price Index (All urban consumers): All items	4.4	4.6	1.3	1.5	.6	1.5	1.5	.7	.9	-100.0
Producer Price Index:										
Finished goods	4.0	4.9	1.3	.8	1.3	1.9	2.0	-.6	1.6	1.4
Finished consumer goods	4.0	5.3	1.4	1.0	1.1	2.2	2.3	-.8	1.5	1.7
Capital equipment	3.6	3.8	.6	.4	1.8	.9	1.1	.1	1.6	.8
Intermediate materials, supplies, components	5.6	2.3	2.6	1.2	.6	1.9	1.1	-.3	-.4	.4
Crude materials	3.1	7.1	4.0	-1.2	.6	6.1	.9	-1.7	1.9	1.3
Productivity data³										
Output per hour of all persons:										
Business sector	1.7	1.1	-2.1	3.1	.2	1.1	1.6	1.5	.4	-.5
Nonfarm business sector	2.0	.9	-1.6	3.3	1.9	-1.3	1.1	2.4	.5	-1.0
Nonfinancial corporations ⁴	2.3	.1	.4	1.3	-.4	-1.7	.1	3.0	-.6	-

¹ Annual changes are December-to-December change. Quarterly changes are calculated using the last month of each quarter. Compensation and price data are not seasonally adjusted and the price data are not compounded.

² Excludes Federal and private household workers.

³ Annual rates of change are computed by comparing annual averages.

Quarterly percent changes reflect annual rates of change in quarterly indexes. The data are seasonally adjusted.

⁴ Output per hour of all employees.

- Data not available.

3. Alternative measures of wage and compensation changes

Components	Quarterly average						Four quarters ended--					
	1988	1989				1990	1988	1989				1990
	IV	I	II	III	IV	I	IV	I	II	III	IV	I
Average hourly compensation:¹												
All persons, business sector	5.2	4.8	6.8	4.7	5.6	4.5	4.8	5.4	5.6	5.4	5.5	5.4
All persons, nonfarm business sector	5.9	4.9	5.6	5.3	6.0	3.9	4.8	5.4	5.5	5.4	5.5	5.2
Employment Cost Index--compensation:												
Civilian nonfarm ²	1.0	1.2	1.1	1.6	1.0	1.7	4.9	4.8	4.8	5.1	5.0	5.5
Private nonfarm	1.0	1.2	1.2	1.2	1.1	1.6	4.8	4.6	4.5	4.8	4.8	5.2
Union .....	.5	.8	1.0	.9	.9	1.5	3.9	3.0	3.1	3.3	3.7	4.3
Nonunion	1.1	1.4	1.2	1.4	1.0	1.7	5.1	5.1	4.9	5.3	5.1	5.4
State and local governments	1.1	1.2	.6	3.3	1.0	1.4	5.6	5.5	5.8	6.4	6.2	6.4
Employment Cost Index--wages and salaries:												
Civilian nonfarm ² .....	.9	1.1	.8	1.6	.8	1.2	4.3	4.4	4.3	4.5	4.4	4.4
Private nonfarm	1.0	1.0	1.0	1.2	.8	1.2	4.1	4.2	4.1	4.3	4.1	4.2
Union .....	.3	.7	.8	.6	1.0	1.0	2.2	2.5	2.6	2.4	3.1	3.4
Nonunion	1.1	1.3	1.0	1.3	.8	1.3	4.5	4.8	4.6	4.9	4.5	4.4
State and local governments	1.0	.8	.5	3.1	.8	1.2	4.9	4.7	5.0	5.5	5.3	5.6
Total effective wage adjustments³												
From current settlements .....	.1	.1	.3	.4	.4	.2	.7	.8	.7	.9	1.2	1.3
From prior settlements .....	.2	.3	.5	.4	.2	.3	1.3	1.3	1.3	1.3	1.3	1.2
From cost-of-living provision .....	.2	.1	.2	.2	.1	.1	.6	.6	.8	.8	.7	.7
Negotiated wage adjustments from settlements:³												
First-year adjustments	2.6	3.2	3.9	3.6	4.9	3.8	2.5	2.7	3.2	3.5	4.0	4.1
Annual rate over life of contract	2.2	3.1	3.3	3.0	4.0	3.3	2.4	2.5	2.9	3.0	3.4	3.4
Negotiated wage and benefit adjustments from settlements:⁴												
First-year adjustment	3.5	3.2	5.1	3.9	5.3	4.6	3.1	3.3	3.8	4.0	4.5	4.6
Annual rate over life of contract	2.1	3.1	3.4	2.7	4.3	3.5	2.5	2.6	3.0	2.8	3.4	3.4

¹ Seasonally adjusted.

² Excludes Federal and household workers.

³ Limited to major collective bargaining units of 1,000 workers or more. The

most recent data are preliminary.

⁴ Limited to major collective bargaining units of 5,000 workers or more. The most recent data are preliminary.

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

(Numbers in thousands)

Employment status	Annual average		1989										1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	
TOTAL																
Noninstitutional population ^{1, 2}	186,322	188,081	187,708	187,854	187,995	188,149	188,286	188,428	188,580	188,721	188,865	188,990	189,090	189,198	189,326	
Labor force ²	123,378	125,557	125,299	125,224	125,777	125,679	125,758	125,725	125,857	126,192	126,246	126,094	126,308	126,498	126,543	
Participation rate ³	66.2	66.8	66.8	66.7	66.9	66.8	66.8	66.7	66.7	66.9	66.8	66.7	66.8	66.9	66.8	
Total employed ²	116,677	119,030	118,768	118,805	119,208	119,102	119,238	119,121	119,294	119,540	119,588	119,560	119,713	120,003	119,773	
Employment-population ratio ⁴	62.6	63.3	63.3	63.2	63.4	63.3	63.3	63.2	63.3	63.3	63.3	63.3	63.3	63.4	63.3	
Resident Armed Forces ¹	1,709	1,688	1,684	1,673	1,666	1,666	1,688	1,702	1,709	1,704	1,700	1,697	1,678	1,669	1,657	
Civilian employed	114,968	117,342	117,084	117,132	117,542	117,436	117,550	117,419	117,585	117,836	117,888	117,863	118,035	118,334	118,116	
Agriculture	3,169	3,199	3,144	3,137	3,138	3,217	3,275	3,219	3,197	3,160	3,197	3,134	3,079	3,200	3,133	
Nonagricultural industries	111,800	114,142	113,940	113,995	114,404	114,219	114,275	114,200	114,388	114,676	114,691	114,728	114,957	115,133	114,983	
Unemployed	6,701	6,528	6,531	6,419	6,569	6,577	6,520	6,604	6,563	6,652	6,658	6,535	6,594	6,495	6,770	
Unemployment rate ⁵	5.4	5.2	5.2	5.1	5.2	5.2	5.2	5.3	5.2	5.3	5.3	5.2	5.2	5.1	5.3	
Not in labor force	62,944	62,523	62,409	62,630	62,218	62,470	62,528	62,703	62,723	62,529	62,619	62,896	62,782	62,700	62,783	
Men, 16 years and over																
Noninstitutional population ^{1, 2}	89,404	90,283	90,094	90,167	90,237	90,315	90,384	90,456	90,535	90,606	90,678	90,772	90,822	90,874	90,942	
Labor force ²	68,474	69,360	69,293	69,142	69,542	69,366	69,404	69,360	69,599	69,635	69,725	69,539	69,639	69,712	69,779	
Participation rate ³	76.6	76.8	76.9	76.7	77.1	76.8	76.8	76.7	76.9	76.9	76.9	76.6	76.7	76.7	76.7	
Total employed ²	64,820	65,835	65,727	65,713	66,078	65,939	65,919	65,681	66,046	66,011	66,143	65,943	66,108	66,208	66,043	
Employment-population ratio ⁴	72.5	72.9	73.0	72.9	73.2	73.0	72.9	72.6	73.0	72.9	72.9	72.6	72.8	72.9	72.6	
Resident Armed Forces ¹	1,547	1,520	1,521	1,511	1,501	1,499	1,519	1,531	1,533	1,529	1,525	1,523	1,506	1,497	1,499	
Civilian employed	63,273	64,315	64,206	64,202	64,577	64,440	64,400	64,150	64,513	64,482	64,618	64,420	64,602	64,711	64,544	
Unemployed	3,655	3,525	3,566	3,429	3,464	3,427	3,485	3,679	3,553	3,624	3,582	3,597	3,530	3,505	3,735	
Unemployment rate ⁵	5.3	5.1	5.1	5.0	5.0	4.9	5.0	5.3	5.1	5.2	5.1	5.2	5.1	5.0	5.4	
Women, 16 years and over																
Noninstitutional population ^{1, 2}	96,918	97,798	97,614	97,687	97,758	97,834	97,902	97,972	98,045	98,115	98,187	98,218	98,268	98,324	98,383	
Labor force ²	54,904	56,198	56,006	56,082	56,235	56,313	56,354	56,365	56,258	56,557	56,521	56,555	56,669	56,785	56,764	
Participation rate ³	56.6	57.5	57.4	57.4	57.5	57.6	57.6	57.5	57.4	57.6	57.6	57.6	57.7	57.8	57.7	
Total employed ²	51,858	53,195	53,041	53,092	53,130	53,163	53,319	53,440	53,248	53,529	53,445	53,617	53,605	53,795	53,729	
Employment-population ratio ⁴	53.5	54.4	54.3	54.3	54.3	54.3	54.5	54.5	54.3	54.6	54.4	54.6	54.5	54.7	54.6	
Resident Armed Forces ¹	162	168	163	162	165	167	169	171	176	175	175	174	172	172	158	
Civilian employed	51,696	53,027	52,878	52,930	52,965	52,996	53,150	53,269	53,072	53,354	53,270	53,443	53,433	53,623	53,571	
Unemployed	3,046	3,003	2,965	2,990	3,105	3,150	3,035	2,925	3,010	3,028	3,076	2,938	3,064	2,990	3,034	
Unemployment rate ⁵	5.5	5.3	5.3	5.3	5.5	5.6	5.4	5.2	5.4	5.4	5.4	5.2	5.4	5.3	5.3	

¹ The population and Armed Forces figures are not adjusted for seasonal variation.

² Includes members of the Armed Forces stationed in the United States.

³ Labor force as a percent of the noninstitutional population.

⁴ Total employed as a percent of the noninstitutional population.

⁵ Unemployment as a percent of the labor force (including the resident Armed Forces).

5. 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		1989										1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	
Hispanic origin																
Civilian noninstitutional population ¹	13,325	13,791	13,690	13,731	13,772	13,813	13,853	13,894	13,936	13,977	14,019	14,080	14,119	14,159	14,198	
Civilian labor force	8,982	9,323	9,288	9,359	9,289	9,403	9,361	9,342	9,339	9,424	9,495	9,440	9,400	9,565	9,618	
Participation rate	67.4	67.6	67.8	68.2	67.4	68.1	67.6	67.2	67.0	67.4	67.7	67.0	66.6	67.6	67.7	
Employed	8,250	8,573	8,531	8,619	8,543	8,579	8,541	8,564	8,595	8,672	8,691	8,769	8,666	8,831	8,850	
Employment-population ratio ²	61.9	62.2	62.3	62.8	62.0	62.1	61.7	61.6	61.7	62.0	62.0	62.3	61.4	62.4	62.3	
Unemployed	732	750	757	740	746	824	820	778	744	752	804	671	734	734	768	
Unemployment rate	8.2	8.0	8.2	7.9	8.0	8.8	8.8	8.3	8.0	8.0	8.5	7.1	7.8	7.7	8.0	

¹ The population figures are not seasonally adjusted.² Civilian employment as a percent of the civilian noninstitutional population.

NOTE: Detail for the above race and Hispanic-origin groups will not sum to totals

because data for the "other races" groups are not presented and Hispanics are included in both the white and black population groups.

6. Selected employment indicators, monthly data seasonally adjusted

(In thousands)

Selected categories	Annual average		1989										1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	
CHARACTERISTIC																
Civilian employed, 16 years and over	114,968	117,342	117,084	117,132	117,542	117,436	117,550	117,419	117,585	117,836	117,888	117,863	118,035	118,334	118,116	
Men	63,273	64,315	64,206	64,202	64,577	64,440	64,400	64,150	64,513	64,482	64,618	64,420	64,602	64,711	64,544	
Women	51,696	53,027	52,878	52,930	52,965	52,996	53,150	53,269	53,072	53,354	53,270	53,443	53,433	53,623	53,571	
Married men, spouse present ..	40,472	40,760	40,857	40,932	41,025	41,067	40,723	40,649	40,839	40,886	41,041	40,982	41,347	40,989	40,730	
Married women, spouse present	28,756	29,404	29,563	29,608	29,499	29,520	29,259	29,506	29,544	29,767	29,695	29,897	29,704	29,618	29,742	
Women who maintain families ..	6,211	6,338	6,263	6,354	6,401	6,446	6,371	6,429	6,354	6,351	6,349	6,215	6,378	6,291	6,325	
MAJOR INDUSTRY AND CLASS OF WORKER																
Agriculture:																
Wage and salary workers	1,621	1,665	1,630	1,647	1,557	1,685	1,723	1,680	1,678	1,687	1,677	1,634	1,578	1,620	1,621	
Self-employed workers	1,398	1,403	1,414	1,377	1,411	1,424	1,410	1,424	1,406	1,373	1,369	1,354	1,375	1,457	1,429	
Unpaid family workers	150	131	126	127	126	127	133	132	124	122	125	107	118	115	112	
Nonagricultural industries:																
Wage and salary workers	103,021	105,259	104,981	105,232	105,430	105,353	105,317	105,476	105,504	105,960	105,643	105,747	106,117	106,029	105,938	
Government	17,114	17,469	17,266	17,305	17,328	17,501	17,559	17,613	17,595	17,681	17,728	17,626	17,607	17,724	17,816	
Private industries	85,907	87,790	87,715	87,927	88,102	87,852	87,758	87,863	87,909	88,279	87,915	88,121	88,510	88,306	88,122	
Private households	1,153	1,101	1,118	1,123	1,128	1,094	1,147	1,065	987	1,051	1,077	1,035	1,021	1,003	957	
Other	84,754	86,689	86,597	86,804	86,974	86,758	86,611	86,798	86,922	87,228	86,838	87,086	87,489	87,302	87,165	
Self-employed workers	8,519	8,605	8,643	8,573	8,578	8,602	8,621	8,581	8,610	8,528	8,653	8,733	8,628	8,852	8,716	
Unpaid family workers	260	279	277	299	245	248	272	279	280	264	251	256	313	261	258	
PERSONS AT WORK PART TIME¹																
All industries:																
Part time for economic reasons ..	5,206	4,894	5,086	4,883	4,928	4,773	4,802	4,864	4,767	4,803	4,802	4,983	4,887	5,004	4,871	
Slack work	2,350	2,303	2,346	2,314	2,315	2,301	2,281	2,321	2,314	2,297	2,277	2,402	2,307	2,476	2,407	
Could only find part-time work ..	2,487	2,233	2,375	2,307	2,269	2,172	2,142	2,161	2,082	2,162	2,106	2,255	2,211	2,127	2,138	
Voluntary part time	14,963	15,393	15,405	15,350	15,466	15,577	15,550	15,506	15,368	15,254	15,388	14,931	15,381	15,464	15,193	
Nonagricultural industries:																
Part time for economic reasons ..	4,965	4,657	4,855	4,643	4,738	4,583	4,567	4,605	4,526	4,552	4,554	4,729	4,703	4,747	4,630	
Slack work	2,199	2,143	2,198	2,137	2,183	2,164	2,129	2,165	2,166	2,132	2,111	2,240	2,183	2,293	2,218	
Could only find part-time work ..	2,408	2,166	2,310	2,246	2,198	2,104	2,076	2,095	2,021	2,097	2,051	2,172	2,173	2,050	2,096	
Voluntary part time	14,509	14,963	14,975	14,977	15,016	15,138	15,071	15,076	14,936	14,805	14,983	14,515	14,924	14,975	14,804	

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

7. Selected unemployment indicators, monthly data seasonally adjusted

(Unemployment rates)

Selected categories	Annual average		1989									1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
CHARACTERISTIC															
Total, all civilian workers	5.5	5.3	5.3	5.2	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.2	5.4
Both sexes, 16 to 19 years	15.3	15.0	14.6	15.0	15.4	15.1	14.8	15.0	14.9	15.3	15.2	14.5	14.8	14.4	14.7
Men, 20 years and over	4.8	4.5	4.6	4.3	4.4	4.4	4.5	4.8	4.5	4.6	4.6	4.7	4.6	4.5	4.8
Women, 20 years and over	4.9	4.7	4.7	4.7	4.8	4.9	4.7	4.5	4.8	4.8	4.8	4.6	4.8	4.7	4.8
White, total	4.7	4.5	4.5	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.6	4.5	4.6	4.5	4.8
Both sexes, 16 to 19 years	13.1	12.7	12.4	12.8	12.9	12.7	12.7	12.2	12.4	12.9	13.0	12.7	13.0	12.9	13.1
Men, 16 to 19 years	13.9	13.7	13.2	14.1	13.5	12.8	13.1	13.3	13.8	14.3	14.0	12.9	12.7	13.0	13.8
Women, 16 to 19 years	12.3	11.5	11.5	11.4	12.3	12.6	12.3	11.1	10.9	11.3	11.9	12.4	13.2	12.7	12.4
Men, 20 years and over	4.1	3.9	3.9	3.7	3.8	3.8	3.9	4.2	3.9	3.9	3.9	4.0	4.1	4.0	4.3
Women, 20 years and over	4.1	4.0	4.1	4.1	4.1	4.2	4.1	3.8	4.0	4.0	4.1	4.0	4.1	3.9	4.1
Black, total	11.7	11.4	11.0	11.1	11.8	11.0	11.2	11.7	11.7	11.9	11.8	11.3	10.5	10.6	10.4
Both sexes, 16 to 19 years	32.4	32.4	31.7	32.4	35.1	27.9	31.9	36.3	33.4	32.5	30.7	26.7	28.0	28.2	25.8
Men, 16 to 19 years	32.7	31.9	34.8	35.4	33.8	23.2	30.3	33.8	32.0	32.3	30.1	29.2	28.5	30.0	27.2
Women, 16 to 19 years	32.0	33.0	28.5	29.6	36.8	33.1	33.6	38.8	34.9	32.7	31.4	24.0	27.5	26.2	24.3
Men, 20 years and over	10.1	10.0	9.9	9.5	9.6	9.5	9.9	10.1	10.3	10.6	10.8	11.2	9.2	9.6	9.4
Women, 20 years and over	10.4	9.8	9.1	9.6	10.5	9.9	9.6	9.7	9.9	10.2	10.0	9.2	9.4	9.0	9.2
Hispanic origin, total	8.2	8.0	8.2	7.9	8.0	8.8	8.8	8.3	8.0	8.0	8.5	7.1	7.8	7.7	8.0
Married men, spouse present	3.3	3.0	3.2	2.9	2.9	3.0	3.1	3.3	3.0	3.1	3.0	3.4	3.0	3.2	3.3
Married women, spouse present	3.9	3.7	4.0	3.8	3.8	3.8	3.9	3.8	3.9	3.8	3.9	3.7	3.8	3.6	3.5
Women who maintain families	8.1	8.1	7.8	8.2	7.9	8.5	8.0	7.7	7.8	8.2	8.1	7.5	7.5	8.4	7.5
Full-time workers	5.2	4.9	5.0	4.9	4.9	5.0	4.9	5.0	4.9	5.0	5.0	5.0	4.9	4.9	5.1
Part-time workers	7.6	7.3	7.2	6.9	7.7	7.2	7.1	7.3	7.1	7.4	7.5	7.0	7.4	7.2	7.1
Unemployed 15 weeks and over	1.3	1.1	1.1	1.1	1.0	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Labor force time lost ¹	6.3	5.9	6.0	6.0	6.0	6.0	6.0	6.0	5.9	5.9	6.0	6.0	5.9	5.9	6.2
INDUSTRY															
Nonagricultural private wage and salary workers	5.5	5.3	5.3	5.2	5.3	5.4	5.4	5.4	5.3	5.4	5.4	5.5	5.5	5.5	5.7
Mining	7.9	5.8	5.8	4.6	3.9	5.8	6.4	8.4	4.8	6.2	4.4	6.8	4.8	5.9	4.6
Construction	10.6	10.0	9.8	9.5	10.0	10.3	10.2	10.1	9.3	9.8	9.8	9.3	8.9	10.0	10.6
Manufacturing	5.3	5.1	5.0	4.9	5.1	5.1	5.2	5.2	5.4	5.4	5.6	5.9	5.9	5.5	5.9
Durable goods	5.0	4.8	4.7	4.6	4.6	4.7	4.9	4.9	5.2	5.4	5.4	5.8	5.5	5.3	5.7
Nondurable goods	5.7	5.5	5.3	5.5	5.8	5.6	5.7	5.5	5.6	5.3	5.9	5.9	6.4	5.9	6.3
Transportation and public utilities	3.9	3.9	3.9	4.0	4.1	4.1	3.7	4.5	3.9	3.6	3.4	4.3	4.0	3.4	4.3
Wholesale and retail trade	6.2	6.0	5.9	5.6	6.0	6.1	6.0	5.9	5.9	6.4	6.3	6.2	6.0	6.2	6.2
Finance and service industries	4.5	4.4	4.6	4.6	4.3	4.4	4.4	4.5	4.3	4.3	4.2	4.3	4.4	4.5	4.5
Government workers	2.8	2.7	2.7	2.9	2.9	2.8	2.7	2.8	2.7	2.7	2.6	2.4	2.5	2.3	2.1
Agricultural wage and salary workers	10.6	9.6	9.8	9.9	10.4	8.9	9.0	7.8	9.8	12.1	9.7	9.2	9.3	10.1	11.0

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

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

(Civilian workers)

Sex and age	Annual average		1989									1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Total, 16 years and over	5.5	5.3	5.3	5.2	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.2	5.4
16 to 24 years	11.0	10.9	10.6	10.5	11.1	10.9	11.0	11.1	11.1	11.3	11.2	10.6	10.7	10.5	11.2
16 to 19 years	15.3	15.0	14.6	15.0	15.4	15.1	14.8	15.0	14.9	15.3	15.2	14.5	14.8	14.4	14.7
16 to 17 years	17.4	17.2	15.9	16.6	17.4	17.7	17.5	17.2	16.9	17.4	18.1	14.8	16.8	16.9	17.4
18 to 19 years	13.8	13.6	13.7	14.3	14.6	13.1	12.8	14.2	13.5	13.8	13.4	14.2	13.0	12.9	13.0
20 to 24 years	8.7	8.6	8.4	7.9	8.7	8.6	8.8	8.8	8.9	9.0	8.9	8.5	8.4	8.3	9.3
25 years and over	4.3	4.0	4.1	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.2	4.2	4.1	4.2
25 to 54 years	4.5	4.2	4.3	4.2	4.1	4.2	4.1	4.3	4.2	4.2	4.3	4.3	4.3	4.3	4.4
55 years and over	3.1	3.1	3.0	2.9	3.3	3.1	3.1	3.0	3.0	3.2	3.2	3.4	3.4	3.3	3.3
Men, 16 years and over	5.5	5.2	5.3	5.1	5.1	5.0	5.1	5.4	5.2	5.3	5.3	5.3	5.2	5.1	5.5
16 to 24 years	11.4	11.4	10.8	10.9	11.4	10.9	11.5	11.9	11.7	12.0	11.8	11.2	10.9	10.9	11.8
16 to 19 years	16.0	15.9	15.6	16.3	15.9	14.7	15.1	15.7	15.9	16.7	16.1	15.1	14.9	14.7	15.4
16 to 17 years	18.2	18.6	17.5	18.7	19.5	17.8	17.7	19.5	18.5	19.0	19.6	14.2	16.5	16.9	18.1
18 to 19 years	14.6	14.2	14.3	15.1	13.7	12.1	13.1	13.7	14.2	15.1	13.8	15.6	13.7	13.6	13.8
20 to 24 years	8.9	8.8	8.2	8.0	8.9	8.9	9.4	9.8	9.3	9.4	9.5	8.9	8.6	8.8	9.8
25 years and over	4.2	3.9	4.1	3.8	3.7	3.8	3.8	4.1	3.9	4.0	3.9	4.2	4.1	4.0	4.2
25 to 54 years	4.4	4.1	4.3	3.9	3.8	3.9	3.8	4.1	4.0	4.1	4.0	4.3	4.2	4.2	4.4
55 years and over	3.3	3.2	3.2	3.0	3.1	3.1	3.3	3.5	3.2	3.5	3.6	3.6	3.5	3.4	3.5
Women, 16 years and over	5.6	5.4	5.3	5.3	5.5	5.6	5.4	5.2	5.4	5.4	5.5	5.2	5.4	5.3	5.4
16 to 24 years	10.6	10.4	10.4	10.0	10.8	10.9	10.4	10.2	10.4	10.4	10.4	10.1	10.4	10.0	10.5
16 to 19 years	14.4	14.0	13.5	13.7	14.9	15.5	14.6	14.4	13.8	13.8	14.3	13.7	14.6	14.0	13.9
16 to 17 years	16.6	15.7	14.1	14.3	15.2	17.6	17.2	14.7	15.0	15.7	16.5	15.5	17.3	16.9	16.7
18 to 19 years	12.9	13.0	12.9	13.4	15.6	14.2	12.5	14.6	12.8	12.3	13.0	12.6	12.3	12.0	12.1
20 to 24 years	8.5	8.3	8.7	7.9	8.5	8.3	8.1	7.7	8.5	8.5	8.2	8.0	8.1	7.7	8.7
25 years and over	4.3	4.2	4.1	4.3	4.3	4.3	4.2	4.1	4.2	4.2	4.3	4.1	4.3	4.2	4.2
25 to 54 years	4.6	4.4	4.4	4.6	4.5	4.5	4.5	4.4	4.4	4.4	4.6	4.3	4.5	4.4	4.4
55 years and over	2.8	2.8	2.7	2.9	3.6	3.1	2.8	2.4	2.8	2.9	2.7	3.3	3.3	3.3	2.9

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

(Numbers in thousands)

Reason for unemployment	Annual average		1989									1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Job losers	3,092	2,983	2,932	2,798	2,820	2,916	2,964	2,932	2,979	3,092	3,097	3,183	3,103	3,038	3,147
On layoff	851	850	833	805	813	829	865	852	780	969	957	1,033	964	941	999
Other job losers	2,241	2,133	2,099	1,993	2,007	2,087	2,099	2,080	2,199	2,123	2,140	2,150	2,139	2,097	2,148
Job leavers	983	1,024	985	1,103	1,021	1,016	1,031	1,034	994	1,049	1,055	1,016	1,006	1,014	1,179
Reentrants	1,809	1,843	1,882	1,853	1,993	1,901	1,772	1,920	1,890	1,845	1,853	1,730	1,805	1,859	1,780
New entrants	816	677	692	696	726	723	643	648	685	695	686	640	680	644	617
PERCENT OF UNEMPLOYED															
Job losers	46.1	45.7	45.2	43.4	43.0	44.5	46.2	44.9	45.5	46.3	46.3	48.5	47.1	46.3	46.8
On layoff	12.7	13.0	12.8	12.5	12.4	12.6	13.5	13.0	11.9	14.5	14.3	15.7	14.6	14.4	14.9
Other job losers	33.4	32.7	32.3	30.9	30.6	31.8	32.7	31.8	33.6	31.8	32.0	32.7	32.4	32.0	31.9
Job leavers	14.7	15.7	15.2	17.1	15.6	15.5	16.1	15.8	15.2	15.7	15.8	15.5	15.3	15.5	17.5
Reentrants	27.0	28.2	29.0	28.7	30.4	29.0	27.6	29.4	28.9	27.6	27.7	26.3	27.4	28.4	26.5
New entrants	12.2	10.4	10.7	10.8	11.1	11.0	10.0	9.9	10.5	10.4	10.3	9.7	10.3	9.8	9.2
PERCENT OF CIVILIAN LABOR FORCE															
Job losers	2.5	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.6	2.5	2.4	2.5
On layoff	.8	.8	.8	.9	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.9
Other job losers	1.5	1.5	1.5	1.5	1.6	1.5	1.4	1.5	1.5	1.5	1.5	1.4	1.4	1.5	1.4
Job leavers	.7	.5	.6	.6	.6	.6	.5	.5	.6	.6	.6	.5	.5	.5	.5

10. Duration of unemployment, monthly data seasonally adjusted

(Numbers in thousands)

Weeks of unemployment	Annual average		1989									1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Less than 5 weeks	3,084	3,174	3,113	3,070	3,279	3,156	3,125	3,169	3,166	3,258	3,302	3,119	3,159	3,194	3,204
5 to 14 weeks	2,007	1,978	2,006	1,993	2,006	1,965	2,002	2,030	1,995	1,991	2,013	2,012	2,079	2,044	2,175
15 weeks and over	1,610	1,375	1,391	1,331	1,295	1,461	1,338	1,359	1,378	1,422	1,362	1,430	1,369	1,333	1,386
15 to 26 weeks	801	730	667	711	684	838	759	769	743	765	730	777	731	702	697
27 weeks and over	809	646	724	620	611	623	579	590	635	657	632	653	638	631	688
Mean duration in weeks	13.5	11.9	12.6	11.9	11.2	11.9	11.4	11.5	11.7	11.6	11.5	12.1	11.7	12.0	12.1
Median duration in weeks	5.9	4.8	5.4	5.3	5.4	5.4	5.0	5.0	5.0	4.8	4.8	5.1	5.4	5.1	5.0

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

State	Mar. 1989	Mar. 1990	State	Mar. 1989	Mar. 1990
Alabama	7.3	7.0	Montana	7.6	6.0
Alaska	8.1	7.9	Nebraska	3.3	2.8
Arizona	5.7	5.1	Nevada	5.4	4.9
Arkansas	7.4	7.3	New Hampshire	2.9	5.3
California	4.7	5.3			
			New Jersey	3.3	4.9
Colorado	6.9	5.5	New Mexico	7.4	6.5
Connecticut	3.2	5.2	New York	4.7	5.3
Delaware	3.7	4.4	North Carolina	3.4	3.6
District of Columbia	4.9	5.6	North Dakota	4.8	5.1
Florida	4.7	5.0			
			Ohio	5.8	5.9
Georgia	5.3	4.7	Oklahoma	6.5	5.4
Hawaii	2.7	3.0	Oregon	6.4	5.7
Idaho	6.5	6.7	Pennsylvania	4.2	5.3
Illinois	6.2	5.9	Rhode Island	4.0	8.2
Indiana	5.2	6.2			
			South Carolina	4.6	4.3
Iowa	4.5	4.8	South Dakota	4.4	4.0
Kansas	4.2	4.0	Tennessee	5.1	5.1
Kentucky	7.5	6.3	Texas	6.4	5.7
Louisiana	8.0	6.8	Utah	6.0	5.2
Maine	4.3	5.8			
			Vermont	3.7	5.0
Maryland	3.9	3.3	Virginia	4.2	3.9
Massachusetts	4.0	5.9	Washington	6.6	5.6
Michigan	7.1	7.6	West Virginia	8.8	7.6
Minnesota	4.6	5.4	Wisconsin	5.3	4.9
Mississippi	8.3	7.1			
Missouri	5.7	5.8	Wyoming	7.0	6.9

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	Mar. 1989	Feb. 1990	Mar. 1990 ^P	State	Mar. 1989	Feb. 1990	Mar. 1990 ^P
Alabama	1,582.9	1,586.5	1,583.4	Nebraska	696.2	713.1	717.5
Alaska	211.3	217.6	221.4	Nevada	562.1	602.9	609.2
Arizona	1,464.6	1,498.1	1,505.4	New Hampshire	526.0	506.0	506.4
Arkansas	878.5	895.7	903.7				
California	12,441.9	12,646.4	12,732.6	New Jersey	3,675.1	3,664.3	3,686.5
				New Mexico	555.0	561.7	565.6
Colorado	1,467.6	1,477.1	1,483.8	New York	8,195.5	8,210.5	8,261.1
Connecticut	1,668.6	1,659.7	1,668.2	North Carolina	3,034.2	3,087.0	3,094.6
Delaware	338.4	343.9	345.8	North Dakota	253.8	258.4	259.9
District of Columbia	676.4	683.5	688.6				
Florida	5,290.2	5,447.4	5,502.9	Ohio	4,746.9	4,790.2	4,834.1
				Oklahoma	1,151.3	1,156.6	1,165.8
Georgia	2,906.3	2,992.5	3,002.2	Oregon	1,176.4	1,210.0	1,225.0
Hawaii	501.5	516.8	518.1	Pennsylvania	5,072.9	5,081.1	5,106.4
Idaho	352.4	373.2	375.7	Rhode Island	457.3	454.0	455.5
Illinois	5,138.3	5,160.0	5,168.8				
Indiana	2,434.6	2,463.7	2,477.1	South Carolina	1,479.4	1,522.6	1,532.3
				South Dakota	265.9	271.0	272.2
Iowa	1,176.1	1,204.2	1,206.9	Tennessee	2,118.5	2,153.0	2,161.5
Kansas	1,054.7	1,075.7	1,085.0	Texas	6,769.7	6,880.4	6,895.8
Kentucky	1,408.0	1,447.6	1,451.8	Utah	675.9	698.2	707.7
Louisiana	1,513.7	1,516.1	1,518.2				
Maine	526.0	529.1	529.5	Vermont	261.2	262.4	260.0
				Virginia	2,808.9	2,875.7	2,897.7
Maryland	2,128.1	2,136.4	2,150.3	Washington	1,987.1	2,073.3	2,096.7
Massachusetts	3,102.3	3,048.3	3,048.8	West Virginia	606.3	611.1	617.1
Michigan	3,850.0	3,846.0	3,867.9	Wisconsin	2,179.1	2,219.2	2,227.2
Minnesota	2,038.8	2,088.3	2,094.8				
Mississippi	909.7	923.6	927.8	Wyoming	183.8	186.0	186.8
Missouri	2,276.0	2,288.8	2,305.9	Puerto Rico	822.4	-	-
Montana	279.4	287.7	290.2	Virgin Islands	43.3	40.8	41.0

- Data not available.

^P = preliminary

NOTE: Some data in this table may differ from data published elsewhere because of the continual updating of the database.

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

Industry	Annual average		1989									1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar. ^P	Apr. ^P
PRIVATE SECTOR	34.7	34.7	34.9	34.6	34.6	34.8	34.6	34.7	34.7	34.6	34.5	34.5	34.6	34.6	34.6
MANUFACTURING	41.1	41.0	41.3	41.0	41.0	41.0	41.0	41.0	40.8	40.7	40.6	40.7	40.7	40.8	40.6
Overtime hours	3.9	3.8	3.9	3.8	3.8	3.9	3.8	3.8	3.7	3.7	3.6	3.7	3.6	3.7	3.5
Durable goods	41.8	41.6	41.9	41.5	41.5	41.5	41.6	41.6	41.2	41.2	41.2	41.3	41.3	41.4	41.2
Overtime hours	4.1	3.9	4.1	3.9	3.9	4.0	3.9	3.9	3.8	3.7	3.6	3.7	3.6	3.7	3.5
Lumber and wood products	40.3	40.1	40.5	39.7	39.8	39.6	40.2	40.2	40.4	40.3	40.1	40.5	39.8	40.3	40.3
Furniture and fixtures	39.4	39.5	39.9	39.4	39.4	39.5	39.6	39.6	39.2	39.4	39.2	39.8	39.5	39.2	39.2
Stone, clay, and glass products	42.3	42.3	42.5	41.9	42.2	42.3	42.5	42.2	42.3	42.4	41.5	42.2	42.1	41.9	42.1
Primary metal industries	43.6	43.0	43.3	43.2	43.3	43.0	42.9	42.8	42.5	42.6	42.5	42.5	42.3	42.5	41.7
Blast furnaces and basic steel products	44.0	43.4	43.5	43.6	43.7	43.2	43.4	42.9	42.8	43.0	42.8	43.2	42.8	42.9	42.9
Fabricated metal products	41.9	41.6	41.9	41.7	41.5	41.5	41.5	41.6	41.5	41.4	41.2	41.1	41.3	41.7	41.1
Machinery except electrical	42.6	42.4	42.7	42.5	42.5	42.4	42.2	42.3	42.0	42.1	42.0	42.1	42.2	42.0	41.7
Electrical and electronic equipment	41.0	40.8	41.0	40.7	40.7	40.6	40.9	41.1	40.9	40.8	40.5	40.8	41.1	41.1	40.9
Transportation equipment	42.7	42.4	42.8	42.5	42.5	42.6	42.7	42.8	41.2	40.9	41.9	41.4	41.5	42.1	42.0
Motor vehicles and equipment	43.5	43.1	43.3	42.8	42.7	42.6	43.0	43.4	42.9	42.3	42.2	40.8	41.2	42.2	41.4
Instruments and related products	41.5	41.2	41.5	41.1	41.3	41.4	41.1	41.0	41.1	41.0	40.9	41.0	41.0	41.1	41.4
Miscellaneous manufacturing	39.2	39.4	39.8	39.6	39.4	39.3	39.4	39.2	39.3	39.7	39.3	39.4	39.5	39.4	39.1
Nondurable goods	40.1	40.2	40.4	40.2	40.3	40.2	40.2	40.2	40.2	40.1	39.9	40.0	39.9	39.9	39.7
Overtime hours	3.7	3.7	3.8	3.7	3.6	3.8	3.6	3.7	3.7	3.6	3.6	3.6	3.5	3.5	3.4
Food and kindred products	40.3	40.7	40.7	40.5	40.7	41.0	40.8	41.0	40.8	40.8	40.6	40.5	40.5	40.6	40.4
Textile mill products	41.1	41.0	41.7	41.4	41.4	41.2	41.0	40.6	40.7	40.5	40.2	40.5	40.2	40.0	39.7
Apparel and other textile products	37.0	37.0	37.6	37.1	37.1	37.0	37.0	37.0	36.9	36.8	36.3	36.7	36.6	36.2	36.0
Paper and allied products	43.2	43.3	43.4	43.3	43.3	43.2	43.5	43.2	43.4	43.4	43.1	43.3	43.0	43.2	43.1
Printing and publishing	38.0	37.8	37.9	37.7	37.8	37.6	37.7	37.9	37.8	37.9	37.6	37.8	37.8	37.8	37.5
Chemicals and allied products	42.3	42.4	42.6	42.1	42.5	42.5	42.4	42.5	42.4	42.3	42.7	42.7	42.3	42.4	42.6
Rubber and miscellaneous plastics products	41.7	41.5	41.6	41.5	41.5	41.4	41.5	41.5	41.4	41.2	40.8	40.9	41.1	41.2	40.9
Leather and leather products	37.5	37.9	38.3	37.4	37.9	37.7	38.1	38.1	37.7	37.5	37.2	37.4	38.0	37.8	37.1
TRANSPORTATION AND PUBLIC UTILITIES	39.3	39.4	40.1	39.5	39.4	39.4	39.0	39.3	39.3	39.1	39.3	39.1	39.3	39.4	39.7
WHOLESALE TRADE	37.4	37.4	38.3	37.9	38.0	38.1	38.0	38.1	38.1	38.1	38.0	38.0	38.1	38.1	38.2
RETAIL TRADE	29.1	28.9	29.1	28.9	28.9	29.2	28.8	28.8	29.0	28.8	28.7	28.8	28.9	28.9	29.0
SERVICES	32.6	32.6	32.8	32.5	32.5	32.8	32.6	32.7	32.8	32.6	32.6	32.5	32.6	32.7	32.7

^P = preliminary

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

15. Average hourly earnings of production or nonsupervisory workers on private nonagricultural payrolls by industry, seasonally adjusted

Industry	Annual average		1989										1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar. ^P	Apr. ^P	
PRIVATE SECTOR (in current dollars)¹	\$9.29	\$9.66	\$9.61	\$9.60	\$9.62	\$9.69	\$9.69	\$9.74	\$9.78	\$9.78	\$9.83	\$9.83	\$9.88	\$9.92	\$9.95	
Construction	13.01	13.37	13.33	13.32	13.32	13.42	13.37	13.39	13.44	13.52	13.60	13.34	13.43	13.47	13.39	
Manufacturing	10.18	10.47	10.40	10.42	10.45	10.48	10.52	10.55	10.55	10.57	10.61	10.55	10.65	10.72	10.76	
Excluding overtime	9.72	10.01	9.92	9.97	9.99	10.01	10.05	10.08	10.08	10.11	10.15	10.10	10.21	10.27	10.37	
Transportation and public utilities	12.32	12.57	12.52	12.54	12.54	12.61	12.57	12.67	12.68	12.61	12.71	12.79	12.82	12.85	12.86	
Wholesale trade	9.94	10.38	10.36	10.28	10.33	10.44	10.39	10.47	10.54	10.54	10.59	10.57	10.62	10.65	10.75	
Retail trade	6.31	6.54	6.51	6.49	6.52	6.54	6.57	6.58	6.61	6.61	6.65	6.69	6.71	6.74	6.75	
Finance, insurance, and real estate	9.09	9.57	9.54	9.45	9.53	9.68	9.57	9.66	9.77	9.67	9.79	9.75	9.78	9.82	9.92	
Services	8.91	9.39	9.32	9.33	9.34	9.46	9.43	9.49	9.58	9.54	9.62	9.62	9.65	9.70	9.78	
PRIVATE SECTOR (in constant (1977) dollars)¹	4.84	4.80	4.80	4.77	4.77	4.79	4.80	4.81	4.81	4.79	4.80	4.74	4.74	4.75	-	

¹ Includes mining, not shown separately
 - Data not available.
^P = preliminary

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

16. Average hourly earnings of production or nonsupervisory workers on private nonagricultural payrolls by industry

Industry	Annual average		1989										1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar. ^P	Apr. ^P	
PRIVATE SECTOR	\$9.29	\$9.66	\$9.62	\$9.59	\$9.58	\$9.63	\$9.61	\$9.77	\$9.81	\$9.81	\$9.84	\$9.88	\$9.91	\$9.93	\$9.97	
MINING	12.75	13.14	13.19	13.13	13.03	12.95	13.11	13.15	13.10	13.13	13.31	13.31	13.30	13.39	13.48	
CONSTRUCTION	13.01	13.37	13.30	13.28	13.24	13.33	13.33	13.48	13.52	13.51	13.64	13.42	13.42	13.47	13.38	
MANUFACTURING	10.18	10.47	10.41	10.42	10.44	10.47	10.44	10.55	10.52	10.58	10.67	10.59	10.66	10.74	10.77	
Durable goods	10.71	11.00	10.93	10.94	10.98	10.99	10.98	11.10	11.06	11.10	11.18	11.05	11.17	11.24	11.25	
Lumber and wood products	8.61	8.86	8.76	8.79	8.85	8.92	8.93	8.98	8.99	8.99	9.00	9.00	8.96	9.05	9.08	
Furniture and fixtures	7.94	8.25	8.12	8.16	8.23	8.26	8.29	8.40	8.39	8.40	8.42	8.45	8.39	8.41	8.42	
Stone, clay, and glass products	10.47	10.74	10.71	10.69	10.73	10.75	10.77	10.79	10.82	10.87	10.88	10.87	10.85	10.94	11.16	
Primary metal industries	12.15	12.36	12.26	12.25	12.32	12.40	12.36	12.47	12.43	12.51	12.52	12.50	12.60	12.66	13.03	
Blast furnaces and basic steel products	13.97	14.23	14.06	14.06	14.18	14.33	14.27	14.38	14.40	14.48	14.40	14.44	14.59	14.54	15.37	
Fabricated metal products	10.26	10.53	10.48	10.49	10.51	10.53	10.50	10.64	10.57	10.61	10.69	10.56	10.66	10.74	10.69	
Machinery, except electrical	11.01	11.34	11.26	11.29	11.32	11.35	11.32	11.41	11.43	11.48	11.57	11.51	11.53	11.57	11.53	
Electrical and electronic equipment	10.13	10.38	10.31	10.33	10.37	10.41	10.40	10.47	10.43	10.47	10.52	10.50	10.54	10.58	10.58	
Transportation equipment	13.31	13.70	13.60	13.58	13.65	13.61	13.70	13.89	13.84	13.85	13.93	13.57	13.90	14.04	13.94	
Motor vehicles and equipment	14.00	14.28	14.20	14.17	14.22	14.07	14.18	14.48	14.45	14.46	14.49	13.76	14.33	14.61	14.45	
Instruments and related products	9.98	10.26	10.17	10.17	10.25	10.31	10.29	10.32	10.35	10.36	10.49	10.53	10.55	10.56	10.57	
Miscellaneous manufacturing	8.01	8.31	8.21	8.24	8.24	8.29	8.20	8.39	8.38	8.49	8.60	8.59	8.58	8.59	8.59	
Nondurable goods	9.43	9.74	9.65	9.68	9.70	9.77	9.71	9.80	9.80	9.86	9.95	9.95	9.96	10.02	10.10	
Food and kindred products	9.10	9.33	9.32	9.34	9.37	9.35	9.28	9.32	9.27	9.38	9.50	9.47	9.48	9.57	9.61	
Tobacco manufactures	14.68	15.37	15.87	16.13	16.48	16.34	15.72	14.69	14.91	15.01	15.31	15.48	15.70	16.47	17.30	
Textile mill products	7.37	7.68	7.60	7.62	7.65	7.66	7.69	7.76	7.77	7.82	7.87	7.92	7.92	7.94	7.94	
Apparel and other textile products	6.12	6.35	6.32	6.32	6.33	6.28	6.32	6.41	6.39	6.42	6.45	6.41	6.45	6.54	6.58	
Paper and allied products	11.65	11.93	11.83	11.89	11.91	12.04	11.90	11.99	11.97	12.08	12.14	12.13	12.12	12.12	12.26	
Printing and publishing	10.52	10.87	10.73	10.76	10.75	10.83	10.89	11.05	11.04	11.05	11.07	11.09	11.09	11.13	11.10	
Chemicals and allied products	12.67	13.06	12.92	12.98	12.98	13.12	13.08	13.18	13.25	13.26	13.31	13.31	13.24	13.29	13.44	
Petroleum and coal products	14.98	15.44	15.50	15.34	15.23	15.34	15.23	15.43	15.63	15.64	15.76	15.89	15.92	16.06	16.34	
Rubber and miscellaneous plastics products	9.14	9.42	9.35	9.40	9.41	9.45	9.44	9.46	9.47	9.50	9.58	9.59	9.59	9.63	9.59	
Leather and leather products	6.27	6.58	6.55	6.58	6.59	6.54	6.53	6.63	6.64	6.67	6.73	6.80	6.82	6.84	6.98	
TRANSPORTATION AND PUBLIC UTILITIES	12.32	12.57	12.51	12.49	12.48	12.58	12.56	12.70	12.69	12.67	12.76	12.80	12.85	12.81	12.86	
WHOLESALE TRADE	9.94	10.38	10.36	10.28	10.31	10.40	10.35	10.47	10.50	10.55	10.62	10.61	10.66	10.65	10.76	
RETAIL TRADE	6.31	6.54	6.52	6.49	6.49	6.49	6.50	6.61	6.62	6.64	6.66	6.74	6.73	6.75	6.77	
FINANCE, INSURANCE, AND REAL ESTATE	9.09	9.57	9.59	9.48	9.48	9.59	9.50	9.62	9.71	9.69	9.76	9.82	9.90	9.87	10.00	
SERVICES	8.91	9.39	9.34	9.30	9.26	9.33	9.29	9.49	9.59	9.61	9.69	9.73	9.75	9.75	9.81	

^P = preliminary

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

17. Average weekly earnings of production or nonsupervisory workers on private nonagricultural payrolls by industry

Industry	Annual average		1989									1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar. ^P	Apr. ^P
PRIVATE SECTOR															
Current dollars	\$322.36	\$335.20	\$334.78	\$330.86	\$333.38	\$338.01	\$335.39	\$339.02	\$341.39	\$338.45	\$341.45	\$337.90	\$339.91	\$341.59	\$343.97
Seasonally adjusted	-	-	335.39	332.16	332.85	337.21	335.27	337.98	339.37	338.39	339.14	339.14	341.85	343.23	344.27
Constant (1977) dollars	167.81	166.52	167.39	164.53	165.37	167.08	165.79	167.00	167.43	165.66	166.89	163.47	163.73	163.68	-
MINING	539.33	562.39	564.53	551.46	555.08	550.38	566.35	574.66	575.09	572.47	581.65	580.32	574.56	574.43	582.34
CONSTRUCTION	493.08	506.72	504.07	500.66	503.12	518.54	519.87	520.33	529.98	514.73	504.68	504.59	499.22	510.51	500.41
MANUFACTURING															
Current dollars	418.40	429.27	426.81	426.18	429.08	424.04	425.95	434.66	430.27	434.84	440.67	429.95	430.66	437.12	427.57
Constant (1977) dollars	217.80	213.25	213.41	211.92	212.84	209.61	210.55	214.12	211.02	212.84	215.38	208.01	207.45	209.45	-
Durable goods	447.68	457.60	455.78	454.01	457.87	449.49	453.47	462.87	457.88	460.65	468.44	455.26	457.97	465.34	453.38
Lumber and wood products	346.98	355.29	354.78	352.48	357.54	352.34	360.77	362.79	364.99	360.50	361.80	359.10	352.13	362.91	365.02
Furniture and fixtures	312.84	325.88	319.12	318.24	324.26	320.49	329.94	336.84	334.76	334.32	339.33	332.93	326.37	327.99	322.49
Stone, clay, and glass products	442.88	454.30	456.25	453.26	457.10	456.88	460.96	459.65	464.18	461.98	450.43	448.93	444.85	455.10	469.84
Primary metal industries	529.74	531.48	529.63	527.98	533.46	528.24	525.30	534.96	527.03	535.43	539.61	532.50	532.98	539.32	542.05
Blast furnaces and basic steel products	614.68	617.58	613.02	613.02	622.50	619.06	613.61	619.78	612.00	622.64	622.08	623.81	622.99	623.77	659.37
Fabricated metal products	429.89	438.05	437.02	435.34	438.27	428.57	432.60	443.69	439.71	443.50	450.05	435.07	438.13	446.78	426.53
Machinery, except electrical	469.03	480.82	478.55	477.57	482.23	475.57	472.04	482.64	480.06	486.75	497.51	485.72	485.41	487.10	468.12
Electrical and electronic equipment	415.33	423.50	419.62	417.33	423.10	416.40	423.28	430.32	427.63	431.36	436.58	430.50	430.03	432.72	420.03
Transportation equipment	568.34	580.88	584.80	579.87	581.49	566.18	572.66	594.49	571.59	573.39	593.42	563.16	576.85	595.30	565.96
Motor vehicles and equipment	609.00	615.47	620.54	613.56	611.46	582.50	589.89	628.43	621.35	620.33	621.62	561.41	590.40	623.85	589.56
Instruments and related products	414.17	422.71	420.02	414.94	423.33	420.65	419.83	423.12	425.39	428.90	438.48	432.78	432.55	435.07	428.09
Miscellaneous manufacturing	313.99	327.41	325.12	324.66	324.66	319.99	321.44	329.73	332.69	341.30	344.00	336.73	336.34	338.45	327.28
Nondurable goods	378.14	391.55	386.97	387.20	390.91	390.80	391.31	396.90	394.94	398.34	401.98	396.01	394.42	397.79	393.90
Food and kindred products	366.73	379.73	372.80	377.34	381.36	382.42	382.34	386.78	381.00	386.46	391.40	381.64	377.30	382.80	380.56
Tobacco manufactures	584.26	593.28	604.65	637.14	660.85	619.29	586.36	592.01	599.38	585.39	583.31	582.05	591.89	639.04	655.67
Textile mill products	302.91	314.88	313.12	313.94	318.24	311.00	317.60	318.16	317.79	319.84	319.52	318.38	316.01	316.01	306.48
Apparel and other textile products	226.44	234.95	234.47	233.84	236.74	230.48	234.47	237.17	237.07	238.18	236.72	233.32	234.78	236.75	228.98
Paper and allied products	503.28	516.57	509.87	512.46	514.51	516.52	514.08	523.96	520.70	527.90	532.95	525.23	517.52	519.95	518.60
Printing and publishing	399.76	410.89	405.59	402.42	402.05	405.04	411.64	423.22	418.42	421.01	422.87	415.88	416.98	421.83	411.81
Chemicals and allied products	535.94	553.74	549.10	546.46	551.65	553.66	550.67	560.15	560.48	564.88	576.32	568.34	558.73	563.50	572.54
Petroleum and coal products	665.11	683.99	686.65	673.43	679.26	679.56	665.55	685.09	704.91	699.11	715.50	699.16	698.89	713.06	733.67
Rubber and miscellaneous plastics products	381.14	390.93	388.03	390.10	391.46	385.56	388.93	392.59	393.01	394.25	397.57	394.15	393.19	396.76	383.60
Leather and leather products	235.13	249.38	247.59	247.41	255.03	247.21	250.75	252.60	251.66	250.13	253.72	252.96	254.39	255.13	251.98
TRANSPORTATION AND PUBLIC UTILITIES	484.18	495.26	497.90	490.86	494.21	500.68	494.86	500.38	499.99	495.40	501.47	496.64	501.15	502.15	507.97
WHOLESALE TRADE	378.71	395.48	395.75	389.61	392.81	398.32	394.34	398.91	402.15	401.96	405.68	401.06	402.95	403.64	409.96
RETAIL TRADE	183.62	189.01	188.43	186.91	189.51	194.05	192.40	191.03	191.32	189.90	194.47	189.39	190.46	192.38	196.33
FINANCE, INSURANCE, AND REAL ESTATE	326.33	343.56	348.12	337.49	339.38	348.12	340.10	343.43	350.53	345.93	348.43	350.57	354.42	351.37	362.00
SERVICES	290.47	306.11	306.35	301.32	302.80	308.82	305.64	309.37	314.55	313.29	314.93	315.25	316.88	316.88	320.79

- Data not available.

P = preliminary

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

18. Diffusion indexes of employment change, seasonally adjusted

(In percent)

Time span and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Private nonagricultural payrolls, 349 industries												
Over 1-month span:												
1988	60.7	63.5	63.0	62.8	61.3	67.2	63.6	58.0	55.4	63.9	68.2	64.6
1989	68.3	60.5	61.0	58.2	55.6	59.7	55.6	57.4	47.9	55.3	60.9	51.9
1990	58.5	57.9	51.6	49.9	-	-	-	-	-	-	-	-
Over 3-month span:												
1988	64.8	65.6	69.5	70.2	71.1	71.9	71.2	64.2	65.3	70.1	73.4	74.6
1989	71.6	70.1	64.5	61.9	61.6	60.7	61.6	53.4	54.6	55.7	57.2	60.2
1990	58.2	58.6	53.2	-	-	-	-	-	-	-	-	-
Over 6-month span:												
1988	69.9	70.2	71.5	73.9	73.9	69.1	70.2	74.6	73.5	73.9	74.5	75.8
1989	75.1	69.5	68.2	66.0	63.0	57.9	57.7	60.2	53.4	58.3	58.3	60.5
1990	56.3	-	-	-	-	-	-	-	-	-	-	-
Over 12-month span:												
1988	76.2	76.1	74.8	74.6	75.8	74.9	78.1	75.5	75.5	74.8	74.9	74.1
1989	73.2	73.6	69.6	67.6	66.6	62.6	63.6	63.2	60.7	58.0	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
Manufacturing payrolls, 141 industries												
Over 1-month span:												
1988	58.5	56.0	55.0	59.9	58.5	61.7	59.6	51.1	49.3	62.8	64.9	58.5
1989	62.4	53.5	53.2	49.6	46.8	48.6	49.6	45.4	34.8	52.1	48.2	44.7
1990	45.4	49.3	44.0	46.5	-	-	-	-	-	-	-	-
Over 3-month span:												
1988	63.1	61.0	62.4	64.9	67.4	67.0	64.5	58.2	62.1	66.7	71.3	70.9
1989	67.4	63.8	55.7	51.8	49.3	48.6	47.9	34.0	41.8	41.5	46.5	41.1
1990	42.2	41.1	44.3	-	-	-	-	-	-	-	-	-
Over 6-month span:												
1988	66.3	66.3	67.7	69.5	66.7	64.2	66.0	70.9	68.8	69.9	71.6	74.1
1989	69.5	58.5	55.7	52.8	48.9	39.0	40.1	41.8	34.4	37.9	40.8	44.0
1990	37.9	-	-	-	-	-	-	-	-	-	-	-
Over 12-month span:												
1988	73.8	70.2	70.9	71.6	72.0	69.9	70.9	69.1	71.6	70.2	69.9	67.0
1989	63.1	63.8	57.1	53.5	49.6	42.9	43.3	42.2	37.9	36.9	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-

- Data not available.

NOTE: Figures are the percent of industries with employment increasing plus one-half of the industries with unchanged employment, where 50 percent indicates an equal balance between industries with increasing and decreasing

employment. Data for the 2 most recent months shown in each span are preliminary. See the "Definitions" in this section. See "Notes on the data" for a description of the most recent benchmark revision.

19. Annual data: Employment status of the noninstitutional population

(Numbers in thousands)

Employment status	1981	1982	1983	1984	1985	1986	1987	1988	1989
Noninstitutional population	171,775	173,939	175,891	178,080	179,912	182,293	184,490	186,322	188,081
Labor force:									
Total (number)	110,315	111,872	113,226	115,241	117,167	119,540	121,602	123,378	125,557
Percent of population	64.2	64.3	64.4	64.7	65.1	65.6	65.9	66.2	66.8
Employed:									
Total (number)	102,042	101,194	102,510	106,702	108,856	111,303	114,177	116,677	119,030
Percent of population	59.4	58.2	58.3	59.9	60.5	61.1	61.9	62.6	63.3
Resident Armed Forces	1,645	1,668	1,676	1,697	1,706	1,706	1,737	1,709	1,688
Civilian									
Total	100,397	99,526	100,834	105,005	107,150	109,597	112,440	114,968	117,342
Agriculture	3,368	3,401	3,383	3,321	3,179	3,163	3,208	3,169	3,199
Nonagricultural industries	97,030	96,125	97,450	101,685	103,971	106,434	109,232	111,800	114,142
Unemployed:									
Total (number)	8,273	10,678	10,717	8,539	8,312	8,237	7,425	6,701	6,528
Percent of labor force	7.5	9.5	9.5	7.4	7.1	6.9	6.1	5.4	5.2
Not in labor force (number)	61,460	62,067	62,665	62,839	62,744	62,752	62,888	62,944	62,523

20. Annual data: Employment levels by industry

(Numbers in thousands)

Industry	1981	1982	1983	1984	1985	1986	1987	1988	1989
Total employment	91,156	89,566	90,200	94,496	97,519	99,525	102,200	105,584	108,581
Private sector	75,126	73,729	74,330	78,472	81,125	82,832	85,190	88,212	90,854
Goods-producing	25,497	23,813	23,334	24,727	24,859	24,558	24,708	25,249	25,634
Mining	1,139	1,128	952	966	927	777	717	721	722
Construction	4,188	3,905	3,948	4,383	4,673	4,816	4,967	5,125	5,300
Manufacturing	20,170	18,781	18,434	19,378	19,260	18,965	19,024	19,403	19,612
Service-producing	65,659	65,753	66,866	69,769	72,660	74,967	77,492	80,335	82,947
Transportation and public utilities	5,165	5,082	4,954	5,159	5,238	5,255	5,372	5,548	5,705
Wholesale trade	5,358	5,278	5,268	5,555	5,717	5,753	5,844	6,029	6,234
Retail trade	15,189	15,179	15,613	16,545	17,356	17,930	18,483	19,110	19,575
Finance, insurance, and real estate	5,298	5,341	5,468	5,689	5,955	6,283	6,547	6,676	6,814
Services	18,619	19,036	19,694	20,797	22,000	23,053	24,236	25,600	26,892
Government	16,031	15,837	15,869	16,024	16,394	16,693	17,010	17,372	17,727
Federal	2,772	2,739	2,774	2,807	2,875	2,899	2,943	2,971	2,988
State	3,640	3,640	3,662	3,734	3,832	3,893	3,967	4,063	4,134
Local	9,619	9,458	9,434	9,482	9,687	9,901	10,100	10,339	10,606

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

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

Industry	1981	1982	1983	1984	1985	1986	1987	1988	1989
Private sector:									
Average weekly hours	35.2	34.8	35.0	35.2	34.9	34.8	34.8	34.7	34.7
Average hourly earnings (in dollars)	7.25	7.68	8.02	8.32	8.57	8.76	8.98	9.29	9.66
Average weekly earnings (in dollars)	255.20	267.26	280.70	292.86	299.09	304.85	312.50	322.36	335.20
Mining:									
Average weekly hours	43.7	42.7	42.5	43.3	43.4	42.2	42.4	42.3	42.8
Average hourly earnings (in dollars)	10.04	10.77	11.28	11.63	11.98	12.46	12.54	12.75	13.14
Average weekly earnings (in dollars)	438.75	459.88	479.40	503.58	519.93	525.81	531.70	539.33	562.39
Construction:									
Average weekly hours	36.9	36.7	37.1	37.8	37.7	37.4	37.8	37.9	37.9
Average hourly earnings (in dollars)	10.82	11.63	11.94	12.13	12.32	12.48	12.71	13.01	13.37
Average weekly earnings (in dollars)	399.26	426.82	442.97	458.51	464.46	466.75	480.44	493.08	506.72
Manufacturing:									
Average weekly hours	39.8	38.9	40.1	40.7	40.5	40.7	41.0	41.1	41.0
Average hourly earnings (in dollars)	7.99	8.49	8.83	9.19	9.54	9.73	9.91	10.18	10.47
Average weekly earnings (in dollars)	318.00	330.26	354.08	374.03	386.37	396.01	406.31	418.40	429.27
Transportation and public utilities:									
Average weekly hours	39.4	39.0	39.0	39.4	39.5	39.2	39.2	39.3	39.4
Average hourly earnings (in dollars)	9.70	10.32	10.79	11.12	11.40	11.70	12.03	12.32	12.57
Average weekly earnings (in dollars)	382.18	402.48	420.81	438.13	450.30	458.64	471.58	484.18	495.26
Wholesale trade:									
Average weekly hours	38.5	38.3	38.5	38.5	38.4	38.3	38.1	38.1	38.1
Average hourly earnings (in dollars)	7.56	8.09	8.55	8.89	9.16	9.35	9.60	9.94	10.38
Average weekly earnings (in dollars)	291.06	309.85	329.18	342.27	351.74	358.11	365.76	378.71	395.48
Retail trade:									
Average weekly hours	30.1	29.9	29.8	29.8	29.4	29.2	29.2	29.1	28.9
Average hourly earnings (in dollars)	5.25	5.48	5.74	5.85	5.94	6.03	6.12	6.31	6.54
Average weekly earnings (in dollars)	158.03	163.85	171.05	174.33	174.64	176.08	178.70	183.62	189.01
Finance, insurance, and real estate:									
Average weekly hours	36.3	36.2	36.2	36.5	36.4	36.4	36.3	35.9	35.9
Average hourly earnings (in dollars)	6.31	6.78	7.29	7.63	7.94	8.36	8.73	9.09	9.57
Average weekly earnings (in dollars)	229.05	245.44	263.90	278.50	289.02	304.30	316.90	326.33	343.56
Services:									
Average weekly hours	32.6	32.6	32.7	32.6	32.5	32.5	32.5	32.6	32.6
Average hourly earnings (in dollars)	6.41	6.92	7.31	7.59	7.90	8.18	8.49	8.91	9.39
Average weekly earnings (in dollars)	208.97	225.59	239.04	247.43	256.75	265.85	275.93	290.47	306.11

22. Employment Cost Index, compensation,¹ by occupation and industry group

(June 1989 = 100)

Series	1988				1989				1990	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
	Mar. 1990										
Civilian workers ²	94.4	95.4	96.7	97.7	98.9	100.0	101.6	102.6	104.3	1.7	5.5
Workers, by occupational group:											
White-collar workers	94.0	95.0	96.4	97.6	99.0	100.0	102.0	102.9	104.6	1.7	5.7
Blue-collar workers	95.3	96.4	97.1	97.8	98.8	100.0	101.1	102.0	103.6	1.6	4.9
Service occupations	94.5	95.4	97.4	98.2	99.2	100.0	101.7	102.8	104.2	1.4	5.0
Workers, by industry division:											
Goods-producing	95.4	96.5	97.1	97.9	98.9	100.0	101.1	102.1	103.9	1.8	5.1
Manufacturing	95.3	96.2	96.9	97.6	98.9	100.0	101.1	102.0	104.0	2.0	5.2
Service-producing	93.9	94.9	96.5	97.6	99.0	100.0	102.0	102.9	104.4	1.5	5.5
Services	93.7	94.3	96.7	97.9	99.2	100.0	102.7	103.7	105.5	1.7	6.4
Health services	92.9	94.2	95.8	97.0	98.9	100.0	102.2	103.9	105.9	1.9	7.1
Hospitals	92.6	93.9	95.6	96.9	98.7	100.0	102.3	103.7	105.6	1.8	7.0
Public administration ³	95.2	95.8	97.5	97.8	99.2	100.0	102.5	103.2	105.1	1.8	5.9
Nonmanufacturing	94.1	95.2	96.6	97.7	99.0	100.0	101.9	102.8	104.3	1.5	5.4
Private industry workers	94.5	95.7	96.6	97.6	98.8	100.0	101.2	102.3	103.9	1.6	5.2
Excluding sales occupations	94.9	95.9	96.9	97.7	99.0	100.0	101.2	102.1	103.9	1.8	4.9
Workers, by occupational group:											
White-collar workers	93.9	95.1	96.2	97.3	98.9	100.0	101.4	102.4	104.1	1.7	5.3
Excluding sales occupations	94.5	95.5	96.7	97.5	99.0	100.0	101.3	102.2	104.2	2.0	5.3
Professional, specialty and technical occupations	94.3	95.4	96.9	97.5	99.0	100.0	101.8	102.9	104.9	1.9	6.0
Executive, administrative, and managerial occupations	94.7	95.7	96.6	97.8	99.1	100.0	100.9	101.5	103.7	2.2	4.6
Sales occupations	91.4	93.6	94.1	96.3	98.3	100.0	101.9	103.3	103.6	.3	5.4
Administrative support occupations, including clerical	94.4	95.3	96.6	97.3	98.9	100.0	101.2	102.3	104.2	1.9	5.4
Blue-collar workers	95.4	96.4	97.1	97.9	98.8	100.0	101.1	101.9	103.5	1.6	4.8
Precision production, craft, and repair occupations	95.8	96.8	97.3	98.0	98.7	100.0	101.2	102.0	103.4	1.4	4.8
Machine operators, assemblers, and inspectors	94.7	95.8	96.5	97.6	98.9	100.0	100.9	101.8	103.7	1.9	4.9
Transportation and material moving occupations	95.3	97.0	97.9	98.2	99.0	100.0	101.2	101.4	103.1	1.7	4.1
Handlers, equipment cleaners, helpers, and laborers	95.5	96.2	97.0	97.7	98.8	100.0	101.3	102.2	103.6	1.4	4.9
Service occupations	94.6	95.6	97.1	98.2	99.2	100.0	101.1	102.5	103.9	1.4	4.7
Workers, by industry division:											
Goods-producing	95.5	96.5	97.1	97.9	98.9	100.0	101.1	102.1	103.9	1.8	5.1
Excluding sales occupations	95.4	96.5	97.1	97.9	98.9	100.0	101.1	102.2	103.9	1.7	5.1
Construction	95.2	96.4	97.2	98.0	99.0	100.0	101.2	102.4	103.1	.7	4.1
Manufacturing	95.3	96.2	96.9	97.6	98.9	100.0	101.1	102.0	104.0	2.0	5.2
Durables	95.6	96.5	97.0	97.7	99.0	100.0	101.1	102.2	104.0	1.8	5.1
Nondurables	94.8	95.6	96.5	97.5	98.8	100.0	101.2	101.9	104.1	2.2	5.4
Service-producing	93.8	95.1	96.2	97.3	98.8	100.0	101.3	102.3	103.8	1.5	5.1
Excluding sales occupations	94.3	95.4	96.7	97.5	98.9	100.0	101.2	102.1	103.9	1.8	5.1
Transportation and public utilities	95.8	96.8	97.5	97.5	98.7	100.0	100.7	101.2	103.0	1.8	4.4
Transportation	95.3	96.9	97.6	97.3	98.8	100.0	100.5	100.8	102.8	2.0	4.0
Public utilities	96.4	96.7	97.3	97.7	98.8	100.0	101.0	101.7	103.2	1.5	4.5
Communications	-	-	-	-	-	-	-	-	-	1.5	-
Electric, gas, and sanitary services	-	-	-	-	-	-	-	-	-	1.5	-
Wholesale and retail trade	94.0	95.8	96.8	97.6	98.9	100.0	101.6	102.6	103.5	.9	4.7
Excluding sales occupations	-	-	-	-	-	-	-	-	-	1.0	3.8
Wholesale trade	93.0	94.7	95.6	96.1	98.5	100.0	102.6	104.5	104.8	.3	6.4
Excluding sales occupations	-	-	-	-	-	-	-	-	-	1.1	4.9
Retail trade	94.5	96.3	97.3	98.4	99.1	100.0	101.1	101.6	103.0	1.4	3.9
Food stores	-	-	-	-	-	-	-	-	-	1.5	-
Finance, insurance, and real estate	91.5	92.8	92.9	96.2	98.3	100.0	100.4	101.4	102.6	1.2	4.4
Excluding sales occupations	-	-	-	-	-	-	-	-	-	2.5	5.1
Banking, savings and loan, and other credit agencies	-	-	-	-	-	-	-	-	-	1.4	3.3
Insurance	-	-	-	-	-	-	-	-	-	2.2	-
Service	93.6	94.5	96.4	97.5	99.0	100.0	101.8	102.9	105.0	2.0	6.1
Business services	-	-	-	-	-	-	-	-	-	2.3	5.6
Health services	92.6	94.1	95.6	97.0	98.9	100.0	101.9	103.7	105.8	2.0	7.0
Hospitals	92.2	93.6	95.2	96.6	98.8	100.0	101.9	103.5	105.4	1.8	6.7
Nonmanufacturing	94.1	95.4	96.5	97.5	98.8	100.0	101.3	102.3	103.8	1.5	5.1
State and local government workers	94.2	94.5	97.1	98.2	99.4	100.0	103.3	104.3	105.8	1.4	6.4
Workers, by occupational group:											
White-collar workers	94.0	94.3	97.0	98.3	99.5	100.0	103.6	104.6	106.1	1.4	6.6
Blue-collar workers	95.4	95.4	97.0	97.5	99.3	100.0	102.1	103.7	105.5	1.7	6.2

See footnotes at end of table.

22. Continued—Employment Cost Index, compensation,¹ by occupation and industry group

(June 1989 = 100)

Series	1988				1989				1990	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
	Mar. 1990										
Workers, by industry division:											
Services	93.8	94.0	97.0	98.5	99.5	100.0	103.8	104.7	106.1	1.3	6.6
Hospitals and other services ⁴	94.7	94.8	96.5	97.8	99.1	100.0	102.5	103.2	105.4	2.1	6.4
Health services	94.0	94.4	96.5	97.3	98.8	100.0	103.1	104.2	106.2	1.9	7.5
Schools	93.4	93.7	97.2	98.7	99.6	100.0	104.4	105.3	106.4	1.0	6.8
Elementary and secondary	93.5	93.8	97.4	99.1	99.6	100.0	104.6	105.5	106.5	.9	6.9
Public administration ³	95.2	95.8	97.5	97.8	99.2	100.0	102.5	103.2	105.1	1.8	5.9

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

² Consist of private industry workers (excluding farm and household workers) and State and local government (excluding Federal Government) workers.

³ Consist of legislative, judicial, administrative, and regulatory activities.

⁴ Includes, for example, library, social, and health services.

- Data not available.

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

(June 1981 = 100)

Series	1988				1989				1990	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
	Mar. 1990										
Civilian workers¹	95.0	95.9	97.2	98.1	99.2	100.0	101.6	102.4	103.6	1.2	4.4
Workers, by occupational group:											
White-collar workers	94.5	95.5	96.9	98.0	99.2	100.0	101.9	102.8	104.1	1.3	4.9
Blue-collar workers	95.9	96.8	97.4	98.1	99.0	100.0	101.0	101.7	102.8	1.1	3.8
Service occupations	95.3	96.2	97.9	98.7	99.4	100.0	101.4	102.5	103.4	.9	4.0
Workers, by industry division:											
Goods-producing	96.0	96.9	97.4	98.1	99.0	100.0	100.9	101.9	103.1	1.2	4.1
Manufacturing	96.0	96.8	97.3	98.1	99.0	100.0	100.9	101.9	103.3	1.4	4.3
Service-producing	94.5	95.4	97.0	98.0	99.2	100.0	101.8	102.7	103.8	1.1	4.6
Services	94.4	94.9	97.2	98.3	99.4	100.0	102.5	103.3	104.8	1.5	5.4
Health services	92.9	94.4	96.1	97.4	99.0	100.0	102.0	103.5	105.3	1.7	6.4
Hospitals	92.9	94.3	96.0	97.3	98.9	100.0	102.2	103.5	105.0	1.4	6.2
Public administration ²	95.8	96.4	98.1	98.4	99.4	100.0	102.1	102.8	104.3	1.5	4.9
Nonmanufacturing	94.6	95.6	97.1	98.0	99.2	100.0	101.8	102.6	103.7	1.1	4.5
Private industry workers	95.0	96.1	97.0	98.0	99.0	100.0	101.2	102.0	103.2	1.2	4.2
Excluding sales occupations	95.4	96.3	97.3	98.0	99.1	100.0	101.1	101.9	103.2	1.3	4.1
Workers, by occupational group:											
White-collar workers	94.4	95.6	96.7	97.8	99.0	100.0	101.4	102.4	103.6	1.2	4.6
Excluding sales occupations	95.0	95.9	97.1	98.0	99.2	100.0	101.2	102.1	103.7	1.6	4.5
Professional specialty and technical occupations	94.7	95.9	97.4	97.9	99.3	100.0	101.6	102.5	104.1	1.6	4.8
Executive, administrative, and managerial occupations	95.0	95.9	96.7	98.0	99.3	100.0	100.8	101.5	103.3	1.8	4.0
Sales occupations	91.9	94.3	94.8	96.9	98.6	100.0	102.1	103.7	103.3	-4	4.8
Administrative support occupations, including clerical	95.1	95.8	97.2	97.8	99.1	100.0	101.1	102.2	103.6	1.4	4.5
Blue-collar workers	95.9	96.8	97.4	98.2	99.0	100.0	101.0	101.6	102.7	1.1	3.7
Precision production, craft, and repair occupations	95.9	96.8	97.2	97.9	98.8	100.0	101.0	101.6	102.5	.9	3.7
Machine operators, assemblers, and inspectors	95.6	96.5	97.1	98.1	99.0	100.0	100.6	101.6	103.0	1.4	4.0
Transportation and material moving occupations	96.1	97.4	98.4	98.6	99.3	100.0	101.2	101.2	102.0	.8	2.7
Handlers, equipment cleaners, helpers, and laborers	96.3	96.9	97.6	98.3	99.1	100.0	101.1	102.0	103.0	1.0	3.9
Service occupations	95.5	96.4	97.7	98.7	99.4	100.0	100.9	102.3	103.1	.8	3.7
Workers, by industry division:											
Goods-producing	96.1	96.9	97.5	98.2	99.1	100.0	101.0	102.0	103.1	1.1	4.0
Excluding sales occupations	95.9	96.9	97.4	98.2	99.1	100.0	101.0	102.0	103.0	1.0	3.9
Construction	95.7	97.0	97.7	98.3	99.1	100.0	101.1	101.7	102.0	.3	2.9

See footnotes at end of table.

23. Continued— Employment Cost Index, wages and salaries, by occupation and industry group

(June 1989 = 100)

Series	1988				1989				1990	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
										Mar. 1990	
Manufacturing	96.0	96.8	97.3	98.1	99.0	100.0	100.9	101.9	103.3	1.4	4.3
Durables	96.2	96.9	97.4	98.0	99.0	100.0	100.7	101.9	103.2	1.3	4.2
Nondurables	95.8	96.5	97.2	98.2	99.0	100.0	101.1	101.8	103.6	1.8	4.6
Service-producing	94.3	95.5	96.7	97.8	99.1	100.0	101.4	102.2	103.3	1.1	4.2
Excluding sales occupations	94.9	95.8	97.1	98.0	99.2	100.0	101.2	101.8	103.4	1.6	4.2
Transportation and public utilities	97.0	97.9	98.7	98.6	99.5	100.0	100.7	101.2	102.6	1.4	3.1
Transportation	97.1	98.2	99.0	98.7	99.4	100.0	100.6	100.7	102.3	1.6	2.9
Public utilities	97.0	97.6	98.3	98.7	99.5	100.0	101.1	101.8	103.0	1.2	3.5
Communications	-	-	-	-	-	-	-	-	-	1.3	-
Electric, gas, and sanitary services	-	-	-	-	-	-	-	-	-	1.3	-
Wholesale and retail trade	94.3	96.2	97.2	97.9	99.1	100.0	101.6	102.7	103.3	.6	4.2
Excluding sales occupations	95.3	96.6	97.5	98.4	99.4	100.0	101.1	101.9	102.6	.7	3.2
Wholesale trade	93.3	95.1	96.1	96.4	99.0	100.0	102.8	102.5	104.6	-6	5.7
Excluding sales occupations	95.7	96.7	97.7	98.3	99.2	100.0	101.7	102.5	103.2	.7	4.0
Retail trade	94.8	96.6	97.7	98.5	99.1	100.0	101.0	101.6	102.7	1.1	3.6
Food stores	-	-	-	-	-	-	-	-	-	1.1	-
Finance, insurance, and real estate	91.5	92.9	92.9	96.3	98.3	100.0	100.6	101.3	101.8	.5	3.6
Excluding sales occupations	91.5	92.9	92.9	96.3	98.3	100.0	100.6	101.3	101.8	.5	3.6
Banking, savings and loan, and other credit agencies	-	-	-	-	-	-	-	-	-	.7	2.8
Insurance	-	-	-	-	-	-	-	-	-	1.5	-
Services	94.2	94.9	96.9	97.8	99.1	100.0	101.6	102.5	104.2	1.7	5.1
Business services	-	-	-	-	-	-	-	-	-	1.8	4.7
Health services	92.7	94.4	96.0	97.3	99.1	100.0	101.9	103.5	105.3	1.7	6.3
Hospitals	92.5	94.0	95.6	96.9	98.9	100.0	101.9	103.3	105.0	1.6	6.2
Nonmanufacturing	94.5	95.8	96.9	97.8	99.1	100.0	101.4	102.2	103.2	1.0	4.1
State and local government workers	95.0	95.2	97.7	98.7	99.5	100.0	103.1	103.9	105.1	1.2	5.6
Workers, by occupational group:											
White-collar workers	94.8	95.0	97.6	98.8	99.6	100.0	103.4	104.2	105.5	1.2	5.9
Blue-collar workers	96.1	96.1	97.8	98.2	99.5	100.0	101.9	103.3	104.3	1.0	4.8
Workers, by industry division:											
Services	94.6	94.9	97.7	98.9	99.6	100.0	103.6	104.3	105.5	1.2	5.9
Hospitals and other services ³	95.4	95.5	97.3	98.2	99.1	100.0	102.5	103.0	105.4	2.3	6.4
Health services	93.8	94.4	96.7	97.7	98.9	100.0	102.7	103.7	105.5	1.7	6.7
Schools	94.4	94.6	97.7	99.1	99.7	100.0	104.0	104.7	105.5	.8	5.8
Elementary and secondary	94.3	94.5	97.8	99.3	99.7	100.0	104.2	104.9	105.5	.6	5.8
Public administration ²	95.8	96.4	98.1	98.4	99.4	100.0	102.1	102.8	104.3	1.5	4.9

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

² Consists of legislative, judicial, administrative, and regulatory activities.

³ Includes, for example, library, social and health services.

- Data not available.

24. Employment Cost Index, benefits, private industry workers by occupation and industry group

(June 1989 = 100)

Series	1988				1989				1990	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
										Mar. 1990	
Private industry workers	93.4	94.7	95.7	96.7	98.4	100.0	101.4	102.6	105.5	2.8	7.2
Workers, by occupational group:											
White-collar workers	92.8	94.0	95.0	96.2	98.3	100.0	101.4	102.6	105.6	2.9	7.4
Blue-collar workers	94.2	95.7	96.5	97.4	98.6	100.0	101.4	102.6	105.2	2.5	6.7
Workers, by industry group:											
Goods-producing	94.4	95.7	96.5	97.3	98.7	100.0	101.5	102.6	105.7	3.0	7.1
Service-producing	92.5	93.8	94.9	96.1	98.2	100.0	101.4	102.6	105.3	2.6	7.2
Manufacturing	93.7	94.9	95.8	96.6	98.8	100.0	101.6	102.3	105.5	3.1	6.8
Nonmanufacturing	93.2	94.5	95.5	96.8	98.2	100.0	101.4	102.8	105.4	2.5	7.3

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

(June 1989 = 100)

Series	1988				1989				1990	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
	Mar. 1990										
COMPENSATION											
Workers, by bargaining status¹											
Union	96.1	97.0	97.7	98.2	99.0	100.0	100.9	101.8	103.3	1.5	4.3
Goods-producing	96.2	97.1	97.7	98.4	98.9	100.0	100.9	101.9	103.3	1.4	4.4
Service-producing	95.9	96.9	97.6	97.9	99.1	100.0	100.8	101.7	103.2	1.5	4.1
Manufacturing	95.5	96.4	97.0	97.8	99.0	100.0	100.8	102.0	103.6	1.6	4.6
Nonmanufacturing	96.6	97.5	98.3	98.5	98.9	100.0	100.8	101.6	103.0	1.4	4.1
Nonunion	94.0	95.3	96.3	97.4	98.8	100.0	101.4	102.4	104.1	1.7	5.4
Goods-producing	95.1	96.2	96.9	97.7	98.9	100.0	101.3	102.3	104.2	1.9	5.4
Service-producing	93.4	94.7	95.9	97.2	98.7	100.0	101.5	102.4	103.9	1.5	5.3
Manufacturing	95.2	96.1	96.8	97.6	98.8	100.0	101.2	102.1	104.2	2.1	5.5
Nonmanufacturing	93.5	94.9	96.0	97.3	98.8	100.0	101.4	102.4	104.0	1.6	5.3
Workers, by region¹											
Northeast	92.4	93.8	95.0	96.7	98.7	100.0	101.8	102.9	104.4	1.5	5.8
South	95.1	96.7	97.4	98.1	99.0	100.0	101.2	102.2	104.0	1.8	5.1
Midwest (formerly North Central)	95.4	96.2	97.0	97.9	98.9	100.0	101.0	101.9	103.5	1.6	4.7
West	95.4	96.3	97.0	97.7	98.8	100.0	101.0	101.8	103.3	1.5	4.6
Workers, by area size¹											
Metropolitan areas	94.2	95.3	96.3	97.4	98.8	100.0	101.4	102.2	103.9	1.7	5.2
Other areas	96.6	98.0	98.5	98.9	99.4	100.0	100.8	102.0	103.6	1.6	4.2
WAGES AND SALARIES											
Workers, by bargaining status¹											
Union	96.8	97.5	98.2	98.5	99.2	100.0	100.6	101.6	102.6	1.0	3.4
Goods-producing	96.5	97.2	97.8	98.4	99.0	100.0	100.6	101.6	102.3	.7	3.3
Service-producing	97.1	97.8	98.8	98.8	99.6	100.0	100.7	101.7	102.9	1.2	3.3
Manufacturing	96.4	97.0	97.5	98.3	99.0	100.0	100.5	101.7	102.6	.9	3.6
Nonmanufacturing	97.0	97.9	98.8	98.8	99.4	100.0	100.7	101.5	102.5	1.0	3.1
Nonunion	94.5	95.6	96.6	97.7	99.0	100.0	101.3	102.1	103.4	1.3	4.4
Goods-producing	95.8	96.8	97.3	98.1	99.1	100.0	101.1	102.1	103.5	1.4	4.4
Service-producing	93.8	95.1	96.3	97.6	98.9	100.0	101.4	102.2	103.4	1.2	4.6
Manufacturing	95.8	96.7	97.2	98.0	98.9	100.0	101.0	102.0	103.6	1.6	4.8
Nonmanufacturing	94.0	95.3	96.4	97.7	99.0	100.0	101.4	102.3	103.3	1.0	4.3
Workers, by region¹											
Northeast	92.7	94.0	95.1	96.9	98.7	100.0	101.8	102.9	104.0	1.1	5.4
South	95.7	97.2	97.9	98.4	99.2	100.0	101.2	102.1	103.5	1.4	4.3
Midwest (formerly North Central)	95.9	96.5	97.4	98.2	99.1	100.0	100.8	101.6	102.6	1.0	3.5
West	95.9	96.7	97.7	98.2	99.1	100.0	100.8	101.4	102.5	1.1	3.4
Workers, by area size¹											
Metropolitan areas	94.7	95.7	96.7	97.8	99.0	100.0	101.3	102.1	103.3	1.2	4.3
Other areas	96.8	98.4	98.7	98.9	99.6	100.0	100.7	101.9	103.0	1.1	3.4

¹ The indexes are calculated differently from those for the occupation and industry groups. For a detailed description of the index calculation, see the

Monthly Labor Review Technical Note, "Estimation procedures for the Employment Cost Index," May 1982.

26. 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							1990	
	1987	1988	1988			1989					
			II	III	IV	I	II	III	IV		^P
Specified adjustments:											
Total compensation ¹ adjustments, ² settlements covering 5,000 workers or more:											
First year of contract	3.0	3.1	3.1	3.4	3.5	3.2	5.1	3.9	5.3	4.6	
Annual rate over life of contract	2.6	2.5	2.4	3.2	2.1	3.1	3.4	2.7	4.3	3.5	
Wage adjustments, settlements covering 1,000 workers or more:											
First year of contract	2.2	2.5	2.6	2.7	2.6	3.2	3.9	3.6	4.9	3.8	
Annual rate over life of contract	2.1	2.4	2.2	2.8	2.2	3.1	3.3	3.0	4.0	3.3	
Effective adjustments:											
Total effective wage adjustment ³	3.1	2.6	.9	.8	.5	.5	1.0	1.0	.7	.6	
From settlements reached in period .....	.7	.7	.3	.2	.1	.1	.3	.4	.4	.2
Deferred from settlements reached in earlier periods	1.8	1.3	.5	.4	.2	.3	.5	.4	.2	.3	
From cost-of-living-adjustments clauses .....	.5	.6	.1	.2	.2	.1	.2	.2	.1	.1

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

² Adjustments are the net result of increases, decreases, and no changes in

compensation or wages.

³ Because of rounding, total may not equal sum of parts.

^P = preliminary.

27. 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--								1990
	1988			1989					
	II	III	IV	I	II	III	IV	^P	
Specified total compensation adjustments, settlements covering 5,000 workers or more, all industries:									
First year of contract	3.0	3.1	3.1	3.3	3.8	4.0	4.5	4.6	
Annual rate over life of contract	2.3	2.5	2.5	2.6	3.0	2.8	3.4	3.4	
Specified wage adjustments, settlements covering 1,000 workers or more:									
All industries:									
First year of contract	2.4	2.5	2.5	2.7	3.2	3.5	4.0	4.1	
Contracts with COLA clauses	2.4	2.4	2.4	2.4	2.2	2.6	3.9	3.8	
Contracts without COLA clauses	2.4	2.6	2.7	2.9	3.4	3.6	4.0	4.1	
Annual rate over life of contract	2.0	2.2	2.4	2.5	2.9	3.0	3.4	3.4	
Contracts with COLA clauses	1.5	1.5	1.8	1.8	1.8	2.0	2.8	2.7	
Contracts without COLA clauses	2.5	2.8	2.8	2.9	3.2	3.2	3.5	3.6	
Manufacturing:									
First year of contract	2.5	2.6	2.2	2.2	2.6	2.6	3.9	3.9	
Contracts with COLA clauses	2.5	2.4	2.1	2.1	2.1	2.1	5.4	4.8	
Contracts without COLA clauses	2.5	3.0	2.5	2.5	3.1	2.8	3.1	3.5	
Annual rate over life of contract	1.6	1.9	2.1	2.2	2.4	2.5	3.2	3.2	
Contracts with COLA clauses	1.3	1.4	1.8	1.8	1.7	1.7	3.5	3.1	
Contracts without COLA clauses	2.5	3.1	2.6	2.8	3.1	2.9	3.0	3.3	
Nonmanufacturing:									
First year of contract	2.3	2.4	2.8	3.0	3.5	3.8	4.0	4.1	
Contracts with COLA clauses	2.2	2.4	2.9	2.9	3.0	3.0	3.2	3.2	
Contracts without COLA clauses	2.4	2.5	2.7	3.0	3.5	3.9	4.2	4.3	
Annual rate over life of contract	2.4	2.4	2.5	2.7	3.2	3.1	3.4	3.4	
Contracts with COLA clauses	1.9	1.8	1.7	1.7	2.5	2.1	2.4	2.4	
Contracts without COLA clauses	2.6	2.7	2.8	3.0	3.3	3.3	3.7	3.7	
Construction:									
First year of contract	2.6	2.1	2.2	2.4	2.4	2.6	2.8	2.9	
Contracts with COLA clauses	(¹)	(¹)	(¹)	(¹)	(²)	(²)	(²)	(²)	
Contracts without COLA clauses	2.6	2.1	2.2	2.4	(²)	(²)	(²)	(²)	
Annual rate over life of contract	2.7	2.4	2.6	2.7	2.9	2.9	3.0	3.1	
Contracts with COLA clauses	(¹)	(¹)	(¹)	(¹)	(²)	(²)	(²)	(²)	
Contracts without COLA clauses	2.7	2.4	2.6	2.7	(²)	(²)	(²)	(²)	

¹ None of the settlements included COLA provisions.

² Data do not meet publication standards.

^P = preliminary.

28. 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--						
	1988		1989				1990
	III	IV	I	II	III	IV	P
For all workers:¹							
Total	2.9	2.6	2.7	2.8	3.0	3.2	3.2
From settlements reached in period	1.0	.7	.8	.7	.9	1.2	1.3
Deferred from settlements reached in earlier period	1.4	1.3	1.3	1.3	1.3	1.3	1.2
From cost-of-living-adjustments clauses .....	.5	.6	.6	.8	.8	.7	.7
For workers receiving changes:							
Total	3.5	3.3	3.5	3.8	4.0	4.0	4.0
From settlements reached in period	2.9	3.1	3.2	3.5	3.7	4.2	4.1
Deferred from settlements reached in earlier period	3.0	3.0	3.2	3.2	3.4	3.4	3.4
From cost-of-living-adjustments clauses	2.5	2.7	2.9	3.2	3.8	3.3	3.3

¹ Because of rounding, total may not equal sum of parts.
^P = preliminary.

29. 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		
	1987	1988	1989
Specified adjustments:			
Total compensation ¹ adjustments, ² settlements covering 5,000 workers or more:			
First year of contract	4.9	5.4	5.1
Annual rate over life of contract	4.8	5.3	4.9
Wage adjustments, settlements covering 1,000 workers or more:			
First year of contract	4.9	5.1	5.1
Annual rate over life of contract	5.1	5.3	5.1
Effective adjustments:			
Total effective wage adjustment ³	4.9	4.7	5.1
From settlements reached in period	2.7	2.3	2.5
Deferred from settlements reached in earlier periods	2.2	2.4	2.6
From cost-of-living-adjustment clauses	(⁴)	(⁴)	(⁴)

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

² Adjustments are the net result of increases, decreases, and no changes in

compensation or wages.

³ Because of rounding, total may not equal sum of parts.

⁴ Less than 0.05 percent.

30. Work stoppages involving 1,000 workers or more

Measure	Annual totals		1989										1990			
	1988	1989	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. ^P	Feb. ^P	Mar. ^P	Apr. ^P	
Number of stoppages:																
Beginning in period	40	51	6	8	2	6	6	6	5	5	1	3	3	5	5	
In effect during period	43	52	10	14	7	12	13	12	13	14	9	9	7	8	12	
Workers involved:																
Beginning in period (in thousands)	118.3	452.1	8.7	56.1	3.3	45.7	203.0	14.5	68.9	8.0	5.0	4.5	18.0	39.6	33.1	
In effect during period (in thousands)	121.9	454.1	45.2	95.2	46.3	88.8	239.8	108.7	171.1	169.1	104.1	20.3	31.4	51.1	70.3	
Days idle:																
Number (in thousands)	4,364.3	16,996.3	770.2	1,337.1	924.8	1,273.8	3,761.4	1,922.3	3,220.9	2,343.7	376.0	311.9	280.7	720.2	812.7	
Percent of estimated working time ¹ .....	.02	.07	.04	.06	.04	.06	.15	.09	.14	.11	.02	.1	.1	.3	.3

¹ Agricultural and government employees are included in the total employed and total working time; private household, forestry, and fishery employees are excluded. An explanation of the measurement of idleness as a percentage of the total time worked is found

in "'Total economy' measure of strike idleness," *Monthly Labor Review*, October 1968, pp. 54-56.

^P = preliminary.

33. Annual data: Consumer Price Index, U.S. city average, all items and major groups

(1982-84=100)

Series	1981	1982	1983	1984	1985	1986	1987	1988	1989
Consumer Price Index for All Urban Consumers:									
All items:									
Index	90.9	96.5	99.6	103.9	107.6	109.6	113.6	118.3	124.0
Percent change	10.3	6.2	3.2	4.3	3.6	1.9	3.6	4.1	4.8
Food and beverages:									
Index	93.5	97.3	99.5	103.2	105.6	109.1	113.5	118.2	124.9
Percent change	7.8	4.1	2.3	3.7	2.3	3.3	4.0	4.1	5.7
Housing:									
Index	90.4	96.9	99.5	103.6	107.7	110.9	114.2	118.5	123.0
Percent change	11.5	7.2	2.7	4.1	4.0	3.0	3.0	3.8	3.8
Apparel and upkeep:									
Index	95.3	97.8	100.2	102.1	105.0	105.9	110.6	115.4	118.6
Percent change	4.8	2.6	2.5	1.9	2.8	.9	4.4	4.3	2.8
Transportation:									
Index	93.2	97.0	99.3	103.7	106.4	102.3	105.4	108.7	114.1
Percent change	12.2	4.1	2.4	4.4	2.6	-3.9	3.0	3.1	5.0
Medical care:									
Index	82.9	92.5	100.6	106.8	113.5	122.0	130.1	138.6	149.3
Percent change	10.7	11.6	8.8	6.2	6.3	7.5	6.6	6.5	7.7
Entertainment:									
Index	90.1	96.0	100.1	103.8	107.9	111.6	115.3	120.3	126.5
Percent change	7.8	6.5	4.3	3.7	3.9	3.4	3.3	4.3	5.2
Other goods and services:									
Index	82.6	91.1	101.1	107.9	114.5	121.4	128.5	137.0	147.7
Percent change	9.8	10.3	11.0	6.7	6.1	6.0	5.8	6.6	7.8
Consumer Price Index for Urban Wage Earners and Clerical Workers:									
All items:									
Index	91.4	96.9	99.8	103.3	106.9	108.6	112.5	117.0	122.6
Percent change	10.3	6.0	3.0	3.5	3.5	1.6	3.6	4.0	4.8

34. Producer Price Indexes, by stage of processing

(1982=100)

Grouping	Annual average		1989								1990			
	1988	1989	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Finished goods	108.0	113.6	114.2	114.3	114.1	113.4	113.6	114.9	114.9	115.4	117.5	117.4	117.0	117.0
Finished consumer goods	106.2	112.1	113.2	113.1	112.8	111.9	112.2	113.3	113.2	113.9	116.6	116.3	115.8	115.6
Finished consumer goods	112.6	118.7	119.1	118.6	119.0	118.7	118.5	119.5	120.1	121.1	123.6	124.4	124.1	123.2
Finished consumer goods excluding foods	103.1	108.9	110.3	110.4	109.8	108.5	109.1	110.3	109.9	110.4	113.2	112.4	111.7	111.9
Nondurable goods less food	97.3	103.8	106.0	106.0	105.3	103.5	104.5	104.8	104.3	105.0	109.1	107.9	107.1	107.4
Durable goods	113.8	117.6	117.1	117.5	116.9	117.0	116.7	120.0	119.6	119.7	119.4	119.3	119.2	119.2
Capital equipment	114.3	118.8	118.3	118.8	118.7	119.0	118.9	120.5	120.8	120.8	121.1	121.4	121.8	122.1
Intermediate materials, supplies, and components	107.1	112.0	112.7	112.7	112.5	112.0	112.4	112.3	112.0	111.9	113.4	112.5	112.4	112.8
Materials and components for manufacturing	113.2	118.1	118.9	118.4	118.1	117.7	117.7	117.9	117.7	117.4	117.6	117.6	117.9	118.2
Materials for food manufacturing	106.0	112.7	112.5	112.4	113.3	113.3	113.7	113.1	115.4	115.5	115.5	114.9	115.8	117.3
Materials for nondurable manufacturing ..	112.9	118.5	120.3	119.5	118.6	117.4	116.9	117.0	116.7	116.6	116.5	117.4	117.2	116.9
Materials for durable manufacturing	118.7	123.6	125.0	123.6	122.7	122.1	122.6	123.1	121.9	120.3	120.2	119.2	120.1	121.0
Components for manufacturing	112.3	116.4	116.1	116.4	116.6	116.9	117.0	117.2	117.3	117.4	118.0	118.1	118.4	118.5
Materials and components for construction	116.1	121.3	121.5	121.5	121.6	121.6	121.9	122.3	122.1	121.7	121.8	122.0	122.3	123.1
Processed fuels and lubricants	71.2	76.4	78.1	79.3	78.7	77.3	78.7	77.8	76.3	77.3	84.6	79.1	77.7	77.9
Containers	120.1	125.4	125.3	125.6	126.0	126.0	126.1	126.3	126.8	126.7	126.9	127.4	127.6	128.2
Supplies	113.7	118.1	118.2	118.1	118.5	118.3	118.5	118.3	118.3	118.3	118.7	118.5	118.7	118.9
Crude materials for further processing ..	96.0	103.1	106.1	104.1	103.9	101.1	102.3	102.1	102.6	104.2	106.7	106.9	105.6	102.6
Foodstuffs and feedstuffs	106.1	111.2	114.9	111.7	110.1	110.0	108.9	107.9	109.9	112.6	113.6	114.4	115.2	114.8
Crude nonfood materials	85.5	93.4	96.0	94.7	95.4	91.1	93.6	94.0	93.5	94.3	97.6	97.6	95.0	90.5
Special groupings:														
Finished goods, excluding foods	106.5	111.8	112.6	112.8	112.4	111.7	112.0	113.3	113.1	113.5	115.5	115.0	114.7	114.9
Finished energy goods	59.8	65.7	71.8	70.2	68.4	63.6	65.9	65.8	64.6	64.8	72.8	69.0	66.9	67.2
Finished goods less energy	115.8	121.2	120.8	121.2	121.3	121.4	121.3	122.7	123.0	123.5	124.5	125.1	125.1	125.0
Finished consumer goods less energy	116.3	122.1	121.8	122.1	122.2	122.3	122.1	123.6	123.8	124.5	125.8	126.4	126.3	126.0
Finished goods less food and energy	117.0	122.1	121.4	122.1	122.1	122.4	122.3	123.9	124.0	124.4	124.7	125.2	125.3	125.6
Finished consumer goods less food and energy	118.5	124.0	123.3	124.1	124.1	124.5	124.2	126.0	125.9	126.5	126.9	127.5	127.5	127.6
Consumer nondurable goods less food and energy	122.0	128.8	127.9	129.0	129.3	129.9	129.7	130.4	130.5	131.6	132.3	133.4	133.5	133.7
Intermediate materials less foods and feeds	106.9	111.9	112.6	112.7	112.4	112.0	112.3	112.4	111.9	111.9	113.4	112.6	112.5	112.8
Intermediate foods and feeds	109.5	113.8	114.2	112.9	114.5	113.1	113.7	112.3	113.2	113.0	113.3	111.0	111.4	112.7
Intermediate energy goods	70.9	76.1	77.7	78.9	78.3	76.9	78.3	77.5	76.0	76.9	84.2	78.8	77.4	77.6
Intermediate goods less energy	114.6	119.5	120.0	119.7	119.6	119.3	119.5	119.6	119.5	119.2	119.5	119.5	119.7	120.1
Intermediate materials less foods and energy	115.2	120.2	120.8	120.5	120.2	120.0	120.1	120.3	120.0	119.7	119.9	120.1	120.3	120.6
Crude energy materials	67.7	75.9	78.3	77.5	78.9	73.5	76.1	76.6	76.9	78.5	82.4	82.5	78.7	72.6
Crude materials less energy	112.6	117.7	121.0	118.0	116.2	116.4	115.9	115.1	115.8	117.1	117.9	118.3	119.7	120.2
Crude nonfood materials less energy	133.0	137.9	140.3	137.9	135.5	136.6	137.7	137.6	134.3	132.0	132.1	131.3	134.3	137.4

35. Producer Price indexes, by durability of product

(1982=100)

Grouping	Annual average		1989								1990			
	1988	1989	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Total durable goods	114.7	119.0	118.9	119.0	118.8	119.0	119.2	120.2	119.9	119.7	120.0	119.9	120.4	120.8
Total nondurable goods	101.1	107.1	108.6	108.2	108.1	106.7	107.2	107.2	107.2	107.9	110.7	110.0	109.3	108.8
Total manufactures	109.1	114.3	115.0	114.9	114.7	114.2	114.5	115.2	115.1	115.2	116.5	116.0	116.1	116.6
Durable	114.1	118.3	118.1	118.3	118.2	118.4	118.6	119.6	119.5	119.3	119.6	119.6	119.9	120.2
Nondurable	104.1	110.2	111.6	111.3	110.9	110.0	110.4	110.7	110.7	111.0	113.1	112.2	112.2	112.8
Total raw or slightly processed goods	95.9	101.3	103.3	102.6	102.7	100.4	101.2	100.4	100.2	101.8	105.8	105.6	103.7	100.8
Durable	148.0	151.6	157.5	151.5	146.0	146.5	148.0	146.5	141.2	138.0	138.6	135.9	140.7	145.6
Nondurable	93.4	98.9	100.8	100.3	100.6	98.3	99.0	98.3	98.3	100.1	104.2	104.1	101.9	98.6

36. Producer price indexes for the net output of major industry groups

(December 1984=100, unless otherwise indicated)

Industry	SIC	Annual average		1989								1990			
		1988	1989	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Total mining industries		70.6	76.4	78.2	77.4	78.0	74.0	76.5	76.1	76.3	77.6	81.2	81.0	78.1	73.8
Metal mining	10	100.7	100.3	100.6	96.0	91.8	96.2	101.0	101.0	96.2	93.6	90.6	87.8	92.0	94.4
Anthracite mining (12/85=100)	11	100.2	102.7	102.4	102.4	102.6	102.6	102.7	102.9	103.0	103.2	105.0	105.0	105.0	104.9
Bituminous coal and lignite mining (12/85=100)	12	94.6	94.3	93.9	94.0	94.7	94.9	94.7	95.1	96.1	95.6	95.1	95.0	95.9	95.8
Oil and gas extraction (12/85=100)	13	68.5	75.7	78.1	77.2	78.1	72.8	75.8	75.2	75.5	77.3	82.4	82.1	77.8	71.7
Mining and quarrying of nonmetallic minerals, except fuels	14	108.0	111.2	111.6	112.1	111.3	111.4	111.0	111.3	111.3	111.2	111.6	111.9	112.3	112.9
Total manufacturing industries		104.4	109.6	110.1	110.1	109.9	109.6	109.9	110.8	110.8	111.0	112.6	112.2	112.2	112.6
Food and kindred products	20	107.1	112.2	112.2	112.1	112.5	112.3	112.4	112.3	113.2	113.7	114.2	114.4	115.0	115.3
Tobacco manufactures	21	141.8	161.4	155.1	163.5	164.4	164.6	164.5	165.7	165.7	173.8	173.8	177.4	176.1	176.1
Textile mill products	22	106.8	109.3	108.8	109.4	109.5	109.8	109.7	110.0	110.1	110.0	110.6	111.6	111.8	111.9
Apparel and other finished products made from fabrics and similar materials	23	107.2	110.2	109.6	109.8	110.4	110.7	110.9	111.1	111.3	111.6	112.1	112.3	112.4	112.7
Lumber and wood products, except furniture	24	109.2	115.3	115.4	115.9	117.1	116.7	116.8	118.1	117.3	116.1	116.1	116.9	117.4	119.3
Furniture and fixtures	25	111.4	115.6	115.2	115.5	115.7	116.3	116.6	117.0	117.0	117.2	117.6	118.0	118.1	118.4
Paper and allied products	26	113.7	120.8	121.1	121.2	120.9	121.1	121.1	121.7	121.7	121.6	121.7	121.6	121.5	122.0
Printing, publishing, and allied industries	27	118.2	124.7	124.2	124.6	124.9	125.4	125.8	126.0	126.3	126.4	128.0	128.6	129.0	129.1
Chemicals and allied products	28	113.0	119.6	120.9	120.6	119.4	119.0	118.7	118.7	118.7	118.6	118.7	119.6	119.9	120.1
Petroleum refining and related products	29	67.7	75.7	82.9	80.4	77.7	73.0	75.6	77.4	75.9	76.0	87.4	80.3	78.6	80.0
Rubber and miscellaneous plastic products	30	106.7	110.2	110.5	110.4	110.4	110.3	110.4	110.3	110.3	110.5	110.8	110.7	110.9	111.2
Leather and leather products	31	113.4	118.0	117.4	117.3	117.8	118.6	119.4	119.5	119.4	120.2	120.7	121.4	121.9	121.9
Stone, clay, glass, and concrete products ..	32	105.8	107.9	107.9	108.1	108.2	108.2	108.3	108.3	108.5	108.6	109.0	109.3	109.5	110.0
Primary metal industries	33	113.0	118.8	119.8	118.9	118.2	118.0	118.6	118.8	118.0	116.6	116.1	115.1	116.2	116.6
Fabricated metal products, except machinery and transportation equipment	34	107.4	112.6	112.5	112.5	112.8	113.0	113.3	113.6	113.8	113.9	114.1	114.4	114.6	114.9
Machinery, except electrical	35	106.4	110.7	110.2	110.3	110.9	111.3	111.5	111.8	112.1	112.2	112.7	113.2	113.3	113.5
Electrical and electronic machinery, equipment, and supplies	36	104.6	107.1	106.8	107.1	107.6	107.6	107.7	107.8	107.8	107.8	108.5	108.4	108.6	108.8
Transportation equipment	37	107.8	112.1	111.6	111.8	111.1	111.3	110.7	115.0	114.6	114.6	114.4	114.5	114.4	114.3
Measuring and controlling instruments; photographic, medical, optical goods; watches, clocks	38	107.0	110.8	110.6	110.9	111.0	111.2	111.5	111.9	112.1	112.4	113.5	113.5	113.8	114.2
Miscellaneous manufacturing industries (12/85=100)	39	107.5	111.8	111.5	111.7	112.0	112.4	112.5	112.7	112.8	113.1	113.6	114.2	114.6	114.5
Service industries:															
Pipelines, except natural gas (12/86=100)	46	94.8	94.4	94.4	94.4	94.4	94.4	94.4	94.4	94.4	94.4	95.5	95.5	95.5	95.5

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

(1982=100)

Index	1981	1982	1983	1984	1985	1986	1987	1988	1989
Finished goods:									
Total	96.1	100.0	101.6	103.7	104.7	103.2	105.4	108.0	113.6
Consumer goods	96.6	100.0	101.3	103.3	103.8	101.4	103.6	106.2	112.1
Capital equipment	94.6	100.0	102.8	105.2	107.5	109.7	111.7	114.3	118.8
Intermediate materials, supplies, and components:									
Total	98.6	100.0	100.6	103.1	102.7	99.1	101.5	107.1	112.0
Materials and components for manufacturing	98.7	100.0	101.2	104.1	103.3	102.2	105.3	113.2	118.1
Materials and components for construction	97.9	100.0	102.8	105.6	107.3	108.1	109.8	116.1	121.3
Processed fuels and lubricants	100.6	100.0	95.4	95.7	92.8	72.7	73.3	71.2	76.4
Containers	96.7	100.0	100.4	105.9	109.0	110.3	114.5	120.1	125.4
Supplies	96.9	100.0	101.8	104.1	104.4	105.6	107.7	113.7	118.1
Crude materials for further processing:									
Total	103.0	100.0	101.3	103.5	95.8	87.7	93.7	96.0	103.1
Foodstuffs and feedstuffs	103.9	100.0	101.8	104.7	94.8	93.2	96.2	106.1	111.2
Nonfood materials except fuel	101.8	100.0	100.7	102.2	96.9	81.6	87.9	85.5	93.4
Fuel	84.8	100.0	105.1	105.1	102.7	92.2	84.1	82.1	85.3

39. U.S. import price indexes by Standard International Trade Classification

(1985=100, unless otherwise indicated)

Category	1974 SITC	1988				1989				1990
		Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
ALL COMMODITIES		113.8	116.8	115.3	117.6	119.7	119.8	118.4	119.9	121.3
ALL COMMODITIES, EXCLUDING FUELS		123.7	126.7	126.1	129.1	129.6	128.5	127.6	128.5	129.8
Food and live animals	0	114.1	114.0	112.7	114.3	114.1	111.3	106.1	108.2	111.6
Meat and meat preparations	01	111.5	107.0	111.2	108.7	111.2	109.7	124.1	134.1	131.6
Dairy products and eggs	02	125.6	125.0	122.2	125.8	124.0	120.2	120.3	123.2	129.2
Fish and crustaceans	03	132.5	129.3	125.9	126.7	127.0	122.7	121.6	122.1	125.7
Bakery goods, pasta products, grain, and grain preparations	04	135.8	139.8	136.9	142.2	140.4	140.2	141.6	142.9	148.5
Fruits and vegetables	05	115.4	120.3	123.7	127.7	123.4	123.2	119.1	128.2	130.9
Sugar, sugar preparations, and honey	06	109.6	110.0	112.1	110.8	109.8	111.8	114.4	117.0	116.2
Coffee, tea, cocoa	07	94.3	93.3	87.4	90.6	91.2	85.3	62.5	57.3	65.3
Beverages and tobacco	1	116.0	116.2	115.3	116.2	117.0	117.2	120.7	122.4	124.8
Beverages	11	118.7	120.0	118.9	119.9	120.7	120.7	122.9	124.1	127.0
Crude materials	2	129.2	137.8	135.4	143.2	146.2	144.3	137.2	136.1	132.4
Crude rubber (including synthetic and reclaimed)	23	121.7	151.1	133.3	121.5	123.0	103.4	98.3	98.5	101.0
Cork and wood	24	112.4	111.4	109.7	107.8	112.1	112.4	113.5	111.6	114.0
Pulp and waste paper	25	151.0	160.5	169.6	174.7	184.7	190.0	190.1	189.6	184.0
Textile fibers	26	137.8	145.5	141.9	145.6	151.5	145.4	141.7	140.2	133.9
Crude fertilizers and crude minerals	27	100.4	101.0	97.2	100.2	103.3	104.7	101.2	98.0	96.8
Metalliferous ores and metal scrap	28	151.2	167.6	172.2	205.4	204.3	212.3	183.4	176.6	167.2
Crude animal and vegetable materials, n.e.s.	29	135.8	148.2	122.0	139.5	138.5	110.3	108.6	127.7	111.0
Fuels and related products	3	60.6	63.4	57.7	56.4	66.8	73.3	68.8	74.0	75.9
Crude petroleum and petroleum products	33	60.4	63.6	57.7	56.1	67.3	74.4	69.5	74.8	76.4
Fats and oils	4	106.4	111.2	114.0	112.3	112.5	117.4	106.7	100.7	98.3
Fixed vegetable oils and fats (9/87=100)	42	111.1	116.1	119.2	117.4	117.3	122.6	110.7	104.2	101.5
Chemicals and related products	5	114.2	116.4	119.2	122.2	123.6	120.4	117.7	118.9	119.0
Organic chemicals	51	105.8	107.3	111.3	115.1	117.6	114.0	110.3	112.7	114.5
Inorganic chemicals	52	92.0	92.3	93.0	96.1	93.1	86.6	85.7	86.0	84.4
Medicinal and pharmaceutical products	54	135.3	140.3	145.4	146.4	154.9	153.5	149.2	149.7	152.3
Essential oils and perfumes	55	125.7	126.2	127.5	130.5	130.3	130.2	127.2	135.3	131.7
Manufactured fertilizers	56	133.7	136.3	136.5	139.9	143.5	142.1	132.4	130.5	129.3
Artificial resins and plastics and cellulose	58	121.6	124.3	127.6	129.5	129.5	129.8	130.8	130.6	129.4
Chemical materials and products, n.e.s.	59	138.7	148.5	153.4	156.5	154.8	151.6	150.2	150.9	150.2
Intermediate manufactured products	6	124.4	132.2	132.3	135.0	137.3	136.1	135.3	134.0	134.0
Leather and furskins	61	131.8	137.0	136.6	134.9	134.6	133.8	133.9	133.4	141.1
Rubber manufactures, n.e.s.	62	106.0	107.7	109.1	111.1	111.7	112.2	113.7	114.0	115.1
Cork and wood manufactures	63	133.8	138.2	136.1	134.1	136.9	139.8	140.8	140.5	141.5
Paper and paperboard products	64	117.2	118.3	119.5	119.9	120.6	120.8	119.7	118.8	117.1
Textiles	65	120.0	120.6	119.1	120.5	120.5	122.1	121.7	122.8	125.1
Nonmetallic mineral manufactures, n.e.s.	66	137.4	142.5	139.7	141.9	147.5	149.5	151.7	153.1	158.5
Iron and steel	67	120.0	127.2	129.9	130.7	132.6	133.6	133.7	130.9	128.7
Nonferrous metals	68	132.7	159.7	158.9	169.1	172.8	158.6	150.7	144.1	138.3
Metal manufactures	69	121.1	126.9	127.5	130.7	132.4	132.6	133.2	133.8	135.6
Machinery and transport equipment	7	125.4	127.3	126.7	129.9	130.1	129.2	129.0	130.2	131.4
Machinery (including SITC 71-77)	7hyb	124.6	126.4	125.9	128.7	129.2	128.4	127.8	128.1	130.3
Machinery specialized for particular industries	72	146.8	149.8	143.7	150.8	149.1	145.7	145.7	148.2	157.4
Metalworking machinery	73	139.9	142.4	139.7	144.1	142.9	139.5	143.9	144.2	148.1
General industrial machinery and parts, n.e.s.	74	140.4	143.7	139.6	144.2	144.7	143.0	143.7	145.5	150.9
Office machines and automatic data processing equipment	75	118.1	119.5	118.7	118.7	119.6	119.3	117.2	117.9	117.0
Telecommunications, sound recording and reproducing apparatus	76	112.8	113.8	113.9	115.5	115.7	115.7	115.0	113.9	112.9
Electrical machinery and equipment	77	122.2	124.2	125.9	129.3	130.5	129.6	128.7	129.0	131.8
Road vehicles and parts	78	125.5	127.6	127.1	130.8	130.5	129.6	129.5	131.9	131.3
Miscellaneous manufactured articles	8	124.2	125.7	124.2	126.6	126.6	126.6	127.2	128.7	131.8
Plumbing, heating, and lighting fixtures	81	123.4	126.9	124.5	127.2	130.0	131.5	133.0	136.6	142.1
Furniture and parts	82	125.4	129.6	128.0	129.1	127.2	127.9	128.8	130.9	135.9
Travel goods, handbags, and similar goods (6/85=100)	83	105.8	107.3	111.3	115.1	117.6	114.0	110.3	112.7	114.5
Clothing	84	115.6	114.9	116.7	117.2	118.5	119.9	120.8	121.7	121.8
Footwear	85	125.4	129.6	128.0	129.1	127.2	127.9	128.8	130.9	135.9
Professional, scientific, and controlling instruments and apparatus	87	140.0	142.5	135.8	141.9	141.1	136.5	136.3	137.1	143.3
Photographic apparatus and supplies, optical goods, watches, and clocks	88	129.2	129.3	125.4	130.6	130.2	127.9	126.3	128.7	131.4
Miscellaneous manufactured articles, n.e.s.	89	129.2	132.1	128.2	131.4	131.7	131.4	131.9	133.8	139.2

40. U.S. export price indexes by end-use category

(1985 = 100 unless otherwise indicated)

Category	1988				1989				1990
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
Foods, feeds, and beverages	98.5	110.1	124.5	117.4	120.8	117.2	110.3	108.2	107.3
Industrial supplies and materials	114.2	118.3	118.7	118.6	120.7	120.9	119.5	118.7	118.8
Capital goods	103.4	104.3	104.9	105.7	106.7	107.4	108.2	108.8	109.9
Automotive	104.3	104.8	106.5	107.7	108.1	108.6	109.4	110.7	111.1
Consumer goods	110.1	110.6	111.3	112.9	115.3	115.6	116.5	117.1	119.0
Consumer nondurables, manufactured, except rugs	107.4	108.7	109.3	110.0	111.4	111.5	111.7	112.7	113.9
Consumer durables, manufactured	110.4	110.4	110.7	112.6	115.4	115.4	116.5	116.8	118.8
Agricultural (9/88=100)	101.1	110.9	120.6	114.0	117.7	116.1	111.2	109.8	109.5
All exports, excluding agricultural (9/88=100)	107.7	109.7	110.8	111.6	112.9	113.1	113.0	113.1	113.8

41. U.S. import price indexes by end-use category

(1985=100)

Category	1988				1989				1990
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
All imports, excluding petroleum (6/88=100)	123.2	126.2	125.4	128.3	129.0	128.0	127.1	128.0	129.3
Foods, feeds, and beverages	113.7	113.7	112.7	114.2	113.8	111.7	107.1	109.0	111.9
Industrial supplies and materials	92.7	97.8	95.2	96.4	102.1	104.2	100.6	102.7	103.1
Petroleum and petroleum products, excluding natural gas	60.3	63.5	57.5	56.2	67.2	74.1	69.1	74.6	76.2
Industrial supplies and materials, excluding petroleum	119.6	126.4	126.4	129.6	131.2	129.4	126.9	126.2	125.5
Capital goods, except automotive	128.6	131.0	129.0	132.3	132.4	131.0	130.6	131.5	134.8
Automotive vehicles, parts and engines	123.7	125.8	126.0	129.2	129.1	128.2	128.2	130.0	129.9
Consumer goods except automotive	124.2	126.3	125.0	127.4	128.7	129.1	129.5	130.8	133.1
Nondurables, manufactured	123.3	124.2	123.8	125.4	126.5	127.5	128.5	129.9	132.8
Durables, manufactured	123.5	125.5	124.5	127.4	127.9	127.9	127.8	128.6	130.4

42. U.S. export price indexes by Standard Industrial Classification ¹

(1985=100)

Industry group	1988				1989				1990
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
Manufacturing:									
Food and kindred products	120.8	125.1	128.9	123.5	124.5	122.7	119.5	117.2	118.5
Lumber and wood products, except furniture	146.1	145.4	146.1	144.0	151.7	164.4	171.2	170.7	173.6
Furniture and fixtures	112.5	112.9	112.9	115.3	115.2	116.0	116.5	118.1	119.0
Paper and allied products	124.6	129.8	133.1	135.6	139.9	141.4	141.6	140.4	137.3
Chemicals and allied products	118.4	122.3	125.4	125.5	125.9	122.5	118.5	115.9	116.9
Petroleum and coal products	73.0	77.8	73.7	75.4	79.8	86.9	88.7	94.4	90.7
Primary metal products	126.9	133.8	133.5	133.6	130.8	125.7	122.5	122.9	122.6
Machinery, except electrical	100.6	101.3	102.2	102.8	103.4	103.7	104.4	105.2	106.3
Electrical machinery	102.9	103.7	104.9	105.4	106.3	106.8	107.5	107.7	108.3
Transportation equipment	108.1	109.1	109.4	110.9	111.8	112.7	113.4	114.5	115.1
Scientific instruments; optical goods; clocks	109.2	110.8	112.0	113.4	114.5	116.7	117.7	119.7	120.6

¹ SIC-based classification.

43. U.S. import price indexes by Standard Industrial Classification ¹

(1985=100)

Industry group	1988				1989				1990
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
Manufacturing:									
Food and kindred products	114.0	114.4	115.0	115.4	114.9	114.0	114.8	115.9	118.8
Textile mill products	127.4	128.9	127.0	127.8	139.0	139.8	137.5	138.8	141.3
Apparel and related products	116.6	115.8	117.0	117.5	118.9	120.3	121.2	122.1	122.3
Lumber and wood products, except furniture	119.5	120.3	118.6	117.0	120.5	122.2	123.3	122.1	124.2
Furniture and fixtures	122.2	124.0	124.8	128.0	126.3	126.1	128.7	128.6	130.3
Paper and allied products	119.1	121.3	123.8	125.2	127.4	128.2	127.3	126.6	124.6
Chemicals and allied products	116.8	121.3	123.5	130.6	130.7	130.0	123.9	123.7	123.7
Petroleum refining and allied products	114.5	119.2	110.8	111.6	121.3	139.1	128.0	134.9	138.9
Rubber and miscellaneous plastics products	117.2	119.0	117.7	122.6	122.3	123.1	124.2	125.2	125.4
Leather and leather products	120.8	124.6	123.7	124.0	122.8	123.5	124.6	126.0	130.5
Stone, clay, glass, and concrete products	138.2	141.5	140.5	144.3	144.3	144.8	147.4	148.0	152.5
Primary metal products	122.6	137.0	136.2	140.2	140.6	135.2	132.0	129.6	127.4
Fabricated metal products	127.3	133.3	133.0	136.3	138.9	140.3	141.3	142.0	144.1
Machinery, except electrical	135.9	138.2	135.0	138.4	138.6	136.7	135.8	137.8	141.8
Electrical machinery and supplies	114.7	116.1	116.7	119.0	119.7	119.4	118.9	118.5	119.5
Transportation equipment	127.3	129.5	129.3	132.8	132.6	131.9	132.0	134.1	134.2
Scientific instruments; optical goods; clocks	135.8	137.0	132.2	137.7	136.7	133.8	132.8	134.2	137.8
Miscellaneous manufactured commodities	127.7	133.1	130.6	132.2	136.6	137.7	138.4	139.8	143.4

¹ SIC - based classification.

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

(1977=100)

Item	Quarterly Indexes										
	1987		1988				1989				1990
	III	IV	I	II	III	IV	I	II	III	IV	I
Business:											
Output per hour of all persons	111.7	112.5	113.2	112.6	113.4	113.5	113.8	114.2	114.7	114.8	114.6
Compensation per hour	191.8	195.1	196.4	199.1	201.9	204.5	206.9	210.4	212.8	215.7	218.1
Real compensation per hour	101.6	102.5	102.3	102.6	102.8	103.0	102.8	103.0	103.5	103.9	103.0
Unit labor costs	171.6	173.5	173.5	176.9	178.0	180.2	181.9	184.1	185.6	187.9	190.2
Unit nonlabor payments	168.9	167.2	168.9	168.8	171.8	173.7	174.7	176.3	176.5	175.8	178.5
Implicit price deflator	170.7	171.3	171.9	174.1	175.8	177.9	179.4	181.4	182.4	183.7	186.1
Nonfarm business:											
Output per hour of all persons	109.5	110.2	111.0	110.5	111.5	112.0	111.6	111.9	112.6	112.7	112.5
Compensation per hour	190.5	193.8	195.0	197.5	200.2	203.0	205.5	208.3	211.0	214.1	216.2
Real compensation per hour	101.0	101.8	101.5	101.8	101.9	102.3	102.1	102.0	102.6	103.1	102.1
Unit labor costs	173.9	175.8	175.7	178.7	179.6	181.3	184.1	186.1	187.4	189.9	192.2
Unit nonlabor payments	170.3	168.7	170.3	169.8	172.1	176.3	174.6	176.5	177.6	177.3	179.0
Implicit price deflator	172.6	173.4	173.8	175.6	177.0	179.6	180.8	182.8	184.0	185.6	187.7
Nonfinancial corporations:											
Output per hour of all employees	113.0	113.5	114.6	114.7	115.1	114.9	114.5	114.5	115.3	115.2	-
Compensation per hour	186.9	189.5	190.9	193.1	195.5	197.8	200.2	202.8	205.5	208.5	-
Real compensation per hour	99.1	99.5	99.4	99.5	99.5	99.6	99.5	99.3	99.9	100.4	-
Total unit costs	170.8	172.1	171.9	173.6	175.2	177.5	180.4	182.9	184.6	187.3	-
Unit labor costs	165.3	167.0	166.6	168.4	169.9	172.1	174.9	177.1	178.1	181.0	-
Unit nonlabor costs	186.9	187.2	187.8	188.9	191.0	193.3	196.9	200.1	203.9	205.7	-
Unit profits	129.3	122.0	127.0	129.1	127.5	131.6	119.6	116.6	113.5	106.1	-
Unit nonlabor payments	166.7	164.4	166.5	168.0	168.8	171.7	169.8	170.9	172.2	170.8	-
Implicit price deflator	165.8	166.1	166.5	168.2	169.5	172.0	173.1	175.0	176.1	177.5	-
Manufacturing:											
Output per hour of all persons	134.2	134.5	135.1	136.0	137.3	137.8	138.6	139.5	139.0	140.1	141.5
Compensation per hour	190.4	191.7	194.3	195.3	197.4	200.2	201.9	203.2	206.1	209.6	211.3
Real compensation per hour	100.9	100.6	101.2	100.6	100.5	100.8	100.3	99.5	100.3	101.0	99.8
Unit labor costs	141.8	142.5	143.8	143.6	143.7	145.2	145.6	145.6	148.3	149.7	149.3

- Data not available.

45. Annual indexes of multifactor productivity and related measures, selected years

(1977=100)

Item	1960	1970	1973	1978	1980	1982	1983	1984	1985	1986	1987
Private business:											
Productivity:											
Output per hour of all persons	67.3	88.4	95.9	100.8	99.2	100.3	103.0	105.6	107.9	110.3	111.2
Output per unit of capital services	103.7	102.7	105.6	101.9	94.1	86.6	88.3	92.7	92.9	93.0	93.7
Multifactor productivity	78.5	93.1	99.2	101.2	97.4	95.2	97.6	100.9	102.4	103.9	104.7
Output	55.3	80.2	93.0	105.8	106.6	105.4	109.9	119.2	124.3	128.7	133.4
Inputs:											
Hours of all persons	82.2	90.8	96.9	105.0	107.5	105.2	106.7	112.9	115.2	116.7	120.0
Capital services	53.3	78.1	88.0	103.8	113.3	121.8	124.4	128.6	133.8	138.5	142.4
Combined units of labor and capital input	70.5	86.1	93.7	104.6	109.4	110.7	112.6	118.1	121.4	123.9	127.4
Capital per hour of all persons	64.9	86.1	90.8	98.9	105.4	115.8	116.6	113.9	116.1	118.7	118.6
Private nonfarm business:											
Productivity:											
Output per hour of all persons	70.7	89.2	96.4	100.8	98.7	99.1	102.5	104.7	106.2	108.3	109.1
Output per unit of capital services	104.9	103.5	106.3	101.9	93.3	85.1	87.3	91.3	91.0	90.8	91.5
Multifactor productivity	81.2	93.8	99.7	101.2	96.9	94.1	97.0	99.9	100.7	102.0	102.7
Output	54.4	79.9	92.9	106.0	106.6	104.8	110.1	119.3	124.0	128.3	133.2
Inputs:											
Hours of all persons	77.0	89.6	96.3	105.1	108.0	105.7	107.4	114.0	116.8	118.5	122.0
Capital services	51.9	77.2	87.3	104.0	114.2	123.3	126.1	130.6	136.3	141.3	145.5
Combined units of labor and capital input	67.1	85.2	93.2	104.7	110.0	111.4	113.5	119.4	123.1	125.8	129.6
Capital per hour of all persons	67.4	86.2	90.7	99.0	105.7	116.6	117.4	114.6	116.7	119.3	119.2
Manufacturing:											
Productivity:											
Output per hour of all persons	62.2	80.8	93.4	101.5	101.4	105.9	112.0	118.1	123.6	127.7	131.9
Output per unit of capital services	103.0	99.1	112.0	102.0	91.0	81.6	86.7	95.5	97.3	98.4	102.0
Multifactor productivity	72.0	85.3	98.0	101.6	98.6	99.2	105.0	112.1	116.4	119.5	123.6
Output	52.5	78.6	96.3	106.0	103.2	98.4	104.7	117.5	122.0	124.7	130.1
Inputs:											
Hours of all persons	84.4	97.3	103.1	104.4	101.7	92.9	93.5	99.5	98.7	97.7	98.6
Capital services	51.0	79.3	86.0	103.9	113.4	120.5	120.8	123.0	125.4	126.8	127.6
Combined units of labor and capital inputs	72.9	92.1	98.3	104.2	104.6	99.2	99.7	104.8	104.8	104.4	105.3
Capital per hour of all persons	60.4	81.5	83.4	99.5	111.5	129.8	129.3	123.7	127.1	129.8	129.4

- Data not available.

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

(1977 = 100)

Item	1960	1970	1973	1978	1980	1982	1983	1984	1985	1986	1987	1988	1989
Business:													
Output per hour of all persons	66.1	87.6	95.2	100.9	99.4	100.2	102.6	105.2	107.3	109.8	111.1	113.0	114.2
Compensation per hour	32.9	57.2	70.3	108.6	131.8	154.9	160.8	167.4	174.8	183.8	191.0	200.2	211.2
Real compensation per hour	67.3	89.4	96.0	100.9	97.0	97.3	97.8	97.6	98.4	101.7	101.9	102.5	103.2
Unit labor costs	49.7	65.3	73.8	107.7	132.6	154.5	156.7	159.1	162.8	167.5	171.9	177.1	184.9
Unit nonlabor payments	46.4	59.4	72.6	106.7	118.4	136.3	146.2	156.4	160.9	162.1	166.3	170.9	175.8
Implicit price deflator	48.5	63.2	73.4	107.3	127.6	148.1	153.0	158.2	162.2	165.6	170.0	174.9	181.7
Nonfarm business:													
Output per hour of all persons	69.5	88.4	95.8	100.9	99.0	99.1	102.0	104.2	105.6	107.7	108.9	111.1	112.1
Compensation per hour	34.5	57.6	70.7	108.6	131.6	154.7	160.8	167.2	174.0	182.9	189.8	198.7	209.5
Real compensation per hour	70.7	90.0	96.4	101.0	96.7	97.1	97.8	97.5	98.0	101.1	101.2	101.8	102.4
Unit labor costs	49.7	65.2	73.8	107.7	132.9	156.1	157.6	160.4	164.9	169.8	174.2	178.8	186.9
Unit nonlabor payments	46.3	60.0	69.4	105.6	118.1	136.1	148.1	156.3	161.9	163.3	167.7	172.2	176.5
Implicit price deflator	48.5	63.4	72.3	107.0	127.8	149.2	154.3	159.0	163.8	167.6	172.0	176.5	183.3
Nonfinancial corporations:													
Output per hour of all employees	71.9	90.2	96.8	100.7	99.3	100.2	103.0	105.5	107.2	109.6	112.1	114.7	114.8
Compensation per hour	36.1	58.6	71.0	108.5	131.4	154.1	159.1	165.0	171.6	179.9	186.1	194.1	204.0
Real compensation per hour	74.0	91.6	96.9	100.8	96.6	96.8	96.8	96.3	96.7	99.5	99.3	99.4	99.7
Total unit costs	49.4	64.8	72.7	107.3	133.4	159.5	159.5	160.8	164.1	168.5	171.2	174.6	183.8
Unit labor costs	50.2	65.0	73.4	107.8	132.3	153.8	154.5	156.5	160.2	164.1	166.1	169.3	177.8
Unit nonlabor costs	47.0	64.2	70.7	105.7	136.7	176.4	174.3	173.6	175.8	181.7	186.4	190.3	201.7
Unit profits	59.8	52.3	65.6	102.0	85.2	78.5	110.9	136.5	133.0	123.1	123.0	128.8	113.9
Unit nonlabor payments	51.5	60.1	68.9	104.4	118.6	142.1	152.1	160.6	160.8	161.2	164.2	168.8	170.9
Implicit price deflator	50.7	63.3	71.9	106.6	127.6	149.8	153.7	157.9	160.4	163.1	165.4	169.1	175.5
Manufacturing:													
Output per hour of all persons	60.7	80.2	92.6	101.6	101.7	106.6	112.2	118.2	123.5	128.2	132.9	136.0	138.7
Compensation per hour	35.6	57.0	68.2	108.3	132.8	158.7	162.7	168.1	176.3	184.3	189.2	196.0	204.3
Real compensation per hour	73.0	89.0	93.1	100.6	97.7	99.6	99.0	98.1	99.3	101.9	100.9	100.4	99.9
Unit labor costs	58.7	71.0	73.7	106.6	130.6	148.8	145.1	142.3	142.7	143.8	142.3	144.1	147.3
Unit nonlabor payments	60.0	64.1	70.8	101.8	97.6	113.7	128.3	138.5	130.3	135.2	137.6	-	-
Implicit price deflator	59.1	69.0	72.8	105.2	121.0	138.6	140.2	141.2	139.1	141.3	141.0	-	-

- Data not available.

47. Continued—Annual productivity indexes for selected industries

(1977 = 100)

Industry	SIC	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988
Construction machinery and equipment	3531	83.4	93.9	97.4	96.1	88.9	88.2	102.6	104.1	107.1	100.8	101.6
Oilfield machinery and equipment	3533	86.4	107.9	104.0	104.7	98.4	91.8	87.5	79.9	73.2	75.6	72.0
Machine tools	3541,42	91.7	103.0	98.8	96.5	88.0	83.0	93.6	96.7	97.7	110.8	106.0
Metal-cutting machine tools	3541	89.5	102.9	100.6	98.9	89.2	81.1	93.3	96.4	97.6	112.4	95.1
Metal-forming machine tools	3542	98.5	104.0	93.5	89.4	85.0	87.6	93.7	96.6	97.1	105.9	127.4
Pumps and compressors	3561,63	85.8	91.4	100.2	102.4	95.9	100.2	106.1	106.8	108.3	115.4	-
Ball and roller bearings	3562	85.5	97.5	95.4	94.3	83.3	86.3	94.4	92.1	95.6	103.6	106.3
Refrigeration and heating equipment	3585	88.4	89.9	93.8	99.4	100.1	100.9	105.5	103.7	101.5	107.9	-
Carburetors, pistons, rings, and valves	3592	-	100.1	90.3	91.7	92.0	99.6	110.3	114.0	111.1	118.8	-
Transformers	3612	89.1	89.3	110.6	106.9	99.6	99.1	97.6	99.3	100.4	101.5	103.1
Switchgear and switchboard apparatus	3613	83.3	93.4	103.2	99.5	101.3	106.1	107.4	110.6	110.7	107.9	112.8
Motors and generators	3621	87.8	93.0	96.7	100.4	102.4	104.3	107.9	110.5	112.3	119.2	117.4
Major household appliances	3631,32,33,39	70.2	93.6	105.8	107.6	108.6	117.6	123.6	127.2	134.1	137.2	138.9
Household cooking equipment	3631	68.7	97.8	103.9	105.7	112.6	120.8	131.9	135.6	158.4	168.5	170.9
Household refrigerators and freezers	3632	71.7	94.5	114.4	117.4	116.1	127.1	127.5	136.8	133.5	129.0	131.2
Household laundry equipment	3633	70.7	93.6	102.1	103.9	105.4	112.2	117.5	118.2	123.1	125.3	129.8
Household appliances, not elsewhere classified	3639	70.4	88.8	99.1	100.4	94.7	103.7	109.8	110.0	113.1	120.1	117.7
Electric lamps	3641	88.3	96.4	103.2	106.9	108.4	124.8	131.9	126.9	131.1	144.5	150.4
Lighting fixtures	3645,46,47,48	78.1	89.2	93.3	88.7	91.0	96.3	102.2	107.1	113.9	109.9	109.8
Radio and television receiving sets	3651	70.6	90.1	116.9	133.6	163.9	196.1	236.9	249.8	278.1	257.7	258.5
Semiconductors and related devices	3674	-	56.0	149.4	171.6	197.9	211.5	229.2	206.4	215.6	292.2	318.2
Motor vehicles and equipment	371	70.5	87.7	90.8	93.1	96.9	109.6	115.7	121.2	121.7	129.1	133.8
Instruments to measure electricity	3825	-	95.9	108.4	111.9	119.2	121.8	133.7	130.4	122.2	132.2	-
Photographic equipment and supplies	3861	-	-	108.2	104.8	103.0	123.5	122.2	127.9	133.8	138.7	-
Railroad transportation, revenue traffic	401 Class I	77.7	89.5	107.3	111.5	115.8	141.9	152.9	161.7	178.1	206.4	226.5
Railroad transportation, car-miles	401 Class I	89.1	98.3	107.9	107.6	110.1	128.9	137.7	138.9	148.2	167.5	179.4
Class 1 bus carriers	411,13,14 pts.	107.3	97.0	100.9	90.7	98.8	95.4	90.9	87.4	86.8	90.6	-
Intercity trucking	4213 pt.	83.5	89.2	107.7	116.3	108.0	130.7	135.1	130.2	134.5	138.9	-
Intercity trucking, general freight	4213 pt.	76.8	88.4	107.5	117.2	107.8	136.0	137.6	131.7	140.9	144.9	-
Air transportation	4511,4521 pt.	71.4	87.6	106.2	104.9	114.9	126.7	131.7	136.3	137.9	146.1	140.8
Petroleum pipelines	4612,13	79.5	95.7	93.0	86.0	89.2	94.3	104.5	104.9	107.0	104.9	110.7
Telephone communications	4811	62.1	85.9	118.1	124.4	129.1	145.1	143.0	149.8	161.3	165.9	176.7
Gas and electric utilities	491,92,93	83.1	94.7	96.2	94.4	89.3	88.4	91.6	90.9	90.6	93.5	97.9
Electric utilities	491,493 pt.	77.1	92.9	94.0	93.0	89.5	90.9	94.4	93.5	95.8	100.7	105.6
Gas utilities	492,493 pt.	102.1	101.4	102.1	98.1	89.0	81.1	83.6	82.1	74.1	71.6	74.7
Scrap and waste materials	5093	-	-	108.2	104.8	103.0	123.5	122.2	127.9	133.8	138.7	-
Hardware stores	5251	-	97.8	111.6	107.5	109.2	111.4	121.1	124.6	137.4	140.3	150.6
Department stores	5311	77.5	89.7	103.8	109.9	112.4	119.5	126.6	129.2	135.3	138.5	141.7
Variety stores	5331	124.9	122.5	107.8	118.8	113.0	121.5	126.8	118.5	101.1	97.2	93.8
Retail food stores	54	107.0	98.8	100.3	97.1	95.5	95.2	95.6	95.8	93.7	92.7	91.8
Grocery stores	5411	-	98.6	100.1	97.9	97.9	98.6	100.1	98.4	96.3	93.8	92.1
Retail bakeries	546	-	93.1	102.5	97.9	90.6	88.4	78.9	69.8	73.6	78.9	76.9
Franchised new car dealers	5511	86.1	95.0	99.6	98.1	100.4	109.4	110.4	109.7	110.7	107.4	111.8
Auto and home supply stores	5531	-	89.9	106.7	109.2	107.2	118.9	118.4	124.7	125.6	134.1	136.6
Gasoline service stations	5541	74.6	85.3	105.1	106.7	111.8	122.5	129.1	134.3	143.9	139.8	141.5
Apparel and accessory stores	56	81.3	105.0	117.9	123.9	126.4	132.9	140.9	146.3	153.5	142.3	141.2
Men's and boys' clothing stores	5611	82.7	102.3	107.1	116.4	116.6	119.5	125.1	131.4	135.0	134.0	133.7
Women's ready-to-wear stores	5621	76.5	106.5	117.9	127.8	142.0	151.3	158.3	162.8	176.4	166.1	162.8
Family clothing stores	5651	75.2	109.5	123.7	132.4	140.7	149.2	145.8	138.5	136.0	128.8	128.0
Shoe stores	5661	95.3	95.1	110.3	114.2	110.2	107.9	110.9	118.7	127.5	119.9	118.2
Furniture, furnishings, and equipment stores	57	80.1	91.9	107.4	112.6	109.2	118.4	129.4	133.5	144.4	146.8	154.4
Furniture and home furnishings stores	571	79.3	90.1	98.0	101.2	97.6	104.1	113.1	108.7	115.5	113.0	111.0
Appliance, radio, television, and music stores	572,73	81.2	94.8	124.0	132.4	128.7	143.4	158.5	180.0	198.9	211.9	243.2
Household appliance stores	572	-	89.5	109.9	114.9	102.0	111.8	139.2	154.6	177.2	172.1	177.2
Radio, television, and music stores	573	-	98.0	131.5	140.5	142.4	159.5	165.9	190.2	206.5	226.7	269.5
Eating and drinking places	58	100.6	100.8	99.8	97.3	96.9	95.3	91.1	87.9	89.7	90.7	91.3
Drug and proprietary stores	5912	83.4	94.2	107.0	107.6	107.9	110.9	105.7	105.5	104.6	103.8	105.3
Liquor stores	5921	-	96.3	102.2	104.0	108.1	101.6	98.7	107.1	98.0	91.6	88.5
Commercial banking	602	85.5	90.0	92.7	90.5	93.2	101.3	104.3	109.7	111.8	116.5	-
Hotels, motels, and tourist courts	7011	85.1	89.7	95.0	91.6	88.8	95.4	102.1	97.5	92.8	88.0	-
Laundry and cleaning services	721	94.7	96.6	91.0	88.4	90.6	90.4	92.3	87.3	85.0	84.1	83.8
Beauty and barber shops	7231,41	-	98.7	102.9	109.2	108.3	114.0	103.9	98.6	97.3	99.1	96.0
Beauty shops	7231	-	100.1	106.2	114.7	113.1	120.1	112.3	104.1	98.8	100.1	96.2
Automotive repair shops	753	-	102.0	95.9	93.3	87.4	86.1	88.3	96.1	93.2	96.1	101.1

- Data not available.

48. Unemployment rates, approximating U.S. concepts, in nine countries, quarterly data seasonally adjusted

Country	Annual average		1988		1989				1990
	1988	1989	III	IV	I	II	III	IV	I
Total labor force basis									
United States	5.4	5.2	5.4	5.2	5.1	5.2	5.2	5.3	5.2
Canada	7.7	-	7.8	7.7	7.5	7.6	7.3	7.5	-
Australia	7.2	-	6.9	6.8	6.6	6.1	6.0	5.9	-
Japan	2.5	-	2.6	2.4	2.4	2.3	2.3	2.2	-
France	10.0	-	10.1	9.8	9.8	9.8	9.8	9.8	-
Germany	6.2	-	6.2	6.1	5.7	5.6	5.6	5.5	-
Italy ^{1, 2}	7.8	-	7.8	7.7	7.6	7.8	7.7	7.5	-
Sweden	1.6	-	1.6	1.4	1.4	1.3	1.3	1.4	-
United Kingdom	8.2	-	8.0	7.5	7.0	6.5	6.2	5.8	-
Civilian labor force basis									
United States	5.5	5.3	5.5	5.3	5.2	5.3	5.3	5.3	5.2
Canada	7.8	-	7.8	7.7	7.6	7.6	7.4	7.6	-
Australia	7.2	-	7.0	6.8	6.6	6.1	6.0	5.9	-
Japan	2.5	-	2.6	2.4	2.4	2.3	2.3	2.2	-
France	10.4	-	10.3	10.1	10.0	10.0	10.0	10.0	-
Germany	6.3	-	6.3	6.2	5.8	5.7	5.7	5.6	-
Italy ^{1, 2}	7.9	-	7.9	7.8	7.8	8.0	7.8	7.7	-
Sweden	1.6	-	1.6	1.4	1.4	1.3	1.3	1.4	-
United Kingdom	8.3	-	8.0	7.6	7.0	6.6	6.2	5.9	-

¹ Quarterly rates are for the first month of the quarter.
² Many Italians reported as unemployed did not actively seek work in the past 30 days, and they have been excluded for comparability with U.S. concepts. Inclusion of such persons would about double the Italian unemployment rate in 1985 and earlier years and increase it to 11-12 percent for 1986 onward.

- Data not available.
 NOTE: Quarterly figures for France, Germany, and the United Kingdom are calculated by applying annual adjustment factors to current published data and therefore should be viewed as less precise indicators of unemployment under U.S. concepts than the annual figures.

49. Annual data: Employment status of the civilian working-age population, approximating U.S. concepts, 10 countries

(Numbers in thousands)

Employment status and country	1980	1981	1982	1983	1984	1985	1986	1987	1988
Labor force									
United States	106,940	108,670	110,204	111,550	113,544	115,461	117,834	119,865	121,669
Canada	11,573	11,899	11,926	12,109	12,316	12,532	12,746	13,011	13,275
Australia	6,693	6,810	6,910	6,997	7,135	7,300	7,588	7,758	7,974
Japan	55,740	56,320	56,980	58,110	58,480	58,820	59,410	60,050	60,860
France	22,800	22,950	23,160	23,140	23,300	23,360	23,440	23,540	23,580
Germany	26,520	26,650	26,700	26,650	26,760	26,970	27,090	28,360	28,540
Italy	21,120	21,320	21,410	21,590	21,670	21,800	22,290	22,350	22,660
Netherlands	5,860	6,080	6,140	6,170	6,260	6,280	6,370	6,490	6,540
Sweden	4,312	4,327	4,350	4,369	4,385	4,418	4,443	4,480	4,530
United Kingdom	26,520	26,590	26,720	26,750	27,170	27,370	27,540	27,860	28,110
Participation rate¹									
United States	63.8	63.9	64.0	64.0	64.4	64.8	65.3	65.6	65.9
Canada	64.1	64.8	64.1	64.4	64.8	65.3	65.7	66.2	66.7
Australia	62.1	61.9	61.7	61.4	61.5	61.6	62.8	63.0	63.3
Japan	62.6	62.6	62.7	63.1	62.7	62.3	62.1	61.9	61.9
France	57.2	57.1	57.1	56.6	56.6	56.3	56.1	55.8	55.6
Germany	53.2	52.9	52.6	52.3	52.4	52.6	52.6	55.0	55.2
Italy	48.2	48.3	47.7	47.5	47.3	47.2	47.8	47.9	48.4
Netherlands	55.3	56.6	56.5	56.1	56.2	55.7	55.9	56.3	56.2
Sweden	66.9	66.8	66.8	66.7	66.6	66.9	67.0	67.3	67.8
United Kingdom	62.5	62.2	62.2	61.9	62.5	62.6	62.6	63.0	63.3
Employed									
United States	99,303	100,397	99,526	100,834	105,005	107,150	109,597	112,440	114,968
Canada	10,708	11,001	10,618	10,675	10,932	11,221	11,531	11,861	12,244
Australia	6,284	6,416	6,415	6,300	6,494	6,697	6,974	7,129	7,398
Japan	54,600	55,060	55,620	56,550	56,870	57,260	57,740	58,320	59,310
France	21,330	21,200	21,240	21,170	20,980	20,920	20,950	21,010	21,140
Germany	25,750	25,560	25,140	24,750	24,790	24,960	25,230	26,550	26,730
Italy	20,200	20,280	20,250	20,320	20,390	20,490	20,610	20,590	20,870
Netherlands	5,510	5,540	5,510	5,410	5,490	5,640	5,730	5,840	5,920
Sweden	4,226	4,219	4,213	4,218	4,249	4,293	4,326	4,396	4,458
United Kingdom	24,670	23,800	23,720	23,610	23,990	24,310	24,460	25,010	25,780
Employment-population ratio²									
United States	59.2	59.0	57.8	57.9	59.5	60.1	60.7	61.5	62.3
Canada	59.3	59.9	57.1	56.8	57.5	58.5	59.4	60.4	61.6
Australia	58.3	58.4	57.3	55.3	56.0	56.5	57.7	57.9	58.7
Japan	61.3	61.2	61.2	61.4	61.0	60.6	60.4	60.1	60.4
France	53.5	52.8	52.3	51.8	51.0	50.4	50.2	49.8	49.9
Germany	51.7	50.8	49.6	48.6	48.5	48.7	49.0	51.5	51.7
Italy	46.1	45.9	45.2	44.7	44.5	44.4	44.2	44.1	44.6
Netherlands	52.0	51.6	50.7	49.2	49.3	50.0	50.2	50.6	50.9
Sweden	65.6	65.1	64.7	64.4	64.5	65.0	65.2	66.0	66.7
United Kingdom	58.1	55.7	55.2	54.7	55.2	55.6	55.6	56.6	58.0
Unemployed									
United States	7,637	8,273	10,678	10,717	8,539	8,312	8,237	7,425	6,701
Canada	865	898	1,308	1,434	1,384	1,311	1,215	1,150	1,031
Australia	409	394	495	697	641	603	613	629	576
Japan	1,140	1,260	1,360	1,560	1,610	1,560	1,670	1,730	1,550
France	1,470	1,750	1,920	1,970	2,320	2,440	2,490	2,530	2,440
Germany	770	1,090	1,560	1,900	1,970	2,010	1,860	1,800	1,810
Italy	920	1,040	1,160	1,270	1,280	1,310	1,680	1,760	1,790
Netherlands	350	540	630	760	770	640	640	650	620
Sweden	86	108	137	151	136	125	117	84	72
United Kingdom	1,850	2,790	3,000	3,140	3,180	3,060	3,080	2,850	2,330
Unemployment rate									
United States	7.1	7.6	9.7	9.6	7.5	7.2	7.0	6.2	5.5
Canada	7.5	7.5	11.0	11.8	11.2	10.5	9.5	8.8	7.8
Australia	6.1	5.8	7.2	10.0	9.0	8.3	8.1	8.1	7.2
Japan	2.0	2.2	2.4	2.7	2.8	2.6	2.8	2.9	2.5
France	6.4	7.6	8.3	8.5	10.0	10.4	10.6	10.8	10.4
Germany	2.9	4.1	5.8	7.1	7.4	7.5	6.9	6.4	6.3
Italy	4.4	4.9	5.4	5.9	5.9	6.0	7.5	7.9	7.9
Netherlands	6.0	8.9	10.3	12.3	12.3	10.2	10.0	10.0	9.5
Sweden	2.0	2.5	3.1	-	3.1	2.8	2.6	1.9	1.6
United Kingdom	7.0	10.5	11.2	11.7	11.7	11.2	11.2	10.2	8.3

¹ Labor force as a percent of the civilian working-age population.

² Employment as a percent of the civilian working-age population.

- Data not available.

NOTE: See "Notes on the data" for information on breaks in series for Germany, Italy, the Netherlands, and Sweden.

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

Industry and type of case ¹	Incidence rates per 100 full-time workers ²								
	1980	1981	1982	1983	1984	1985	1986	1987	1988
PRIVATE SECTOR³									
Total cases	8.7	8.3	7.7	7.6	8.0	7.9	7.9	8.3	8.6
Lost workday cases	4.0	3.8	3.5	3.4	3.7	3.6	3.6	3.8	4.0
Lost workdays	65.2	61.7	58.7	58.5	63.4	64.9	65.8	69.9	76.1
Agriculture, forestry, and fishing³									
Total cases	11.9	12.3	11.8	11.9	12.0	11.4	11.2	11.2	10.9
Lost workday cases	5.8	5.9	5.9	6.1	6.1	5.7	5.6	5.7	5.6
Lost workdays	82.7	82.8	86.0	90.8	90.7	91.3	93.6	94.1	101.8
Mining									
Total cases	11.2	11.6	10.5	8.4	9.7	8.4	7.4	8.5	8.8
Lost workday cases	6.5	6.2	5.4	4.5	5.3	4.8	4.1	4.9	5.1
Lost workdays	163.6	146.4	137.3	125.1	160.2	145.3	125.9	144.0	152.1
Construction									
Total cases	15.7	15.1	14.6	14.8	15.5	15.2	15.2	14.7	14.6
Lost workday cases	6.5	6.3	6.0	6.3	6.9	6.8	6.9	6.8	6.8
Lost workdays	117.0	113.1	115.7	118.2	128.1	128.9	134.5	135.8	142.2
General building contractors:									
Total cases	15.5	15.1	14.1	14.4	15.4	15.2	14.9	14.2	14.0
Lost workday cases	6.5	6.1	5.9	6.2	6.9	6.8	6.6	6.5	6.4
Lost workdays	113.0	107.1	112.0	113.0	121.3	120.4	122.7	134.0	132.2
Heavy construction contractors:									
Total cases	16.3	14.9	15.1	15.4	14.9	14.5	14.7	14.5	15.1
Lost workday cases	6.3	6.0	5.8	6.2	6.4	6.3	6.3	6.4	7.0
Lost workdays	117.6	106.0	113.1	122.4	131.7	127.3	132.9	139.1	162.3
Special trade contractors:									
Total cases	15.5	15.2	14.7	14.8	15.8	15.4	15.6	15.0	14.7
Lost workday cases	6.7	6.6	6.2	6.4	7.1	7.0	7.2	7.1	7.0
Lost workdays	118.9	119.3	118.6	119.0	130.1	133.3	140.4	135.7	141.1
Manufacturing									
Total cases	12.2	11.5	10.2	10.0	10.6	10.4	10.6	11.9	13.1
Lost workday cases	5.4	5.1	4.4	4.3	4.7	4.6	4.7	5.3	5.7
Lost workdays	86.7	82.0	75.0	73.5	77.9	80.2	85.2	95.5	107.4
Durable goods									
Lumber and wood products:									
Total cases	18.6	17.6	16.9	18.3	19.6	18.5	18.9	18.9	19.5
Lost workday cases	9.5	9.0	8.3	9.2	9.9	9.3	9.7	9.6	10.0
Lost workdays	171.8	158.4	153.3	163.5	172.0	171.4	177.2	176.5	189.1
Furniture and fixtures:									
Total cases	16.0	15.1	13.9	14.1	15.3	15.0	15.2	15.4	16.6
Lost workday cases	6.6	6.2	5.5	5.7	6.4	6.3	6.3	6.7	7.3
Lost workdays	97.6	91.9	85.6	83.0	101.5	100.4	103.0	103.6	115.7
Stone, clay, and glass products:									
Total cases	15.0	14.1	13.0	13.1	13.6	13.9	13.6	14.9	16.0
Lost workday cases	7.1	6.9	6.1	6.0	6.6	6.7	6.5	7.1	7.5
Lost workdays	128.1	122.2	112.2	112.0	120.8	127.8	126.0	135.8	141.0
Primary metal industries:									
Total cases	15.2	14.4	12.4	12.4	13.3	12.6	13.6	17.0	19.4
Lost workday cases	7.1	6.7	5.4	5.4	6.1	5.7	6.1	7.4	8.2
Lost workdays	128.3	121.3	101.6	103.4	115.3	113.8	125.5	145.8	161.3
Fabricated metal products:									
Total cases	18.5	17.5	15.3	15.1	16.1	16.3	16.0	17.0	18.8
Lost workday cases	8.0	7.5	6.4	6.1	6.7	6.9	6.8	7.2	8.0
Lost workdays	118.4	109.9	102.5	96.5	104.9	110.1	115.5	121.9	138.8
Machinery, except electrical:									
Total cases	13.7	12.9	10.7	9.8	10.7	10.8	10.7	11.3	12.1
Lost workday cases	5.5	5.1	4.2	3.6	4.1	4.2	4.2	4.4	4.7
Lost workdays	81.3	74.9	66.0	58.1	65.8	69.3	72.0	72.7	82.8
Electric and electronic equipment:									
Total cases	8.0	7.4	6.5	6.3	6.8	6.4	6.4	7.2	8.0
Lost workday cases	3.3	3.1	2.7	2.6	2.8	2.7	2.7	3.1	3.3
Lost workdays	51.8	48.4	42.2	41.4	45.0	45.7	49.8	55.9	64.6
Transportation equipment:									
Total cases	10.6	9.8	9.2	8.4	9.3	9.0	9.6	13.5	17.7
Lost workday cases	4.9	4.6	4.0	3.6	4.2	3.9	4.1	5.7	6.6
Lost workdays	82.4	78.1	72.2	64.5	68.8	71.6	79.1	105.7	134.2
Instruments and related products:									
Total cases	6.8	6.5	5.6	5.2	5.4	5.2	5.3	5.8	6.1
Lost workday cases	2.7	2.7	2.3	2.1	2.2	2.2	2.3	2.4	2.6
Lost workdays	41.8	39.2	37.0	35.6	37.5	37.9	42.2	43.9	51.5
Miscellaneous manufacturing industries:									
Total cases	10.9	10.7	9.9	9.9	10.5	9.7	10.2	10.7	11.3
Lost workday cases	4.4	4.4	4.1	4.0	4.3	4.2	4.3	4.6	5.1
Lost workdays	67.9	68.3	69.9	66.3	70.2	73.2	70.9	81.5	91.0
Nondurable goods									
Food and kindred products:									
Total cases	18.7	17.8	16.7	16.5	16.7	16.7	16.5	17.7	18.5
Lost workday cases	9.0	8.6	8.0	7.9	8.1	8.1	8.0	8.6	9.2
Lost workdays	136.8	130.7	129.3	131.2	131.6	138.0	137.8	153.7	169.7

See footnotes at end of table.

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

Industry and type of case ¹	Incidence rates per 100 full-time workers ²									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	
Tobacco manufacturing:										
Total cases	8.1	8.2	7.2	6.5	7.7	7.3	6.7	8.6	9.3	
Lost workday cases	3.8	3.9	3.2	3.0	3.2	3.0	2.5	2.5	2.9	
Lost workdays	45.8	56.8	44.6	42.8	51.7	51.7	45.6	46.4	53.0	
Textile mill products:										
Total cases	9.1	8.8	7.6	7.4	8.0	7.5	7.8	9.0	9.6	
Lost workday cases	3.3	3.2	2.8	2.8	3.0	3.0	3.1	3.6	4.0	
Lost workdays	62.8	59.2	53.8	51.4	54.0	57.4	59.3	65.9	78.8	
Apparel and other textile products:										
Total cases	6.4	6.3	6.0	6.4	6.7	6.7	6.7	7.4	8.1	
Lost workday cases	2.2	2.2	2.1	2.4	2.5	2.6	2.7	3.1	3.5	
Lost workdays	34.9	35.0	36.4	40.6	40.9	44.1	49.4	59.5	68.2	
Paper and allied products:										
Total cases	12.7	11.6	10.6	10.0	10.4	10.2	10.5	12.8	13.1	
Lost workday cases	5.8	5.4	4.9	4.5	4.7	4.7	4.7	5.8	5.9	
Lost workdays	112.3	103.6	99.1	90.3	93.8	94.6	99.5	122.3	124.3	
Printing and publishing:										
Total cases	6.9	6.7	6.6	6.6	6.5	6.3	6.5	6.7	6.6	
Lost workday cases	3.1	3.0	2.8	2.9	2.9	2.9	2.9	3.1	3.2	
Lost workdays	46.5	47.4	45.7	44.6	46.0	49.2	50.8	55.1	59.8	
Chemicals and allied products:										
Total cases	6.8	6.6	5.7	5.5	5.3	5.1	6.3	7.0	7.0	
Lost workday cases	3.1	3.0	2.5	2.5	2.4	2.3	2.7	3.1	3.3	
Lost workdays	50.3	48.1	39.4	42.3	40.8	38.8	49.4	58.8	59.0	
Petroleum and coal products:										
Total cases	7.2	6.7	5.3	5.5	5.1	5.1	7.1	7.3	7.0	
Lost workday cases	3.5	2.9	2.5	2.4	2.4	2.4	3.2	3.1	3.2	
Lost workdays	59.1	51.2	46.4	46.8	53.5	49.9	67.5	65.9	68.4	
Rubber and miscellaneous plastics products:										
Total cases	15.5	14.6	12.7	13.0	13.6	13.4	14.0	15.9	16.3	
Lost workday cases	7.4	7.2	6.0	6.2	6.4	6.3	6.6	7.6	8.1	
Lost workdays	118.6	117.4	100.9	101.4	104.3	107.4	118.2	130.8	142.9	
Leather and leather products:										
Total cases	11.7	11.5	9.9	10.0	10.5	10.3	10.5	12.4	11.4	
Lost workday cases	5.0	5.1	4.5	4.4	4.7	4.6	4.8	5.8	5.6	
Lost workdays	82.7	82.6	86.5	87.3	94.4	88.3	83.4	114.5	128.2	
Transportation and public utilities										
Total cases	9.4	9.0	8.5	8.2	8.8	8.6	8.2	8.4	8.9	
Lost workday cases	5.5	5.3	4.9	4.7	5.2	5.0	4.8	4.9	5.1	
Lost workdays	104.5	100.6	96.7	94.9	105.1	107.1	102.1	108.1	118.6	
Wholesale and retail trade										
Total cases	7.4	7.3	7.2	7.2	7.4	7.4	7.7	7.7	7.8	
Lost workday cases	3.2	3.1	3.1	3.1	3.3	3.2	3.3	3.4	3.5	
Lost workdays	48.7	45.3	45.5	47.8	50.5	50.7	54.0	56.1	60.9	
Wholesale trade:										
Total cases	8.2	7.7	7.1	7.0	7.2	7.2	7.2	7.4	7.6	
Lost workday cases	3.9	3.6	3.4	3.2	3.5	3.5	3.6	3.7	3.8	
Lost workdays	58.2	54.7	52.1	50.6	55.5	59.8	62.5	64.0	69.2	
Retail trade:										
Total cases	7.1	7.1	7.2	7.3	7.5	7.5	7.8	7.8	7.9	
Lost workday cases	2.9	2.9	2.9	3.0	3.2	3.1	3.2	3.3	3.4	
Lost workdays	44.5	41.1	42.6	46.7	48.4	47.0	50.5	52.9	57.6	
Finance, insurance, and real estate										
Total cases	2.0	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0	
Lost workday cases .....	.8	.8	.9	.9	.9	.9	.9	.9	.9
Lost workdays	12.2	11.6	13.2	12.8	13.6	15.4	17.1	14.3	17.2	
Services										
Total cases	5.2	5.0	4.9	5.1	5.2	5.4	5.3	5.5	5.4	
Lost workday cases	2.3	2.3	2.3	2.4	2.5	2.6	2.5	2.7	2.6	
Lost workdays	35.8	35.9	35.8	37.0	41.1	45.4	43.0	45.8	47.7	

¹ Total cases include fatalities.

² The incidence rates represent the number of injuries and illnesses or lost workdays per 100 full-time workers and were calculated as: (N/EH) X 200,000, where:

N = number of injuries and illnesses or lost workdays.

EH = total hours worked by all employees during calendar year.
200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year.)

³ Excludes farms with fewer than 11 employees since 1976.

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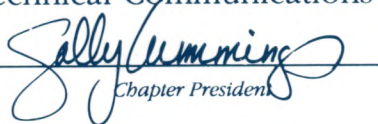
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