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U.S. DEPARTMENT OF LABOR
Ann McLaughlin, *Secretary*

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

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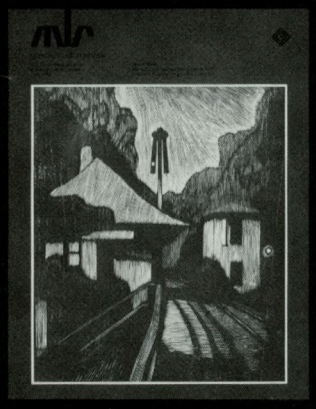

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Henry Lowenstern, Editor-in-Chief
Robert W. Fisher, Executive Editor

Labor Month In Review

COMPETITION AND COMPETENCE. Commissioner of Labor Statistics Janet L. Norwood discussed changes needed to help the United States regain its competitive edge in the world economy. Here are excerpts from her remarks, May 15, in St. Louis, to the American Forum on Education and International Competence.

Productivity growth. In many ways, today's American work force is the best and most productive in history. More than 1 in 4 of our adult workers (25 to 64 years old) has a college degree. A decade ago, it was 1 in 5. In 1987, there was more than $33,000 of gross domestic product for every worker; in 1960 the figure—measured in dollars of comparable value—was $24,000. And output per hour of all persons has improved in recent years.

If these numbers are so good, why do we express so much concern with our competitiveness and competence? How do we compare with the other nations of a dynamic and increasingly interdependent world? How do we go about preparing our workers to be competitive in such an international economy?

There have been at least three distinct stages of international productivity competition in manufacturing since 1960. First, from 1960 to 1973, there was a tremendous increase in productivity as the major European and Japanese economies, by then fully recovered from the devastation of the Second World War, posted annual rates of productivity growth averaging 6.6 percent and ranging as high as the 10.3-percent yearly pace in Japan. In that era, the 2.9-percent annual rate of increase in U.S. factory productivity looked rather puny.

Second, all of these industrial economies began to record a dramatic slowdown in productivity growth. The relative position of the United States continued to slip, however, and the competitiveness issue was promoted from a problem to a crisis. Third, after the recessions of the 1980's ran their course, our stronger recovery was reflected in a significant improvement in productivity performance. During this third phase, U.S. productivity gains have been near the average of our overseas competitors. In fact, in 1985, only Japan posted a larger gain in manufacturing efficiency, and in 1986, the United States was at the top of the heap.

The competitive position of the United States has been further boosted by restraint in wage gains and the depreciation of the dollar. Relatively slow wage growth has been reflected in lower unit labor costs for manufactured goods. The relatively cheap dollar has made our exports less expensive to foreign buyers and, conversely, raised the dollar price of our imports from them.

Over the course of the past 27 years, then, the comparative productivity of our factories has careened from problem to crisis to, possibly, a renewed position of leadership. It is plain that, for better or worse, the international economy is a dynamic forum of competition; no lead seems to last forever.

Educational needs. How can we continue to improve our competitive position? Our analysis of the work force demand and supply projections stresses that education will, as always, be a key to job market success, but probably more so in the future than in the past. As growth rates in professional and managerial occupations continue to be strong, and the number of youth entering the labor market declines, those workers with college degrees should be in a stronger competitive position. At the other extreme, however, opportunities for those without a high school education will be quite limited in both quality and quantity. Far fewer poorly educated youth will have the opportunity to obtain factory jobs. Many lower paying service and retail trade jobs will still be created, but opportunities for advancement will be quite limited, particularly for those without competence in language and math skills. This rising skill requirement will pose a particular challenge to our society—that is, to find ways for those who have had relatively poor records of academic success to raise their educational levels and compete for the better jobs.

If our new jobs are performed competently, we will create a healthy U.S. economy. If they are done in a slipshod manner, by persons with second rate education and training, some of the worst-case scenarios of lost competitiveness will be more likely to come true. We have found out the hard way that American leadership in the world economy is no longer a foregone conclusion. From this point on, our businesses and our workers, together, will have to *earn* our position in the international marketplace. □

Rising export and import prices in 1987 reversed the trend of recent years

The falling value of the dollar played a large role in export and import price increases; exports were also affected by rising commodity prices and imports, by rising fuel prices

ROBERT BLANCHFIELD AND WILLIAM MARSTELLER

In 1987, both U.S. export and import prices broke the downward trend of recent years. Export prices rose 6.9 percent, the first increase recorded in the all-export price index which was begun in 1983. (See table 1.) Import prices turned sharply upward, rising 14.8 percent after falling every previous year since the all-import index was initiated in 1982.[1] (See table 2.)

The rise in export prices reflected the strong upward trend in commodity prices. Food and crude materials prices rose substantially in 1987 compared to previous years. (See chart 1.) For example, exported food prices were up 9 percent last year after falling 13.2 percent in 1986. Similarly, those for crude materials rose 20.7 percent in 1987 following a 2.5-percent increase in 1986. On the other hand, 1987 price increases for manufactured goods were only marginally changed from those posted in 1986. Price changes for intermediate goods were mixed.

Last year's 14.8-percent increase in the all-import index was a significant upturn from the 8.7-percent drop in 1986; however, when fuels and related products are excluded, the price changes for the last 2 years were very similar, 9.6 and 8.4 percent, respectively. This is indicative of the large influence that fuels exert on the all-import index. Imported fuel prices rose 43.8 percent in 1987 after declining 51.5 percent in 1986.

Robert Blanchfield and William Marsteller are economists in the Division of International Prices, Bureau of Labor Statistics. Susan Chen, an economist in the same division, prepared the charts.

Falling dollar and the trade balance

The falling value of the dollar continued to play a large role in the upward price movements for both exports and imports. For a better measure of the effect of the dollar's movement on the prices of imports and exports in foreign currency terms, the Bureau of Labor Statistics developed new indexes. They indicate that, while prices of nonfuel imports have risen 22.4 percent in dollar terms, the trade-weighted value of the dollar has fallen 32.8 percent since March 1985. (See chart 2.) Nonfuel import prices in foreign currency terms declined 17.7 percent during the same period. These offsetting price movements suggest that foreign exporters have been willing to absorb a substantial portion of the drop in the trading value of the dollar. In addition, the moderate increase in export dollar prices since the first quarter of 1985 suggests that U.S. exporters are using currency changes to improve their competitive position. As a result of a modest export price increase in dollar terms of 5.4 percent, and a 27.2-percent drop in the dollar's trade-weighted value, foreign currency prices of U.S. exports have fallen 23.2 percent since the first quarter of 1985.

The dollar began its fall in February of 1985. In September of that year, the decline was accelerated when

the Group of Five countries—the United States, Japan, West Germany, Great Britain, and France—agreed to intervene in foreign exchange markets to bring the dollar down further. However, by February of 1987, the dollar had fallen 37.2 percent from its peak,[2] leading to a meeting of the Group of Five countries and Canada and a consensus (the Louvre Accord) to stabilize exchange rates at approximately the levels existing at that time. It was further agreed that, in order to alleviate the large trade imbalances, the United States would strive to reduce its budget deficit, and West Germany and Japan would stimulate their economies.

This program of exchange rate stabilization experienced initial success, but some economic analysts were concerned that the high interest rates necessary to maintain the value of the dollar would lead to an economic slowdown. Although both short-term and long-term interest rates were relatively stable through April 1987, both began an upward trend in subsequent months which continued until the dramatic fall of the stock market on October 19. For example, the rate on 3-month U.S. Treasury bills increased from approximately 5.5 percent in January 1987 to 7 percent in mid-October 1987. The 30-year U.S. constant-maturity rate rose over the period from 7.3 to 10 percent.[3]

Fear of an economic downturn led to an easing of monetary policy and, hence, to lower interest rates. In the 9 weeks following the fall of the stock market, the dollar dropped another 7.6 percent,[4] setting postwar lows in world money markets numerous times.[5] Finally, on December 22, 1987, the Group of Seven (the Group of Five countries plus Canada and Italy), determining that the dollar had fallen far enough, "agreed that either excessive fluctuations of exchange rates, a further decline of the dollar, or a rise in the dollar to an extent that becomes destabilizing . . . could be counterproductive by damaging growth prospects in the world economy."[6]

In addition to the falling dollar, the Nation's persistent trade deficit was once again a major story in U.S. international economic relations in 1987. Although the deficit decreased by 5 percent in constant dollars,[7] in nominal terms it set a new high in 1987 for the fifth consecutive year at $171.2 billion, up from $156.2 billion in 1986. Significant deficits were registered against Japan, $59.8 billion; the so-called Four Tigers (Singapore, Hong Kong, South Korea, and Taiwan), $37.7 billion; Western Europe, $30.2 billion; the Latin American Free Trade Association countries,[8] $14.9 billion; and Canada, $11.7 billion.[9] West Germany ($16.3 billion) accounted for over half of the U.S. deficit with Western Europe, while Mexico and Brazil accounted for $10.3 billion of the deficit with the Latin American Free Trade Association countries. The deficits recorded with the Four Tigers individually were: Singapore, $2.3 billion; Hong Kong, $6.5 billion; South Korea, $9.9 billion; and Taiwan, $19 billion.[10] Chart 3 shows the relative shares of the U.S. trade deficit by region.

Table 1. Changes in Export Price Indexes for selected categories of goods, 1986–87

SITC category	Commodity	Percentage of 1980 trade value	Annual percent change		Quarterly percent change			
			December 1985 to December 1986	December 1986 to December 1987	December 1986 to March 1987	March 1987 to June 1987	June 1987 to September 1987	September 1987 to December 1987
	All commodities[1]	100.000	−0.5	6.9	1.0	2.8	0.3	2.6
0	Food	12.786	−13.2	9.0	−1.7	4.5	−4.6	11.2
04	Grain and grain preparations	8.341	−25.6	11.6	−2.9	5.7	−6.6	16.4
2	Crude materials	10.948	2.5	20.7	2.4	9.5	2.6	4.9
22	Oilseeds	3.024	−1.6	17.0	−4.0	13.6	−6.3	14.5
24	Wood	1.417	5.8	32.8	2.6	5.2	19.0	3.4
25	Pulp and wastepaper	.954	30.7	21.0	9.7	4.3	2.8	2.8
26	Textile fibers	1.813	−5.6	24.1	8.1	15.3	3.7	−4.0
28	Metal ores and metal scrap	2.062	2.5	28.6	1.9	10.3	9.9	4.1
5	Chemicals and related products	9.578	−4.5	17.8	4.8	6.7	1.0	4.3
51	Organic chemicals	2.289	−6.0	29.5	11.3	14.9	−2.0	4.2
56	Fertilizers, manufactured	1.036	−23.7	36.7	9.8	6.6	9.5	6.7
58	Artificial resins, plastics, and cellulose	1.767	.0	27.6	5.2	7.5	5.4	7.0
6	Intermediate manufactured products	10.544	3.6	6.7	1.7	2.3	1.6	1.0
7	Machinery and transport equipment, excluding military and commercial aircraft	35.261	1.3	1.6	.5	.1	.3	.7
74	General industrial machines, parts, n.e.s	4.939	2.1	2.6	1.5	.1	.1	.9
75	Office machines and automatic data processing equipment	3.990	−1.3	−2.8	−2.0	−.1	−.5	−.1
77	Electric machines and equipment	4.738	1.1	3.7	1.4	.3	.2	1.3

[1] This category includes indexes in addition to those shown here. For all of the indexes available in each category, see "U.S. Import and Export Indexes," Release 86–36 (Bureau of Labor Statistics, Jan. 28, 1988).

n.e.s. = not elsewhere specified.

Table 2. Changes in Import Price Indexes for selected categories of goods, 1986–87

SITC category	Commodity	Percentage of 1980 trade value	Annual percent change		Quarterly percent change			
			December 1985 to December 1986	December 1986 to December 1987	December 1986 to March 1987	March 1987 to June 1987	June 1987 to September 1987	September 1987 to December 1987
	All commodities[1]	100.000	-8.7	14.8	6.5	4.0	1.6	2.0
	All commodities, excluding fuels and related products[1]	67.223	8.4	9.6	2.5	2.6	1.3	3.0
3	Fuels and related products	32.776	-51.5	43.8	29.4	10.3	2.9	-2.1
33	Crude petroleum and petroleum products	30.653	-52.7	48.3	31.7	10.6	3.8	-1.9
6	Intermediate manufactured products	13.520	4.5	13.3	2.0	3.7	3.7	3.3
67	Iron and steel	3.127	0.2	17.2	3.2	3.9	3.9	5.1
68	Nonferrous metals	3.123	1.5	24.9	1.0	10.3	7.3	4.5
7	Machinery and transport equipment	25.442	12.0	7.7	3.1	1.8	.2	2.4
72	Machinery specialized for particular industries	1.998	15.3	13.1	5.4	2.0	.0	5.3
74	General industrial machinery and parts, n.e.s	1.645	16.2	13.0	5.8	2.3	-.7	5.1
78	Road vehicles and parts	10.887	13.1	6.4	2.9	1.6	.3	1.5

[1] This category includes indexes in addition to those shown here. For all of the indexes available in each category, see "U.S. Import and Export Indexes," Release 86–36 (Bureau of Labor Statistics, Jan. 28, 1988).

n.e.s. = not elsewhere specified.

A number of explanations have been put forward in recent years for the seemingly contradictory trends of a rising U.S. trade deficit and the falling dollar. They include the *j*-curve effect, the international debt crisis, a larger relative share of trade with the newly industrialized countries whose currencies are pegged to the dollar, and the willingness and ability of foreign exporters to cut profits, costs, or both to limit dollar-denominated price increases.

Most estimates indicate that the *j*-curve effect—that is, lagged improvements in the trade balance after a currency depreciation—should be seen within 12 to 18 months after the depreciation. The *j*-curve effect further assumes that, after the initial depreciation, the value of the currency in question is stable. However, since early 1985, the dollar has not been sufficiently stabilized to determine the *j*-curve effect. The effect of each successive fall in the dollar has spilled over into previous depreciations, blurring the effect of any one particular decline. Thus, the magnitude of the *j*-curve effect, if any, has been difficult to determine.

The international debt crisis has contributed to the Nation's inability to reverse its trade imbalance, especially with Latin American countries. External debt has forced these countries to tighten their belts domestically and promote substantial export growth in order to accumulate U.S. dollars to service their debts. This practice restricts the ability of U.S. firms to export to these countries.

A clear trend in recent years toward increased trade with the newly industrialized countries also is a source of the deficit. However, the contention that their currencies have not appreciated relative to the dollar did not hold true in every case last year. The currencies of three of the Nation's major trading partners—Singapore, South Korea, and Taiwan—rose 8.8, 8.8, and 24.1 percent, respectively.[11] It is interesting to note that Taiwan had both the largest trade surplus and the largest currency appreciation vis-a-vis the United States of any of the newly industrialized countries.

Lastly, although it is apparent that import prices have not risen as much as might have been expected in the face of sharply appreciating foreign currencies, the reasons for this are less clear. When the dollar initially began falling, the standard assumption was that foreign exporters were narrowing profit margins significantly to maintain market shares. However, recent evidence suggests that, as foreign currencies have appreciated, the focus among U.S. trade partners has been on reducing costs rather than profit margins as a method of holding the line on import prices. Taking Japan as a prime example of a country whose currency has appreciated against the dollar, yet which has been able to maintain a high level of exports to the United States, one can examine the reasons for this occurrence.

When the value of the dollar falls against the currencies of surplus countries, the costs of the raw materials also fall, because many world markets for these products transact business exclusively in dollars. For example, the drop in the yen-denominated price of oil allowed the Japanese chemical industry to limit price increases to about 9 percent during 1987.[12] Lower interest rates in Japan also enabled the Japanese to enjoy relatively cheaper capital costs. In addition, some Japanese intermediate manufacturing has been relocated to countries whose currencies and wages are relatively low, such as Malaysia. Many Japanese firms also have taken steps to increase labor and capital productivity.

Recently, structural considerations have also been advanced to explain the inability of the falling dollar to induce a more favorable trade balance. The dollar's appreciation during 1980–85 allowed many foreign exporters to undercut the prices of their U.S. competitors. Thus, many U.S. producers were forced out of selected markets, causing domestic capacity in these industries to fall or be completely eliminated. For example, if there are no longer any U.S. manufacturers of a particular product, such as videodisk players, then no domestic substitute exists at any price. In such a scenario, a cheaper dollar alone may not be enough to return nominal trade flows to their previous levels. If the price elasticity of demand is less than 1, price increases of imported videodisks will actually worsen the deficit. Domestic manufacturers' ability and willingness to reenter the market depends on industry startup costs and forecasts of the future level of the dollar, as well as other factors particular to the industry.

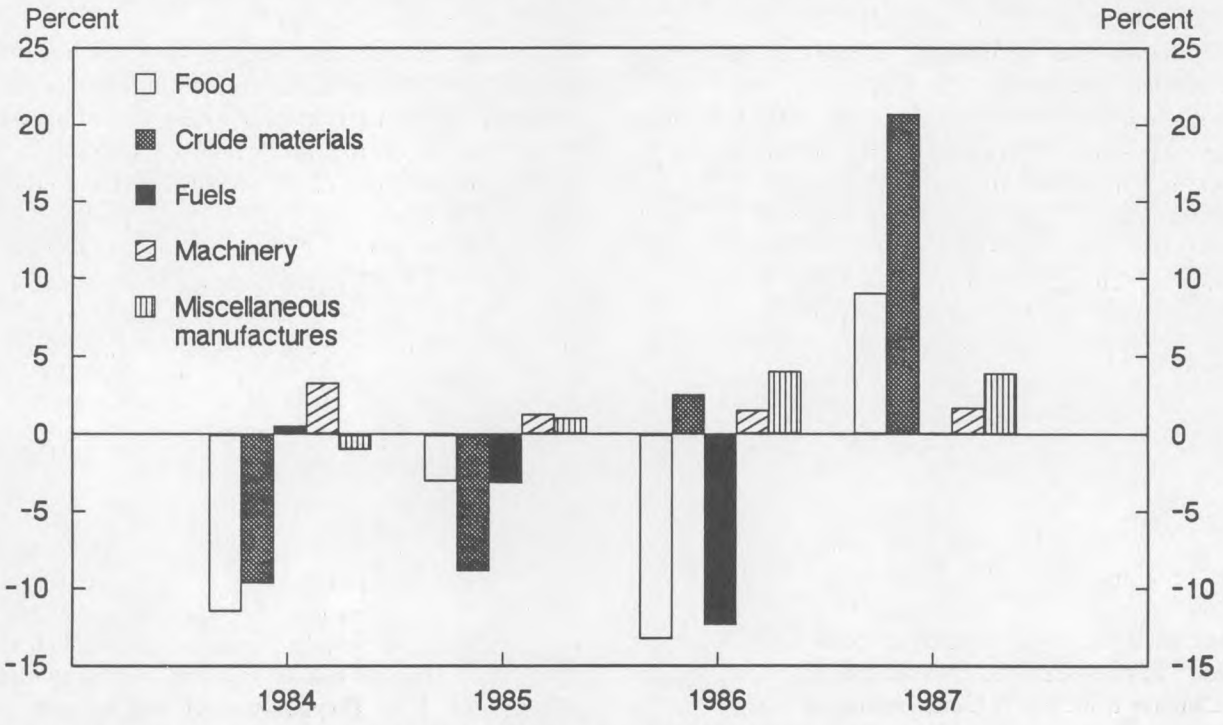
On a macroeconomic level, another explanation for the persistent trade deficit is differential rates of growth in gross national product between the United States and some of the surplus countries. For example, since the last year of balanced trade, 1980, the cumulative GNP growth in the United States exceeded that of Western Europe and Japan by 12 percent.[13] A higher growth rate implies a greater absorption of imports. In order to regain a trade balance, this trend must be reversed.

Export price developments

Food. The index for exported food products, which represents approximately 13 percent of the all-export index, rose 9 percent during 1987. This increase was due primarily to an 11.6-percent advance in the grain subcategory. Overall, 1987 was an unusually successful year for U.S. farmers, as their incomes hit record highs.[14] Farm debt declined, land values stabilized, and export volumes rose in both real and nominal terms. In fact, 1987 was the first year since 1980 in which agricultural exports increased, with grains playing a major role in the turnaround. Japan continued to be the largest consumer of U.S. farm exports, as it had been since 1964.[15]

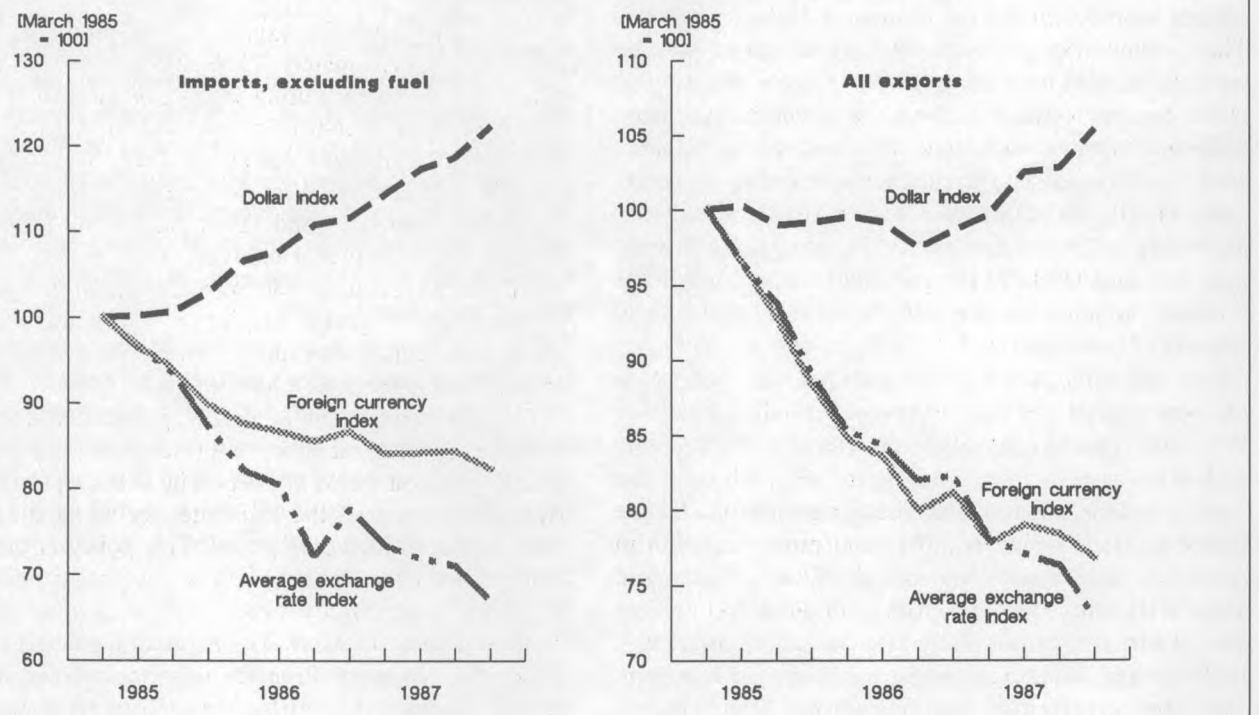
The combination of a weaker dollar and changing domestic agricultural policy contributed to the popularity of U.S. grain on world markets. The U.S. Department of Agriculture lowered the loan rates for selected agricultural products, including grains. This policy adjustment reduced many loan rates to near world-market prices and allowed U.S. agricultural products to be more competitive on international markets. The Agriculture Department's Export Enhancement Program also promoted exports by allowing farmers to sell their goods overseas at below

Chart 1. Annual percent price changes for selected export product groups, 1984-87



NOTE: Solid bars denote categories of unfinished goods; patterned bars denote categories of finished goods.

Chart 2. Quarterly indexes of U.S. dollar prices, foreign currency prices, and dollar exchange rate values for all imports, excluding fuel, and all exports, 1985-87



market rates and receive a government subsidy equal to the difference between the sale price and market price. This program was particularly effective in promoting sales of wheat and barley.

In the major grain subcategories, the index for wheat, which represents 3 percent of the all-export index, advanced 6.8 percent during 1987 because of reduced plantings and stronger worldwide demand. However, index movements during the year were inconsistent as prices rose during the first quarter, fell significantly during midyear, and climbed again at yearend.

The initial price rise was primarily due to large wheat purchases by the Soviet Union, North Africa, Latin America, Japan, and China. Normal seasonal price declines and a large U.S. winter wheat harvest helped dampen midyear prices. (Winter wheat is planted in the fall and harvested in the spring.) Record yields caused the harvest to increase 1 percent from 1986, despite government programs that idled more than one-fifth of the Nation's cropland.[16] These programs were designed to reduce excess stocks of selected crops in order to bolster prices.[17] Midyear demand from selected countries, including China and the Soviet Union, remained strong.

Export wheat prices advanced 8.9 percent during the fourth quarter owing to a smaller world crop and heightened world demand for wheat. Demand was especially strong from countries that experienced crop shortfalls because of inclement weather, such as China, India, and the Soviet Union. Reduced plantings in Canada and Australia, both net exporters of wheat, caused harvests in those countries to fall and allowed U.S. exporters to pick up much of the shortfall. An increased willingness on the part of some countries to rely on imports to satisfy domestic needs also contributed to the wheat industry's success during 1987. Ultimately, world demand for U.S. wheat exceeded the 1987 supply at the prices prevailing at the beginning of the year. This imbalance resulted in higher yearend prices, and reduced domestic stocks by 30 percent.

Rice export prices soared 81.3 percent during 1987. Early in the year, however, prices were flat due to sagging demand which reflected increased self-sufficiency in Asia, lack of economic growth in Africa, and declining revenues in the Organization of Petroleum Exporting Countries.[18] Increased supplies, especially from Thailand, contributed to the already depressed rice market. Developments in the first half of the year were also strongly affected by U.S. Department of Agriculture policy changes of 1986. In April of that year, regular Government-loan rates, which set a floor for the U.S. price for

rice, were changed to those of marketing loans, which more accurately reflect world prices. This change sent U.S. prices tumbling to the world-market level and was still affecting prices during the first half of 1987.

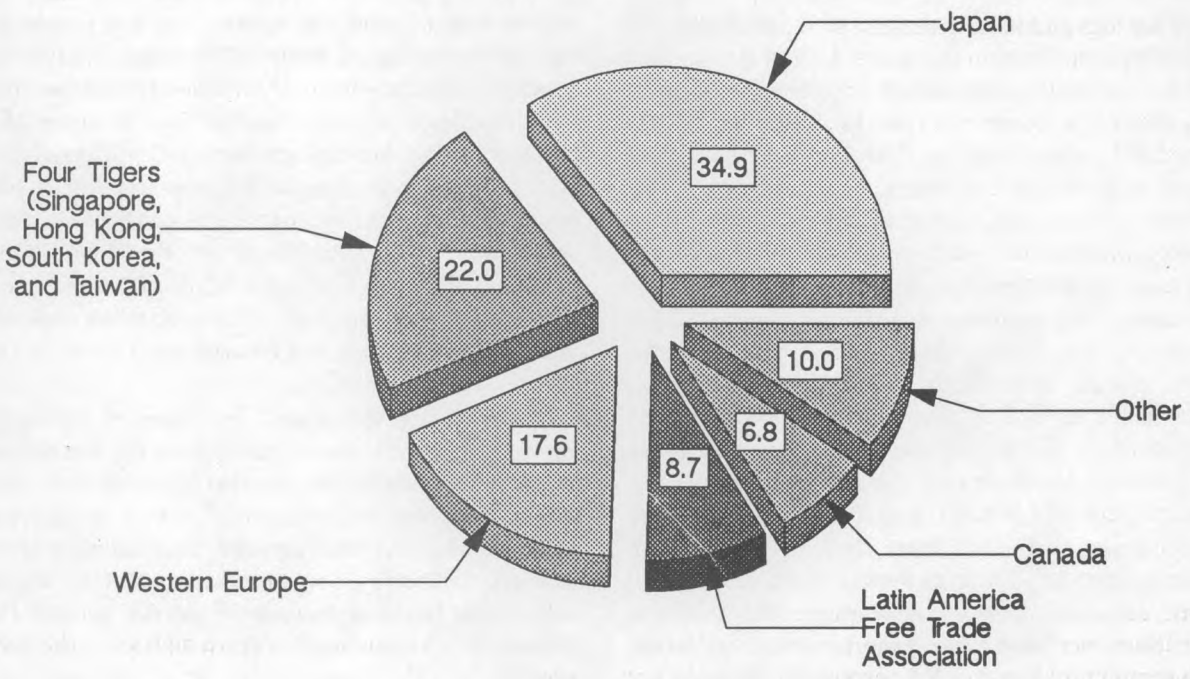
Tightened world supplies, however, characterized the remainder of the year. In response, prices rose 6.7 percent during the third quarter and 77.4 percent during the fourth quarter. Production in many of the leading rice-producing nations, including Thailand, India, Bangladesh, China, Nepal, and Burma, was reduced significantly because of inclement weather. Particularly hard hit was the harvest in Thailand, the world's leading rice exporter. Because world stocks of rice are traditionally not as high as those of other crops, rice prices rose quickly, as did the quantity of U.S. exports.

Like the indexes for wheat and rice, the index for exported corn, which represents approximately 4 percent of the all-export index, rose during 1987 by 10.3 percent. Export prices were volatile during the year, falling in the first and third quarters and rising significantly in the second and fourth quarters. The fall of prices early in the year can be attributed to burgeoning supplies of feed grain and a 5-billion-bushel carryover from 1986.[19] However, the combination of unusually large second-quarter purchases by the Soviet Union and tight supplies bolstered midyear prices. Restricted supplies in the United States were largely due to the Agriculture Department's "Acreage Reduction Program," in which 88 percent of American corn growers participated.[20] A seasonal drop in prices took place in the third quarter. Record yields of summer harvest also had a dampening effect on prices. Prices rebounded strongly in the fourth quarter due to heightened demand and reduced harvests by two major producers, Argentina and Thailand. Thailand's exports were reduced by attempts to substitute corn for rice in domestic consumption. U.S. farmers also contributed to higher prices as they withheld crops from the market in anticipation of increasing prices. Market speculation was based on the fact that the crop in 1987 was 1 billion bushels lower than in 1986.

The U.S. grain industry experienced strong advances in both exports and prices for the first time in several years.[21] Farmers appeared to be better positioned to weather economic fluctuations than they were during the early 1980's, because of reductions in debt, lower interest rates, and the 1987 farm bill which shored up the ailing farm credit system and created a number of debt restructuring opportunities.[22]

Crude materials. After a moderate 2.5-percent rise in 1986, prices of exported crude materials advanced 20.7 percent during 1987. Although all product categories,

Chart 3. Percent distribution of U.S. trade deficit by region, 1987



except crude minerals, showed price increases, the product groups contributing most to this large increase were wood, metalliferous ores and scrap, textile fibers, pulp and wastepaper, and oilseeds.

A lower dollar and strong overseas housing markets enabled wood export prices to increase 32.8 percent in 1987—the largest annual increase since 1978. The increase was propelled chiefly by the strength of a large third-quarter price rise—19 percent, the largest quarterly increase ever recorded in this index.

Indexes for the main categories of wood exports, softwood logs and lumber, rose 52.5 and 20.4 percent, respectively, largely due to the strength of very large third-quarter price increases (32.9 and 10.4 percent). These increases were facilitated by the highest quarterly level of log and lumber exports in at least 15 years.[23]

Because Japan currently is the largest purchaser of U.S. softwood logs and lumber, its influence on the U.S. export market is significant. In 1987, the Japanese housing market was the main impetus for the large price increases in U.S. softwood log and lumber exports. Housing was one of the sectors successfully targeted in the Japanese Government's attempt to stimulate domestic consumption, and this development is an example of what the U.S. Government had hoped for from the Japanese and West German economies—stimulative growth leading to larger volumes of imports from the United States. Moreover, wood-based construction was specifically targeted in Japan.

U.S. log and lumber exporters were in an advantageous position to satisfy much of the additional Japanese demand for logs and lumber because of Japanese dissatisfaction with supplies from the Soviet Union, the banning by the Canadian Government of exports of high-grade hemlock logs, the raising of export taxes on other grades and species by the Canadians,[24] and, most importantly, the lower value of the U.S. dollar. In fact, log exports to Japan were 15 percent higher, and lumber exports 33 percent higher, than in 1986.[25]

The year 1987 was an excellent one for producers of metal scrap. Large price increases for metal scrap outweighed a 7.1-percent decline in metal ores to raise the export price index for metalliferous ores and scrap by 28.6 percent. High rates of capacity utilization in primary steel, aluminum, and copper plants resulted in high U.S. scrap consumption.

Ferrous scrap export prices posted a 29.6-percent gain. Although exports fell to 10 million tons in 1987 from their level of 11.7 million in 1986,[26] this reflected a strong domestic demand that absorbed a greater share of total production rather than weak export markets (domestic ferrous scrap purchases rose 9.9 percent in real terms last year[27]). Some traders claimed that high prices in the domestic market resulted in domestic sales of approximately 1 million tons of top-grade scrap that otherwise would have been exported.[28]

Nonferrous base metal scrap prices rose 55.8 percent during 1987. A stronger aluminum market allowed consistently strong aluminum-scrap price increases throughout the year. Also, copper scrap prices, while less consistent, were a pleasant surprise for dealers. Prices for alloyed copper scrap were up 44.8 percent during the year, and those for unalloyed copper scrap soared 74 percent.

U.S. brass mills, which account for approximately 40 percent of domestic copper scrap consumption, stepped up production in 1987.[29] This increase reflected strong domestic demand and fewer imports resulting from a weaker dollar and the success of the anti-dumping efforts of the Copper & Brass Fabricators Council. Meanwhile, copper scrap exports through the first 11 months of 1987 were essentially the same as 1986 levels in real terms.[30] Also contributing to the tight market were declines of copper scrap supplies in recent years. Many manufacturers whose operations produce scrap as a byproduct have moved offshore, while the remaining firms produce less scrap as a result of more efficient production processes.[31]

In 1987, U.S. textile fiber manufacturers experienced the highest capacity utilization rates in 20 years.[32] Textile fiber export prices rose 24.1 percent during 1987 on the strength of a 34.4-percent increase in exported raw cotton prices.

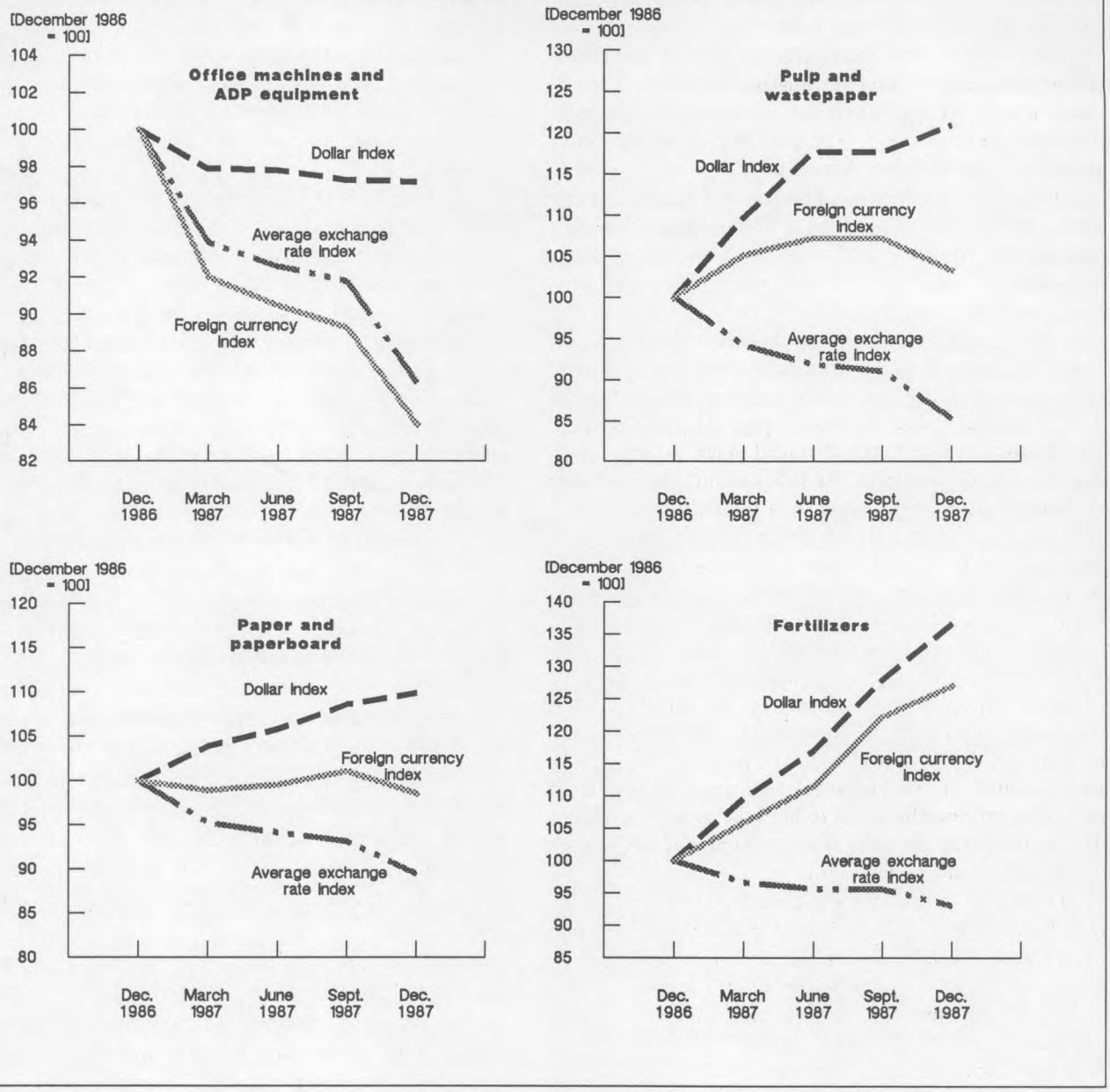
Strong production of finished cotton goods in Japan, the newly industrialized countries, and the European Community led to a healthy demand for raw cotton. World consumption of raw cotton was at a record-setting pace of 81.9 million bales in 1987. Moreover, 1987 world production levels were at 77.4 million bales, lower than in 1986 due to the expectation that the low prices of 1986 would continue and to poor weather in 1987.[33]

U.S. pulp and wastepaper export prices rose 21 percent in 1987. Tight market conditions were reflected in the fifth consecutive record year of world shipments of chemical paper-grade market pulp, 7.3 million metric tons, and the lowest inventories of North American and Scandinavian producers in 8 years, 641,000 metric tons.[34]

Sulphate woodpulp export prices were up 24.9 percent and accounted for over half the value of the pulp and wastepaper index. Sulphate woodpulp is used in the manufacturing of kraft linerboard, used primarily in making corrugated containers. A strong world economy requires the use of containers for shipping and, therefore, keeps demand for sulphate woodpulp healthy. U.S. corrugated box shipments were up 4.8 percent in real terms in 1987, breaking the record high set in the previous year.[35]

Markets were so strong that U.S. exporters were able to raise prices substantially in dollar terms and, because of

Chart 4. Quarterly indexes of U.S. dollar prices, foreign currency prices, and dollar exchange rate values for selected categories of exports, 1986-87



the low level of the dollar, increase sales by undercutting other major producers, such as the Scandinavians. At the same time that pulp and wastepaper export prices rose 21.0 percent, the trade-weighted value of the dollar fell 14.6 percent. The result was that the price of exported pulp and wastepaper in foreign currency terms rose slightly in 1987—3.3 percent. (See chart 4.) This indicates that a tight world market for crude paper products has not made it necessary for U.S. exporters to take advantage of the sharp changes in relative prices that currency adjustments would have accomplished to increase sales.

Prices of exported oilseeds were up 17 percent in 1987, the first increase since 1983. This rise was driven by an 18.4-percent rise in soybean prices, also the first increase in 4 years. The index was volatile, falling 4 and 6.3 percent in the first and third quarters, while rising 13.6 and 14.5 percent in the second and fourth.

Soybean prices began 1987 at the depressed levels characteristic of the 2 previous years, largely a result of a high level of world supplies. However, when the price descended toward the U.S. loan rate (a Government-set rate which effectively acts as a minimum price), the price

strengthening mechanism took effect. A price level at or below the loan rate encourages U.S. farmers to forfeit their crops to the Department of Agriculture's Commodity Credit Corporation stocks in lieu of repaying their Government loans. Because these crops do not reach the market, supplies are tightened. In addition, Brazil, a major competitor, underestimated its own domestic demand and, therefore, had fewer soybeans available for export. Lastly, in the fourth quarter, the Soviet Union reentered the U.S. market with major purchases of soybeans and soybean meal. This surge in demand pushed prices up 14.1 percent during a time of year when they usually fall, resulting in the first annual price increase since 1983.

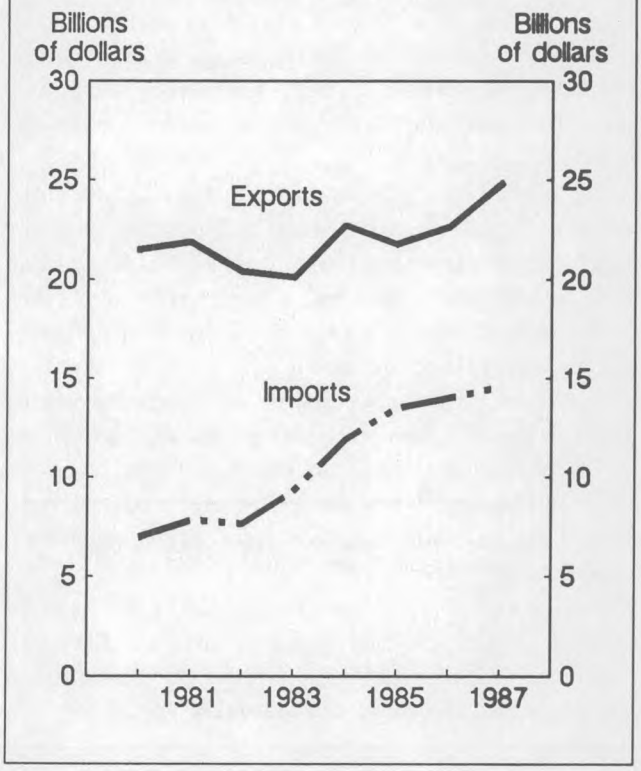
Chemicals. The index for exported chemicals and chemical products rose 18 percent in 1987 following years of relatively stability. Capacity constraints and higher raw materials costs in the form of surging oil prices contributed to the advance in the chemical index. After years of depressed prices and sales, the U.S. chemical industry was revitalized during 1987 because of the fall in the dollar's value and heightened worldwide consumer and industrial demand.[36] In response to these factors, export prices rose in all major subcategories, including organic chemicals (29.5 percent), inorganic chemicals (42.4 percent), fertilizers (36.7 percent), and resins and plastics (27.6 percent).

Chemicals, which represent approximately 10 percent of the all-export index, trail only oil and automobiles as America's largest smokestack industry.[37] Products manufactured by the chemical industry provide materials to many sectors of the industrial economy, ranging from industrial process chemicals to high-technology products. The industry also provides many consumer goods, including drugs, cosmetics, and paints.

The success of the chemical industry in 1987 occurred as a result of that industry's vast transformation during the previous decade. Rising demand, increasing prices, and greater profit opportunities characterized the late 1970's. In response, chemical manufacturers worldwide expanded capacity. However, higher oil prices and the economic downturns of the early 1980's resulted in overcapacity and caused profits to fall precipitously.[38] The industry responded by cutting capacity and investing heavily in research and development to develop specialty chemicals such as drugs, engineering plastics, and agrichemicals.[39] These products typically enjoy higher profit margins and less cyclical demand than do bulk chemicals.[40]

The combination of lower production and increased demand for both bulk and specialty chemicals helped make 1987 the most successful year in the domestic industry since 1980. As chart 5 illustrates, the dollar value of chemical exports increased 10 percent in 1987 to reach $24.8 billion. While imports also rose marginally during the year, the trade surplus in chemicals was the largest since 1980 at $10.2 billion, up $1.6 billion from 1986.[41]

Chart 5. Dollar volume of U.S. imports and exports of chemicals, 1980-87



The declining value of the dollar clearly had a positive effect on the trade balance in chemicals. The combination of the 18-percent advance in the price of exported chemicals and the increase in real exports reflected U.S. producers' ability to raise prices without sacrificing market share.

Surging crude petroleum prices were an obvious contributor to higher chemical prices during 1987. Petroleum feedstocks, prices of which skyrocketed due to the rising cost of crude oil, account for approximately 70 percent of total production costs of organic chemicals.[42]

Heightened demand for products manufactured from chemicals such as synthetic rubber, plastics, paints, fertilizers, and drugs also helped bring about the advance in chemical prices. This demand placed a strain on many chemical producers, which already were operating at 85–95 percent of capacity. Rather than invest heavily to open new plants, many firms chose to install more efficient equipment to increase an existing plant's productivity. In addition to being influenced by high costs, domestic chemical producers have been reluctant to open new plants because they feared an appreciation of the dollar or an increase in petroleum feedstock prices.[43]

Similar to that for bulk chemicals, the index for exported fertilizers surged 36.7 percent during 1987 and was also up 27.1 percent in foreign currency terms, as chart 4 illustrates. The dramatic rise in foreign currency prices indicates that factors other than exchange rates affected the decision of U.S. exporters to raise prices. These factors included capacity limitations, higher raw materials costs, and moderately increased foreign demand.

Capacity limitations were caused by the combination of low fertilizer prices in recent years and technical problems which caused plant shutdowns during 1987. In addition to U.S. capacity constraints, a labor strike in Turkey rendered that country incapable of exporting its usual large quantities of fertilizer.

Higher raw materials costs, in the form of increased urea and diammonium phosphate prices, also contributed to the 36.7-percent jump in exported fertilizer prices. Urea and diammonium phosphate are produced from natural gas and phosphate rock, respectively, which both were more expensive in 1987.

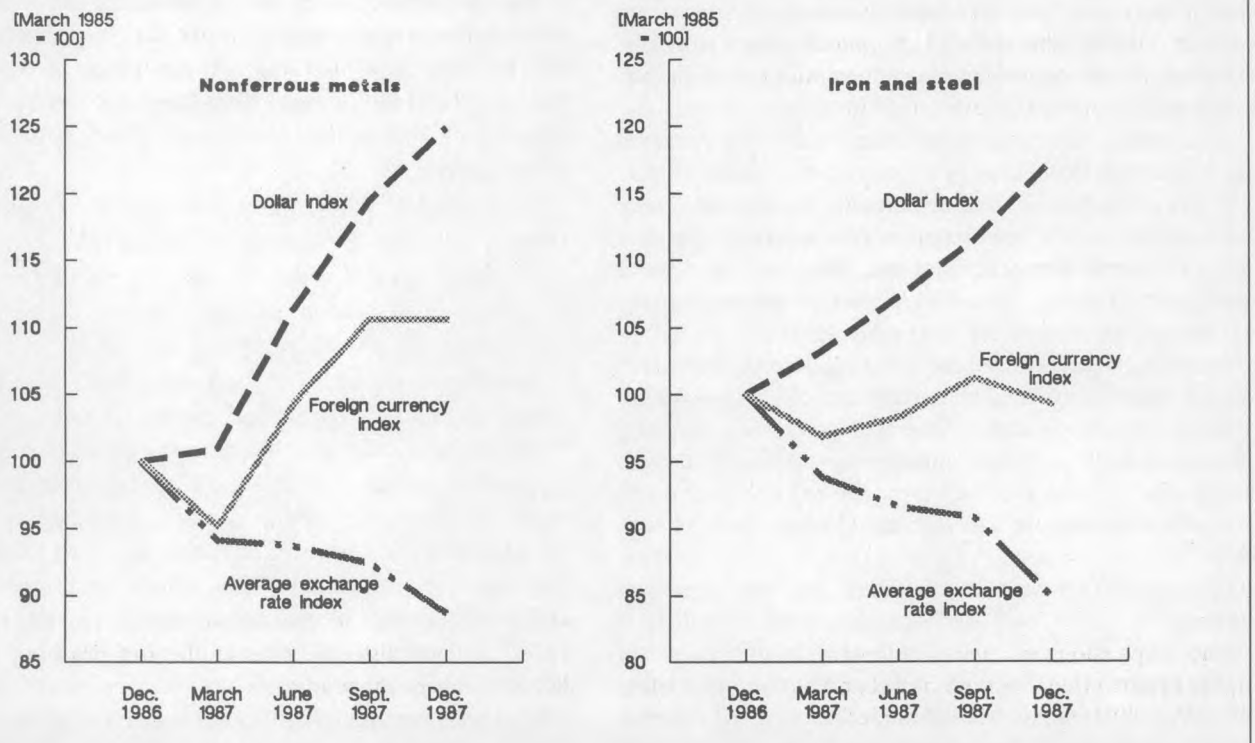
Finally, two atypical occurrences during 1987 caused demand for U.S. fertilizer to surge: First, the European Community eliminated specific duties on diammonium phosphate, which led to easier market access for U.S. exporters. Second, China and India both entered the market as buyers after depleting their own inventories.

After nearly a decade of decline, the U.S. plastics industry rebounded strongly in 1987. Like producers of its chemical feedstocks, the plastics industry during the early 1980's was characterized by increasing raw materials costs, falling profits, and excess capacity. In response, many firms closed mills and laid off workers during the mid-1980's in order to lower production capabilities.[44]

Lower oil prices in 1986, the continued decline of the dollar, and the expansion of the packaging industry led to increased U.S. plastics exports during 1987.[45] The greater use of plastic motor oil containers, disposable diapers, plastic grocery sacks, and other plastic consumer goods helped bring about the renewed health of the domestic plastics industry.

The combination of capacity constraints, soaring petroluem prices in mid-1987, and heightened consumer demand generated a 27.6-percent advance in the index for exported plastics. This price climb allowed many plastics producers to increase profit margins lost during the recessions of the early 1980's.[46] The continued substitution of plastics for metal, glass, paper, and wood in various industrial and consumer applications should ensure industry vitality.[47]

Chart 6. Quarterly indexes of U.S. dollar prices, foreign currency prices, and dollar exchange rate values for selected categories of imports, 1986-87



Intermediate products. The export price index for intermediate manufactured products rose 6.7 percent during 1987. Although all major categories in this area experienced significantly higher export prices during the year, the major increases were for paper and paperboard products and nonferrous metals. One significant aberration was a small (0.9-percent) advance in the index for exports of miscellaneous metal manufactures. This relatively small increase was due to the strong competition the United States faces in world markets from many Pacific Rim nations. Competition is especially fierce in cutlery, handtools, fasteners, and wire products markets.

Export prices of paper and paperboard products advanced 9.9 percent during 1987, but actually fell 1.1 percent in foreign currency terms. (See chart 4.) The 9.9-percent increase was primarily the result of a 21.3-percent jump in export prices in the kraft paper and paperboard subcategory. This increase was largely the result of strong demand in the European and Asian markets which was augmented by a weaker dollar. U.S. producers continued to penetrate foreign markets, achieving a 9-percent increase in export shipments to approximately 5 million tons.[48] Although paper and paperboard production was up during the year, utilization rates were actually slightly lower than in 1986 because productive capacity increased during 1987.[49]

Foreign demand was especially strong for unbleached and bleached grades of paperboard packaging. These materials are used in the manufacture of corrugated boxes and account for approximately 70 percent of all export shipments in the paperboard area.[50] Mill strikes and startup problems also affected prices during the year by causing supply shortfalls. U.S. paper manufacturers' adoption of new technologies, such as multi-ply forming, high-pressure presses, and preprinted linerboards, enabled them to reduce costs while improving product quality during 1987.

The export index for nonferrous metals rose 20.7 percent during 1987 as a result of tightened supplies and stronger world demand for most base metals. Strong foreign demand also allowed U.S. producers to increase the real dollar value of exports by 18 percent.[51]

Specifically, export copper prices increased 24.4 percent during 1987. Surging domestic demand for copper was the biggest reason for higher copper export prices and also contributed to the 82-million-ton decline in real exports.[52]

The combination of strong demand from Japan and Europe, the stock market drop in October, and inflation fears led to a 23.5-percent advance in the export price of silver.

The expansion of heavy industry contributed to higher export prices for both nickel and aluminum during 1987. Very little nickel was available for export during the year because of greater domestic demand for stainless steel.[53] Domestic capacity limitations forced many U.S. producers to ignore export opportunities and added to the 6.6-percent rise in exported nickel prices. Aluminum prices also climbed (24.3 percent) in response to the strengthening of the durable goods industries and a weaker dollar. The dollar's decline against the yen made U.S. exporters more competitive against Japan—their biggest rival in world aluminum markets. U.S. exports rose 18 percent during 1987, owing to the lower dollar and lower import tariffs on aluminum shipped to Japan and the European Community.

Machinery and transport equipment. The machinery and transport equipment index, which accounts for over one-third of the all-export index, continued its gradual upward climb, rising 1.7 percent in 1987. This was the third consecutive year in which it increased between just 1 and 2 percent. In only one category—office machines and automatic data processing (ADP) equipment—did prices fall, by 2.8 percent. The increases for the remainder of the indexes were limited to a relatively narrow range, from 0.9 to 4.3 percent.

The fall in prices for office machines and ADP equipment was predominantly driven by a 3.7-percent decline in ADP machine prices. Most significantly, central processing unit prices fell 7.2 percent. The trend toward mini and micro systems and personal computer networks has led manufacturers of central processing units to make significant price reductions. Declining demand amidst a very competitive market induced many companies to take advantage of the lower dollar to either maintain or increase their market share, rather than raise prices. In fact, for office machines and ADP equipment as a whole, the 2.8-percent dip in export prices, combined with the 13.7-percent decline in the trade-weighted value of the dollar in 1987, resulted in a 16-percent drop in export prices for these products in foreign currency terms. (See chart 4.) General industrial machines prices were up in all categories, leading to a 2.6-percent overall increase. The largest rise occurred for heating and cooling equipment and parts—4.9 percent. The trade balance for general industrial machines was in deficit for the first time in 1987. The forecast for 1988 is that the dollar volume of exports will be 27 percent lower than in 1982.[54]

For many years, U.S. manufacturers of industrial machines have been moving production offshore in order to penetrate particular markets. Because these firms export to both the United States and other countries, this effectively raises U.S. imports and lowers exports. Unless production returns to the United States, the fall in the dollar may do little to reverse the deteriorating trade deficit in this product area.

Electrical machinery and equipment prices rose 3.7 percent in 1987. Prices in all product categories were up.

Electrical component prices rose 6.2 percent, the largest increase since 1984.

Increases in export prices of electrical components were driven by a strong domestic market. Dollar-volume shipments increased by an estimated 8.2 percent; shipment quantities were up 12.5 percent. Much of this growth was due to increased demand from the personal computer and defense industries.[55]

Propelled by the strength of the personal computer market, shipments of U.S. semiconductors rose 13 percent in dollar terms in 1987.[56] A large portion of this growth occurred near the end of the year when unit shipments were running at a nearly 30-percent annual growth rate.[57] This increase helped to push semiconductor export prices up 4.4 percent—the largest annual increase since 1979. Higher raw materials costs also exerted upward pressure on prices.

The strength of the global semiconductor market was apparent in increased revenues for the domestic industry, the largest backlogs in 2 years,[58] and a healthy ratio of new orders to actual shipments—known as the book-to-bill ratio. Market growth occurs when this ratio is greater than 1, as it was during 1987. U.S. exports of semiconductors, which have the largest trade weight in the electrical components category, were pushed up 20 percent in 1987.[59] Increased exports led to an 11-percent decline in the trade deficit for semiconductors, reducing it to $1.01 billion.

The production of metal oxide silicon memory devices is characterized by significant economies of scale. This factor, in combination with an extremely competitive world market and technological improvements in the production process, has led to depressed world prices for these products in recent years. This has been particularly true of dynamic random access memory devices (DRAM's). Poor markets, particularly in 1985 when companies endured large losses, resulted in the suspension of production by many U.S. companies. A trade agreement enacted in September 1986 between the United States and Japan has contributed to more stable prices, but now there are few U.S. producers of market dynamic random access memory devices. Nevertheless, one of the objectives of the trade agreement was to ensure greater access to the Japanese market, which is especially important to U.S. exporters because Japan's electronics and automotive industries now consume half of the world's production of semiconductors.[60]

Import price developments

Energy. The index for imported energy, which represents one-third of the trade value of the all-import index, soared 43.8 percent during 1987. This increase, in large part, reflected surging prices of petroleum, which constitutes 94 percent of the energy index. Higher petroleum prices were related to the renewed commitment of OPEC to oil production quotas and a fixed-price system. Higher import prices were also a result of heightened U.S. demand for petroleum.[61]

Faced with rapidly decreasing world oil prices, the OPEC ministers met in December 1986 in an attempt to curb production and shore up prices. Prior to that meeting, the absence of quotas allowed many OPEC members, including Saudi Arabia, to discount prices in order sell a large volume of crude petroleum. This practice sent prices falling during 1986. Faced with lower world oil prices, and therefore more limited profit opportunities, U.S. firms curtailed many exploration projects and U.S. drilling dropped significantly in the first quarter of 1987. Consequently, U.S. petroleum production fell from approximately 9.2 million barrels per day (mb/d) early in 1986 to about 8.3 mb/d during early 1987.[62]

In response to declining prices, OPEC ministers agreed in December 1986 to lower production through country-specific quotas and to return to a fixed-price system that allowed crude petroleum prices to range from $16.27 to $18.92 per barrel.[63] First-quarter 1987 production responded, dropping 2.1 mb/d from the volume at the end of 1986.[64] Supplies tightened immediately, and the price of imported crude petroleum rose 31.7 percent during the first quarter. To avoid expensive purchases, petroleum firms worldwide immediately began drawing heavily on their petroleum stocks. In the United States, stocks of petroleum products were drawn down at a rate of 0.5 mb/d during the first quarter of 1987, the fastest pace since 1979.[65] However, this trend did not curb the import flow of crude petroleum, which rose approximately 1.1 mb/d during early 1987.[66]

OPEC's continued adherence to production quotas was manifested in the 9.4-percent increase in import crude petroleum prices during the second quarter. In June 1987, the OPEC ministers agreed to keep the official benchmark price at approximately $18 per barrel and to raise production 5 percent over second-quarter levels.[67] OPEC production levels, however, rose drastically during the third quarter, ending approximately 3.1 mb/d above quota levels, causing import prices to moderate.[68] Iran, Iraq, Kuwait, and the United Arab Emirates all produced well above established quota levels in order to export large volumes of crude petroleum. Fearing interruptions of petroleum shipments through the Persian Gulf, many importer nations, including the United States, purchased significantly higher volumes of OPEC petroleum during the third quarter. The United States, in fact, spent $12.6 billion on crude oil and petroleum products during the third quarter, a 27-percent increase over the amount spent during the second quarter.[69]

In an attempt to stem the excess flow of crude petroleum, OPEC called a stop-gap meeting of its monitor-

ing committee in September 1987. Little progress was realized from this meeting, however, and "overproduction" continued through the end of the quarter. Consequently, oil companies in the United States increased stocks of crude petroleum and petroleum products in land storage to 1.6 billion barrels by the end of third-quarter 1987.[70]

Despite increased supplies, prices moved moderately higher (0.4 percent) during the fourth quarter owing to the increased demand for OPEC petroleum. OPEC's production fell, but was still approximately 2 mb/d above its quota of 16.6 mb/d. Demand for OPEC oil waned in the fourth quarter due to earlier stockpiling of petroleum by purchasers worldwide who feared an interruption in petroleum shipments.

Dissension among OPEC members at their December 1987 meeting led to an agreement that failed to address the problems of "overproduction" or discounted prices. OPEC ministers did agree to keep the production level at 16.6 mb/d and the benchmark price at approximately $18 per barrel. However, production at yearend continued at approximately 18.6 mb/d (2 mb/d above quota level) and contributed to already burgeoning inventories.[71] Some OPEC members chartered tankers to store crude petroleum in order to maintain relatively stable production levels as export sales fell during the winter months.[72]

Despite higher prices during 1987, imports continued unabated, averaging 4.52 mb/d, or 12.3 percent higher than 1986 levels. U.S. dependence on OPEC oil increased during the year while domestic production declined 5 percent.[73]

Ultimately, the combination of increased domestic consumption and lower U.S. production resulted in the second consecutive annual increase in petroleum imports, and made 1987 the most costly year for imported energy since 1980. The Nation's total bill for imported petroleum for the year was approximately $45 billion, or one-fourth of the total trade deficit.[74]

In sharp contrast to developments for petroleum, import prices of natural gas fell 11 percent during 1987. The index for imported natural gas rose moderately during the first half of the year and fell precipitously near yearend. Initial increases can be attributed, in part, to soaring crude petroleum prices, because natural gas competes with distillate fuel oil in the home heating market and with residual fuel oil in the power generating market. The large drop in prices during the second half of the year can be attributed to continued excess supplies. U.S. supplies of natural gas increased 3.4 percent during the year, largely due to an increase of 1.7 percent in U.S. production and a 32-percent rise in imports from Canada.[75] A fall in demand also helped bring about the price decline during the second half of the year. The drop in consumption in the industrial and commercial sector was partially explained by the fact that many U.S. firms were still depleting their stocks of relatively inexpensive residual fuel purchased during 1986. The single bright spot for natural gas producers was the utility sector where U.S. demand rose from 1.777 trillion cubic feet in 1986 to 1.923 trillion cubic feet in 1987. The increased demand by this sector reflected a switch back to natural gas caused by the sharp increases in heavy oil prices.[76]

Intermediate products. Although prices increased in all major subcategories of imported intermediate manufactured products, including leather, rubber, cork, and textiles, the overall rise of 13.3 percent was primarily caused by large advances in the indexes for nonferrous metals and iron and steel.

The index for imported nonferrous metals (except gold) jumped 24.9 percent during 1987, due largely to the fall in the dollar, tight supplies, and surging demand in U.S. manufacturing industries. It seems clear that factors other than exchange rates played a significant role in the increase as foreign exporters raised prices 10.7 percent in their own currencies, "passing through" the entire depreciation of the dollar. (See chart 6.)

Tight supplies had a significant impact on the index for imported nickel, which rose 39.3 percent during 1987. The closing of the primary American nickel smelter in 1986 made the United States almost totally dependent on foreign supplies. The combination of scarce domestic production and booming U.S. demand for stainless steel induced an 11-percent increase in the quantity of nickel imports during 1987. Increased production of stainless and other specialty steels did, in fact, raise U.S. primary nickel consumption to the highest level since 1974. Tight foreign supplies caused by mine closures and extended summer shutdown contributed to higher nickel prices during the year.

Tight supplies also contributed to a 50.1-percent surge in copper import prices during the year. Domestically, higher consumption of refined copper left U.S. inventories at a 13-year low.[77]

After years of sluggishness, the U.S. aluminum industry rebounded sharply in 1987 due to a resurgence of demand from customers in heavy industries. Driven by exceptionally strong world demand, U.S. primary production rose 4 percent, to an estimated 3.2 million tons, during 1987.[78] Domestic demand was especially strong for packaging materials, particularly aluminum cans and foils.[79] Import prices responded, rising 37.8 percent during the year.

Despite lower domestic consumption, prices for imported zinc advanced 3.6 percent during the year due to lower U.S. production and the fall of the dollar. The galvanization of steel is zinc's largest application in the United States, and the auto industry is the largest domestic market for this product. The average weight of galvanized steel used per car has increased 34 percent

over the last 3 years. In addition, orders for galvanized steel during 1987 frequently exceeded capacity, fueling higher import prices.

After falling precipitously in 1986, imported tin prices rose 15.3 percent during 1987. Lower 1986 prices had forced the closure of many less efficient world producers, which resulted in reduced capacity. Lower production and the renewed health of the U.S. steel industry were the primary reasons for higher prices of imported tin during the year.

After years of relative stability, the index for iron and steel, which represents 3 percent of U.S. imports, rose steadily throughout 1987. The 17.2-percent advance in prices was largely a reflection of the weaker dollar. Foreign exporters lowered prices only 0.7 percent in foreign currency terms during the year, allowing nearly all of the dollar's fall to be passed through in the form of sharply higher U.S. import prices. (See chart 6.) Stronger demand, continued enforcement of the voluntary restraint agreements negotiated with foreign governments, and higher raw materials costs also contributed to the rise in imported steel prices during 1987. These factors led to a fourth-quarter price rise of 5.1 percent, the largest single quarterly increase since 1984. All major subcategories experienced price gains including: pig iron (19.3 percent); bars, rods, and angles (12.4 percent); plates and sheets (16.9 percent); hoop and strip (14.5 percent); wire (5.3 percent); and tubes, pipes, and fittings (19.7 percent). As a result of higher costs for imports, domestic prices of many steel products were actually lower than the prices of imports for the first time in several years.

Higher import prices during 1987 also reflected the continued decline of the dollar vis-a-vis the currencies of major steel-exporting countries, including Japan and West Germany. Higher import prices for products such as steel plates and sheets, which tend to originate in these countries, can be directly related to the fall in the dollar. Japan was especially hard hit by the dollar's decline as approximately 30 percent of Japanese steel output is directed toward the export market, and 25 percent is indirectly exported in the form of automobiles and machinery.[80] Because the dollar's fall made foreign steel less competitive on domestic markets, U.S. producers were able to regain some of the market share lost since 1980.

Demand also played a role in the advance of the index for iron and steel. During a typical year, steel orders slacken and backlogs are low by summer; however, during mid-1987, new orders were 24 percent higher and unfilled orders were 35 percent higher than 1986 levels. In response, delivery dates were stretched to the fourth quarter, and, in some instances, duplicate orders were placed with more than one steelmaker in order to ensure supply.[81] Fearing the market strength was temporary, domestic steelmakers were reluctant to reopen marginal plants because of the substantial cost. The temporary shutdown of some facilities for repair, and the slow return to the market of the largest U.S. steelmaker after a 6-month strike, also hampered domestic steel production during the year.

Along with the domestic supply shortfalls, import volumes also were lower due to the impact of voluntary restraint agreements. These arrangements are negotiated bilaterally and allow imports based on a percentage of forecast consumption. Because consumption was expected to decrease during 1987, allowable imports were reduced as well.[82] The goal for 1987 was to reduce imports of finished steel from 26 percent to 20 percent of the U.S. market.[83] Voluntary restraint agreements were especially effective in reducing import quantity of steel wire, which fell 7 percent during the year. The decrease in shipments, combined with the lower dollar, led to a 12-percent rise in the index for imported wire.

Although import volumes fell during the year, import penetration remained high at approximately 22.5 percent, or 2 percent above the target of the administration's import restraint program. This was primarily due to surging imports from countries not covered by a voluntary restraint agreement, including Canada, Turkey, Argentina, and Sweden.[84]

Rising raw materials costs also helped bring about the advance in the index during 1987. This was especially true for imported hoop and strip, for which prices increased 14.5 percent during the year as a result of rising worldwide scrap costs.

The dollar's large appreciation between 1980 and 1985 also indirectly affected the price and market share of imported steel during 1987. During those 5 years, the dollar's appreciation allowed foreign sellers to undercut the prices of rival U.S. firms in domestic markets. Many U.S. producers were driven out of the market, and domestic capacity fell 27 percent between 1982 and 1987. During 1987, the dollar's decline forced many foreign exporters to raise prices; however, the ability of U.S. manufacturers to exploit the market was hampered by capacity limitations. Ultimately, this structural change allowed foreign producers more freedom to raise export prices because of insufficient U.S. competition.

Factors contributing to the rise in imported steel prices during the year were numerous. In turn, these price increases allowed many domestic producers to expand sales to both American, and to a small extent, foreign purchasers. However, export activity was limited in some cases by capacity constraints and strong domestic demand. A positive fourth-quarter sign was an announcement by USX Corp. that it was reopening its export division, which has been largely dormant since 1984.[85]

Machinery and transport equipment. The import price index for machinery and transport equipment, which accounts for approximately one-quarter of the all-import index, advanced 7.7 percent in 1987. This was the third consecutive year of higher prices. All eight product categories were up, with the smallest increase at 3.6 percent and the largest at 16.7 percent. The main movers of the index were specialized industrial machinery, general industrial machinery, electrical machinery and equipment, and road vehicles and parts.

Imported road vehicles and parts, which account for 42.8 percent of the machinery and transport index, rose 6.4 percent in 1987. This followed a 13.1-percent advance in 1986. The smaller increase was largely attributable to a slack automobile market in the United States. Automobiles account for approximately two-thirds of the product category, and despite the continued decline of the dollar, imported automobile prices rose only 4.3 percent—the smallest increase in 3 years.

The relatively modest increase in imported car prices was accomplished while maintaining profitability, albeit at narrower margins, largely due to the apparent ability of Japanese exporters to cut costs in order to maintain market shares. For example, Toyota reduced costs by close to 160 billion yen during the fiscal year ended June 30, 1987.[86] Toyota's cost-cutting measures included reducing the number of manufacturing stations on assembly lines, giving only modest annual wage increases to labor, enforcing a Saturday-to-Wednesday workweek at some factories to take advantage of cheaper weekend electricity rates, and getting agreements on price reductions from subcontractors who supply components.

Oversupply characterized the domestic automobile market in 1987, as both domestic and import inventories were at their highest levels in years.[87] Unit sales in the United States were below 1986 levels by 10.7 percent. Both domestic and import car sales fell, the former by 13.8 percent and the latter by 2.8 percent.[88] Market shrinkage allowed the share for imports to increase from 28.3 percent in 1986 to an unprecedented 31.1 percent last year. Japan's market share edged up to 21.3 percent from 20.7 percent in 1986 despite a drop in sales of 190,819 units.[89]

Falling unit sales were not a uniform occurrence among importers. For example, Hyundai's sales rose 56.1 percent (moving the company from the sixth to the fourth largest importer); Yugo, 35.7 percent; and Acura, 107.1 percent.[90]

The Japanese may have found that building plants in the United States dampens pressure on them to limit auto exports to this country. However, the current high value of the yen has also proven it to be an efficient cost-cutting measure. In fact, Japanese auto producers located in the United States will be exporting autos to Japan later in 1988. Sales from this transplanted production were 543,884 units in 1987, up 57.2 percent from 1986, while the market share rose from 3.0 to 5.3 percent. Japanese companies accounted for 88.8 percent of this type of production in 1987. In addition, for the first time, American Honda Motor Co.'s U.S. sales in 1987 actually exceeded exports to the United States by Honda Motor Co. Ltd. (the manufacturer located in Japan).[91]

Specialized industrial machinery prices advanced 13.1 percent. They were led by prices for textile machinery and parts, which rose 19.3 percent. European and Japanese exporters have acquired significant power in the U.S. market due to their superior development and commercialization of technological advances in most types of textile machinery.[92] This has enabled them to pass along a large part of the exchange rate adjustment to U.S. importers, as evidenced by the sharply higher dollar prices.

Textile machinery imports increased 22 percent in 1987, to over $1.1 billion. The leading importers were all countries with strong currencies: West Germany (41 percent), Switzerland (16 percent), Japan (15 percent), Italy (8 percent), and France (4 percent). Imports accounted for 59 percent of new supplies in the United States in 1987, up 50 percent from 1986 levels.[93]

General industrial machinery import prices increased 13.0 percent on the strength of first- and fourth-quarter price increases of over 5 percent. □

——FOOTNOTES——

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[1]Price developments discussed in this article are based on data from the BLS International Price Program (IPP). That program produces import and export price indexes based on the Standard Industrial Trade Classification scheme. Both indexes use a modified Laspeyres formula. Price data are collected for more than 22,000 products, and are not seasonally adjusted. Price indexes are weighted by the value of trade in 1980. Beginning with the first-quarter 1988 release in April, the IPP indexes will shift to 1985 weights. In addition, the indexes will be recalculated from 1985 forward using the new weights. BLS also publishes these series by Standard Industrial Classification and end-use classifications.

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Domestic price rise during 1987 reflects swing of energy prices

Impact of volatile energy components again evident in Consumer Price Index and Producer Price Index, with increase in CPI returning to the 4-percent range, compared with a 1.1-percent rise in 1986

CRAIG HOWELL, ANDREW CLEM,
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U.S. inflation in 1987 accelerated from its lowest level in more than 20 years, largely reflecting the partial rebound in energy prices. The Consumer Price Index (CPI) rose 4.4 percent during the 12-month period ended in December. This compared with an energy-restrained 1.1-percent rise in 1986 and increases of about 4 percent in each of the preceding 4 years. The turnaround in energy prices—particularly in the first half of the year—was almost entirely responsible for the acceleration in the overall index in 1987. Excluding energy, the CPI increased 4.1 percent during the year, after advancing 3.8 percent in 1986.

In 1987, the food component rose somewhat less than in 1986, despite the sharp increase in fruit and vegetable prices. The indexes for shelter and all items excluding food, shelter, and energy each rose slightly more than in 1986. Within the latter group, however, price movements for commodities and services differed substantially from 1986. The other commodities component, in part reflecting the declining value of the dollar in international markets, accelerated in 1987. Prices for clothing, wine, and entertainment commodities were sharply higher. Charges for other services, however, slowed in 1987, particularly those for medical care and transportation services. (See table 1.)

Producer prices turned up across a broad front during 1987. The Finished Goods Price Index increased 2.1 percent from December 1986 to December 1987, following a 2.3-percent decline in 1986 and a 1.8-percent increase in 1985. The index level in December 1987 was almost the same as it had been in December 1985. Prices for intermediate goods moved up 5.5 percent over the year, in the wake of a 4.4-percent drop in 1986 and a nominal decline in 1985. In contrast to substantial decreases in 1986 (8.9 percent) and 1985 (5.6 percent), the Crude Goods Price Index climbed 8.8 percent in 1987.

Energy prices, which had spearheaded the 1986 declines, rebounded somewhat in 1987, contributing to the upturn at each stage of processing. Food price index movements were generally moderate. The behavior of price indexes for goods except food and energy was mixed. At the crude material level, prices for sensitive industrial materials surged 22.4 percent. Prices for intermediate industrial materials advanced 5.3 percent after 2 years of virtually no change. Yet prices of finished goods other than foods and energy rose only 2.1 percent, even less than in either 1985 or 1986, in large part because of a downturn in the motor vehicles price index.

Consumer spending slows

The general economic expansion that had begun when the most recent recession ended in late 1982 completed its fifth year in 1987, but with some signs of faltering. Consumer expenditures, which had fueled the recovery for some time, weakened as the year progressed, resulting in some excessive inventory accumulation by retailers. Business expenditures on capital goods generally enjoyed another good year in the wake of some broad 1986 changes in tax laws affecting investment spending, but also exhibited some weakness. The pace of residential-housing construction was somewhat slower than in other recent years, in part because of a moderate climb in mortgage interest rates. The October stock market crash, while further heightening concerns about the durability of

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Table 1. Percentage changes for major categories of the Consumer Price Index and Producer Price Index, 1983–87[1]

Index	1983	1984	1985	1986	1987
Consumer Price Index					
All items	3.8	3.9	3.8	1.1	4.4
Energy	−.5	.2	1.8	−19.7	8.2
Energy commodities	−3.2	−1.8	3.4	−30.5	17.8
Energy services	4.1	3.5	−.6	−3.3	.2
All items less energy	4.5	4.4	4.0	3.8	4.1
Food	2.7	3.8	2.6	3.8	3.5
Shelter	4.7	5.2	6.0	4.6	4.8
All items less food, shelter, and energy	5.0	4.3	3.7	3.3	3.8
Other commodities	5.0	3.1	2.2	1.4	3.5
Other services	4.9	6.0	5.4	5.6	4.9
Producer Price Index					
Finished goods	.6	1.7	1.8	−2.3	2.1
Finished consumer foods	2.3	3.5	.6	2.8	−.3
Finished energy goods	−9.2	−4.2	−.2	−38.1	10.3
Finished goods less food and energy	1.9	2.0	2.7	2.7	2.1
Intermediate materials, supplies, and components	1.8	1.4	−.3	−4.4	5.5
Intermediate foods and feeds	9.3	−5.4	−4.2	−.5	5.4
Intermediate energy goods	−5.5	−.1	−.8	−29.0	9.4
Intermediate materials less food and energy	2.9	2.1	−.1	.1	5.3
Crude materials for further processing	4.7	−1.6	−5.6	−8.9	8.8
Foodstuffs and feedstuffs	7.9	−1.2	−6.4	−1.5	1.7
Crude energy materials	−4.7	−1.2	−4.9	−27.6	10.5
Crude nonfood materials less energy	15.5	−3.4	−4.3	1.8	22.4

[1]Calculated on a December-to-December basis.

the expansion, did not seem to curtail either consumer or capital goods demand at yearend.

As in other recent years, developments in international currency and trade markets had a complex effect on the American economy and the behavior of domestic producer prices. The value of the U.S. dollar fell rapidly through most of the year, tending to lower prices of American goods sold in other countries and to raise prices of imported goods. Significantly improved export demand for many kinds of U.S.-made products was a major factor in boosting the capacity utilization rate in manufacturing to its highest level since the early 1980's and in pushing the unemployment rate even lower. At the same time, higher prices for foreign-made goods generally failed to dampen consumer demand for imported products with a reputation for value and quality.

But despite rising exports and advances in prices of competitive imported goods, domestic producers of many finished goods did not appear to raise their own output prices very much, in part because they hoped to keep or recapture a greater market share. For similar reasons, some output prices did not seem to reflect the full pass-through of higher costs for materials, whether domestic or imported.

CONSUMER PRICES

Food. Retail food prices rose 3.5 percent in 1987, after increasing 3.8 percent in 1986. Price advances in the second half were considerably less than in the prior 12 months. In 1986, a severe spring drought in the Southeast led to higher prices for fresh fruits and vegetables, pork, poultry, and eggs. By the end of 1987, prices for the latter three groups were below their levels of a year earlier. The index for fruits and vegetables, however, rose 12.8 percent. Heavy demand from food processors led to higher prices for citrus fruits. Fresh vegetable prices surged, typically because of the vagaries of the weather. In addition, lettuce prices more than doubled late in the year after a virus spread by the sweet potato white fly seriously damaged the winter lettuce crop.

The index for meats, poultry, fish, and eggs increased 1.1 percent in 1987, as advances in prices for beef and veal and for fish and seafood—6.7 percent and 10 percent—were partly offset by the declines in pork, poultry, and egg prices. These declines largely reflected the return to pre-drought supply levels.

Other grocery food groups contributing to deceleration in the food index were dairy products and nonalcoholic beverages, especially coffee—the largest U.S. agricultural import—which continued to be affected by the release of stocks built up earlier in the decade. The index for cereal and bakery products rose 4.1 percent, while other prepared foods rose 4.2 percent. Prices for food away from home increased 3.7 percent.

Shelter. Shelter costs rose 4.8 percent in 1987, compared with a 4.6-percent increase in 1986. Despite the apparent similarity, the composition of the change was different. A 4.0-percent increase in house and apartment rents followed a 5.0-percent rise in 1986 and was the smallest annual increase since 1972. Conversely, the index for owners' equivalent rent advanced 5.3 percent in 1987, up from 4.6 percent in 1986. The homeowner and renter index for maintenance and repair costs increased 3.3 percent in 1987, compared with 1.8 percent in 1986. The acceleration was largely the result of increased charges for services as prices for maintenance and repair commodities rose at about the same rate as in 1986.

Energy. The energy component of the CPI, which had declined 19.7 percent in 1986, partially rebounded in 1987, advancing 8.2 percent. In 1986, a glut of crude oil resulted when production quotas were formally abandoned by the Organization of Petroleum Exporting Countries (OPEC). However, during the winter of 1986, OPEC tentatively managed to restore control, and, with the backdrop of hostilities in the Persian Gulf, oil prices rose sharply in the first quarter of 1987.

The 8.2-percent rise in the energy index in 1987 was its largest advance since 1981. Leading the way were items whose price fluctuations closely paralleled those of crude oil. Fuel oil prices surged 17.9 percent during 1987, while gasoline prices were up 18.6 percent. However, by yearend the indexes for both fuel oil and gasoline

remained considerably below their peak levels in early 1981. Energy services (gas and electricity) also turned upward, but only modestly, advancing 0.2 percent in 1987 after declining 3.3 percent last year. Charges for electricity rose 1.8 percent, but were nearly offset by a 2.9-percent decline in charges for natural gas.

Services excluding shelter and energy. For each of the 5 years prior to 1987, prices for services excluding shelter and energy rose substantially more than the average for all items. (See table 2.) During 1987, the 4.3-percent increase in this category was about the same as the advance in the overall CPI. The only significant decline in the services less shelter and energy component was registered by long distance telephone rates. Charges for interstate toll calls fell 12.4 percent in 1987 and were 26.9 percent below their level of December 1983, the last month preceding deregulation of the industry. This drop, coupled with a 3.0-percent decline in intrastate toll calls, was sharp enough to pull the yearend telephone services index down 1.3 percent, despite a 3.3-percent increase for local telephone charges.

Charges for several services components, although outpacing the overall CPI, slowed significantly in 1987. Automobile insurance charges increased 5.8 percent after double-digit increases in each of the previous 2 years. A 5.6-percent advance in the cost of medical care services followed a 7.9-percent rise in 1986 and was the smallest increase in 15 years.

A few service categories experienced price acceleration in 1987. Auto finance charges were up 5.9 percent as a result of the expiration of several manufacturer incentive plans. Refuse collection charges increased at double-digit rates because of the apparent scarcity of landfill sites around major metropolitan areas. And the cable TV index rose 9.5 percent reflecting deregulation of the cable industry, which allowed for increases in both periodic and installation charges.

Commodities less food and energy. Price movements accelerated in 1987 for several groups of commodities with above-average representation of imports in market sales, reflecting the declining value of the dollar. (See table 3.) For example, wine at home and entertainment commodities such as toys, sport vehicles, and photographic supplies all rose substantially more in 1987 than in 1986. In addition, prices for apparel commodities moved up 4.9 percent in 1987, the largest increase since 1980. Significantly, however, a relatively high proportion of clothing imports were from the Newly Industrializing Countries of the Pacific Rim. The currencies of these countries traditionally have been pegged to the U.S.

Table 2. Price changes for consumer services other than shelter and energy, December 1982–December 1987

Consumer service category	Percent change				
	December 1982 to December 1983	December 1983 to December 1984	December 1984 to December 1985	December 1985 to December 1986	December 1986 to December 1987
Services excluding shelter and energy	4.9	6.0	5.4	5.6	4.3
Telephone:					
Local charges	3.2	17.1	8.9	7.1	3.3
Interstate toll calls	1.4	−4.3	−3.8	−9.5	−12.4
Intrastate toll calls	7.4	3.7	.5	.4	−3.0
Water and sewerage maintenance	8.5	5.5	5.5	5.4	5.2
Cable television	(1)	6.1	6.0	3.8	9.5
Refuse collection	(1)	3.2	6.4	9.4	10.2
Postage	.0	.0	10.2	.0	.0
Appliance and furniture repair	4.9	5.6	3.1	2.6	3.1
Moving, storage, freight, household laundry, and drycleaning	6.2	4.9	7.2	3.2	(1)
Gardening and other household services	(1)	(1)	(1)	(1)	4.9
Apparel services	5.0	4.9	4.9	3.9	3.9
Automobile maintenance and repair	3.8	3.2	3.3	3.7	3.8
Automobile insurance	9.1	7.9	12.0	11.8	5.8
Automobile finance charges	−7.9	6.8	−8.3	−7.3	5.9
Automobile registration, licensing, and inspection fees	7.8	8.5	2.1	3.4	1.7
Other automobile related fees	3.5	5.8	4.2	10.0	5.2
Airline fares	4.8	6.5	6.3	5.3	1.6
Other intercity public transportation	7.0	10.7	6.4	4.9	2.0
Intracity public transportation	2.1	5.9	3.6	6.8	2.4
Professional medical services	7.6	6.3	6.5	6.3	6.3
Hospital and related services	10.4	7.6	5.0	7.2	7.0
Entertainment services	5.4	5.7	4.4	5.4	4.3
Personal care services	3.6	4.9	3.6	2.6	3.8
Tuition and other school fees	9.4	10.1	8.4	7.9	7.6
Personal expenses (legal, financial, and funeral)	12.2	6.5	6.1	9.0	4.4

[1]Data not available.

dollar, and, unlike the currencies of Japan and the nations of Western Europe, have only recently been allowed to appreciate. Another import-sensitive commodity—new cars—experienced a smaller increase in prices in 1987, rising only 1.8 percent after climbing 5.9 percent in 1986. The price behavior of automobiles is an example of market conditions vitiating the effects of exchange rate movements. New car sales consistently trailed the prior year's levels and, combined with high inventories of unsold vehicles, led to widespread use of manufacturer and dealer incentives.

Although prices of imported cars increased more than those of their domestic counterparts, the rise was below expectations based on the appreciation of the exporters' currencies. There are several possible explanations. First, foreign car manufacturers might be willing in the short run to sacrifice profit margins rather than reduce their market share. Second, there was evidence that dealers, who in the past added substantial surcharges to the sticker price of imports in short supply, were cutting or eliminating entirely these "dealer markups." Finally, the determination of exactly what is or is not an imported vehicle was becoming blurred as an increasingly large number of "foreign" models were manufactured domestically.

Prices also accelerated for two additional commodity groups that are not directly sensitive to imports. Used car prices rose a brisk 8.9 percent because the weakness in new car sales reduced the supply of trade-ins. And the index for medical care commodities rose 7.1 percent in 1987, compared with a 6.8-percent increase in 1986.

PRODUCER PRICES

Finished goods

Energy. After slumping 38.0 percent in 1986, the index for finished energy goods rose 10.2 percent in 1987. This reflected a similar upturn in crude petroleum prices in both domestic and world markets. Price indexes for gasoline and home heating oil each climbed more than 20 percent, after plunging almost 50 percent the year before. Natural gas did not share in the 1987 price resurgence, however, falling about 4 percent in the wake of a 16.7-percent decrease in 1986 and a 7.8-percent drop in 1985.

Other consumer goods. Prices received by domestic producers of consumer goods other than foods and energy moved up 2.6 percent, following a 3.0-percent increase during 1986. This index would have accelerated somewhat had it not been for a downturn in the passenger cars index. Prices for a number of goods tended to rise more rapidly in the second half than in the first half.

The new car price index dropped 3.1 percent in 1987, in contrast to its 6.5-percent climb a year before. Imports commanded more than 30 percent of the new car market, but sales of domestic automobiles retreated somewhat after several strong years. Car sales had been unusually brisk in the second half of 1986, because of both attractive factory-subsidized finance programs and changes in Federal income tax laws scheduled to take effect in 1987. As a result, demand for cars was sluggish in early 1987, and incentive programs later in the year had to be generous to hold down dealer inventories. Even with higher prices of many foreign-made models because of the reduced value of the dollar and with escalating costs of some materials such as copper and plastics, American car manufacturers minimized their own price increases to improve their competitive stand.

Prices for prescription and over-the-counter pharmaceutical preparations continued to advance rapidly in 1987 (9.3 and 4.8 percent); these increases were partly attributed by manufacturers to the continued substantial rise in research and development costs associated with bringing new drugs onto the market. Increases in gold and silver prices were reflected in higher prices for precious metal jewelry. The index for tobacco products also moved up sharply, partly to respond to stronger export demand but also to boost profit margins in the face of several years of falling domestic sales. Increased costs for stainless steel and silver contributed to the substantial advance in household flatware prices. Producer prices for many kinds of apparel rose more than in 1986, although most of the 1987 advances were still modest.

Capital equipment. The Producer Price Index for capital equipment edged up 1.3 percent for the 12 months ended in December 1987, following a 2.1-percent rise in 1986 and a 2.7-percent increase in 1985. As with consumer goods, indexes for motor vehicles played a key role in restraining inflation in the capital goods sector in 1987. Prices received by manufacturers of heavy trucks dropped 2.7 percent after a 3.4-percent advance a year before, while the light trucks index retreated from a 3.6-percent advance in 1986 to a 0.5-percent decline a year later. Prices for most other kinds of capital equipment rose less than 4 percent in 1987; however, some of these prices tended to accelerate at the end of the year in reaction to much-improved export demand.

Capital spending in 1987, as in most other recent years, was concentrated on equipment that would cut costs and enhance productivity rather than on large-scale capacity expansion projects. While this strategy limited the vulnerability of companies to cyclical downturns, it also limited the ability of producers to respond to increased domestic or foreign demand without encountering capacity restraints and having to boost prices as a result.

Foods. The Producer Price Index for finished consumer foods inched down 0.3 percent in 1987, following a 2.8-percent advance for 1986. As often happens, there was a

Table 3. Seasonally adjusted annual rates of change for Consumer Price Indexes for certain commodities with higher-than-average import proportions, selected periods, December 1982–December 1987

Category	December 1982 to December 1983	December 1983 to March 1985	March 1985 to June 1986	June 1986 to December 1986	December 1986 to December 1987
Commodities less food and energy	5.0	3.5	0.7	2.0	3.5
Wine at home	−1.5	.7	2.6	−1.3	3.8
Whiskey at home	1.5	1.3	7.8	.2	1.3
Alcoholic spirits, excluding whiskey	1.0	2.0	9.7	−.3	.9
TV and sound equipment	−2.2	−4.1	−5.1	−3.0	−3.7
Clocks, lamps, and decor items	2.4	1.0	1.6	−5.8	1.7
Tableware, serving pieces, and nonelectric kitchenware	1.6	.5	2.2	.9	1.3
Lawn equipment, power tools, other hardware	2.3	1.9	−1.9	1.8	1.3
Men's and boys' apparel	2.3	2.3	1.3	.9	3.1
Women's and girls' apparel	3.3	2.5	−2.3	5.0	5.9
Infants' and toddlers' apparel	3.5	5.5	4.6	−4.3	2.4
Jewelry and luggage	3.4	.3	−1.1	5.1	[1]11.5
Footwear	1.0	2.0	−1.4	3.9	3.8
New vehicles	3.3	3.0	4.1	5.8	1.8

[1] Jewelry only.

wide variation in price behavior among the items within this category. Substantial decreases for pork, processed poultry, roasted coffee, and eggs offset increases for fish, fresh and dried vegetables, shortening and cooking oils, and milled rice. Indexes for most other major foods rose less than 5 percent.

Pork and processed poultry prices fell during most months of 1987, principally because of significant increases in supplies. Beef and veal index movements were more mixed, as strong advances in the first half were negated by later declines, resulting in a modest increase for the year as a whole. Fish prices, however, were 18.1 percent higher at the end of 1987 than they had been a year earlier, in part because of the continuing shift towards fish as an alternative to red meats. Seafood consumption reached a new high.

Extensive damage to California crops from the white fly virus late in the year was the primary reason prices of lettuce doubled. Bad weather contributed to price increases for tomatoes, citrus fruits, and milled rice. Higher costs for ingredients such as grains, soybeans, and sugar were passed through in increases for such foods as shortening and cooking oils, bakery products, confectionery products, and soft drinks. In contrast, excess supplies and sluggish retail demand resulted in considerably lower prices for roasted coffee and eggs.

Intermediate goods

The Producer Price Index for intermediate materials, supplies, and components advanced 5.5 percent during 1987, more than recovering the 4.4-percent decline of 1986. Although the upturn was most pronounced within the intermediate energy category, the same pattern was observed for a number of other industrial goods, particularly metals and petroleum-derived products.

Manufacturing materials. After showing virtually no net change over the two preceding years, the index for intermediate goods other than food and energy advanced 5.3 percent in 1987. The strongest surge was centered in the materials for durable manufacturing category, which climbed 11.6 percent, after 3 consecutive years of small declines. Unusually large increases occurred for certain nonferrous metals, and steel prices turned up moderately. According to Federal Reserve Board data, the rate of capacity utilization in the primary metals sector jumped from 72 percent to 88 percent between December 1986 and December 1987.

Primary copper prices soared 86 percent, more than in any other year since PPI records for this commodity began in 1947. Because of a long-term decline in demand for copper (owing in part to fiber optics replacing copper wire, and plastics replacing copper pipes) and excess production by certain Third World countries, copper prices had fallen in 6 of the 7 preceding years. This led to a severe contraction and restructuring of the copper industry in the United States and overseas. Smaller output, in turn, set the stage for an upturn in prices. Demand for copper was stronger than expected throughout 1987; by the end of the year, tight supplies resulted in sharp price increases. Copper and brass mill shape prices rose 55 percent in 1987.

Similarly, aluminum prices advanced sharply during the year; unalloyed primary aluminum advanced 33 percent, while aluminum mill shape prices rose 14 percent. As with copper, price decreases in recent years had led producers to cut back their output. Heightened

speculative interest in aluminum contributed to the volatility experienced during 1987.

Lead prices rose 49 percent, even more than in the year before. The jump resulted from strong non-automotive demand, a strike in a Canadian lead-zinc smelter, and production problems elsewhere. Gold and silver prices both registered increases of about 30 percent, reflecting renewed speculative and precautionary demand responding to the drop in the exchange value of the U.S. dollar.

After a 4.2-percent decline in 1986 and a small dip in 1985, the PPI for steel mill products moved up 6.4 percent. Sizable increases were noted for all major categories of steel except wire and cold finished bars. Having undergone extensive plant modernization and closings of obsolescent furnaces and mills in recent years, the American steel industry emerged in a stronger competitive position vis-a-vis producers in other countries. For example, most of the steel produced in this country is now made in mills with continuous casters, compared to less than 30 percent 5 years earlier. Such productivity-enhancing measures, plus the decline in the value of the dollar, helped to regain part of the market share from foreign producers and restored profitability to the industry. Among other durable materials, hardwood lumber prices advanced 9.0 percent, reflecting the strong demand from Europe and Japan.

After moving down about 2 percent in both 1985 and 1986, the index for materials for nondurable manufacturing advanced 7.7 percent. A major portion of the increase resulted from petrochemicals and derivative products. In the wake of the sharp oil price increases early in the year, prices for benzene and toluene advanced sharply until June, and propylene continued to rise throughout the year. The PPI for basic organic chemicals ended the year 11.7 percent higher than in December 1986, reflecting increases in oil costs, while inorganic chemical prices showed little change.

Petrochemical-derived products likewise began to move up, particularly during the second quarter. Plastic resins prices climbed 14.4 percent over the year, and synthetic rubber advanced 24 percent; both had declined during the two previous years. Comparatively little effect on synthetic fibers took place, however; prices turned up 1.9 percent after 5 consecutive years of decrease. The continued trend in consumer preferences for clothing made from natural fibers contributed to price increases in cotton and wool yarns and fabrics. Aided by restrictions on textile imports, the American textile industry was operating at about 93 percent of capacity at the end of the year, versus 90 percent in December 1986.

Much like textiles, the pulp and paper products industry operated at more than 90 percent of capacity for the entire year, resulting in significant price increases for the second consecutive year. Paper manufacturers in this country and abroad have been reluctant to boost capacity in recent years, leading to higher prices in reaction to improved demand as production limits are reached. Woodpulp prices rose 16.1 percent, almost as much as in 1986. Newsprint and paperboard prices also advanced more than 10 percent, while other grades of paper continued to move up modestly.

Domestic and export demand for leather was strong during 1987, and supplies of hides became tight. As a result, prices for leather advanced 20 percent. Double-digit increases also occurred for both phosphates and inedible fats and oils, following declines in recent years.

Construction materials. Although new residential construction activity continued to recede gradually during the year, prices for several types of materials showed substantial increases. During the spring, mortgage interest rates began to jump because of Federal policy moves to bolster the exchange rate of the U.S. dollar. The rate of private housing starts declined from about 1.8 million at the beginning of the year to about 1.4 million at the end. However, most of this reduction came from the multi-unit segment of the market (which was adversely affected by the new tax law), while single-family housing starts were only slightly below year-earlier levels. However, nonresidential construction spending turned up slightly after a sharp drop in the previous year.

The PPI for materials and components for construction rose 4.3 percent, following 3 years of smaller increases. Softwood lumber prices advanced 6.8 percent, slightly more than in the year before, led by large increases for southern pine. Because the slowdown in new housing starts was centered in multi-unit structures in which less lumber is used per unit, lumber markets were rather stable through most of the year. Strength in the home repair sector, construction of larger homes, and the popularity of such amenities as wood sundecks boosted lumber prices. Prices for both plywood and millwork advanced moderately.

Tight supplies of copper and aluminum contributed to the 21.7-percent jump in the index for nonferrous wire and cable, the biggest annual increase since 1979. Higher costs for the component resins caused the plastic construction products index to climb 8.4 percent, after declining the two previous years.

In contrast, price movements for nonmetallic minerals were modest. Gypsum product prices fell 10.6 percent, after a small decline in the previous year. Prices for concrete products and insulation materials continued to be very stable. Small upturns occurred for refractories, asphalt roofing, and asphalt paving mixtures.

Energy. In the wake of the record 29-percent drop of 1986, the index for intermediate energy goods rose 9.4 percent; this index was still more than one-quarter below its peak level in 1981. Most refined petroleum fuels had

fallen nearly 50 percent during the prior year; the magnitude of the increases in 1987 was varied.

Prices for jet fuel soared more than any other intermediate energy product (over 40 percent), contrary to their usual pattern of relative stability among energy products. Number 2 diesel fuel and residual fuel prices climbed nearly 30 percent, while liquefied petroleum gas prices rose about 25 percent. Prices for electric power declined slightly (as in 1986), reflecting lower costs for coal and natural gas used for power generation.

Foods. The intermediate foods and feeds index rose 5.4 percent, the first over-the-year increase since 1983. Prices for crude vegetable oils jumped 21.1 percent, because of strong export demand. Similarly, demand from foreign and domestic sources led to a 13.3-percent increase in the prepared animal feeds index. Prices for most materials used in food manufacturing were generally stable.

Crude goods

Following decreases in each year from 1984 through 1986, the Producer Price Index for crude materials for further processing rose 8.8 percent during 1987. The category for basic industrial materials showed a record advance for 1987. Crude oil prices turned up substantially after falling in recent years, and scrap metals and other items surged at double-digit rates.

Basic industrial materials. The index for crude nonfood materials other than energy advanced 22.4 percent, much more than 1.8-percent increase of 1986, and the largest annual advance recorded since this grouping was first compiled in 1973. Prices for all varieties of scrap metal soared at double-digit rates. Production cutbacks in recent years for steel, aluminum, and copper had led to low inventories for scrap metal (scrap in part is generated as a by-product of metal production); increased demand for metals during 1987 then drew up demand for scrap. Iron and steel scrap soared 41.1 percent after a modest increase in 1986; in addition, the falling U.S. dollar boosted exports for ferrous scrap. Aluminum base scrap surged 53.0 percent, and copper base scrap jumped 60.1 percent, each following a much smaller increase in 1986. Lead scrap prices soared 61.5 percent.

Prices for logs and timber and for raw cotton turned up sharply following declines in 1986. Logging operations were hindered by inclement weather, thus tightening supplies, and lumber demand associated with residential housing rose. The rising popularity of pure cotton clothing and higher export sales because of the low U.S. dollar, together with falling world cotton harvests, drove up raw cotton prices. Leaf tobacco prices also moved up after falling in the previous year; smaller carry-in stocks made for tighter supplies despite slightly higher production. Cattle hide prices showed stronger advances than in the previous year; domestic demand for leather goods was up, demand from the Far East for cattle hides increased, and world supplies decreased in accord with lowered cattle slaughter rates. Prices also rose for phosphates and domestic apparel wool. Price advances slowed for wastepaper, nonferrous metal ores, and construction sand and gravel, however, compared to the previous year.

Energy. The crude energy materials index moved up 10.5 percent following a 27.6-percent drop in 1986. Crude petroleum prices jumped 29.3 percent after plummeting 50.6 percent in 1986. U.S. production continued to decline in 1987, and imports won an increased share of domestic consumption. Prices surged in the early part of the year after the Organization of Petroleum Exporting Countries set a new policy of lower production and higher prices at its December 1986 meeting. The aggregate output quota was cut from 17 million barrels per day to 15.8 million, and the U.S. Producer Price Index for crude oil jumped 20 percent in January. The effectiveness of the OPEC agreement was short-lived, however. The December 1987 meeting of OPEC members achieved little substantive success.

The index for natural gas dropped 4.1 percent, following more sizable declines in 1985 and 1986. Gas consumers continued to switch to refined petroleum products. Prices for coal moved down nearly 5 percent, considerably more than in either of the 2 preceding years.

Foodstuffs. The index for crude foodstuffs and feedstuffs moved up 1.7 percent, after decreasing 1.5 percent in 1986. Cattle prices advanced 11.3 percent, prompted by tight supplies. A smaller world crop, together with greater exports, pushed soybean prices up. Grain prices rose with higher export demand, particularly from the Soviet Union. Supply problems, owing in part to weather, boosted prices for hay, fresh vegetables, and citrus fruits. Prices for unprocessed fish were up substantially, while raw cane sugar showed a small increase. In contrast, expanded production brought price declines of 24.7 percent for hogs and 30.3 percent for chickens. Fluid milk prices also declined. □

The role of capital discards in multifactor productivity measurement

Discarding of plant and equipment varies over the business cycle, but new measures of capital input in 20 industries suggest the effect on multifactor productivity is minor

SUSAN G. POWERS

Since the early 1970's, the United States has experienced a marked slowdown in productivity growth, in comparison with the experience of the early postwar years.[1] The slowdown focused increased attention on long-term productivity trends. This article examines a second pattern in productivity growth, prevalent since World War II. Productivity growth increased during business cycle expansions, and decreased during downturns. The cyclical pattern is illustrated in chart 1, using the Bureau of Labor Statistics multifactor productivity measure for the private business sector from 1948 to 1986. The multifactor productivity measure is the ratio of output to combined capital and labor inputs.[2]

The cyclical pattern in the multifactor productivity measure has not been satisfactorily explained, although various factors that may contribute to such movements have been identified. Change in multifactor productivity is measured as the difference between the growth rate of output and the growth rate of labor and capital inputs.[3] Growth in this measure reflects increase in output due to factors other than growth in capital and labor inputs. One of these factors is technical change—the increased efficiency of production resulting from better management or organization of resources and improved technology. However, the multifactor productivity measure also reflects the impact on output of changes in capacity utilization, in the composition of labor, and in economies of scale. In addition, the measure can be affected by errors in the measurement of output and of capital and labor inputs.

One possible explanation for the cyclical pattern of multifactor productivity focuses on the measurement of capital input, specifically, the measurement of capital discards. Capital input in production is defined as the flow of services from the available stock of capital, which is composed of capital assets of various vintages. The stock of capital changes over time as a result of new investment in capital assets, discarding of capital assets, and decay or loss in economic value of existing capital assets. In the BLS framework, capital stock is measured using gross investment data and some assumptions about how capital assets decay and when they are discarded.[4] The assumption used to estimate when capital assets are discarded does not allow for increases and decreases in discards over the business cycle.[5] However, capital discards generally increase when the economy is experiencing a slowdown, and decrease when economic activity is at a peak.

Because this fluctuation in capital discards over the business cycle is not reflected by the capital input

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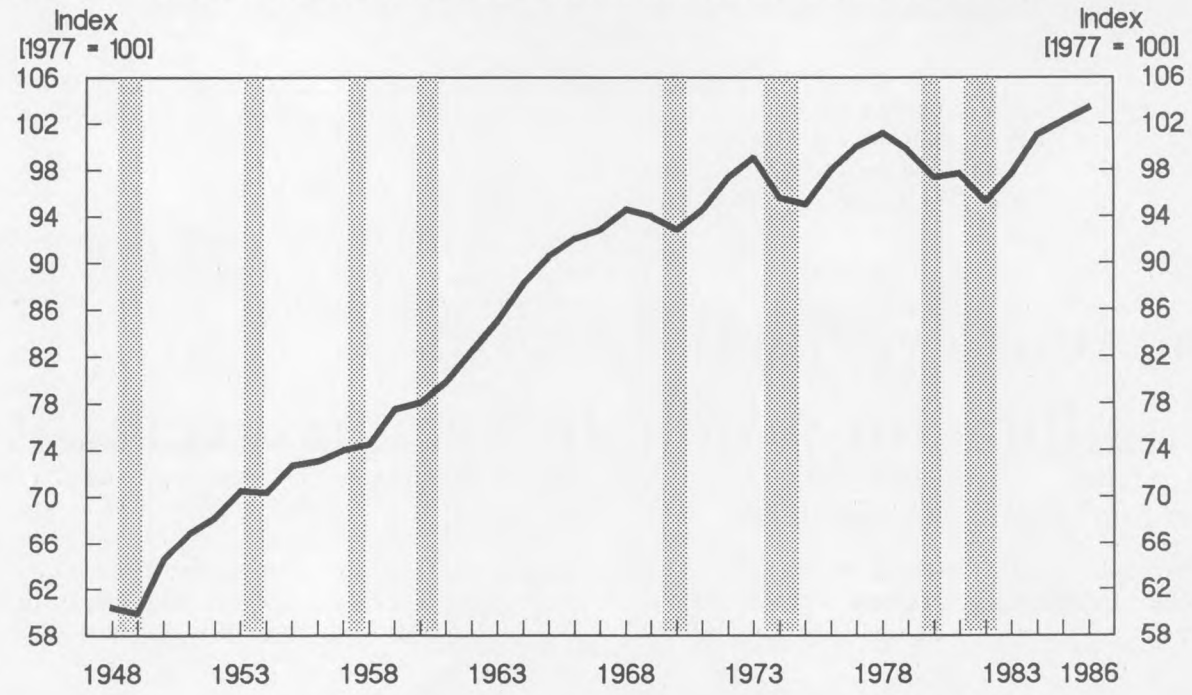
Chart 1. Index of multifactor productivity in the private business sector, 1948-86



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

measure, variation in capital input over the business cycle may be understated. The capital input measure will reflect only cyclical movements in the gross investment series and changes in the distribution of the average age of assets over time. When multifactor productivity is measured using this smooth capital input series, cyclical movements in the output series may be more extreme than the understated cyclical movements in capital input. The result will be exaggerated cyclical movements in the multifactor productivity measure.

BLS has conducted research that develops direct measures of capital discards, in order to examine whether capital discards increase and decrease over the business cycle, and, if so, what implications this may have for cyclical movements in the multifactor productivity measure.[6] Direct capital discard measures are developed for each 2-digit Standard Industrial Classification (SIC) manufacturing industry, and for durable, nondurable, and total manufacturing, for the period 1963–81. The capital discard measures are constructed using data on the gross book value of depreciable capital assets.

Gross book value measures

For a firm in a particular year, the gross book value of capital is defined as the sum of the original purchase cost of all existing capital assets. When a company discards capital assets, the gross book value is reduced by the original cost of the asset. Data on the gross book value of capital, then, directly reflect actual capital discards as they occur. The method used to obtain the direct measures of discards is described below.

This research provides a sensitivity test for the impact that an assumed smooth pattern of capital discards may have on business cycle movements in capital input and in multifactor productivity.[7] The direct capital discard measures are compared to the smoothed measures to assess the implications of increases and decreases in discards over the business cycle. The gross book value data, which are in historical dollars, are deflated to obtain constant-dollar gross book value measures. These gross book value capital stock measures reflect actual movements in capital discards over time and are developed for each 2-digit SIC industry for the years 1962–81.

Next, the gross book value capital stock series, which reflect increases and decreases in discards over the business cycle, are used to construct multifactor productivity measures for each industry for 1962–81. Finally, for each industry, the capital discard, gross book value capital stock, and multifactor productivity measures that reflect actual capital discards are compared to corresponding measures that reflect a static capital discard assumption.

Measurement of capital discards

Capital may be discarded for a variety of reasons.[8] The physical condition of capital assets deteriorates over time and as the result of wear and tear from use. The benefit to a firm of keeping an asset in use eventually may be eclipsed by the cost of maintaining the asset. The asset may become obsolete, or a company may discontinue the production of a good or service for which the asset was required. Capital also may be discarded as the result of accidental destruction.

Discarding an asset involves removing the asset from useful service. A discarded asset may be physically removed from a plant or left in place but not used. An asset no longer in use is considered to be discarded when the firm's account of the value of capital assets in service is adjusted to remove the original cost of the asset.

Capital discards can be measured using data on the gross book value of depreciable capital assets. The gross book value of capital for a firm in a given year is the historical dollar value of existing capital assets. These data reflect capital discards as they occur, because the original cost of an asset is removed from the gross book value when the asset is retired.

This research developed a measure of actual capital discards by deflating historical dollar gross book value data to obtain gross book value capital stock measures. The gross book value capital stock measure for a given year may be expressed as:

$$GBV_t = GBV_{t-1} + GI_t - DI_t$$

where:

GBV_t is the gross book value of capital stock in period t;
GI_t is gross investment in period t; and
DI_t is discards in period t.

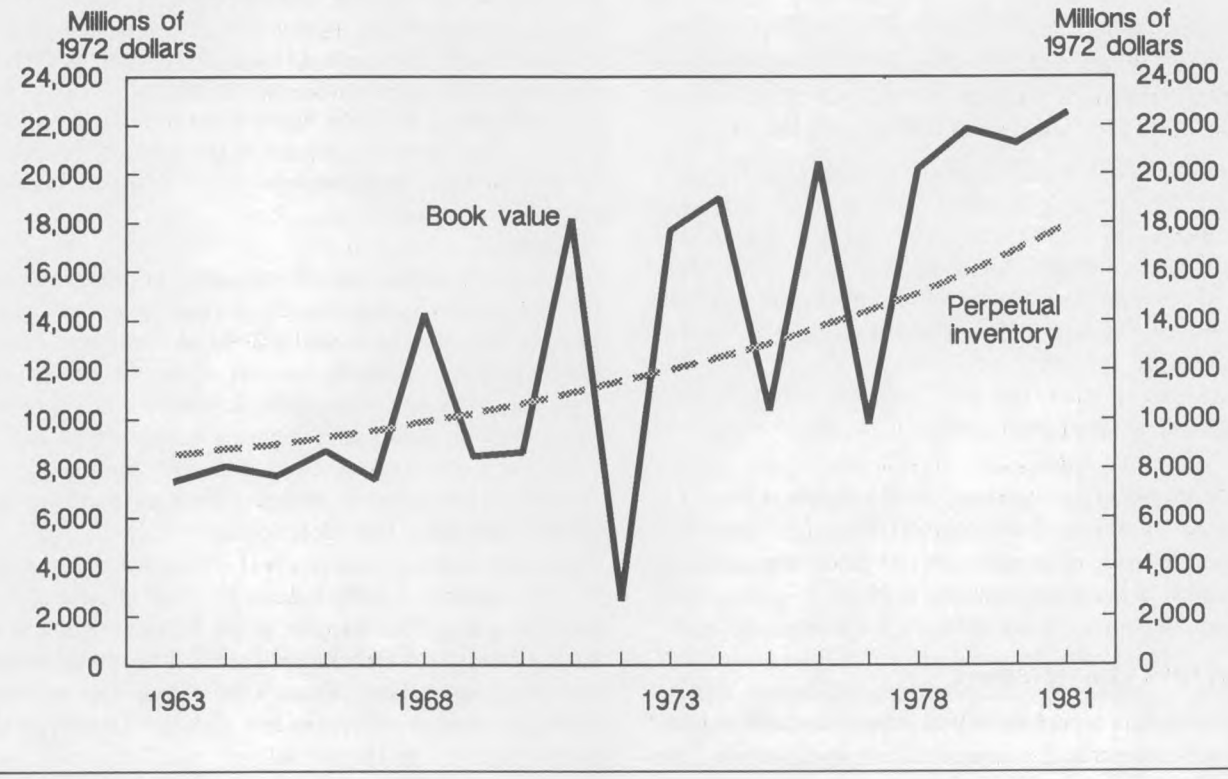
When the expression for gross book value capital stock is rearranged, a measure of actual capital discards can be defined in terms of gross investment and gross book value capital stock:

$$DI_t = GI_t - (GBV_t - GBV_{t-1})$$

For the period 1963–1981, capital discards for each industry were measured using this expression and data on gross investment and the gross book value of capital stock.[9] Census Bureau data on new capital expenditures were used for the gross investment series. Gross book value capital stock measures were developed by deflating data on the gross book value of depreciable capital assets from *Annual Survey of Manufactures* and *Census of Manufactures*, published by the Census Bureau.

The capital discard measures derived using the gross book value data reflect the actual cyclical pattern of

Chart 2. Discard measures by type of gross capital stock estimate, total manufacturing, 1963-81



capital discards. This contrasts with the smooth pattern of capital discards that underlies the BLS capital stock measures. The BLS uses the perpetual inventory method to construct net capital stock measures, that is, measures of capital stock net of the decay in the productive efficiency of existing capital assets.[10] The perpetual inventory method measures net capital stock as the cumulated value of investment minus cumulated discards and cumulated decay of capital assets. Under the perpetual inventory method, capital discards are determined by a static assumption, and this results in a smooth pattern of capital discards over the business cycle.

For each industry, gross capital stock measures are constructed using the perpetual inventory method, and are used to derive the capital discard series implied by the method's discard assumption for the years 1963 to 1981. Gross, rather than net, capital stock measures are created, to facilitate comparison with the gross book value capital stock measures.[11] Under the perpetual inventory method, gross capital stock is defined as the cumulated value of investment, minus the cumulated value of discards. This measure can be expressed as:

$$GPIM_t = GPIM_{t-1} + GI_t - DI_t^*$$

where:

$GPIM_t$ is the gross perpetual inventory method capital stock in period t;
GI_t is gross investment in period t; and
DI_t^* is capital discards in period t.

Capital discards, implicit in the gross perpetual inventory capital stock measure, can be defined in terms of gross investment and the gross capital stock measure:

$$DI_t^* = GI_t - (GPIM_t - GPIM_{t-1})$$

This measure of capital discards is computed for each industry. The gross investment series is measured using gross investment data from the Commerce Department's Bureau of Economic Analysis. The gross perpetual inventory capital stock measures are developed using the gross investment data, and the discard assumption used in BLS methods.

Measurement of capital stock

Gross book value estimates. Gross book value capital stock is measured for each industry for the years 1962–81, and used to compute the discard measures described above. The gross book value capital stock measures are also useful because movements in these measures over time can be compared, by industry, to movements in the gross perpetual inventory capital stock measures. This comparison is made to determine whether the use of gross book value data to reflect actual capital discards significantly affects cyclical movements in capital stock. The sensitivity of the multifactor productivity measure to movements in discards is also studied using the book value capital measures. Multifactor productivity is computed for each industry using the gross book value capital stock measures, and compared to multifactor productivity measures computed using the gross perpetual inventory method measures of capital stock.

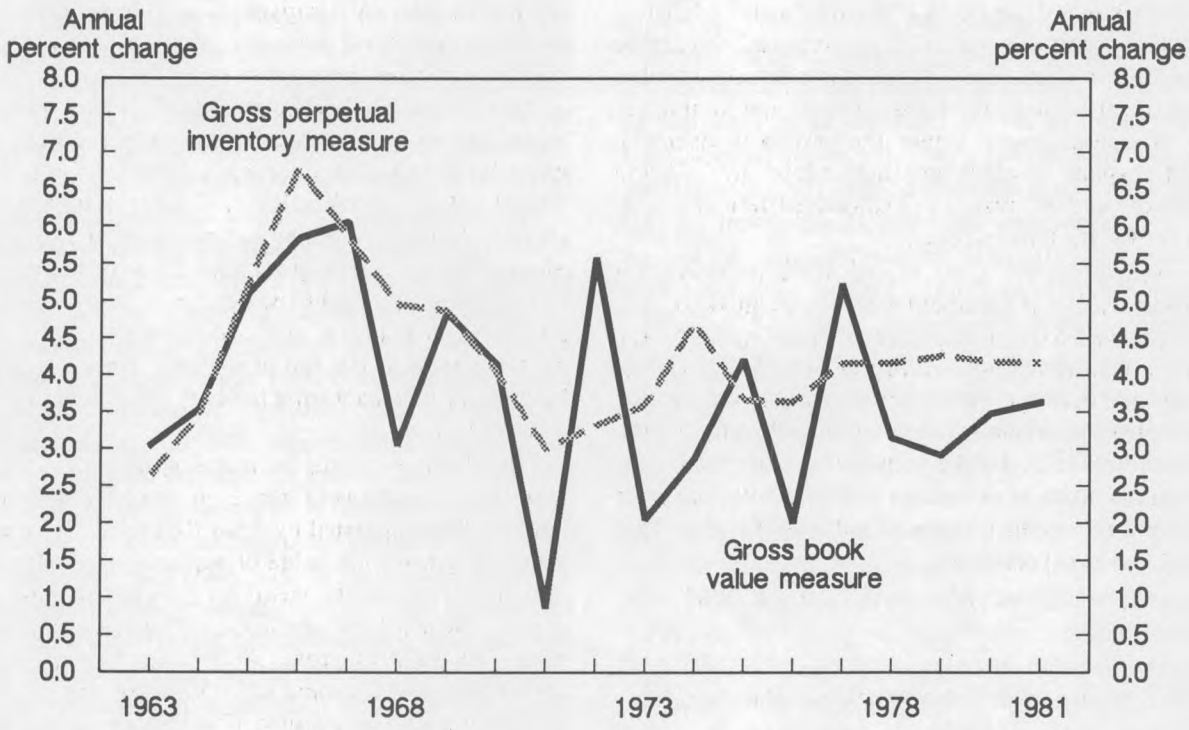
As indicated earlier, the gross book value capital stock measures are constructed by deflating historical-dollar gross book value data for each industry for the years 1962–81. Gross book value data are obtained from the *Annual Survey of Manufactures* and the *Census of Manufactures*. Census gross book value is defined as the gross book value of all fixed depreciable assets (buildings, structures, machinery, and equipment) on the books of establishments at the end of the year. Data are available by detailed manufacturing industry[12] for 1957, 1962–64, and 1967–81.

Price deflators for the historical-dollar gross book value data were constructed for each industry following a methodology suggested by John Kendrick.[13] For a given year, the gross book value of capital is the value of the existing capital assets, based on the original cost of the assets. The existing capital assets include capital purchased in different years, that is, of different vintages. Development of a capital stock measure using the gross book value data is possible if the value of the various vintages of capital assets can be expressed in constant dollars. This requires a price deflator that considers the vintage distribution of assets in the gross book value for a given year, and adjusts the valuation of capital assets from historical dollar to constant dollar, based on this vintage distribution. The price deflators developed reflected estimates of the vintages of capital included in a specific year's gross book value data, and the proportion of investment in each vintage, in the form of Bureau of Economic Analysis gross investment data and average useful life estimates.[14]

Perpetual inventory method estimates. Gross perpetual inventory method capital stock measures were created for each industry for the years 1962–81. As indicated above, the perpetual inventory method measures net capital stock as cumulated new capital investment adjusted for decay and discarding of previously accumulated capital stock. For a gross capital stock measure, cumulated new investment is adjusted for the cumulated value of discarded investment, but not for decay.

Constructing a gross perpetual inventory capital stock measure requires a long historical series of new capital investment data for each year in the capital series and an assumption regarding capital discards. The capital investment data used were Bureau of Economic Analysis constant-dollar gross investment data by asset type for each industry, from 1880–1981.

Chart 3. Growth rates of alternative capital stock measures, total manufacturing, 1963-81



The discard assumption used was identical to the BLS discard assumption. In using the perpetual inventory method to measure capital, BLS assumes capital assets are discarded as a function of the average useful life of an asset.[15] For each industry, capital assets of similar characteristics are grouped into asset-type categories. An average useful life for each type of asset is estimated by the Bureau of Economic Analysis. Because each type contains many different, although similar, assets, a particular asset may have a slightly different average useful life than that determined for its asset type. In addition, capital assets of a given description may exhibit variation in their useful lives as a result of random variations in breakage, loss, or obsolesence. Because of this, discards are assumed to be normally distributed around the average service life.

Initially, gross perpetual inventory capital stock measures were constructed for each detailed asset type within each 2-digit SIC manufacturing industry. The detailed asset-type measures in each industry were then summed to obtain the 2-digit industry gross capital stock measure. The durable, nondurable, and total manufacturing industry gross capital stock measures were similarly obtained by summing the appropriate 2-digit SIC manufacturing industry measures.[16]

Measurement of multifactor productivity

The impact on multifactor productivity of using a static assumption to estimate capital discards was examined by comparing alternative measures of multifactor productivity. The measures were constructed by methods similar to those used in constructing the BLS published multifactor productivity measures for major sectors.[17] The growth rate of multifactor productivity for each industry is defined as the growth rate of output minus the weighted growth rates of labor and capital inputs, where the weights are the cost shares of the respective inputs in total cost.[18] Multifactor productivity was measured using first the gross book value capital stock measure and, alternatively, the gross perpetual inventory capital stock measure for each industry for the years 1962–81.

Results

As noted, actual capital discards, derived from the gross book value data, increase and decrease substantially with economic slowdowns and expansions, respectively, in each industry studied.[19] This is in contrast to the smooth capital discard pattern assumed in the BLS capital measures. For each industry, the growth rate of gross book value capital stock showed substantially more

movement over the business cycle than did the growth rate of the perpetual inventory-based stock. In contrast, multifactor productivity based on the gross book value capital stock measure, which reflects actual capital discards, displays virtually the same cyclical pattern as multifactor productivity computed using the gross perpetual inventory capital stock measure, which reflects a smooth pattern of capital discards. Thus, even though capital discards do vary over the business cycle, and incorporating these variations into the capital stock measure does increase the cyclical movement of that measure, this pattern of capital discards is not an important factor in explaining cyclical variation in the multifactor productivity measures.

A measure summarizing cyclical movement in the book value and perpetual inventory method series on capital discards, capital stock, and multifactor productivity was computed for each industry. This measure uses the deviation of the actual series values from trend values as a proxy for the cyclical movement in the series. The summary measure of cyclicality is the absolute value of the percentage difference between the actual and the trend values of a series, summed over the years 1969 to 1981.[20] Those years respectively contained the initial and the final business cycle peaks occurring during the study period. A higher value of the measure indicates that a series has more extreme movements over the business cycle than a series with a lower value. The summary measures of cyclicality for each industry are presented in table 1.

Actual capital discards in each industry vary substantially over the business cycle, compared to capital discards implied by the gross perpetual inventory capital stock measures. The summary measure of cyclicality for capital discards based on the gross book value data, as shown in table 1, is consistently of a much higher magnitude than the same measure based on the static perpetual inventory discard assumption.

The second set of columns in table 1 presents the summary measures of cyclicality for gross book value and gross perpetual inventory capital stock in each industry. Although the perpetual inventory capital stocks do exhibit some cyclical movements as a result of variation in gross investment over the business cycle, the book value measures in each industry consistently exhibit more extreme cyclical movements. The book value capital stock measures reflect variation in capital discards, as well as gross investment, over the business cycle.

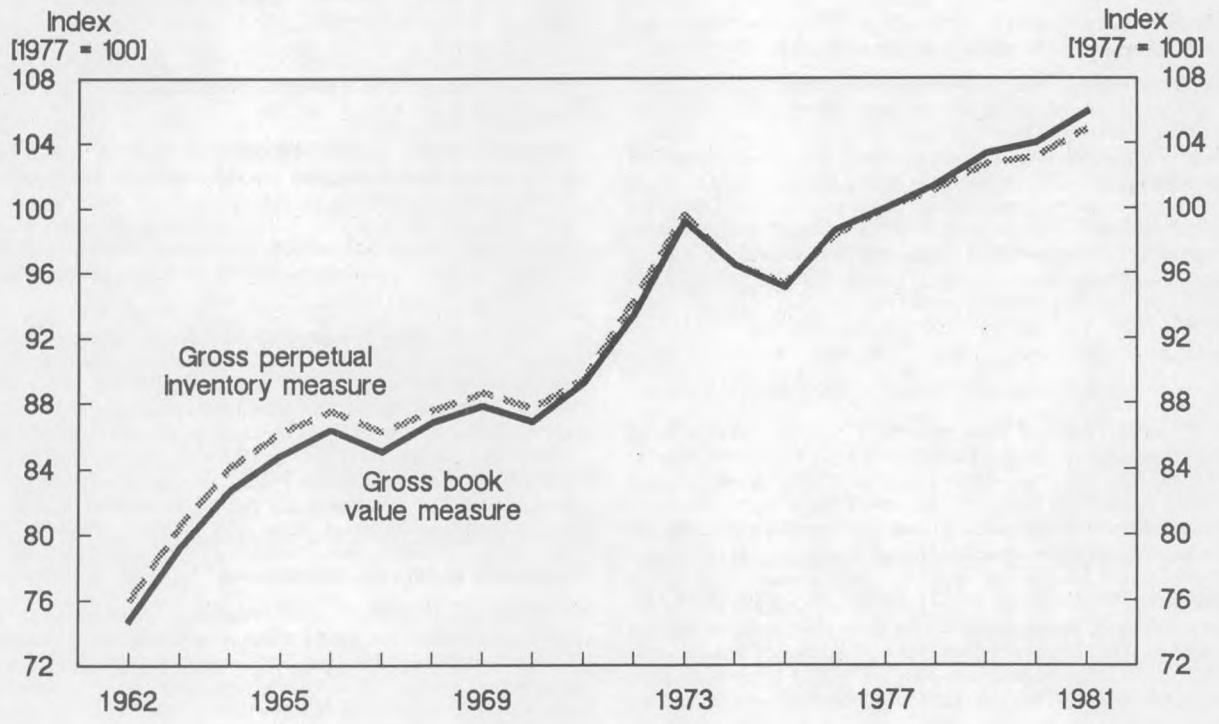
The third set of columns in table 1 presents the summary measures of cyclicality for the alternative measures of multifactor productivity. Multifactor productivity is first measured using gross book value capital stock, and then using gross perpetual inventory capital stock. The resulting multifactor productivity measures demonstrate similar patterns of cyclical variation, as evidenced by the small difference between the summary

Table 1. Summary measures of cyclicality in alternative measures of capital discards, growth rates of gross capital stock, and multifactor productivity, by industry, 1969–81

Standard Industrial Classification code	Industry	Capital discards			Capital stock growth rates			Multifactor productivity indexes		
		Book value basis	Perpetual inventory basis	Difference	Book value basis	Perpetual inventory basis	Difference	Book value basis	Perpetual inventory basis	Difference
	Total manufacturing	3.56	.05	3.51	3.74	1.15	2.59	.17	.17	.00
	Nondurable manufacturing	2.92	.04	2.88	3.56	1.12	2.44	.18	.18	.00
20	Food and kindred products	2.62	.13	2.49	4.86	1.19	3.67	.28	.26	.02
21	Tobacco manufactures	5.88	.01	5.85	10.17	5.20	4.97	.50	.39	.11
22	Textile mill products	4.47	.12	4.35	18.58	5.31	13.27	.52	.51	.01
23	Apparel and other textile products	22.72	.01	22.71	51.66	2.16	49.50	.30	.33	−.03
26	Paper and allied products	5.05	.05	5.00	4.24	2.74	1.50	.39	.40	−.01
27	Printing and publishing	4.35	.04	4.31	7.50	1.88	5.62	.21	.21	.00
28	Chemicals and allied products	4.24	.11	4.13	5.21	2.49	2.72	.31	.29	.02
29	Petroleum and coal products	7.86	.06	7.80	7.48	2.89	4.59	.44	.45	−.01
30	Rubber and miscellaneous plastics products	17.86	.02	17.84	10.36	2.83	7.53	.31	.36	−.05
31	Leather and leather products	2.62	.02	2.60	26.46	4.22	22.24	.33	.34	−.01
	Durable manufacturing	4.40	.05	4.35	4.04	1.48	2.56	.15	.16	−.01
24	Lumber and wood products	14.75	.02	14.73	14.09	2.78	11.31	.24	.17	.07
25	Furniture and fixtures	5.58	.02	5.56	10.34	3.55	6.79	.36	.37	−.01
32	Stone, clay, glass, and concrete products	6.60	.04	6.56	11.06	2.84	8.22	.27	.28	−.01
33	Primary metal industries	2.09	.02	2.07	5.94	2.53	3.41	.53	.54	−.01
34	Fabricated metal products	15.49	.06	15.43	7.85	1.75	6.10	.31	.32	−.01
35	Machinery, except electrical	3.16	.13	3.03	2.42	1.49	.93	.22	.21	.01
36	Electric and electronic equipment	4.11	.03	4.08	4.30	2.12	2.18	.37	.39	−.02
37	Transportation equipment	5.27	.04	5.23	6.47	2.28	4.19	.53	.53	.00
38	Instruments and related products	34.22	.07	34.15	5.24	2.13	3.11	.34	.35	−.01
39	Miscellaneous manufacturing, industries	4.75	.07	4.68	12.14	2.37	9.77	.33	.33	.00

[1] The summary measure is the sum of the absolute values of the percentage differences between actual and trend values for the specified series, for the years 1969–81.

Chart 4. Indexes of alternative multifactor productivity measures, total manufacturing, 1962-81



measures of cyclical variation for the alternative multifactor productivity measures in each industry.

These results are illustrated for total manufacturing in charts 2, 3, and 4. Chart 2 shows actual capital discards with implied capital discards derived from the gross perpetual inventory capital stock measure. For total manufacturing and for detailed manufacturing industries, actual capital discards derived from gross book value data increase and decrease over the business cycle, while discards implied by the perpetual inventory discard assumption have a smooth, upward-trending pattern. Chart 3 shows that, while the perpetual inventory capital stock measure does vary over the business cycle, the book value measure exhibits more extreme cyclical variation. Chart 4 compares two alternative multifactor productivity measures, one based on the gross book value capital stock, and a second based on the gross perpetual inventory capital stock. The two multifactor productivity measures show similar patterns of cyclical movements.

Accounting for increases and decreases in capital discards over the business cycle demonstrates that variation in capital discards is a minor factor in explaining the cyclical pattern exhibited by multifactor productivity measures. This finding supports the conclusion that the BLS technique of measuring capital stock using the static discard assumption in the perpetual inventory method does not create a large cyclical bias in the multifactor productivity measure. However, the issue of explaining the relationship between multifactor productivity and the business cycle remains open. Possible explanations include fluctuations over the business cycle in the rates of capital and labor utilization, which are not accounted for by the capital or labor input measures. BLS is conducting further research investigating these and other factors that may explain the cyclical fluctuations in multifactor productivity measures. □

FOOTNOTES

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[1]In the private business sector, growth in labor productivity—output per unit of labor input—decreased from a rate of 2.9 percent annually in 1948–73 to a rate of 1.0 percent in 1973–86. Growth in multifactor productivity—output per unit of combined capital and labor input—decreased from a rate of 2.0 percent in the earlier period to a rate of 0.3

percent in 1973–86. For further information on trends in multifactor productivity, see *Multifactor Productivity Measures, 1986*, USDL 87–436 (Bureau of Labor Statistics, Oct. 13, 1987).

[2]A detailed explanation of the multifactor productivity measure published by BLS is available in *Trends in Multifactor Productivity, 1948–81*, Bulletin 2178 (Bureau of Labor Statistics, September 1983).

[3]Output is defined as real gross product originating in a given industry, which is net of its intermediate inputs. The multifactor productivity measurement formula is derived from an assumed production relationship: $Q(t) = A(t)f(K(t),L(t))$, where $Q(t)$ is real output, $K(t)$ is real capital input, $L(t)$ is real labor input, and $A(t)$ is an index of neutral technological progress, or multifactor productivity. Taking the logarithmic differential of this production function with respect to time, and assuming perfect competition and constant returns to scale, a measure of multifactor productivity growth can be derived from observed input and output quantities and prices:

$$\frac{\dot{A}}{A} = \frac{\dot{Q}}{Q} - \frac{P^L L}{PQ}\frac{\dot{L}}{L} - \frac{P^K K}{PQ}\frac{\dot{K}}{K}$$

where P^L is the price of labor services, P^K is the rental price of capital services, P is the price of output, and the "dot" notation refers to the rate of change of the variable over time. The growth rate of multifactor productivity is equal to the growth rate of output minus the cost-share-weighted growth rates of labor and capital inputs. The cost share of labor input is the expenditure on labor, calculated as the price of labor services multiplied by the quantity of labor services, $P^L L$, divided by total input cost, calculated as the price of output multiplied by the quantity of output, or PQ. Similarly, the cost share of capital input is calculated as expenditure on capital input, $P^K K$, divided by total input cost, PQ. Under constant returns to scale and perfect competition, total input cost is equal to the value of total output. That is,

$$PQ = (P^L L + P^K K)$$

[4]The BLS measures capital stock using the perpetual inventory method. This method is described below.

[5]BLS estimates capital discards using a constant discard pattern based on the estimated average useful lives of capital assets. An assumption of a constant discard pattern has generally been made when measuring capital stock using the perpetual inventory method. For example, see L. Christensen and D. Jorgenson, "The Measurement of U.S. Real Capital Input, 1929–1967," *Review of Income and Wealth*, 1969, pp. 293–97; E. Denison, *Accounting for United States Economic Growth, 1929–1969* (Washington, The Brookings Institution, 1974), pp. 156–57; D. Jorgenson and Z. Griliches, "The Explanation of Productivity Change," *Survey of Current Business*, May 1969, pp. 31–38; *Fixed Reproducible Tangible Wealth in the United States, 1925–79* (U.S. Department of Commerce, March 1982), pp. T–1—T–15; *Capital Stock Estimates for Input-Output Industries: Methods and Data*, Bulletin 2034 (Bureau of Labor Statistics, 1979), pp. 1–24; and *Trends in Multifactor Productivity, 1948–81*, pp. 40–45.

[6]This study, of course, does not attempt a complete analysis of the business cycle movements of capital discards, capital stock, and multifactor productivity. The focus of the empirical work performed is annual variation in capital discards, using alternative measures of discards, and the effects of the discard series on trends in multifactor productivity. Additional study of the capital discard data, and related data, within the context of the business cycle is contemplated. Some exploratory work has examined movements in capital discards over the business cycle by correlating the level of capital discards and the rate of growth of output for each industry. These correlations, performed using data for 1964–81, are negative for 18 of the 20 2-digit SIC manufacturing industries and for the durable, nondurable, and total manufacturing sectors. These results indicate a decline in the level of discards as the rate of growth of output increases during business cycle expansions and an increase in the level of discards as the rate of output growth declines during business cycle contractions.

[7]For further analysis and discussion of this issue, see Susan G. Powers, "Cyclical Variation in Capital Stock Measures: Implications for Multifactor Productivity," Ph. D. thesis (State University of New York at Binghamton, 1985).

[8]For a discussion of capital discarding, see A. Marston, R. Winfrey, and J. Hempstead, *Engineering Valuation and Depreciation* (New York, McGraw–Hill Book Company, Inc., 1953), pp. 139–42.

[9]Capital discards are measured for 1963–81, rather than 1962–81, because of the lagged term in the discard definition.

[10]Net capital stock measures are constructed by BLS using the perpetual inventory method. Capital in the current year is equal to capital in the previous year, plus new investment, minus capital discards and decay. Capital discards are determined based on the average useful lives of capital assets. Decay in the productive efficiency of assets is approximated using a hyperbolic functional form. The hyperbolic function is concave, implying slower decay during the early life of an asset and faster decay during the later years.

[11]Net capital stock measures are used more frequently than gross measures. However, net book value data often reflect an accounting, rather than an economic, concept of depreciation. Comparing gross book value and gross perpetual inventory, capital stock measures avoid the bias that might result from comparing net capital stock measures based on different depreciation concepts. Note that capital discards measured using the gross book value capital stock series reflect the original value of the capital asset, rather than the remaining value of the asset after adjusting for loss in productive efficiency of the asset over time. Similarly, discards implied by the gross perpetual inventory capital stock measures are not adjusted for loss in productive efficiency.

[12]These data are available for manufacturing industries at the 2- , 3- , and 4-digit levels of the Standard Industrial Classification of industries. The first year of available data, 1957, is not used. Values for the missing observations, years 1965 and 1966, were interpolated to complete the data series for 1962–81. The Census Bureau gross book value data were regressed on gross book value data series constructed using Bureau of Economic Analysis gross investment data and a discard assumption. The fitted values for the Census Bureau gross book value series in 1965 and 1966 from this regression were used as estimated values.

[13]This method is described in John Kendrick, *Improving Company Productivity: Handbook with Case Studies* (Baltimore, The Johns Hopkins University Press, 1984), pp. 42–46.

[14]Gross book value price deflators were developed for each industry from 1962–81. First, the deflators were constructed for each industry's individual asset types. Total gross book value price deflators for each industry were then constructed as weighted sums of the individual detailed-asset-type gross book value price deflators. The weights used to construct the industry gross book value price deflators were the sum of constant-dollar investment in asset i in years X-L to X, divided by the sum of constant-dollar investment in total assets in years X-L to X. L is the average service life of a capital asset. The weights constructed were variable weights, changing each year.

The individual-asset-type deflators for each industry were constructed using a method that considers the vintage composition of an industry's gross book value in any given year. The gross book value of capital for a given year is defined as the original cost valuation of existing capital assets, and so includes capital assets of different vintages. This method estimates the vintage distribution of assets included in a given year's gross book value figure. Vintages from the previous L years were assumed to remain in a given year's gross book value. The proportion of investment in each vintage within the gross book value figure was determined by the original level of gross investment in the vintage.

The method used can be summarized as follows. The gross book value price deflator value in year X is the sum of historical-dollar gross investment in years X-L to X, divided by the sum of constant-dollar gross investment in years X-L to X. This general formulation was constructed using data on each asset type for each industry. The historical- and constant-dollar gross investment data for each asset type in each industry were obtained from the Bureau of Economic Analysis, as were the average useful life values for each asset type by industry.

[15]The Bureau of Economic Analysis estimates of the average useful lives of assets, and a truncated normal distribution ranging from 2

percent to 198 percent of the average useful life of an asset L, are used by BLS in determining discards. Capital assets are discarded as a function of their average useful life. Variation in the discarding of capital assets around the average useful life is described by the truncated normal distribution. The value of discards in a given year, X, is calculated by summing the product of the constant-dollar value of a capital asset times the probability of the asset's retirement at that age, for capital assets ranging in age from 2 percent to 198 percent of the asset's average life. The truncated normal distribution includes two standard deviations or 95 percent of the area under the discard distribution. An expanded discussion of the discard assumption used by BLS is contained in *Trends in Multifactor Productivity, 1948–81*, appendix C.

[16]For each 2-digit SIC manufacturing industry, the gross perpetual inventory capital stock measure was obtained as an unweighted sum of the industry's detailed-asset-type gross perpetual inventory capital stock measures. This is similar to the methodology underlying the gross book-value capital stock measures for each industry, because an industry's total gross book value is an unweighted sum of the gross book value of existing capital assets. This approach also simplified the construction of the gross perpetual inventory capital stock measures.

[17]For further discussion of the methodology underlying the published BLS multifactor productivity measures, see Jerome A. Mark and William H. Waldorf, "Multifactor productivity: a new BLS measure," *Monthly Labor Review*, December 1983, pp. 3–15; *Trends in Multifactor Productivity, 1948–81;* and *Multifactor Productivity Measures, 1986.*

[18]Bureau of Economic Analysis data on output quantity were used in each industry, whereas labor services data were obtained from BLS 2-digit industry data sources. Labor income, capital income, and total income estimates were obtained from Bureau of Economic Analysis 2-digit industry data.

[19]For example, capital discards in total manufacturing increase during the peak-to-trough years, and decrease during the trough-to-peak years. This is particularly noticeable during the 1973–75 and 1980 recession periods. During the 1969–70 recession, discards increased slightly and then jumped substantially in 1971. For a graphical presentation of capital discards in total manufacturing for 1963–81, see chart 2.

[20]The summary measure of cyclicality for a given series was constructed using trend values which were estimated by regressing the actual series values on a constant, time, and time squared, and obtaining the fitted values from this regression. The measure was constructed using a sum over the years 1969 to 1981, in order to provide a peak-to-peak comparison of the measures.

Excessive hours and productivity

Economists have tended to assume that 1 hour of labor supplied by a worker is much like another. Karl Marx, who cited a variety of evidence to show that long hours of work were detrimental to health and to longevity, did not go on to deduce that those who worked long hours must, because of their poor health, produce less. The most fundamental connection between hours of work and production exists at this *physiological* level. People are able to sustain work for remarkably long continuous periods, and for remarkably high proportions of their total daily hours. But long hours are accommodated by an adjustment of pace or work intensity—by a slowing of movements and an interpolation of more pauses between movements. In addition, long hours (which must also be judged relative to the arduousness of the work) tend to give rise to a high rate of absence and sickness, which has particularly serious effects in production involving the interdependence of workers and complex planning and scheduling.

—MICHAEL WHITE
Working Hours: Assessing the Potential for Reduction (Washington, International Labour Office, 1987), pp. 40–41.

The labor market problems of today's high school dropouts

Of the 4 million young high school dropouts in 1986, 1 in 6 was unemployed; many were not in the labor force at all, and those who were, faced strong competition from high school graduates for limited job opportunities

JAMES P. MARKEY

Among the Nation's unemployed, about 3 of 8 are young persons age 16 to 24. The high unemployment rates among youth reflect the problems often encountered by these new entrants to the job market. Without a doubt, the youth facing the greatest difficulties are the 4 million high school dropouts. Many dropouts do not participate in the job market at all; of those who do, 1 of 4 are unemployed.

The dropout problem

Education has long been recognized as vital in building an able and skilled work force, and the 20th century has seen a tremendous rise in the educational level of the U.S. population. At the beginning of this century, only 10 percent of male students received a high school diploma. During the 1950's, more than half of all students graduated from high school.[1] By the late 1960's, data from the National Center for Education Statistics put high school completion rates at about 75 percent, where they have since remained.[2] This apparent halt in the rising trend of high school completions has resulted in heightened awareness of the dropout problem. Currently, there is debate on the appropriateness of using high school completion rates (and the derived dropout rate) as a means of estimating the magnitude of the dropout problem. The adequacy of estimates obtained from other methods is also questioned given that the range of reported dropout rates extends from 14 percent to 25 percent.[3] However, regardless of the measure chosen, there is little conclusive evidence to suggest that there has been significant improvement in the dropout situation over the last two decades.

Information on dropouts is obtained from several sources, including the administrative records of local school districts, longitudinal surveys of youth/student cohorts, and the Current Population Survey (CPS).[4] This article assesses the labor market behavior of young high school dropouts, relying heavily on data from the CPS. Each October, a supplement to the regular CPS asks questions regarding the school enrollment status of household members, including the year they last attended school and the highest grade completed. Separate data are tabulated for high school graduates and high school dropouts[5] and for two groups of special interest—recent dropouts (those who dropped out of school between October of the previous year and the current October) and recent graduates (those who completed high school during the current calendar year).

The number of recent dropouts has averaged about 700,000 a year for the last 20 years, although it was at its

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lowest level, 562,000, in 1986.[6] The 1978 high of 839,000 roughly mirrors the population peak of baby-boomers. The following tabulation shows the number of recent dropouts, 1967–86:

	Recent dropouts (thousands)		*Recent dropouts (thousands)*
1967	614	1977	832
1968	610	1978	839
1969	661	1979	812
1970	712	1980	759
1971	657	1981	713
1972	734	1982	668
1973	790	1983	597
1974	813	1984	601
1975	737	1985	612
1976	749	1986	562

The recent dropouts of 1986 were nearly equally divided among young men (53 percent) and young women (47 percent), which was typical of the last two decades. Although the dropout problem is often represented as primarily a problem among minority youth, only 16 percent of recent dropouts in 1986 were black, a proportion representative of black high school enrollment, while 80 percent were white.[7] Since 1973, when data were first tabulated for Hispanics (most Hispanics are counted as white), a disproportionate number of dropouts have been of Hispanic origin. Most recently, 23 of 100 recent dropouts were Hispanic, although Hispanics account for only 9 percent of the enrolled high school population.

In October 1986, there were about 4 million young high school dropouts, representing nearly 1 of 8 of the 16- to 24-year-olds.[8] To better understand this sizable group, this article first explores the phenomenon of dropping out of school before analyzing the labor market behavior and performance of young dropouts.

Dropping out: factors and reasons

Several factors have been theorized to explain what influences a youth's decision to drop out of high school. Reliable indicators of who will complete high school appear to be family background characteristics, such as income and parental education, and an individual's performance on intelligence tests and demonstrated reading skill.[9] Studies have found that dropouts are more likely to score lower on ability tests and to come from families with relatively low income and education.

Data from the October 1985 supplement to the CPS were used to look at two background variables for recent graduates and dropouts: family income and parental education. Because it lacks the necessary longitudinal capacity, the CPS cannot identify the parental education and family income of dropouts and graduates prior to their leaving school, but a reasonable proxy for the two variables is found by using data for recent graduates and dropouts who were still living with their parents when surveyed.[10] (Thus, the discussion in this section excludes recent graduates and dropouts who were living on their own.[11])

Table 1. Median family income by type of family in which 16- to 24-year-old recent high school dropouts and graduates reside, October 1985

Type of family and income[1]	High school dropouts	High school graduates	
		Enrolled in college	Not enrolled in college
All families (thousands)	450	1,457	968
Percent with income less than $10,000	40.9	5.7	14.7
Median family income	$12,064	$34,171	$22,659
Married-couple families (thousands)	231	1,190	699
Percent with income less than $10,000	23.4	2.9	8.8
Median family income	$21,249	$37,593	$26,575
Families maintained by women (thousands)	183	206	226
Percent with income less than $10,000	68.0	21.0	33.8
Median family income	$6,764	$17,966	$12,323

[1]Data refer only to those families reporting income.

As one might expect, family income differed significantly for recent dropouts and high school graduates. Median income was $12,100 for families of recent dropouts, $22,700 for families of recent high school graduates not enrolled in college, and $34,200 for families of college-enrolled recent high school graduates.[12] These income differences are explained, in part, by the distribution of family types for each group. For example, dropouts are more likely to come from families maintained by women, whose incomes, on average, are less than half those of married-couple families. (See table 1.)

A second factor, parental education, has also been suggested as influencing the dropout's decision. More than half of the recent dropouts were in families where the householder[13] had completed less than 12 years of school; only 10 percent of college-enrolled recent graduates were in such families. (See table 2.) Dropouts are also more likely to live in families maintained by women, and these women tend to have relatively low levels of both educational attainment and income.

These findings support previous studies that show parental education and family income as factors associated with dropping out of high school. While the findings do not establish a causal relationship, they help identify youths who are "at risk" of dropping out. The data also suggest differences in the familial backgrounds of graduates and dropouts which will not be changed by obtaining a high school diploma, and which must be recognized when formulating programs dealing with the employment problems facing young dropouts.

In addition to the familial background factors, responses obtained from dropouts on their reasons for

leaving school add vital information to their portrait. Data on reasons for leaving school are available from the Center for Education Statistics' longitudinal survey of high school sophomores and seniors, begun in the spring of 1980.[14] The survey categorized reasons for dropping out as school-related, family-related, or other (the categories are not mutually exclusive; dropouts could give more than one reason). Among the other reasons, "offered job and chose to work" was listed separately and is of special interest in this analysis. The following tabulation shows the percent of dropouts, by reason, from the Center for Education Statistics' survey:

	Male	*Female*
Had poor grades	35.9	29.7
School not for me	34.8	31.1
Married or planned to get married	6.9	30.7
Was pregnant	—	23.4
Had to support family	13.6	8.3
Offered job and chose to work	26.9	10.7

For young women, the decision to leave school is primarily related to school or family matters. Many listed marriage or pregnancy as the reason for dropping out; only 11 percent listed "offered job and chose to work." In view of their low labor force participation after leaving school, it appears that work-related factors play a minor role in the decision of young women to drop out. Marital status and childbearing appear to be important factors. For many young men, the reasons given for dropping out of school suggest an implicit choice of work over further studies. For example, in addition to school-related reasons, "offered job and chose to work" and "had to support a family" figured prominently.

Table 2. Distribution of 16- to 24-year-old recent high school dropouts and graduates by the educational attainment of the householder in the family in which they reside, October 1985

[In percent]

Type of family and educational attainment of householder	High school dropouts	High school graduates	
		Enrolled in college	Not enrolled in college
All families[1]	100.0	100.0	100.0
Less than 4 years of high school	55.1	10.3	32.0
4 years of high school	26.7	35.5	46.3
1 to 3 years of college	13.6	22.9	12.7
4 years of college or more	4.7	31.4	9.0
Married-couple families	100.0	100.0	100.0
Less than 4 years of high school	53.5	10.1	33.9
4 years of high school	27.4	34.3	43.9
1 to 3 years of college	11.3	21.7	13.3
4 years of college or more	7.8	33.9	8.9
Families maintained by women	100.0	100.0	100.0
Less than 4 years of high school	59.9	11.7	23.5
4 years of high school	24.2	41.7	55.3
1 to 3 years of college	15.9	30.6	11.9
4 years of college or more	([2])	16.0	9.3

[1]Includes a small number of families maintained by men.

[2]Less than 0.5 percent.

Table 3. Labor force participation rates of 16- to 24-year-old female high school dropouts and graduates by marital status, presence of children, race, and Hispanic origin, March 1987

Marital status and presence of children	Dropouts				Graduates[1]
	Total	White	Black	Hispanic origin	
Total	46.1	47.7	37.9	35.1	77.4
With no own children	59.5	62.4	40.6	58.0	87.1
With own children	35.6	35.5	36.3	21.2	60.0
Married, spouse present	39.5	37.9	([2])	22.8	67.9
With no own children	51.4	47.9	([2])	([2])	81.5
With own children	35.5	34.7	([2])	18.4	58.4
Other marital status[3]	50.0	55.4	35.7	45.4	82.9
With no own children	61.6	66.9	36.5	65.3	88.8
With own children	35.8	36.8	35.1	25.1	62.4
Maintaining families with own children	32.8	35.1	28.2	([2])	61.3

[1]Data refer to graduates who completed 4 years of high school only.

[2]Data not shown where base is less than 75,000.

[3]Refers to single, widowed, divorced, or separated women.

In analyzing data on the reasons for leaving school, it is important to note that "*post hoc* explanations provided by dropouts may be somewhat questionable because of the complexity of the dropout phenomenon and the natural tendency for persons to rationalize behavior which might be regarded by others as evidence of failure."[15] However, data on the reasons for dropping out of school provide insight into the post-school behavior of dropouts. And the labor force behavior of dropouts, both female and male, is inextricably linked to the reasons and causes of dropping out.

Female dropouts

Between October of 1985 and 1986, more than a quarter of a million young women dropped out of high school. Only a little more than half of them were in the labor force in October 1986, continuing the historical pattern of comparatively low labor force participation among young female dropouts. About 20 years earlier, the participation rate for 16- to 24-year-old female dropouts was just 38 percent. Their participation has steadily increased over the last two decades, reaching 50 percent in 1986. However, their rate was still dramatically below the 77-percent rate for 16- to 24-year-old women who had ended their studies with a high school diploma.

Children and marriage. Childbearing and marriage would seem to be two important factors in explaining the

low labor force participation of female dropouts. A special tabulation of the March 1987 CPS data provided a look at the relationship between marital status, presence of children, and labor force participation of 16- to 24-year-old female high school graduates who did not go to college[16] and dropouts. As expected, the presence of children had a negative effect on the participation of both groups. However, regardless of marital or maternal status, dropouts have significantly lower rates of participation than do graduates. (See table 3.)

The presence of children has, by far, the greatest impact on the labor force participation of young female dropouts. Regardless of marital status, just over one-third of the dropouts who were mothers were in the labor force. Marital status, however, affects young women's dependence on family and government for financial support. About 44 percent of unmarried mothers lived with relatives, and many received government assistance. Using data from the Center for Human Resource Research's longitudinal study of young women age 14 to 24 that was begun in 1979, Frank L. Mott and Nan L. Maxwell found that about 32 percent of white dropouts with children and 74 percent of black dropouts with children received government assistance from at least one of the following programs: Aid to Families with Dependent Children, food stamps, and Supplemental Social Security.[17]

Among female dropouts with children, labor force participation rates vary substantially by race and ethnicity. For example, Hispanic dropouts have significantly lower rates than do their white or black counterparts. (See table 3.) Cultural attitudes regarding marriage, childrearing, and paid employment may help explain the variations in participation. Although both white and black dropout mothers have similar participation rates, they exhibit distinctly different marital patterns—only 1 of 10 black mothers was married, compared with about 6 of 10 white mothers and Hispanic mothers. (See table 4.) The high proportion of unmarried black dropouts explains, to some extent, the large percentage of black mothers receiving government assistance, compared with white mothers. This marital pattern also results in nearly half of all black dropout mothers living with relatives, and about 40 percent maintaining their own families.

Even when they do not have children, black female dropouts seem to have a very tenuous attachment to the labor force. Fewer than half of them were in the labor force in March 1987, in contrast to about 60 percent of their white or Hispanic counterparts.

Unemployment. The poor labor market performance of female dropouts is also exemplified by their high unemployment rates. In October 1986, the jobless rate for female dropouts age 16 to 24 was 30.4 percent, about $2\frac{1}{2}$ times the rate for women this age who had ended their education with a high school degree.

Table 4. Distribution of 16- to 24-year-old female dropouts, by marital status, presence of children, race, and Hispanic origin, March 1987

Marital status and presence of children	Total	White	Black	Hispanic origin
Total female dropouts:				
Number (thousands)	2,024	1,577	391	454
Percent	100.0	100.0	100.0	100.0
Married, spouse present	37.2	44.1	10.2	45.8
Other marital status[1]	62.8	55.9	89.8	54.2
With no own children:				
Number (thousands)	887	714	144	171
Percent	100.0	100.0	100.0	100.0
Married, spouse present	21.1	23.7	9.7	26.9
Other marital status[1]	78.9	76.3	90.3	72.5
With own children:				
Number (thousands)	1,137	863	247	283
Percent	100.0	100.0	100.0	100.0
Married, spouse present	49.8	61.1	10.5	56.9
Other marital status[1]	50.2	39.0	89.5	43.1
Maintaining own family	28.1	23.8	42.9	24.4
Living with relatives	22.2	15.3	46.6	18.7

[1]Refers to single, widowed, divorced, or separated women.

From data collected in the October 1986 CPS supplement, a special tabulation was constructed to compare female dropouts and graduates as they go through the transition period during the 4 years after leaving high school. Using cross-sectional data, the following tabulation shows the effect of time out of school and age on the unemployment rates of dropouts and graduates:

	Unemployment rates	
	Dropouts	*Graduates*
Last attended high school:		
Current year (1986)	33.7	20.3
1 year ago	40.3	14.3
2 years ago	31.8	16.6
3 years ago	36.5	8.2
4 years ago, or longer	26.4	10.8
Age in 1986:		
16–17	37.1	—
18–19	35.9	15.9
20–21	27.8	12.7
22–24	28.2	11.2

Unemployment rates for both groups show some decline with age and time out of school, although for dropouts the jobless rate remains exceptionally high. The unemployment rate was 34 percent for current-year dropouts, compared with 20 percent for 1986 high school graduates not enrolled in college. The gap between graduates' and dropouts' unemployment rates was smallest immediately after leaving school.

Male dropouts

Because of their strong labor force attachment, the labor market problems of male dropouts have often

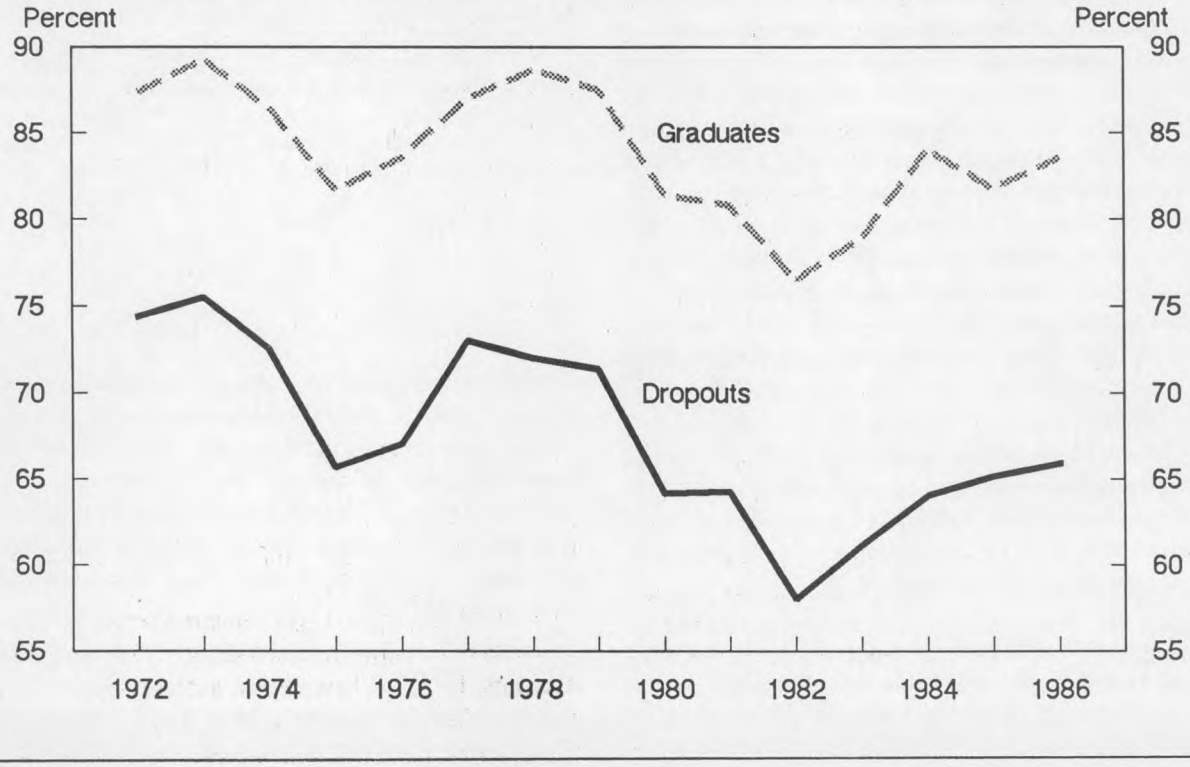
received more analytical attention than those of female dropouts. Numerous studies of the "youth employment problem" identify young male dropouts as the group most adversely affected by a slack youth labor market.[18] Job competition for full-time employment is keen, with dropouts competing not only among themselves, but also with high school graduates who did not go to college. The employment problems of black youth dropouts are often viewed as approaching crisis proportions.

The occupational distribution of young male dropouts suggests that they compete with male high school graduates who did not attend college. Among both groups, about two-fifths of the employed 16- to 21-year-olds were machine operators, fabricators, or laborers; about one-fourth were employed in precision production, craft, and repair jobs; and 1 of 7 was in service occupations. Such competition between graduates and dropouts often puts the dropout at a distinct disadvantage. In the extreme, the use of the high school diploma as an employment screening device could prevent the qualified dropout from even being considered by the employer.

The occupational distribution of high school dropouts is also noteworthy because of the small proportion (14 percent) employed in service occupations. A popular stereotype portrays employed youth as low-paid, often part-time workers in service occupations. However, male dropouts are more likely to work full time in the goods-producing sector as operators, fabricators, or laborers, and as precision production, craft, or repair workers. The sector's lagging performance does not promise very strong employment prospects for the recent dropouts who, in the past, have found jobs in mining, manufacturing, and construction.[19]

The jobless rates for high school dropouts and graduates provide some indication of the labor market performance of these competing groups. In October 1986, more than 1 of 5 male dropouts were unemployed, compared with 1 of 10 high school graduates. Among dropouts, the jobless rate for blacks (44 percent) was much higher than that for whites (18 percent) and Hispanics (15 percent). However, the most useful measure of the labor market success of male dropouts and high school graduates may be the employment-population ratio—that is, the employed as a proportion of the civilian noninstitutional population. This measure focuses on the more clear-cut and analytically important distinction between employment and "nonemployment" (this category includes those unemployed and those not in the labor force), particularly for out-of-school young men, for whom it is sometimes difficult to distinguish between being outside the labor force and being unemployed.[20] In October 1986, the employment-population ratio was 56 percent for recent

Chart 1. Employment-population ratios of 16- to 24-year-old male high school graduates and dropouts, October 1972-86



male dropouts, and 70 percent for recent high school graduates. Although the employment-population ratios for dropouts generally increase with age and time out of school, the gap between graduates and dropouts remains fairly constant. Using cross-sectional data for October 1986, the following tabulation illustrates the impact of the age and time out of school variables on employment-population ratios:

	Employment-population ratios	
	Graduates	*Dropouts*
Last attended school:		
Current year (1986)	69.4	47.6
1 year ago	81.1	58.5
2 years ago	80.9	61.0
3 years ago	87.0	64.8
4 years ago, or longer	87.7	73.6
Age in 1986:		
16–17	—	44.2
18–19	73.7	63.0
20–21	83.1	68.2
22–24	88.3	74.1

Both aging and time out of school give young men a chance to mature and gain valuable work experience as they pass through a "moratorium period," where employment is often of secondary importance.[21] However, over the last two decades there has been an alarming downtrend in employment-population ratios of out-of-school youth, particularly for young black dropouts. It is no longer clear whether the normal increase in such ratios that is typically associated with aging will be enough to integrate these black dropouts into the labor force during their prime working years.[22]

Nonemployment of out-of-school youth. While quite sensitive to cyclical changes over the last 15 years, the employment-population ratio of male dropouts and high school graduates has trended downward—although more moderately for high school graduates. (See chart 1.) From October 1973 (1 month prior to a business cycle peak) to October 1986 (4 years into an expansion), the employment-population ratio of black dropouts fell 25 percentage points, while the white and the Hispanic ratios declined only 7 and 8 percentage points, respectively. Similarly, the decline in the employment-population ratio for black graduates was more severe than that for their white or Hispanic counterparts. (See chart 2.)

While low employment-population ratios among dropouts demonstrate that a large proportion are not working, that measure alone does not capture the underlying dynamics of the labor force activity of dropouts. It is important to know whether low employment-population ratios are a result of frequent, short spells of nonemployment or a product of extended periods of nonemployment. A study sponsored by the National Bureau of Economic Research identified long spells of nonemployment as the primary cause of low employment-population ratios of out-of-school black youth.[23] Analysis of CPS work experience data confirm the existence of long periods of nonemployment among a sizable proportion of dropouts. During 1986, 17 percent of men age 20 to 24 with less than 4 years of high school had no work experience at all; 25 percent had worked 26 weeks or less. By comparison, about 40 percent of the black dropouts reported no employment whatsoever for the year. Since 1974 (when data were first available), the proportion of black dropouts with no work experience during the year has increased dramatically. This is also true among high school graduates, where blacks clearly had the highest incidence of and greatest rise in nonemployment. The following tabulation shows the proportion of 20- to 24-year-old male graduates and dropouts with no work experience during selected calendar years:

	Total	*White*	*Black*	*Hispanic origin*
Graduates:				
1974	5.3	4.6	9.0	9.2
1979	5.4	3.7	15.2	8.7
1982	9.6	7.2	22.9	9.5
1986	6.7	4.8	15.7	8.9
Dropouts:				
1974	10.4	9.1	15.1	8.8
1979	12.4	9.3	23.9	9.4
1982	19.6	14.9	40.1	14.3
1986	16.8	11.8	39.7	9.6

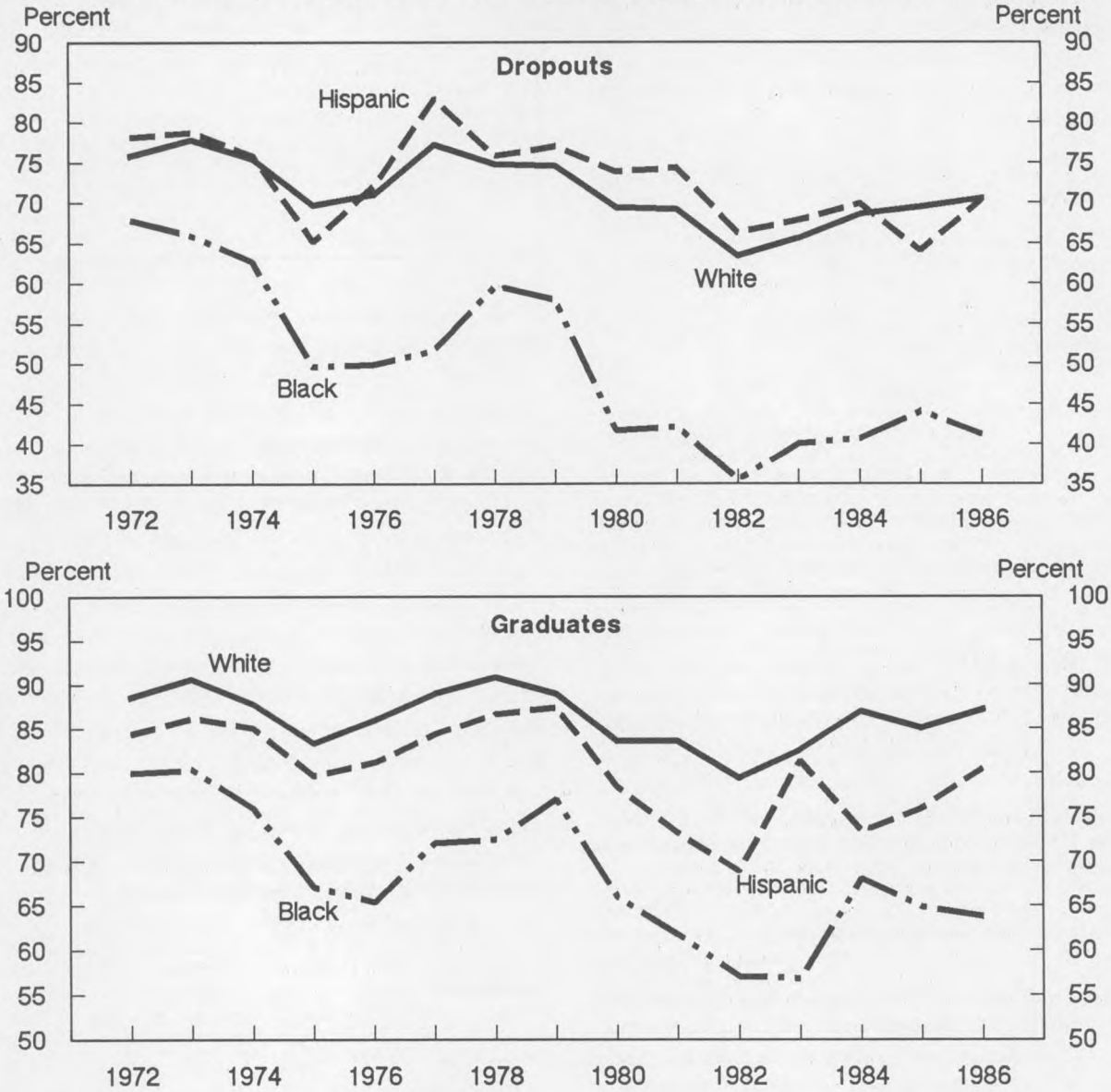
There has also been a slight polarization in the distribution of weeks of work for the dropouts who do work. The proportion working 50–52 weeks rose from 46 percent in 1979 to 50 percent in 1986, while the percentage working 26 weeks or less also increased slightly. (See table 5.) Black dropouts, however, have shown a decrease in the proportion working full year, as well as a large increase in the number working half a year or less.

Table 5. Distribution of 20- to 24-year-old male high school dropouts with work experience by number of weeks worked, race, and Hispanic origin, 1979 and 1986

[In percent]

Weeks worked	Total		White		Black		Hispanic origin	
	1979	1986	1979	1986	1979	1986	1979	1986
Total with work experience	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
50–52 weeks	45.6	49.6	47.2	53.3	37.7	28.1	47.2	58.9
40–49 weeks	16.7	12.4	17.5	12.2	13.4	10.8	13.4	9.1
27–39 weeks	14.4	9.3	13.8	9.8	17.7	6.6	17.7	9.9
1–26 weeks	23.8	28.8	21.2	24.6	31.2	54.5	22.1	21.9
14–26 weeks .	13.7	16.0	12.7	13.9	13.9	27.5	15.6	11.3
1–13 weeks .	10.2	12.7	8.5	10.7	17.3	26.9	6.5	10.6

Chart 2. Employment-population ratios of 16- to 24-year-old male high school graduates and dropouts, by race and Hispanic origin, October 1972-86



YOUNG HIGH SCHOOL DROPOUTS face a difficult time in today's labor market. Unemployment rates are high, especially among black dropouts. Only half of all female dropouts are in the labor force at any time, and many of these young women have the additional responsibility of motherhood, often without a spouse. A surprisingly small proportion of male dropouts are employed, with many experiencing long periods of nonemployment.

In a labor market demanding increasingly higher skill levels, school dropouts face declining employment opportunities. Further, they must compete with high school graduates for these limited jobs. The data suggest that dropouts are less likely to achieve success in the labor market than are high school graduates. However, it would be misleading to infer that the employment problems of dropouts would be solved solely by obtaining a high school diploma. While the importance of education cannot be overstated, there are differences in the family background and personal characteristics of dropouts and graduates that affect labor market success. These differences cannot be overcome simply by obtaining a diploma. □

——FOOTNOTES——

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[1]Jerald G. Bachman, Swayzer Green, and Ilona D. Wirtanen, *Youth in Transition,* Vol. III (Ann Arbor, University of Michigan, Institute for Social Research, 1971), p. 4.

[2]Unpublished data from the U.S. Department of Education, Center for Education Statistics, Washington, DC.

[3]For a discussion of the different dropout measures and the debate surrounding the dropout problem, see Chester E. Finn, Jr., "The high school dropout puzzle," *The Public Interest*, Spring 1987, pp. 3–22; and "School Dropouts: The Extent and Nature of the Problem," Briefing Report to Congressional Requesters, GAO/HRD–86–106BR (U.S. General Accounting Office, June 1986).

[4]Data in this article were derived primarily from the October Current Population Survey (CPS). The CPS is a monthly survey of approximately 60,000 households conducted and tabulated for the Bureau of Labor Statistics by the Bureau of the Census. Most analysis in this article relates to persons 16 to 24 years of age in the civilian noninstitutional population. Because it is a sample survey, estimates derived from the CPS may differ from actual counts that could be obtained from a complete census. Therefore, estimates based on a small sample should be interpreted with caution. For further information on sampling reliability, see *Students, Graduates, and Dropouts, October 1980–82,* Bulletin 2192 (Bureau of Labor Statistics, 1983).

[5]In this article, the term "high school dropouts" refers to individuals who are not enrolled in school and have not completed 4 years of high school. The term is somewhat of a misnomer, as this group contains a small proportion of persons who never attended high school. In October 1986, 14 percent of the "high school dropouts" had left school before ever attending high school. No attempt is made to analyze this small group separately.

[6]Data refer to recent graduates and dropouts age 16 to 24. In addition, an average of 86,000 persons 14 and 15 years of age dropped out of school annually over the same period. While the data presented on dropouts refer to persons who had not completed high school when surveyed, a number of dropouts do return to school or obtain high school equivalency certificates at a later date. Estimates of returnees are as high as half of all dropouts. For further information, see Andrew J. Kolstad and Jeffrey A. Owings, *High School Dropouts Who Changed Their Minds About School* (U.S. Department of Education, Center for Education Statistics, April 1986).

[7]This was the first year in which blacks did not make up a disproportionate share of recent dropouts. Because of the relatively small size of the black youth population, the 1986 anomaly may be a result of sampling error, and not indicative of a change in the past trend.

[8]These figures are not intended as a dropout rate, but only as an indication of the prevalence of dropouts in the 16- to 24-year-old population. See footnote 3 for references on the distinction among these and other measures of the dropout problem.

[9]Bachman and others, *Youth*, ch. 3.

[10]This group is identified as recent graduates and dropouts who are relatives of the householder. Included may be a very small number of individuals who are not sons or daughters of the householder, but are otherwise related (such as a sister or a cousin). The householder, a proxy for the dropout's or graduate's parent, is the person (or one of the persons) in whose name the housing unit is owned or rented. In married-couple families, the term householder is replaced by reference person, but is defined identically. In cases of joint ownership or rental partnership by husband and wife, the reference person is self-designated, invariably the husband. Although several simplifying assumptions have been made, the data are believed to accurately portray the characteristics of the specified population.

[11]Only a small percentage of dropouts are on their own. For example, in October 1985, 91 percent of recent high school graduates and 74 percent of recent high school dropouts were living with their parents.

[12]Median income figures are tabulated from data collected on the CPS control card. This method yields estimates that lack a high degree of precision, but allows for intergroup comparisons.

[13]A householder is the person (or one of the persons) in whose name the housing unit is owned or rented. See footnote 10.

[14]Samuel S. Peng, *High School Dropouts: Descriptive Information from High School and Beyond*, Bulletin NCES 83–221b (Washington, U.S. Department of Education, National Center for Education Statistics, November 1983).

[15]Peng, *High School Dropouts*, p. 4.

[16]All analyses regarding high school graduates refer to those individuals with 4 years of high school education only, unless otherwise specified.

[17]Frank L. Mott and Nan L. Maxwell, "School-Age Mothers: 1968 and 1979," *Family Planning Perspectives*, November/December 1981, p. 290.

[18]See Richard B. Freeman and David A. Wise, eds., *The Youth Labor Market Problem: Its Nature, Causes, and Consequences* (Chicago, National Bureau of Economic Research, 1982); and Richard B. Freeman and Harry J. Holzer, eds., *The Black Youth Employment Crisis* (Chicago, National Bureau of Economic Research, 1986).

[19]Thomas Nardone, "Decline in youth population does not lead to lower jobless rates," *Monthly Labor Review*, June 1987, pp. 40 – 41.

[20]For a discussion of the distinction between unemployment and out of the labor force, see Kim B. Clark and Lawrence H. Summers, "The Dynamics of Youth Unemployment," in Freeman and Wise, eds., *The Youth Labor Market Problem: Its Nature, Causes and Consequences*; and Christopher J. Flinn and James J. Heckman, "Are Unemployment and Out of the Labor Force Behaviorally Distinct Labor Force States?" *Journal of Labor Economics*, 1983, vol. 1, no. 1.

[21]Paul Osterman, *Getting Started* (Cambridge, The MIT Press, 1980), p. 27.

[22]Richard B. Freeman and Harry J. Holzer, "The Black Youth Employment Crisis: Summary of Findings," in Freeman and Holzer, eds., *The Black Youth Employment Crisis.*

[23]John Ballen and Richard B. Freeman, "Transitions between Employment and Nonemployment," in Freeman and Holzer, eds., *Black Youth Employment Crisis.*

Productivity growth slows in the organic chemicals industry

Productivity growth was highest from 1963 to 1974; however, overall declines in hours and employment have characterized the 1974–85 period

CLYDE HUFFSTUTLER AND BARBARA BINGHAM

Output per employee hour in the manufacture of certain industrial organic chemicals—such as ethylene, acetic acid, and formaldehyde—rose at an average annual rate of 4.1 percent between 1963 and 1985, compared with 2.3 percent for all manufacturing.[1] (The industry accounts for nearly four-fifths of total employment in organic chemicals manufacturing.) Over the period, output increased at a faster rate, 5.0 percent a year, than employee hours, which rose by only 0.9 percent.

Productivity growth was greatest from 1963 to 1974, when it increased at a rate of 6.6 percent a year. From 1974 to 1979, the rate dropped to 3.2 percent, reflecting a slowdown in output growth and an increase in the employee hour rate. During the years 1979 to 1985, the productivity rate slowed further, to 1 percent, as both output and hours declined. (See table 1.)

Year-to-year movements in output per hour were volatile, ranging from a 21-percent increase in 1983 to a 17-percent decline in 1975. From 1963 through 1979, the magnitude of change in productivity was generally about the same as, or slightly less than, the corresponding change in output. After 1979, productivity and output still moved in the same direction, but the annual productivity changes were sometimes greater than output changes, largely attributable to a sustained decline in employee hours.

A period of rapid gains. Labor productivity growth over the 1963–74 span was driven by large increases in output (8.4 percent a year), which were spurred, in part, by product innovations.[2] Employee hour growth for the same period was moderate—1.7 percent a year. A major portion of this capital intensive industry's output is made in plants with automated, continuous processes. Construction of more efficient, high-volume plants during this period made for greater economies of scale. In ethylene production, for instance, a major effort to increase plant capacity started in the mid-1950's and continued until a plateau was reached in the late 1960's. Advanced computer technology, especially in the area of process controls, was also a major factor behind the productivity gain.[3] (Computerized controls are essential in high-volume, continuous processing characteristic of the industry.)

Because the number of production workers in large organic chemicals plants is fairly constant over a wide range of output levels, labor productivity changes in the short run largely reflect changes in capacity utilization and the age composition of capital stock.[4] During the early part of the 1963–74 period, effective operating capacity for organic chemicals was high. Some excess capacity did develop after 1966, following rapid modern-

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Table 1. Indexes of productivity, output, and employment in the industrial organic chemicals industry,[1] 1963–85

Year	Output per hour	Output	Employee hours	Employees
1963	46.7	35.5	76.0	76.1
1964	50.1	39.2	78.3	77.6
1965	55.3	45.3	81.9	81.6
1966	58.0	49.2	84.9	85.2
1967	56.3	47.5	84.3	84.7
1968	58.1	51.6	88.8	87.8
1969	61.9	56.9	91.9	90.5
1970	65.5	60.7	92.7	92.8
1971	72.6	64.2	88.4	89.2
1972	81.5	73.3	89.9	91.2
1973	90.4	83.1	91.9	91.5
1974	102.8	94.6	92.0	91.3
1975	85.3	78.6	92.1	93.4
1976	93.4	90.3	96.7	97.3
1977	100.0	100.0	100.0	100.0
1978	102.8	104.3	101.5	101.4
1979	113.4	116.7	102.9	102.6
1980	98.9	102.4	103.5	104.4
1981	103.9	103.9	100.0	99.7
1982	87.2	85.3	97.8	99.6
1983	105.3	98.8	93.8	95.0
1984	114.0	104.2	91.4	92.1
1985	112.4	95.9	85.3	85.9
	Average annual rates of change (in percent)			
1963–1985	4.1	5.0	0.9	0.9
1963–74	6.6	8.4	1.7	1.7
1974–79	3.2	5.9	2.6	2.5
1979–85	1.0	−2.1	−3.1	−2.9

[1] Not elsewhere classified.

ization efforts (including debottlenecking) and new plant construction, but the mix of capital stock had become more efficient. During extended periods of excess capacity, it is common practice to mothball the older, smaller, less efficient plants. Thus, the negative effects of overcapacity on industry productivity are somewhat offset by having more efficient plants in operation.[5]

The slowdown. Plant replacement continued during the 1974–79 period. Further improvements in computer hardware and software also were made. However, the positive influence of these changes was offset by declining capacity utilization and a slowdown in process innovation.[6] Moreover, although the rate of output growth slowed, the growth rate of employee hours increased faster than during the previous 11 years.

By this time, economies of scale had largely been realized in many commodity chemicals plants.[7] Thus, the productivity benefits in building a new plant were less than in the earlier period. Also, as demand slowed, the utilization of many of the very large plants declined, lessening their efficiency and lowering productivity.[8] In 1975, for instance, when output dropped by 17 percent, the industry operated at only 74 percent of capacity—and productivity fell 17 percent. The situation was aggravated by the continued construction of large plants even as demand fell off. The lengthy period involved in plant planning and construction, combined with the belief that high sales growth would soon resume, contributed to the overbuilding.[9]

A volatile period. The 1979–85 period, during which productivity increased moderately, was marked by an overall decline in output accompanied by reductions in employment. Annual changes in productivity were very erratic—due largely to big swings in output.

There was some apparent progress in technical innovation, particularly in improved automation in the production of specialty chemicals.[10] (Specialty chemicals are usually batch-produced in low volume.) However, inasmuch as the commodity chemicals sector dominates the industry and its productivity changes are largely determined by capacity utilization rates, overall industry productivity improvements were dampened by several years of excess capacity.[11] For example, in 1980, when productivity dropped 13 percent, capacity utilization for plants producing ethylene, a major feedstock in the manufacture of other products and the most important industry product in terms of volume, was 71 percent. Operating rates recovered briefly in 1981, but fell again by the end of the year to 70–75 percent. (Productivity increased only 5 percent.) By 1982, when the utilization rate was 60 – 65 percent and many plants were closed, productivity again dropped sharply. Ethylene, formaldehyde, and propylene plants were running at less than 60 percent of capacity.

The upward climb in productivity in 1983 and 1984 mostly reflected increases in output. Producers of ethylene and other commodity chemicals kept their older, less-efficient plants mothballed because of the excess capacity in the more-modern plants currently operating. Thus, the surge in demand was met without having to initiate plant startups, which are costly in both dollars and labor time.[12] There was no significant change in productivity in 1985.

Products

Organic chemicals can be divided into two groups—commodity and specialty. Commodity chemicals are produced and sold in large quantities and usually are used as feedstocks in the synthesis of other organic chemicals. Some commodity chemicals also are sold to manufacturers outside the industry, such as those in plastics production. Specialty chemicals are made in much smaller quantities—a whole year's supply sometimes will be produced in a few days. Some of these chemicals are made to individual customers' specifications; others are simply low-volume stock chemicals.

Few organic chemicals are direct consumer products. They are purchased by companies in many different indus-

tries and have a vast array of end uses. (See exhibit 1.) Synthetic acetic acid, for instance, is used by chemical companies as an intermediate to produce other organic chemicals such as vinyl acetate, and by industries outside chemicals manufacturing, like textile processing. In addition, some acetic acid production processes use other organic chemicals as a feedstock (such as methanol and acetaldehyde), while ethylene is used only as a feedstock in further chemical processing. Other industries that use organic chemicals include pharmaceuticals, automobiles, synthetic tires, cosmetics, building materials, household appliances, and flavorings. The following tabulation shows the volume rank of the industry's top 13 chemicals:[13]

1. Ethylene
2. Propylene
3. Ethylene dichloride
4. Vinyl chloride
5. Terephthalic acid (acid and ether)
6. Methanol
7. Ethylene oxide
8. Formaldehyde, 37 percent
9. Ethylene gylcol
10. Acetic acid
11. Propylene oxide
12. Acrylonitrile
13. Vinyl acetate

Output trends

Over the long term, output increased at a rate of 5 percent, compared with the 2.5-percent rate for all manufacturing. This, however, reflected a high growth rate (8.4 percent) for the first 11 years, followed by a rate of only 0.8 percent over the remaining 10 years.

High growth period. From 1963 to 1974, output grew at an average annual rate of 8.4 percent, with 6 years of double-digit increases. During this period, total manufacturing output rose at a rate of 3.3 percent. Low cost, readily available petroleum-based feedstocks and rapidly developing markets helped fuel the output growth.[14]

The increased demand came mainly from the expanding plastics and synthetics industries. Synthetic fibers output, for example, increased at an average annual rate of 11.7 percent from 1970 to 1974, while the organic chemicals industry's output was rising 12.1 percent. (See table 2.)

Energy shortages—the next 5 years. The period of high output growth ended in 1975 when output dropped sharply (16.9 percent). The 1975 output drop was largely attributable to the general decline in industrial activity, but materials shortages, specifically of petroleum-based products, may also have been limiting factors. The oil embargo of late 1973 and early 1974 and the imposition of an oil import fee in early 1975 restricted the production of petroleum-related feedstocks essential to the industry.[15]

In 1976, output increased 14.9 percent as demand rose and the supplies of petroleum-related products improved, although they generally were priced much higher. Natural gas supplies continued to be somewhat limited. Output grew at an average annual rate of 8.5 percent for the next 3 years, which was slightly above the industry's 1963–74 rate.

Even though the industry's overall rate of output increase slowed over the 1974–79 period, it ran higher than that for all manufacturing—5.9 percent versus 4.5 percent. Major end-use industries showed mixed output trends.

Exhibit 1. Selected organic chemicals and their end uses

Chemical	End use
1,3 Butadiene, made in chemical plants	Synthetic rubber, fibers
Ethylene or ethene	Plastics, antifreeze, synthetic fibers, solvents, anesthetic, welding materials, gasoline additives
Propylene or propene	Plastics, synthetic fibers
Chloroform or trichloromethane	Freon 22, refrigerant, propellants, resins, pencillin solvent
DDT or dichlorodiphenyltrichloroethane	Insecticide, scabicide
Dichlorodifluoromethane	Freon 12, refrigerant, aerosol propellant
Ethyl chloride	Local anesthetic, solvents, refrigerant, gasoline antiknock
Ethanol or ethyl alcohol	Solvents, cosmetics, toiletries
Ethylene glycol or 1,2-Ethanediol	Antifreeze, polyester, Mylar films
Methanol or methyl alcohol	Plastics, fibers, adhesives, solvents, rubbing alcohol, antifreeze, octane booster
Ether or diethyl ether	Solvents, anesthetic
Ethylene oxide	Polyester fibers, films, antifreeze, surfacants, sterilizers, pharmaceuticals, synthetic rubber, paint, adhesives, resin, cosmetics, brake fluid, solvents, pesticides
Mustard gas or dichlorodiethyl sulfide	Chemical warfare agent
Formaldehyde or methanal	Plastics, adhesives, preservatives, dyes, disinfectants, fertilizers
Acetone or 2-propanone	Rayon, plastics, solvents, paints, electronic cleaners
Acetic acid or ethanoic acid	Solvents, rubber manufacturing, photochemicals, plastics, pharmaceuticals, fibers
Ethyl acetate	Rayon, pharmaceuticals, coatings, solvents, perfume, flavorings, paint, plastics
Methyl salicylate (wintergreen)	Perfume, flavorings, counterirritants
Hexamethylenetetramine or methenamine	Vulcanizing accelerator, urinary tract antiseptic, gas mask absorbant, resins, explosives
Acrylonitrile or propenenitrile	Fibers, plastics, synthetic rubber, mustard gas

Slowdown in the 1980's. In 1980, there was another large output decline (12.3 percent) as petroleum-based feedstock supplies were once again strained and the level of industrial activity slowed. There was a small increase in 1981, but for the industry and the general business economy, the rebound was short-lived. The following year, the organic chemicals industry suffered its largest single-year drop, 17.9 percent, largely attributable to a falloff in final demand. Output rebounded strongly in 1983, increasing almost 16 percent, as feedstock supplies were generally good and prices favorable. The growth in demand for automobiles and housing, which helped stimulate the 1983 increase, carried through to 1984, though output grew at a much slower rate. The following year, output once again declined, as industrial production slowed. The one exceptional increase in 1983 could not offset output declines in other years, resulting in an annualized 6-year rate of change of −2.1 percent. (All manufacturing output rose 2 percent.)

During this period, growth in two of the industry's major markets, plastics and synthetic fibers, slowed. There were no comparable major new product markets to sustain high growth rates—rather, the organic chemicals industry had to seek new uses for old products. The increased cost of raw materials for petroleum-based chemicals, which led to increased final chemical prices, also depressed demand somewhat.[16] Furthermore, the industry faced increasing competition abroad (as the dollar strengthened) and at home (from foreign producers), especially in commodity chemicals. While the ratio of imports to new supplies (imports plus product shipments) remained fairly low—it was 0.034 in 1981 and 0.063 in 1985—increased imports in major end-use industries like automobiles and textiles dampened their output growth, thus indirectly reducing demand for the organic chemicals used by these industries.[17]

Employment

Employment numbered 96,500 persons by 1985, having risen 13 percent since 1963, and having peaked at 117,200 in 1980. All of the long-term increase was among nonproduction workers, whose numbers rose 38 percent. The number of production workers was at its highest in 1979, that of nonproduction workers, in 1982.

From 1963 to 1969, moderate increases in employment occurred as salesforces were expanded to open up new markets.[18] (See table 3.) The period was followed by a 5-year lull, in spite of double-digit output increases in 1972, 1973, and 1974.

Nonproduction worker hours rose slightly faster from 1974 to 1979, as research and development efforts were stepped up to meet growing competition and to take advantage of new end-use markets—particularly in plastics. According to industry sources, a larger salesforce and clerical staff, many of whom had been hired in anticipation of continued high sales growth, were part of the nonproduction worker increase.[19] The rate of increase in production worker hours also rose.

Table 2. Average annual rates of change in output for selected industries, 1963–85

Industry	1963 – 85	1963 – 74	1974 – 79	1979 – 85
All manufacturing	2.5	3.3	4.5	2.0
Industrial organic chemicals	5.0	8.4	5.9	– 2.1
Selected industries:[1]				
Synthetic fibers	4.7	10.1	4.5	– 2.7
Pharmaceutical preparations	5.1	8.4	4.2	0.4
Soaps and detergents	[2]2.9	4.6	2.5	– 1.1
Cosmetics and other toiletries	[2]4.7	7.6	3.7	2.5
Paints and allied products	1.7	3.0	2.7	0.4
Tires and inner tubes	1.4	5.1	1.6	0.5
Miscellaneous plastics products	—	—	10.3	6.2
Major household appliances	2.1	3.6	5.9	0.3
Motor vehicles	2.8	4.2	8.3	5.2

[1] Major end-use markets for organic chemicals.

[2] 1963 – 84.

NOTE: Dashes indicate data not available.

Nonproduction worker hours declined from 1979 to 1985. Employment reductions, particularly in corporate staff, were made in conjunction with industrywide cost cuts.[20] The use of management information systems, on-line data base services that provide information on changing regulations and safety and health matters, and better training helped managers become more productive. In addition, some marketing departments increased their participation in industry marketing conferences at which they can present new products to many potential customers at one time, in lieu of numerous separate sales trips.[21] Both the number of production workers and their hours fell every year over the 1979–85 span, as some of the plants that had been closed on a temporary basis stayed closed.[22]

Occupations. Chemical engineers, chemists, and technicians account for a significant proportion of the professional workers employed. Two of the larger production worker occupational groups are machine operatives and mechanics, repairers, and installers.

The proportion of nonproduction workers is high in this industry, and increased from 34 percent in 1963 to 42 percent in 1985. This is 9 percentage points higher than the average for all manufacturing industries for 1963 and 12 points higher than that for 1985. As the use of instruments (especially when computer-based) and the complexity of equipment has grown, so has the need for highly skilled professionals.[23]

Technology, research, and capital

The technology employed to produce most organic chemicals, whether on a large scale or small, is based on chemical reactions: Feedstocks or intermediate chemicals (elements or compounds) are mixed with a catalyst under high pressure or high temperature, or both, in a tightly controlled environment to produce the desired chemical derivatives. Byproducts are separated and then recycled, processed further, sold, or otherwise disposed of.

Large-scale processes. Most commodity chemicals are manufactured in large-scale operations that have low labor requirements per unit of output. The plants that produce them usually operate 24 hours a day, 7 days a week. Such plants account for much of the industry's output volume. Computers control the complex chemical processes through feedback mechanisms that are monitored by engineers and other operators.

Although direct production unit labor requirements are low, there are some operations that are more labor intensive—repair and maintenance, and loading and shipping. Many hours are expended on checking and maintaining the miles of pipeline and other equipment, particularly during a turnaround (such as a scheduled maintenance shutdown), mothballing, or startup.[24] Repair and maintenance are crucial operations, because reactions take place under high temperature or pressure, or both, and often involve highly toxic or corrosive materials.

Olefin plants, which produce two of the major organic chemicals, ethylene and propylene, are large-volume producers. These plants are most economical when they produce great quantities; their annual capacity ranges upward of 1 billion pounds. In the early 1980's, more than 75 percent of the industry's ethylene capacity was from plants that could produce more than 500,000 metric tons annually. More than 20 percent was from plants with a capacity greater than 1 million metric tons.[25] Over the past 25 years, changes and refinements in the plants' processing technologies and increasing economies of scale led to a doubling of their average yield.[26]

Older olefin plants relied on natural gas-based raw materials (butane, ethane, and propane). These plants were succeeded by thermal or steam crackers which use naphtha and gas oil (or heavier, oil-derived hydrocarbons) as a feedstock. Olefin plants make ethylene, propylene (considered a coproduct), and other hydrocarbons, the proportions of which depend on the feedstock used. Generally, the lighter feedstocks produce higher percentages of ethylene.[27] During the early 1970's, many producers who were either retrofitting or building new plants switched from designs that used light hydrocarbon feedstocks to those using heavy hydrocarbons.

In the eighties, companies began to build plants that had more feedstock flexibility. Many new olefin plants were designed to handle wide variations in feedstock type, allowing for more rapid feedstock substitutions. However, use of alternate raw materials (other than the one(s) for which a plant is primarily designed) still result in lower product yield, higher costs, and less output.[28] But costly shutdowns, which had been required when switching feedstocks, can now generally be avoided.

These technological changes, though not primarily designed to lower unit labor requirements, have helped the industry improve productivity over the long run. Significant additional labor is required when starting up a plant or when greatly increasing output from a plant operating at very low capacity. But stepping up from 70 percent to 90 percent of capacity, for example, requires few additional production workers.[29] Continual, high-capacity operations facilitated by feedstock flexibility allow companies to use labor more efficiently.

One technological change that went hand in hand with the construction of very large plants during the seventies was the introduction of computers. (Although older plants were ofttimes retrofitted with state-of-the-art electronics, the new technology proved most effective in new plants.) Since then, there have been continual improvements in both computer hardware and software, particularly for process control. One recent innovation in this area has been the use of optimizing controls.[30] (Optimizing software, when employed plantwide, involves the use of extensive data bases, plant process models including economic and engineering variables and constraints, and reaction models, which all are then integrated with the control system.)

Overall, these changes have helped the industry produce a given volume of chemicals faster. Moreover, some processes are now so complex that they could not be run without computers. The computer control systems constantly monitor and collect data, and then calculate and evaluate the results. These data, in conjunction with process-specific software, enable the systems to perform automatic startups and shutdowns of process units, and to optimize on-line production under given conditions and constraints. Process controls also are used to analyze incoming raw materials and outgoing finished products. Controls have become so important that, in large plant

Table 3. Employment trends in the industrial organic chemicals industry, 1963–85[1]

Period	Average annual rates of change (in percent)		
	All employee hours	Production worker hours	Nonproduction worker hours
1963 – 1985	0.9	0.3	1.9
1963 – 74....	1.7	1.3	2.5
1974 – 79....	2.6	2.5	2.6
1979 – 85....	– 3.1	– 4.0	– 1.5

[1]The difference in rates of change between employment and hours was negligible over the long term, so only rates of change in hours are presented.

construction, instrument expense can account for up to 15 percent of total cost.[31]

Because most of these newer, large plants have very low labor requirements, only those technological innovations that make dramatic improvements in the feedstock-to-output ratio are likely to have a significant, if indirect, effect on labor productivity—and such changes are seldom felt industrywide, at least in the short term.[32] These process innovations can entail changing any or all of the factors in a chemical process—the required temperature or pressure, catalysts, raw material mix, reaction time, and so forth.

Specialty chemical plants. Specialty chemicals, such as synthetic perfumes, are often produced in small volume, either on a batch basis or in a continuous process. While a few stock specialty chemicals are made in quantity, most are custom ordered and produced in short runs. An average specialty plant produces 50 or so different chemicals. In general, these processes tend to be labor intensive, particularly the batch processes. However, recent technological improvements, largely in computerized process controls, have led to increased automation. These advances are particularly applicable to continuous operations, although it is possible to automate some parts of batch processes.

Research and development. Research is crucial to this industry as it seeks to meet the changing user needs. The research and development budgets for all chemicals companies (as a percent of sales) run 15 percent to 20 percent above the all-industry average.[33]

Much of the research focuses on existing products and processes, resulting in incremental improvements. Some of the research is directed toward end-product development, though in recent years it has seldom resulted in revolutionary new products. Instead, research has led to the development of new markets or new applications for existing products.

There is also continual research on technology, though it is focused on improving labor productivity to only a limited degree. Through replacement or retrofitting, plant equipment may be adapted to shifts in raw materials markets (based on price and availability); to new chemical processes that are more energy efficient, have higher yields, and so forth; and to cope with new environmental or safety hazards and regulations. The energy crisis of the seventies made feedstock flexibility and energy efficiency particularly important. New catalysts which are effective at lower temperatures are examples of technological change used to increase energy efficiency.

Capital investment. For the industry as a whole, large expenditures are needed each year to maintain equipment and structures because of the huge amount of capital stock in place. In 1982, capital assets per employee were almost six times greater than for all manufacturing.[34] In addition, because technological changes in this industry occur more or less continuously, obsolescence is rapid and high rates of depreciation are common.[35] In the past, the industry's plant and equipment had a comparatively short lifespan owing to the pace of technological change, the rapidly increasing economies of scale, and the corrosive, high pressure, high temperature processing environment. The average life span of plants lengthened somewhat after 1973 as the pace of technological change slowed and fewer replacement plants were built. (By that time, near-maximum economies of scale had been reached for some commodities and the cost of new plants had risen sharply.[36])

Online industry capacity for a given chemical changes periodically. Within the total available capacity for a product, actual online capacity is adjusted to fluctuations in supply and demand by closing and opening the small, older plants. In addition, plants regularly shut down as they undergo extended turnarounds during which equipment and catalysts are checked and serviced, and, at times, complete processes are replaced.

Industry structure. In 1982, 74 percent of the establishments in the industry had fewer than 100 employees—only 3 percent had 1,000 workers or more. The group of small plants accounted for 10 percent of industry value of shipments and 11 percent of employees. In contrast, the large establishments produced 44 percent of total shipments and employed 45 percent of the industry work force.[37]

Because of the interdependence in the industry (that is, the end product of one plant may be the feedstock of another), many plants intentionally are located near one another. For example, plants making methanol may be integrated with plants making ammonia because the processes and ancillary equipment are similar and the production of methanol requires carbon dioxide, which is a byproduct of ammonia synthesis.

Outlook

The organic chemicals industry has undergone extensive restructuring in recent years, as it undertook a major upgrading of its plants (while restricting capacity expansion), consolidated product lines, closed or sold off inefficient plants, and trimmed its labor force.[38] These changes have possibly laid the foundation for long-term productivity increases, if output grows steadily. The areas of potential output growth appear to be changing, however. Chemicals companies are focusing on opportunities for growth in specialty chemicals because it is unlikely that the commodity chemicals portion of the industry will experience many large, long-term output

increases. Octane enhancers and methanol fuels are two of the few potential high-growth areas for commodities. U.S. companies may find it increasingly less expensive to import feedstock chemicals, rather than produce their own. These imports will come largely from increased production in the Middle East, Mexico, Canada, and other countries that have ready access to cheap and plentiful supplies of oil and natural gas.

Technological innovation for commodity chemical processing will continue, but probably at the comparatively slow rates of recent years. There is greater potential for productivity improvement in specialty chemical production. If research and development activities continue to intensify and efforts to automate batch or semicontinuous processes typical of specialty chemical production are sustained, significant productivity improvements may result. □

——FOOTNOTES——

[1]The segment of the organic chemicals industry discussed in this article, SIC 2869, is defined in the *1972 Standard Industrial Classification Manual* as including establishments primarily engaged in manufacturing industrial organic chemicals not elsewhere classified. Important products of this industry include: noncyclic organic chemicals; solvents; polyhydric alcohols; synthetic perfume and flavoring materials; rubber processing chemicals; plasticizers; synthetic tanning agents; chemical warfare gas; and esters, amines, etc. of polyhydric alcohols and fatty and other acids.

Average annual rates of change presented in this article are based on linear least squares of the logarithms of the index numbers. Extensions of the indexes will appear in the annual BLS Bulletin, *Productivity Measures for Selected Industries and Government Services.*

[2]Martin Neil Baily and Alok K. Chakrabarti, "Innovation and Productivity, in U.S. Industry," *Brookings Papers on Economic Activity,* 2, 1985, pp. 611, 619. The average number of product innovations per year in the chemical industry was as follows:

	Radical or major differences	*Significant improvement*	*Minor importance*
1967–73	2.4	96.9	232.6
1974–79	.2	9.0	29.7
1980–82	.0	5.7	59.0

[3]Industry sources; Harold A. Wittcoff and Bryan G. Reuben, *Industrial Organic Chemicals in Perspective, Pt. One: Raw Materials and Manufacture* (New York, John Wiley & Sons, 1980), p. 20; and various issues of U.S. Department of Commerce, *U.S. Industrial Outlook* (Washington, Government Printing Office), chapters on chemicals.

[4]Industry sources; Baily and Chakrabarti, "Innovation and Productivity," pp. 615, 624; and U.S. Department of Commerce, *1982 U.S. Industrial Outlook,* p. 98.

[5]Effective or preferred capacity is lower than full capacity due to cost considerations or other reasons. Capacity rates quoted are from various issues of the American Chemical Society's *Chemical & Engineering News* and the *U.S. Industrial Outlook.*

Many of the references to energy usage and capacity utilization refer to the "petrochemical" industry or the "organic chemical" industry because data at the 4-digit level are not available. In 1984, SIC 2869 accounted for 79 percent of total employment and 81 percent of the overall value of shipments in SIC 286, Industrial Organic Chemicals. The petrochemicals group includes the following industries: 2821, 2822, 2824, 2843, 2865, 2869, 2873, and 2895. Of these, SIC 2869 is the largest.

[6]Baily and Chakrabarti, "Innovation and Productivity," pp. 617–18, 623. Employees of two large commodity chemical producers, who were interviewed in conjunction with this study, confirmed that a falloff in innovation and the slowdown in product demand were two of the most important causes of the productivity slowdown.

The following data on the average number of process innovations per year were presented on this study of the total chemical industry:

	Productivity-enhancing innovations			*All process innovations*		
	Major	*Significant*	*Minor*	*Major*	*Significant*	*Minor*
1967–73	0.6	4.1	2.6	3.1	22.7	13.1
1974–79	.3	2.8	1.0	2.7	15.8	13.8
1980–82	.7	5.7	1.0	2.3	23.7	8.7

[7]Richard C. Levin, "Technical Change and Optimal Scale; Some Evidence and Implications," *Southern Economic Journal* (Southern Economic Association and the University of North Carolina at Chapel Hill, October 1977), p. 214; and Baily and Chakrabarti, "Innovation and Productivity," pp. 623, 630.

[8]Industry sources; and Baily and Chakrabarti, "Innovation and Productivity," p. 624.

[9]Wittcoff and Reuben, *Industrial Organic Chemicals in Perspective, Pt. One: Raw Materials and Manufacture,* p. 20; Jane H. Cutaia, "Rediscovering the formula for profits," *Business Week*, Jan. 12, 1987, p. 72; and Baily and Chakrabarti, "Innovation and Productivity," p. 624.

[10]Industry sources.

[11]"Productivity makes slim gain as capacity use remains low," *Chemical & Engineering News,* June 14, 1982, p. 61.

[12]Ted Wett, "Capacity down, production up: Rx for ethylene's '84 outlook," *Oil & Gas Journal,* Sept. 3, 1984, p. 55; and U.S. Department of Commerce, *1983 U.S. Industrial Outlook,* pp. 9–7, 9–9.

[13]*Chemical and Engineering News,* Apr. 13, 1987, p. 21.

[14]U.S. Department of Commerce, Industry and Trade Administration, *1985 U.S. Industrial Outlook* (Government Printing Office, January 1985), p. 11–2.

[15]Chemical-grade olefins, particularly ethylene and propylene, are among the most important feedstocks for organic chemicals. These olefins are made from either natural gas or naptha fractions, which are petroleum-based.

[16]Baily and Chakrabarti, "Innovation and Productivity," p. 623.

[17]Bernard A. Gelb and Gary L. Guenther, *U.S. Primary Petrochemicals: The Superfund Taxes and Other Factors Shaping Recent Trends in Supply and Demand* (Washington, Congressional Research Services, The Library of Congress, Aug. 30, 1984), pp. 12, 15–17, 21–23; and Bailey and Chakrabarti, "Innovation and Productivity," pp. 623–24.

[18]Industry sources.

[19]Industry sources; and Baily and Chakrabarti. "Innovation and Productivity," p. 624.

[20]Industry sources; and U.S. Department of Commerce, *1983 U.S. Industrial Outlook,* p. 9–7.

[21]Industry sources.

[22]Industry sources; and U.S. Department of Commerce, *1983 U.S. Industrial Outlook,* pp. 9–10 to 9–12.

[23]R. Norris Shreve and Joseph A. Brink, *Chemical Process Economics* (New York, McGraw-Hill, 1977), p. 20.

[24]Industry sources.

[25]U.S. Department of Commerce, *1983 U.S. Industrial Outlook,* p.9-9.

[26]Wittcoff and Reuben, *Industrial Organic Chemicals in Perspective, Pt. One*, p. 35.

[27]Plants produce different grade feedstocks; chemical (95 percent C_3) or polymer grade (99.9 percent C_3) determines whether they will be used further within the industry (perhaps captively), or sold as a commodity to other industries. (Refinery grade chemicals are made largely by those olefin plants in the petroleum refining industry.)

[28]U.S. Department of Commerce, *1983 U.S. Industrial Outlook,* p. 9-8.

[29]Industry sources.

[30]Industry sources; G. L. Funk and C. C. Kania, "Optimizing an entire olefins plant pays off," *Oil and Gas Journal*, Sept. 3, 1984, p.75; and Shreve and Brink, *Chemical Process Economics*, pp. 12-16.

[31]Shreve and Brink, *Chemical Process Economics*, p. 12.

[32]The average number of production workers per plant in 1982 was only 94.

[33]John K. Stille, *Industrial Organic Chemistry* (Englewood Cliffs, NJ, Prentice-Hall, 1968), p. 1; and Wittcoff and Reuben, *Industrial Organic Chemicals in Perspective, Pt. One*, p. 20.

The following data on research and development expenditures for SIC 28 are from the Bureau of the Census, *Statistical Abstract of the United States 1986* (Government Printing Office, 1985), p. 580:

	R&D dollars (millions)	*R&D as a percent of sales*	
Year	*SIC 28*	*SIC 28*	*All industries*
1975	$2,727	3.7	3.1
1980	4,636	3.6	3.0
1983	7,287	4.4	3.8

According to 1981 data from the National Science Foundation, the industrial chemical industry (SIC 281,2,6) spends slightly less on research and development than the total chemical industry (2.7 versus 3.0 percent of research and development to value of shipments).

[34]Bureau of the Census, *1983 Annual Survey of Manufactures,* M83(AS)4 (Government Printing Office, 1986), pp. 4-7, 4-31.

[35]Stille, *Industrial Organic Chemistry,* p. 1.

[36]Wittcoff and Reuben, *Industrial Organic Chemicals in Perspective, Pt. One,* pp. 1, 27.

[37]Bureau of the Census, *1982 Census of Manufactures,* MC82-I-28F (Government Printing Office, 1985), p. 28F-9.

[38]Blanca Riemer, "Are America's manufacturers finally back on the map?" *Business Week,* Nov. 17, 1986, pp. 92-93; Jane H. Cutaia, *Business Week,* Jan. 2, 1987, p. 72; and "Chemical Recovery Follows Restructuring," *Chemical Marketing Reporter,* Dec. 15, 1986, p. 3.

APPENDIX: Measurement techniques and limitations

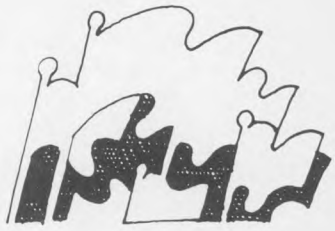
Indexes of output per employee hour measure changes in the relation between the output of an industry and the employee hours expended on that output. An index of output per employee hour is derived by dividing an index of output by an index of industry employee hours.

Real output was calculated in terms of the deflated value of shipments (adjusted for inventory change) for each product group. Changes in prices were removed from the current-dollar values by means of appropriate price indexes at various levels of subaggregation for a variety of products in each group. In order to combine the output segments into a total output index, employee hour weights relating to the individual segments were applied.

Complete output data are available only in years for which the Commerce Department takes a Census of Manufactures (such as 1972, 1977, and 1982). For the intercensal years, the data are based on samples, and are not quite so complete. Therefore, these data are benchmarked to census-year data.

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

Foreign Labor Developments



U.S. ends ILO moratorium by ratifying two conventions

TADD LINSENMAYER

On May 12, 1988, President Ronald Reagan formally ratified two conventions adopted by the International Labor Organization (ILO) in 1976. The U.S. Senate had given its nearly unanimous consent on February 1.

These two actions broke an undeclared but unyielding moratorium on ratification of ILO standards that had lasted 35 years—a moratorium which ILO advocates, particularly AFL–CIO President Lane Kirkland, argued was eroding American influence in the organization. In Senate hearings, Kirkland, along with former Labor Secretary William E. Brock and Secretary of State George P. Shultz, noted that the United States was the target of increasingly sharp criticism not only from Communist countries, but from U.S. allies as well, for failing to ratify ILO standards.

Ratification of the two new conventions still leaves the U.S. ratification record—9 ratifications out of more than 160 ILO standards—far behind most other ILO members. The U.S. action nevertheless is historic. (See exhibit 1.) Not only is this the first American ratification of ILO standards since 1953, but one of the conventions is the first nonmaritime ILO standard *ever* ratified by the United States.

Prior to the ratification of the new standards, all but one of the U.S. ratifications involved ILO maritime standards (the remaining ratification is a purely procedural agreement transferring the ILO from the old League of Nations to the United Nations). One of the two new ratifications is similarly in the maritime field. Approved by a Senate vote of 84 to 0, Convention No. 147 (Minimum Standards in Merchant Ships) requires ratifying countries to ensure effective safety and health conditions on board ships flying their flag or ships calling at their ports.

Convention No. 144 (Tripartite Consultations), which the Senate approved by an 81 to 2 margin, is the first nonmaritime convention ever ratified. It requires governments to establish effective machinery to ensure tripartite (government, worker, employer) consultation on ILO-related issues, including reviewing the possible ratification of other ILO standards.

This requirement became a matter of considerable controversy, and led to a remarkable compromise between American worker and employer delegates to the ILO. U.S. employers have long been concerned that ratification of ILO standards might adversely affect existing U.S. labor law because of the Constitution's supremacy clause making international treaties the supreme law of the land. For that reason, they were initially opposed to the ratification of any nonmaritime standards.

What finally allowed ratification of Convention No. 144 to move ahead was an agreement on a statement of principles concerning how the United States would review other ILO standards for possible ratification. The President's Committee on the ILO, a Federal advisory committee chaired by the Secretary of Labor and including representatives of business and labor, established three fundamental ratification principles:

- Each ILO convention will be examined on its merits on a tripartite basis;
- If there are any differences between the convention and Federal law and practice, these will be dealt with in the normal legislative process; and
- There is no intention to change State law and practice by Federal action through ratification of ILO conventions, and the examination will include possible conflicts between Federal and State law that would be caused by such ratification.

These principles will apply to all ILO standards being considered for possible U.S. ratification, including several key human rights and technical standards now before a tripartite subcommittee of the President's Committee on the ILO.

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Exhibit 1. Chronology of American participation in the ILO

1919	Samuel Gompers chairs the commission which drafts the ILO Constitution
1920	U.S. Senate refuses to join the League of Nations or the ILO
1934	U.S. joins the ILO
1938	U.S. ratifies five ILO conventions (only two others are ratified 1938–88)
1970	U.S. withholds ILO funds, charging pro-Soviet bias
1972	U.S. restores ILO funds, citing progress on reforms
1975	After ILO recognizes Palestine Liberation Organization, U.S. files letter of intent to withdraw
1977	U.S. withdrawal takes effect
1980	U.S. rejoins ILO
1988	U.S. ratifies two ILO conventions, including first nonmaritime convention

American delegates to the forthcoming 1988 ILO conference, which meets in Geneva, Switzerland, June 1–22, say ratification of these two conventions should boost U.S. credibility in the organization. Edward J. Hickey Jr., longtime AFL–CIO representative in the ILO Conference Committee on the Application of Conventions and Recommendations, claims these ratifications will be particularly helpful during the 1988 conference in dealing with worker rights violations in other countries. Says Hickey, "Every time we point to problems in other countries, they point right back at our poor ratification record. Now we can show them we're doing something about it."

In spite of this optimism on worker rights issues, several other 1988 ILO conference issues may prove more difficult than those in the 1987 conference. A number of Americans who attended the 1987 conference described it as being surprisingly calm, and fear the mood may not be as "mellow" in 1988.

The 1987 conference agenda, for example, contained few issues requiring decisions. Two of the technical agenda items—those concerning employment promotion and construction safety—were before the conference for preliminary discussion. The 1988 conference, however, will have to vote on new conventions and recommendations on these issues. A third technical item in 1987 concerning ILO technical cooperation programs resulted in the adoption of noncontroversial general conclusions. This will be replaced in 1988 by two new and potentially contentious issues: proposed new standards on the rights of indigenous and tribal populations, and principles for rural employment promotion.

The 1987 ILO conference also temporarily sidestepped a challenge to the credentials of the Polish worker delegation, an issue which delegates to the 1988 conference may have to face squarely. The 1987 challenge, filed by Western worker delegates, charged that the Polish government had neither consulted *Solidarnosc* nor included any of its members in the Polish worker delegation, in violation of the ILO Constitution. The conference avoided a vote on this challenge by adopting a compromise report calling on Poland to consult *Solidarnosc* in the future. The Polish government, however, emphatically rejected this report, and according to recent press reports has shown no willingness to work with *Solidarnosc* since then. That may spark a new challenge for credentials in 1988 and a politically charged showdown vote.

The 1988 conference may also face other potentially contentious issues involving apartheid, as well as an annual survey on Israel and the occupied territories. But whatever else happens during the conference, 1988 will surely go into the record books as an important new milestone in the history of American involvement in the ILO. □

The landmark provisions of ratified ILO conventions

JOSEPH P. GOLDBERG

Past U.S. inaction concerning the ratification of International Labor Organization (ILO) conventions was the result of concern over whether these conventions would overshadow existing Federal and State labor laws. The avenue to ratification was eased by the establishment of the President's Committee on the ILO. (The members of the Committee are the Secretaries of Labor, State, and Commerce; the President's Assistant for National Security Affairs; and the presidents of the AFL–CIO and the U.S. Council for International Business.) Its subordinate, the Tripartite Advisory Committee on International Labor Standards, had found unanimously that both conventions are consistent with U.S. law and practice.

Convention No. 144, (concerning tripartite consultation to promote the implementation of international labor standards) had been adopted at the 1976 ILO Conference, with the support of the U.S. Government, and employer and worker delegates. It requires ratifying members to establish and maintain machinery to ensure effective

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consultations between governments and employers and workers of "the most representative organizations . . . enjoying the right of freedom of association." The United States has had a long history on effective tripartite consultation on ILO matters, the present President's Committee of the ILO was institutionalized in 1980, when the United States reentered the ILO, after withdrawing in 1977.

U.S. ratification of Convention No. 144 is innovative in that it is of general application and does not deal with seamen and international shipping matters—the sole areas of concern of the only six substantive conventions previously ratified by the United States. These areas were already basically covered by Federal law and practice. Convention No. 144 sets procedures by which adherence to effective tripartism, the foundation of the ILO, can be evaluated. In testimony supporting ratification, Lane Kirkland, president of the AFL–CIO, stressed the role of the ILO in protecting the fundamental interests of workers—including freedom of association; Abraham Katz, president of the U.S. Council for International Business, stressed the ILO role in protecting "free business association as well as free labor unions." In reaching agreement to ratify, the President's Committee also agreed to principles to be used in the consideration of the ratification of additional conventions.

Convention No. 147 (concerning minimum standards in merchant ships) adopted by the ILO Maritime Conference in 1976, was born of long and arduous deliberation. Originally, discussions were directed at dealing with substandard conditions on ships operated under so-called "flags of convenience." To prevent maritime catastrophes, to set uniform international standards, and to avoid *ad hoc* actions by unions and other private groups in individual ports, the conference majority reached tripartite agreement to set minimum standards on the ships of all nations. The convention was supported by the U.S. Government, and seamen's union and employer representatives, including tanker operators.

Not only does the convention set the standards to be met on the ships of the ratifying country, it also contains "port control" provisions—a significant innovation in an ILO convention, in that the standards apply beyond the national limits of the ratifying country. In deciding that the control provided by this article was essential to the effectiveness of the convention in setting international ship standards, the majority recognized the historic

Profile of two ILO conventions ratified by the United States

Convention No. 144. Tripartite Consultations to Promote the Implementation of International Labor Standards, No. 144, was adopted by the International Labor Conference in 1976, with the active participation and support of the U.S. tripartite delegation. It essentially relates to the administrative machinery for participating in the ILO. The Convention provides that ILO members which ratify it must establish and maintain machinery to ensure effective tripartite consultations between the government, employers, and workers on matters relating to the ILO—in particular, matters relating to the adoption, ratification, and implementation of ILO standards.

The United States effectively practiced tripartite consultation on such matters even before the Convention was adopted. U.S. practice in this area has been strengthened in recent years by the establishment of the tripartite President's Committee on the ILO, by regular meetings of its staff-level Consultative Group, and by creation of the Tripartite Advisory Panel on International Labor Standards.

The tripartite advisory panel has unanimously determined that the United States is in full compliance with Convention No. 144, and that no modification of U.S. legislation is required to give effect to its provisions.

Convention No. 147. The Minimum Standards in Merchant Ships, No. 147, is one of 32 conventions adopted by the ILO that deals with the working and living conditions of seafarers. This particular Convention was adopted at a special maritime session of the International Labor Conference in 1976 with the active support of the U.S. Government, employer, and worker delegations.

It obligates ratifying ILO members to establish, by national law and regulation, as well as by encouragement of appropriate collective agreements, labor standards applicable to ships registered in their territory covering:

— safety, including standards of competency, hours of work, and manning;

— appropriate Social Security measures;

— shipboard living arrangements;

— hiring, training, and conditions of employment; and

— investigation of complaints and casualties

The Convention also provides that, if a ratifying member receives a complaint or obtains evidence that a foreign flag ship in its port does not conform to the standards of the Conventions, it may report the matter to both the country of registry and to the ILO, and take measures necessary to rectify conditions on board ships which are clearly hazardous to safety and health.

Following an extensive review, the tripartite advisory panel unanimously determined that there are no legal obstacles to U.S. ratification of Convention No. 147, because existing U.S. legislation, regulations, and industry practice are in full compliance with the obligations of the instrument. All members of the President's Committee on the ILO fully support ratification of Convention No. 147.

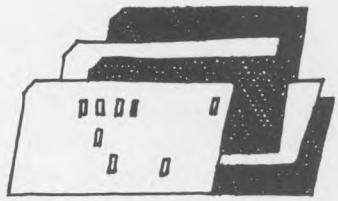
jurisdiction of the port state over the health and safety conditions on all ships when in the port country. Henceforward, the port control provisions will apply to foreign flag ships when in the ports of ratifying states. They also provide that if a ratifying state "receives a complaint or obtains evidence that a foreign flag ship does not conform to the standards of the convention, . . . it may prepare a report to the government of the country in which the ship is registered, with a copy to the Director–General of the ILO and may take measures necessary to rectify any conditions on board which are clearly hazardous to safety or health."

The ratification of the convention, consistent with U.S. standards and law and practice, included several clarifying provisions. With ratification, the United States joins 19 other nations which together represent about 60 percent of the world's merchant fleets. The Soviet Union as a major merchant fleet operator has not ratified the convention. At the 1976 Conference, the Soviet Union pressed for limitation of the convention to "flags of convenience," and opposed the "port control" provision when the Convention was extended to ships of all nations.

In 1982, 14 West European nations drew up a Memorandum of Understanding on Port State Control to coordinate their implementation of the convention. From July 1985 until June 1986, 11,740 inspections were carried out on 8,720 ships of 116 nations. While the total deficiencies on ships did not drop from previous years, the number of ship delays and detentions decreased substantially, suggesting a decline in the number of serious deficiencies, but also the need for continuing inspection.

The minimum international standards of this convention can save lives, cargo, and costs by reducing marine casualties, particularly tanker spills. The standards also reduce the unfair competitive advantage of substandard ships over ships of nations that adhere to ILO standards. □

Research Summaries



Occupational pay in shipbuilding and repairing industry

Production and related workers in the private shipbuilding and repairing industry averaged $10.67 an hour in October 1986, according to a study by the Bureau of Labor Statistics.[1] Individual earnings for the middle 50 percent of the workers ranged from $9.82 to $11.75. The industry's relatively compressed wage structure is due partly to the absence of incentive pay systems and the prevalence of single-rate pay plans in this highly unionized industry.[2]

The October 1986 pay level was 19 percent above the $8.97 hourly average recorded by a similar survey in September 1981.[3] This compares with a 24-percent rise in the wage and salary component of the Bureau's Employment Cost Index for durable goods manufacturing between the third quarters of 1981 and 1986.

In contrast to rising wages, employment in the industry dropped sharply over the same period. The number of production workers in the shipbuilding and repairing industry, estimated at 65,309 by the October 1986 survey, declined by more than two-fifths. This reduction in the work force reflects a steady decline in orders for commercial vessels during the past 10 years, and the loss of commercial repair orders to foreign shipyards. Hence, U.S. builders rely almost exclusively on military and domestic ship procurement that under Federal law is reserved to U.S. shipyards. For example, as of October 1, 1986, nine commercial vessels were under construction, while orders for 77 vessels had been placed by the U.S. Navy.[4]

Regionally, wages in October 1986 averaged $10.39 an hour along the Atlantic Coast, where nearly three-fifths of the production workers were employed. An additional one-fifth of the work force were in Gulf Coast yards and averaged $10.34. The Pacific Coast, accounting for one-sixth of the workers, recorded the highest average—$12.66; the Great Lakes yards recorded the lowest—$9.87 an hour (table 1).

The 27 occupations selected to represent the range of skills in the industry accounted for three-fifths of the production workers. Nationwide, hourly earnings averaged from $7.54 for marine trades helpers to $12.01 for loft workers (table 1). Hand welders, the largest occupational group studied separately, averaged $11.43 an hour for those working under conditions involving critical safety and load requirements (class A) and $11.03 an hour for those performing jobs requiring less skill (class B).

Occupational averages were highest on the Pacific Coast. In seven jobs permitting comparison, workers in Pacific yards averaged 12 percent to 27 percent more than their counterparts in the next highest paying shipyard. Among the three remaining yards—Atlantic Coast, Gulf Coast, and Great Lakes—differences in occupational averages were slight, with no consistent ranking pattern among the few possible comparisons.

Individual earnings frequently were highly concentrated within the occupations studied separately, especially within a given region. For example, nearly half of the 880 shipfitters and half of the 880 hand welders on the Pacific Coast earned between $13.25 and $13.75 an hour. On the Gulf Coast, three-fifths of the 882 shipfitters earned between $10 and $10.50 an hour.

All shipyards studied provided paid vacations, typically 1 week after 1 year of service, 2 weeks after 5 years, 3 weeks after 12 years, and 4 weeks after 20 years. Vacation periods varied among the regions, particularly after longer periods of service. For example, all workers along the Great Lakes and half of those along the Atlantic Coast had provisions for 5 weeks or more after 25 years of service.

Nearly all shipyards provided paid holidays, usually 11 to 13 days annually. Most workers on the Atlantic Coast received 11 to 13 holidays; those on the Gulf Coast, 8 or

12 days; and those on the Great Lakes and the Pacific Coast, 10 to 12 days.

All production workers covered by the survey were in shipyards that provided at least part of the cost of life insurance and a variety of basic health insurance plans. Accidental death and dismemberment insurance was offered to four-fifths of the workers, while short-term protection against loss of income because of illness or accident was available to three-fourths. About half of the workers were provided dental and prescription drug insurance, and one-tenth were covered by long-term disability and vision care insurance.

Retirement pension plans, usually financed entirely by the employers, were available to nine-tenths of the production workers. Coverage under retirement plans varied from all workers in Atlantic and Pacific Coast shipyards to two-thirds on the Gulf Coast, and just over two-fifths along the Great Lakes.

About four-fifths of the production workers covered by the survey were in yards primarily building military vessels, and nearly one-sixth were in yards building or repairing merchant vessels of 1,000 gross tons or more. The remaining workers (about 3 percent) were engaged in the construction or repair of off-shore drilling rigs and platforms, nonself-propelled vessels such as barges, and merchant vessels under 1,000 gross tons.

Approximately four-fifths of the workers were in establishments with collective bargaining agreements covering a majority of their production workers. The principal unions in the industry included the International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers, and Helpers; the International Association of Machinists; and the International Union of Marine and Shipbuilding Workers of America (all AFL–CIO affiliates).

A comprehensive bulletin on the study, *Industry Wage Survey: Shipbuilding and Repairing, October 1986*, Bulletin 2295, may be purchased from the Bureau of Labor Statistics, Publications Sales Center, P.O. Box 2145, Chicago, IL 60690, or the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The bulletin provides additional information on occupational pay and employee benefits. □

Table 1. Number of production workers and average straight-time hourly earnings[1] in selected occupations, private shipyards, U.S. ports, October 1986

Item	United States[2]		Atlantic Coast		Gulf Coast		Great Lakes		Pacific Coast	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
All production workers	65,309	$10.67	38,531	$10.39	13,959	$10.34	2,791	$9.87	9,241	$12.66
Size of establishment:										
Under 2,500 workers	20,578	10.18	9,749	9.23	2,354	9.58	2,791	9.87	4,897	12.63
2,500 workers or more	44,731	10.90	—	—	—	—	—	—	—	—
Labor-management contract coverage:										
Establishments with—										
Majority of workers covered	53,748	11.01	33,349	10.69	—	—	—	—	9,241	12.66
None or minority of workers covered	11,561	9.09	5,182	8.51	—	—	—	—	—	—
Selected occupations										
Crane operators	709	11.54	345	11.59	196	10.96	55	11.32	97	12.97
Electronics technicians	816	11.89	—	—	—	—	—	—	—	—
Insulators	608	11.16	460	11.19	—	—	—	—	—	—
Loft workers	116	12.01	50	10.49	—	—	—	—	—	—
Machine-tool operators	804	11.34	730	11.19	—	—	—	—	46	13.09
Machinists, production	792	11.16	—	—	112	11.05	—	—	135	13.16
Marine electricians	3,576	11.31	1,911	10.80	—	—	199	10.91	690	13.39
Marine machinists	2,851	11.36	1,875	11.06	415	11.14	—	—	509	12.69
Marine pipefitters	3,661	11.41	1,632	10.99	—	—	257	11.04	748	12.93
Marine riggers	1,397	11.14	962	10.69	—	—	—	—	249	12.99
Marine trades helpers	1,978	7.54	—	—	—	—	—	—	—	—
Painters	3,363	11.14	—	—	893	10.78	125	10.59	433	13.25
Sheet-metal workers	2,312	11.69	1,398	11.44	—	—	—	—	459	12.95
Shipfitters	4,339	11.36	2,169	11.28	882	10.52	—	—	880	12.76
Shipwrights	1,915	11.42	—	—	—	—	—	—	—	—
Welders, hand	5,558	11.32	—	—	1,030	9.99	—	—	880	12.86
Class A	4,011	11.43	—	—	584	10.81	—	—	—	—
Class B	1,547	11.03	141	10.30	446	8.92	—	—	—	—
Welders, machine (arc or gas)	1,290	11.44	—	—	—	—	—	—	—	—

[1]Excludes premium pay for overtime and for work on weekends, holidays, and late shifts. Incentive payments, such as those resulting from piecework or production bonus systems, and cost-of-living increases (but not bonuses) were included as part of the workers' regular pay. Excluded are performance bonuses and lump-sum payments of the type negotiated in the auto and aerospace industries, as well as profit-sharing payments, attendance bonuses, Christmas or yearend bonuses, and other nonproduction bonuses.

[2]Includes data for five shipyards located along major inland waterways, principally the Mississippi and Ohio rivers.

NOTE: Dashes indicate no data were reported or that data did not meet publication criteria.

——FOOTNOTES——

[1]Earnings data exclude premium pay for overtime and for work on weekends, holidays, and late shifts. Cost-of-living pay increases (but not bonuses) were included as part of the workers' regular pay. Excluded were performance bonuses and lump-sum payments of the type negotiated in the auto and aerospace industries, as well as profit-sharing payments, attendance bonuses, Christmas or yearend bonuses, and other nonproduction bonuses.

The survey covered establishments employing 100 workers or more primarily engaged in building and repairing ships, barges, and lighters, whether propelled by motor or towed. Shipyards that converted and altered ships were also included. Establishments fabricating structural assemblies, as well as subcontractors and U.S. Navy shipyards, were excluded from the survey. A description of the pay system in seven naval shipyards is included in an appendix to BLS Bulletin 2295.

[2]The index of dispersion, calculated by dividing the middle range of earnings by the median, is 17. This value falls within the first quartile of an array of dispersion indexes for 43 manufacturing industries discussed in an article by Carl B. Barsky and Martin E. Personick, "Measuring wage dispersion: pay ranges reflect industry traits," *Monthly Labor Review*, April 1981, pp. 35–41. Dispersion indexes for the middle half of the industries fell between 24 and 36, according to the article.

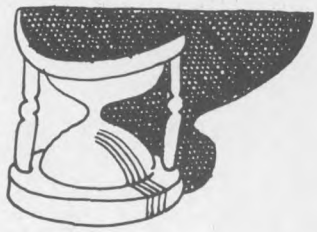
[3]For an account of the earlier survey, see *Industry Wage Survey: Shipbuilding and Repairing, September 1981*, Bulletin 2161 (Bureau of Labor Statistics, 1983). Data are not strictly comparable because the 1986 survey had a lower minimum establishment size — 100 rather than 250 workers. However, shipyards with 100 to 249 workers accounted for only 6 percent of the 1986 survey work force. Using a 250 minimum cutoff for both years, we find the 1981–86 wage increase was 20 percent.

[4]The estimated decline in employment takes into account the lower minimum establishment size for the 1986 survey. For a detailed account of trends in shipbuilding and repair, see *1987 U.S. Industrial Outlook* (U.S. Department of Commerce), ch. 38.

A note on communications

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

Major Agreements Expiring Next Month

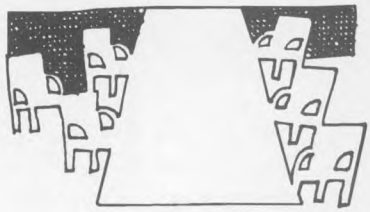


This list of selected collective bargaining agreements expiring in July is based on information collected by the Bureau's Office of Compensation and Working Conditions. The list includes agreements covering 1,000 workers or more. Private industry is arranged in order of Standard Industrial Classification

Industry or activity	Employer and location	Labor organization[1]	Number of workers
Private			
Construction	Associated General Contractors and others (Southern California)	Teamsters	2,650
	Roofing and Sheet Metal Contractors (Boston, MA)	Sheet Metal Workers	1,250
	Air Conditioning Contractors of Arizona (Arizona)	Sheet Metal Workers	1,000
	Mechanical Contractors Association of Utah (Salt Lake City, UT)	Plumbers	1,300
Food products	Dried fruit industry (California)	Longshoremen and Warehousemen (Ind.)	1,000
Paper	Mead Corp. (Chillicothe, OH)	Paperworkers	1,900
Rubber	Armstrong Rubber Co. (Interstate)	Rubber Workers	2,600
Fabricated metal products	Babcock & Wilcox Co. (Interstate)	Boilermakers	2,550
Machinery	American Standard (La Crosse, WI)	Machinists	1,600
Electrical products	Hughes Helicopter Corp. (Los Angeles, CA)	Carpenters	1,550
Transportation equipment	Rockwell International Corp., Automotive Operations (Interstate)	Auto Workers	2,750
	Jacksonville Shipyards, Inc. (Jacksonville, FL)	Boilermakers	1,500
	Fairchild Industries Inc., Fairchild Republic Division (Farmingdale, NY)	Machinists	1,500
	Freightliner Corp. (Portland, OR)	Various unions	1,500
Miscellaneous manufacturing	National Association of Doll & Stuffed Toy Manufacturers (New York, NY)	Toy and Novelty Workers	2,000
Air transportation	Eastern Airlines, pilots (Interstate)	Air Line Pilots	4,200
Communication	General Telephone Co. of Michigan (MI)	Electrical Workers (IBEW)	2,350
Utilities	Pennsylvania Power and Light Co. (Pennsylvania)	Electrical Workers (IBEW)	5,500
	Columbus and Southern Ohio Electric Co. (Ohio)	Electrical Workers (IBEW)	1,400
Retail trade	Bradlees Mercantile, Division of Stop and Shop Co. (New England)	Food and Commercial Workers	4,400
	Bradlees Mercantile (Connecticut)	Food and Commercial Workers	2,800
	Kroger Food Stores (Interstate)	Food and Commercial Workers	5,700
	Jewel, Dominick's, Eagle Discount, and others (Chicago, IL)	Food and Commercial Workers	4,300
Restaurants	President's Council of Food, Beverage and Lodging Industries of Oregon (Portland, OR)	Hotel Employees and Restaurant Employees	2,600
Amusements	Alliance of Motion Picture and Television Producers (Los Angeles, CA)	Theatrical Stage Employees	30,000
Hospitals	Affiliated Hospitals of San Francisco (California)	California Nurses Association	2,000
Public			
Education	Florida: Manatee County Board of Education, faculty	Teachers	1,400
	Illinois: Peoria Board of Education, teachers	Teachers	1,000
Law enforcement	Massachusetts: State Police	Police Associations (Ind.)	1,000
Education	Michigan: Wayne State University, clerical and technical	University Professors (Ind.)	1,400
	Wayne State University, faculty	University Professors (Ind.)	1,400
General government	New Jersey: Essex County, clerical unit	Electrical Workers (IBEW)	1,100
Transit	Ohio: Cleveland Regional Transit, operators	Transit Union	2,000
General government	Pennsylvania: Allegheny County, clerical and technical	Service Employees	1,000
Hospitals	Allegheny County Hospital, blue collar	AFL–CIO	1,150
Transit	Texas: Houston Metro Transit Authority	Transport Workers	1,900

[1]Affiliated with AFL–CIO except where noted as Independent (Ind.).

Developments In Industrial Relations



Brewery contract focuses on job security

After union members rejected two contract proposals because of dissatisfaction with the job security provisions, Anheuser–Busch and the Teamsters negotiated a new approach that the workers approved by a 3-to-1 margin. Under the new approach, employees with at least 5 years of service who lose their jobs due to the increasing use of automation will be offered jobs in another of the 12 plants covered by the settlement.

The 3-year contract, which runs to February 28, 1991, calls for 25-cents-an-hour wage increases in March of each year, and for an immediate $1,000 lump-sum payment to all nonprobationary employees. According to the union, prior to the settlement, the 9,000 employees earned an average of $17 an hour, the highest level in the industry

The accord also provides for a 50-cent hourly increase in the company's financing of benefits in the first contract year and 25-cent increases in the second and third years, with each of the local unions given the right to decide how to spend the money. The plants covered by the agreement are in Los Angeles, CA; Fairfield, CT; Tampa and Jacksonville, FL; St. Louis, MO; Merrimack, NH; Newark, NJ; Syracuse, NY; Columbus, OH; Houston, TX; Williamsburg, VA; and Ft. Collins, CO.

In another development in the brewery industry, AFL–CIO umpire Murray H. Finley ruled that the Teamsters would have exclusive right to attempt to organize 3,000 employees at Adolph Coors Co.'s brewery in Golden, CO. Finley also ruled that both the Teamsters and the Machinists could attempt to organize 250 employees at Coors' packaging and distribution center in Elkton, VA, which is scheduled to add a brewery.

The events leading to the ruling began last year when the AFL–CIO terminated its 10-year boycott of Coors' products in return for a company pledge not to interfere in organizing campaigns at its facilities. At the time, the Auto Workers, the Steelworkers, and the Machinists were all planning organizing campaigns at Coors, but an umpire ruled that only the Machinists should undertake a campaign. (The decision was rendered under AFL–CIO procedures intended to prevent wasteful overlapping of organizing drives.) Later, when the Teamsters, who had begun efforts to organize Coors' operations, rejoined the AFL–CIO, the Federation was forced to decide between the Teamsters and the Machinists.

The Teamsters' organizing campaign at Coors will be directed by the union's Brewery and Soft Drink Conference, which claims to represent 90 percent of the Nation's brewery workers.

Work stoppage at General Electric ends

A 7-week work stoppage at General Electric Co.'s aircraft engine plant in Evendale, OH, ended when the company and the Auto Workers and Machinists unions agreed on contract provisions regarding job consolidations and subcontracting. The stoppage began when General Electric moved to implement a plan, announced in 1987, under which the 5,300 employees represented by the Auto Workers would have been assigned to 32 job classifications, down from 84, to help improve the plant's competitive position. Although the reclassification of duties was expected to result in wage increases for 36 percent of the workers, the Auto Workers contended that it would also result in the loss of 10 percent of the jobs in the bargaining unit. The settlement provided that the number of classifications will only be reduced to 40 and that there will be no resulting layoffs. Employees forced into lower rated jobs will retain their current pay rate for 2 years. The settlement does not prohibit layoffs resulting from declining sales.

The concurrent settlement for the 1,400 skilled trades employees represented by the Machinists centered on the union's contention that General Electric was sending an excessive amount of machining work to its nonunion plants and to subcontractors. Under the settlement, the parties established a joint committee to deal with the issue.

The settlement on the two issues came shortly before the start of national negotiations between General Electric and

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

a Coordinated Bargaining Committee comprising a dozen unions. Announced union demands in the bargaining on contracts to succeed those scheduled to expire in July center on provisions to protect employees from layoffs, plant closings, and automation of operations. The same demands apply to Westinghouse Corp., where current contracts expire in August. A union official said that the unions represent 67,000 workers at the two companies, compared with 100,000 workers in 1966.

New contract for Bloomingdale workers

In New York City, 4,000 employees of Bloomingdale's Manhattan store, two warehouses, and an office building were covered by a settlement between the department store chain and Local 3 of the Retail, Wholesale, and Department Store Union. The 3-year accord included new provisions intended to counter possible job losses resulting from Canadian Campeau Corp.'s purchase of Bloomingdale's parent, Federated Department Stores.

A new provision requires a new owner to honor the terms of the union's contract. Another provision calls for new jobs or retraining for employees who lose jobs as a result of automation in the finance and control department or the closing of the warehouse. The affected workers will retain their current pay rate for 1 year if the new job has a lower rate.

Over the contract term, full-time noncommission employees will receive five wage increases totaling $45 a week. Part-time employees will also receive five increases, totaling $1.20 an hour. The parties agreed to consider changing the pay system for commission employees, as well as changing all hiring and progression rates.

Home health care workers get increase

Nearly 60,000 home health care workers in New York City were covered by a settlement that provided for a 50-percent increase in wages and benefits over the 3-year term. One of the parties to the accord was the New York Home Care Union Coalition—comprising units of the Retail, Wholesale and Department Store Union, the State, County and Municipal Employees, and the Office and Professional Employees. A fourth union, the Service Employees, bargained separately, but accepted the same terms. On management's side, bargaining was conducted by the Home Care Council of New York, Inc., comprising 60 nonprofit service providers.

Labor and management joined in persuading government agencies to accept the cost increase. The State pays 40 percent of the cost of the home care service, the city pays 10 percent, and the Federal Medicaid program pays the balance. Most of the workers covered by the settlement are black and Hispanic women who care for the elderly and chronically ill in the patients' homes.

The settlement provided for an 85-cent-an-hour wage increase retroactive to December 1, 1987, a 40-cent increase in July 1988, and a 50-cent increase in July 1989. The increases will bring pay rates to $5.90 for starting employees and to $6.20 for those with 1 year of service.

Employees who live in patients' homes will now receive a weekend pay differential of 50 cents an hour, increasing to $1.10 on April 1, 1989. Because live-in employees are only paid for 12 hours a day, despite being on call for 24 hours, they will begin to receive a "sleeping differential" of $6.25 a day effective July 1, 1988, rising to $10 on April 1, 1989, and to $14.80 on July 1, 1989.

California nurses avert work stoppage

In California, a possible work stoppage involving 1,300 registered nurses employed by Stanford University Medical Center was averted when the parties agreed on a 2-year contract. According to the president of the Committee for Recognition of Nursing Achievement, which represents the nurses, the chief issues were job staffing and scheduling, even though these subjects were not usually dealt with in past bargaining. Under the settlement, the parties agreed to more frequent meetings of existing joint committees that had been established to deal with these and other issues.

The employees' association was unable to regain "givebacks" it had accepted in 1986, but vowed to continue pressing for restoration during the contract period. The givebacks included a cut to one-quarter pay, from one-half, for on-call assignments, and cuts in educational reimbursements.

Salaries were raised by 5 percent in each year and a 4.5-percent salary progression step was added after $7\frac{1}{2}$ years of service. For a nurse on day shift, the starting rate is $14.57 an hour in the first year, up from $13.88, and the top rate is $23.75, up from $20.62. Top-rated nurses working at night will earn $54,578 in the first contract year and $57,304 in the second.

Employees get 'paybacks' from copper companies

An upswing in copper prices resulted in bonuses to 3,500 employees of Magma Copper Co. and Inspiration Resources Inc. under automatic formulas adopted in bargaining involving 14 unions in 1986. At that time, the industry was in a recession and the employees took compensation cuts of about 15 percent. In return, the companies agreed to the provision for possible bonuses based on the price of copper.

At Magma, the bonuses, which varied with the number of hours worked by the employees, averaged $312 for the third quarter of 1987 and $2,600 for the fourth quarter. At Inspiration, bonuses for the respective quarters averaged $426 and $2,342.

The provision for paybacks differed at Asarco, where employees received guaranteed wage increases instead of bonuses. Workers at Kennecott Corp.'s Utah operations agreed to a compensation cut of about 25 percent without any provision for paybacks linked to the price of copper. However, the company did agree to an immediate $1,000 payment to each worker and to reopen its Bingham Canyon mine.

Employers required to offer parental, sick leave

Under a new law, companies in Maine with at least 25 employees are required to offer 8 consecutive weeks of unpaid leave after the birth or adoption of a child, or when a member of the immediate family becomes ill. The benefit is available only to employees with at least 1 year of service and the employee must submit a doctor's certification in cases of illness. Employees on leave will continue to be covered by health insurance, but must pay the entire premium cost. The law expires in 2 years, unless it is renewed.

AIDS policy set for Federal workers

The Office of Personnel Management has established official policy for dealing with AIDS (acquired immune deficiency syndrome) for all 2.1 million Federal employees. The new policy, which supersedes varying policies adopted by individual agencies, bars discrimination against AIDS-afflicted employees and authorizes disciplinary action against fellow workers who refuse to work with such employees.

In announcing the new policy, Constance Horner, Director of Federal personnel, said, "the Federal Government, as an en-lightened and compassionate employer concerned with the health and welfare of its employees, has an obligation to show the way in addressing the realities of the AIDS epidemic." In the directive to agency personnel directors, Horner stated:

- Afflicted employees "should be allowed to continue working as long as they are able to maintain acceptable performance and do not pose a safety or health threat to themselves or others in the workplace."
- "Agencies should treat infected employees in the same manner as employees who suffer from other serious illnesses."
- "There is no medical basis for employees refusing to work with such fellow employees or agency clients" who are infected with the virus.
- The concerns of employees who fear working with infected fellow workers "should be addressed with appropriate information and counseling."
- If counseling and information measures are unsuccessful, resulting in disruption of work, supervisors "should consider appropriate corrective or disciplinary action against the threatening or disruptive employees."

Horner emphasized the need to educate Federal employees regarding AIDS, and quoted a Center for Disease Control conclusion that "the kind of nonsexual person-to-person contact that generally occurs among workers and clients or consumers in the workplace does not pose a risk for transmission of AIDS."

In other aspects of the new policy:

- Infected employees may request leave and the agency should decide whether to grant it in the same manner as for workers with other medical conditions.
- Agencies should revise the work schedules or assignments of infected employees in the same way they would for employees with other medical conditions.
- Infected employees may continue their insurance coverage, but may not raise their life insurance coverage after they become seriously ill.
- Some workers may be eligible for disability retirement if they have the required years of service.

Supreme Court rules on multiemployer benefit plans

The Supreme Court held that multiemployer benefit plans can not file a court suit against a company for failing to make payments to such plans while the company is negotiating to replace an expired collective bargaining agreement. In the 8–0 opinion, written by Justice John Paul Stevens, the Court said that the only recourse for plan officials is to file a complaint with the National Labor Relations Board. The Court held that the intent of the Congress to leave such disputes to the Board "is so plain" that the plans should appeal to the Congress for remedial legislation, not to the courts.

The decision was a defeat for multiemployer benefit plans because the Board could order plan officials to settle for less than the contested amount, and the Board cannot order employers to pay punitive damages or attorneys' fees.

The case originated in 1983, when eight benefit plans in Northern California sued Advanced Light Concrete Co. after it withdrew from multiemployer benefit plans and offered to negotiate separately with the unions. □

Current Labor Statistics

Productivity data

International comparisons

Injury and illness data

Schedule of release dates for BLS statistical series

Series	Release date	Period covered	Release date	Period covered	Release date	Period covered	MLR table number
Productivity and Costs:							
Nonfarm business and manufacturing					August 4	2nd quarter	2; 42–44
Nonfinancial corporations	June 6	1st quarter					2; 42–44
Employment situation	June 3	May	July 8	June	August 5	July	1; 4–21
Producer Price Indexes	June 10	May	July 15	June	August 12	July	2; 33–35
Consumer Price Index	June 21	May	July 22	June	August 23	July	2; 30–32
Real earnings	June 21	May	July 22	June	August 23	July	14–17
Major collective bargaining settlements			July 26	1st 6 months			3; 25–28
Employment Cost Index			July 26	2nd quarter			1–3; 22–24
U.S. Import and Export Price Indexes			July 28	2nd quarter			36–41

NOTES ON CURRENT LABOR STATISTICS

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

General notes

The following notes apply to several tables in this section:

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

Seasonally adjusted labor force data in tables 1 and 4–10 were revised in the February 1988 issue of the *Review,* to reflect experience through 1987.

Annual revisions of the seasonally adjusted payroll data shown in tables 13, 14, and 18 were made in the July 1987 *Review* using the X-11 ARIMA seasonal adjustment methodology. New seasonal factors for productivity data in table 42 are usually introduced in the September issue. Seasonally adjusted indexes and percent changes from month to month and from quarter to quarter are published for numerous Consumer and Producer Price Index series. However, seasonally adjusted indexes are not published for the U.S. average All Items CPI. Only seasonally adjusted percent changes are available for this series.

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

Additional Information

Data that supplement the tables in this section are published by the Bureau in a variety of sources. News releases provide the latest statistical information published by the Bureau; the major recurring releases are published according to the schedule preceding these general notes. More information about labor force, employment, and unemployment data and the household and establishment surveys underlying the data are available in *Employment and Earnings,* a monthly publication of the Bureau. More data from the household survey are published in the 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 biennally by the Bureau. BLS bulletins are issued covering productivity, injury and illness, and other data in this section. Finally, the *Monthly Labor Review* carries analytical articles on annual and longer term developments in labor force, employment, and unemployment; employee compensation and collective bargaining; prices; productivity; international comparisons; and injury and illness data.

Symbols

p = preliminary. To increase the timeliness of some series, preliminary figures are issued based on representative but incomplete returns.

r = revised. Generally, this revision reflects the availability of later data but may also reflect other adjustments.

n.e.c. = not elsewhere classified.

n.e.s. = not elsewhere specified.

COMPARATIVE INDICATORS
(Tables 1–3)

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

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

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

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

Notes on the data

Definitions of each series and notes on the data are contained in later sections of these notes describing each set of data. For detailed descriptions of each data series, see *BLS Handbook of Methods,* 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, Bureau of Labor Statistics,* Report 718 (Bureau of Labor Statistics, 1985).

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

Household survey data

Description of the series

EMPLOYMENT DATA in this section are obtained from the Current Population Survey, a program of personal interviews conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics. The sample consists of about 55,800 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 employment rate** represents the number unemployed as a percent of the civilian labor force.

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

Notes on the data

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

Data in tables 4–10 are seasonally adjusted, based on the seasonal experience through December 1987.

Additional sources of information

For detailed explanations of the data, see *BLS Handbook of Methods,* Bulletin 2285 (Bureau of Labor Statistics, 1988). 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 nonsupervisory workers closely associated with production operations. Those workers mentioned in tables 12–17 include production workers in manufacturing and mining; construction workers in construction; and nonsupervisory workers in the following industries: transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services. These groups account for about four-fifths of the total employment on private 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). The **Hourly Earnings Index** is calculated from average hourly earnings data adjusted to exclude the effects of two types of changes that are unrelated to underlying wage-rate developments: fluctuations in overtime premiums in manufacturing (the only sector for which overtime data are available) and the effects of changes and seasonal factors in the proportion of workers in high-wage and low-wage industries.

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

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

Notes on the data

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

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

Additional sources of information

Detailed national data from the establishment survey are published monthly in the BLS periodical, *Employment and Earnings.* Earlier comparable unadjusted and seasonally adjusted data are published in *Employment, Hours, and Earnings, United States, 1909–84,* Bulletin 1312–12 (Bureau of Labor Statistics, 1985) and its annual supplement. For a detailed discussion of the methodology of the survey, see BLS *Handbook of Methods,* Bulletin 2285 (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.

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; 22–29)

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

Employment Cost Index

Description of the series

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

Statistical series on total compensation costs, 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 3,400 private nonfarm establishments providing about 18,000 occupational observations and 700 State and local government establishments providing 3,500 occupational observations selected to represent total employment in each sector. On average, each reporting unit provides wage and compensation information on five well-specified occupations. Data are collected each quarter for the pay period including the 12th day of March, June, September, and December.

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

Definitions

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

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

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

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

Notes on the data

The Employment Cost Index for changes in wages and salaries in the private nonfarm economy was published beginning in 1975. Changes in total compensation costs—wages and salaries and benefits combined—were published beginning in 1980. The series for 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 *Handbook of Methods,* Bulletin 2285 (Bureau of Labor Statistics, 1988), and the following *Monthly Labor Review* articles: "Employment Cost Index: a measure of change in the 'price of labor'," July 1975; "How benefits will be incorporated into the Employment Cost Index," January 1978; "Estimation procedures for the Employment Cost Index," May 1982; and "Introducing new weights for the Employment Cost Index," June 1985.

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

Collective bargaining settlements

Description of the series

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

Settlement data are measured in terms of future specified adjustments: those that will occur within 12 months 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 than by private industry settlements. Lump-sum payments and cost-of-living adjustment (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 semi-annually (in February and August) for State and local government. Historical data and additional detailed tabulations for the prior calendar year appear in the April issue of the BLS periodical, *Current Wage Developments.*

Work stoppages

Description of the series

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

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

Definitions

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

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

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

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

Notes on the data

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

Additional sources of information

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

Other compensation data

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

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

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

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

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

PRICE DATA
(Tables 2; 30–41)

PRICE DATA are gathered by the Bureau of Labor Statistics from retail and primary markets in the United States. Price indexes are given in relation to a base period (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 consumer index (CPI–U), introduced in 1978, is representative of the 1982–84 buying habits of about 80 percent of the noninstitutional population of the United States at that time, compared with 32 percent represented in the CPI-W. In addition to wage earners and clerical workers, the CPI-U covers professional, managerial, and technical workers, the self-employed, short-term workers, the unemployed, retirees, and others not in the labor force.

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

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

Notes on the data

In January 1983, the Bureau changed the way in which homeownership costs are measured for the CPI-U. A rental equivalence method replaced the asset-price approach to homeownership costs for that series. In January 1985, the same change was made in the CPI-W. The central purpose of the change was to separate shelter costs from the investment component of homeownership so that the index would reflect only the cost of shelter services provided by owner-occupied homes. An updated CPI-U and CPI-W were introduced with release of the January 1987 data.

Additional sources of information

For a discussion of the general method for computing the CPI, see *BLS Handbook of Methods,* 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 2217 (Bureau of Labor Statistics, 1985).

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, fishing, mining, gas and electricity, and public utilities sectors. The stage of processing structure of Producer Price Indexes organizes products by class of buyer and degree of fabrication (that is, finished goods, intermediate goods, and crude materials). The traditional commodity structure of PPI organizes products by similarity of end use or material composition.

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

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

Notes on the data

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

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

Additional sources of information

For a discussion of the methodology for computing Producer Price Indexes, see *BLS Handbook of Methods,* Bulletin 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 2217 (Bureau of Labor Statistics, 1985).

International Price Indexes

Description of the series

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

For the export price indexes, the preferred pricing basis is f.a.s. (free alongside ship) U.S. port of exportation. When firms report export prices f.o.b. (free on board), production point information is collected which enables the Bureau to calculate a shipment cost to the port of exportation. An attempt is made to collect two prices for imports. The first is the import price f.o.b. at the foreign port of exportation, which is consistent with the basis for valuation of imports in the national accounts. The second is the import price c.i.f. (cost, insurance, and freight) at the U.S. port of importation, which also includes the other costs associated with bringing the product to the U.S. border. It does not, however, include duty charges. 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 2217 (Bureau of Labor Statistics, 1985). 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; 42–47)

U.S. productivity and related data

Description of the series

The productivity measures relate real physical output to real input. As such, they encompass a family of measures which include single factor productivity 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 output per unit of combined 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 efforts of the work force, management, and so forth. Changes in the output per hour measures reflect the impact of these factors as well as the substitution of capital for labor.

Compensation per hour is the wages and salaries of employees plus employers' contributions for social insurance and private benefit plans, and the wages, salaries, and supplementary payments for the self-employed (except for nonfinancial corporations in which there are no self-employed)—the sum divided by hours paid for. **Real compensation per hour** is compensation per hour deflated by the 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 paid of payroll workers, self-employed persons, and unpaid family workers.

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

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

Notes on the data

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

Additional sources of information

Descriptions of methodology underlying the measurement of output per hour and multifactor productivity are found in the *BLS Handbook of Methods,* Bulletin 2285 (Bureau of Labor Statistics, 1988). Historical data for selected industries are provided in the *Handbook of Labor Statistics,* Bulletin 2285 (Bureau of Labor Statistics, 1988).

INTERNATIONAL COMPARISONS (Tables 45–47)

Labor force and unemployment

Description of the series

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

Definitions

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

Notes on the data

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

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

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

There are breaks in the date series for Germany (1983), Italy (1986), the Netherlands (1983), and Sweden (1986). For both Germany and the Netherlands, the 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.

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 past 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 workseeking was reduced from 60 days to 4 weeks. These changes resulted 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 unpublished Supplements to Appendix B, available on request. The statistics are also analyzed periodically in the *Monthly Labor Review.* The latest article appears in the April 1988 *Review.* Additional historical data, generally beginning with 1959, are published in the *Handbook of Labor Statistics* and are available in unpublished statistical supplements to Bulletin 1979.

Manufacturing productivity and labor costs

Description of the series

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

Definitions

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

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

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

Notes on the data

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

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

Additional sources of information

For additional information, see the *BLS Handbook of Methods,* Bulletin 2285 (Bureau of Labor Statistics, 1988), and periodic *Monthly Labor Review* articles. Historical data are provided in the *Handbook of Labor Statistics,* Bulletin 2217 (Bureau of Labor Statistics, 1985). The statistics are issued twice per year—in a news release (generally in May) and in a *Monthly Labor Review* article.

OCCUPATIONAL INJURY AND ILLNESS DATA (Table 48)

Description of the series

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

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

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

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

Definitions

Recordable occupational injuries and illnesses are: (1) occupational deaths, regardless of the time between injury and death, or the length of the illness; or (2) nonfatal occupational illnesses; or (3) nonfatal occupational injuries which involve one or more of the following: loss

of consciousness, restriction of work or motion, transfer to another job, or medical treatment (other than first aid).

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

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

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

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

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

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

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

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

Notes on the data

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

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

Comparable data for individual States are available from the BLS Office of 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 2217 (Bureau of Labor Statistics, 1985), pp. 411–14; annual reports in the *Monthly Labor Review;* and annual U.S. Department of Labor press releases.

1. Labor market indicators

Selected indicators	1986	1987	1986			1987				1988
			II	III	IV	I	II	III	IV	I
Employment data										
Employment status of the civilian noninstitutionalized population (household survey)[1]										
Labor force participation rate	65.3	65.6	65.2	65.4	65.4	65.5	65.5	65.6	65.7	65.8
Employment-population ratio	60.7	61.5	60.6	60.8	60.9	61.1	61.4	61.7	61.9	62.1
Unemployment rate	7.0	6.2	7.2	7.0	6.8	6.6	6.3	6.0	5.9	5.7
Men	6.9	6.2	7.0	7.0	6.9	6.6	6.3	5.9	5.8	5.7
16 to 24 years	13.7	12.6	14.1	13.9	13.4	13.3	12.9	12.2	11.9	11.9
25 years and over	5.4	4.8	5.4	5.4	5.4	5.1	4.9	4.6	4.4	4.4
Women	7.1	6.2	7.3	7.0	6.8	6.6	6.2	6.1	6.0	5.8
16 to 24 years	12.8	11.7	13.1	12.7	12.5	12.5	11.8	11.4	11.1	11.0
25 years and over	5.5	4.8	5.7	5.4	5.3	5.0	4.7	4.7	4.7	4.4
Unemployment rate, 15 weeks and over	1.9	1.7	1.9	1.9	1.9	1.8	1.7	1.6	1.5	1.4
Employment, nonagricultural (payroll data), in thousands:[1]										
Total	99,610	102,112	99,321	99,804	100,397	101,133	101,708	102,278	103,293	104,284
Private sector	82,900	85,049	82,670	83,119	83,498	84,183	84,675	85,240	86,069	86,971
Goods-producing	24,681	24,884	24,702	24,629	24,624	24,733	24,757	24,884	25,164	25,336
Manufacturing	18,994	19,112	19,003	18,939	18,953	18,979	19,015	19,134	19,322	19,418
Service-producing	74,930	77,228	74,619	75,175	75,773	76,399	76,951	77,394	78,129	78,948
Average hours:										
Private sector	34.8	34.8	34.8	34.7	34.7	34.8	34.8	34.8	34.8	34.8
Manufacturing	40.7	41.0	40.7	40.7	40.8	41.0	40.9	40.9	41.2	41.1
Overtime	3.4	3.7	3.4	3.5	3.5	3.6	3.7	3.7	3.9	3.8
Employment Cost Index										
Percent change in the ECI, compensation:										
All workers (excluding farm, household, and Federal workers)	3.6	3.6	.7	1.1	.6	.9	.7	1.2	.8	1.4
Private industry workers	3.2	3.3	.8	.7	.6	1.0	.7	1.0	.7	1.5
Goods-producing[2]	3.1	3.1	.9	.6	.5	.5	.7	.8	1.0	1.8
Service-producing[2]	3.2	3.7	.6	.8	.6	1.3	.7	1.0	.5	1.3
State and local government workers	5.2	4.4	.6	2.8	.8	.8	.3	2.3	.9	1.3
Workers by bargaining status (private industry):										
Union	2.1	2.8	.2	.5	.3	.5	.5	.6	1.1	1.6
Nonunion	3.6	3.6	.9	.8	.7	1.1	.7	1.1	.6	1.5

[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	1986	1987	1986			1987				1988
			II	III	IV	I	II	III	IV	I
Compensation data [1, 2]										
Employment Cost Index--compensation (wages, salaries, benefits):										
Civilian nonfarm	3.6	3.6	0.7	1.1	0.6	0.9	0.7	1.2	0.8	1.4
Private nonfarm	3.2	3.3	.8	.7	.6	1.0	.7	1.0	.7	1.5
Employment Cost Index--wages and salaries										
Civilian nonfarm	3.5	3.5	.8	1.1	.6	1.0	.5	1.3	.7	1.0
Private nonfarm	3.1	3.3	.9	.7	.5	1.0	.7	1.0	.6	1.0
Price data[1]										
Consumer Price Index (All urban consumers): All items	1.1	4.4	−.5	.6	.6	.3	1.4	1.2	1.3	.3
Producer Price Index:										
Finished goods	−2.3	2.2	.5	−.7	1.1	.8	1.2	.2	.1	.4
Finished consumer goods	−3.5	2.6	.4	−.7	.8	.9	1.6	.3	−.2	.3
Capital equipment	2.1	1.3	.6	−.8	2.1	.1	.3	−.2	1.1	.7
Intermediate materials, supplies, components	−4.4	5.4	−.9	−.2	−.3	1.3	1.9	1.2	.9	1.0
Crude materials	−8.9	8.9	−1.5	−.6	.6	4.2	5.3	.6	−1.4	−.3
Productivity data[3]										
Output per hour of all persons:										
Business sector	1.9	.9	.6	−.3	−.1	.5	1.4	4.7	−1.5	.8
Nonfarm business sector	1.6	.8	.1	−.6	.0	.4	1.4	4.2	−1.0	.9
Nonfinancial corporations [4]	1.6	.3	−.2	.9	2.1	−2.9	.7	3.3	−1.0	–

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

3. Alternative measures of wage and compensation changes

Components	Quarterly average						Four quarters ended--					
	1986	1987				1988	1986	1987				1988
	IV	I	II	III	IV	I	IV	I	II	III	IV	I
Average hourly compensation:[1]												
All persons, business sector	3.6	1.4	3.3	3.8	3.2	3.5	3.3	2.8	2.8	3.0	2.9	3.4
All employees, nonfarm business sector	4.0	1.1	3.0	3.6	3.5	3.4	3.4	2.7	2.7	2.9	2.8	3.4
Employment Cost Index--compensation:												
Civilian nonfarm [2]	.6	.9	.7	1.2	.8	1.4	3.6	3.4	3.3	3.4	3.6	4.1
Private nonfarm	.6	1.0	.7	1.0	.7	1.5	3.2	3.1	3.0	3.3	3.3	3.9
Union	.3	.5	.5	.6	1.1	1.6	2.1	1.6	1.9	2.0	2.8	3.9
Nonunion	.7	1.1	.7	1.1	.6	1.5	3.6	3.6	3.4	3.7	3.6	4.0
State and local governments	.8	.8	.3	2.3	.9	1.3	5.2	5.0	4.7	4.2	4.4	4.9
Employment Cost Index--wages and salaries:												
Civilian nonfarm[2]	.6	1.0	.5	1.3	.7	1.0	3.5	3.5	3.2	3.4	3.5	3.5
Private nonfarm	.5	1.0	.7	1.0	.6	1.0	3.1	3.2	3.0	3.3	3.3	3.3
Union	.2	.4	.5	.6	1.1	.4	2.0	1.7	1.7	1.7	2.6	2.6
Nonunion	.7	1.2	.8	1.1	.5	1.0	3.5	3.5	3.3	3.8	3.6	3.5
State and local governments	.7	.8	.2	2.3	.9	.9	5.4	5.2	5.0	4.1	4.2	4.4
Total effective wage adjustments[3]	.5	.4	1.0	.9	.8	.4	2.3	2.0	2.2	2.6	3.1	3.2
From current settlements	.2	(4)	.2	.2	.3	.1	.5	.3	.3	.4	.7	.8
From prior settlements	.2	.3	.7	.6	.3	.3	1.7	1.5	1.6	1.7	1.8	1.8
From cost-of-living provision	.1	.1	.2	.1	.2	.1	.2	.1	.3	.4	.5	.5
Negotiated wage adjustments from settlements:[3]												
First-year adjustments	2.0	.8	2.6	2.1	2.4	2.1	1.2	1.2	1.5	2.0	2.2	2.4
Annual rate over life of contract	2.1	1.6	2.9	2.0	1.8	2.3	1.8	1.8	2.0	2.2	2.1	2.2
Negotiated wage and benefit adjustments from settlements:[5]												
First-year adjustment	2.7	1.1	4.1	2.5	3.4	1.7	1.1	1.2	1.8	2.7	3.0	3.1
Annual rate over life of contract	2.4	2.1	3.9	2.1	2.4	1.8	1.6	1.7	2.1	2.6	2.6	2.5

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

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

(Numbers in thousands)

Employment status	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
TOTAL															
Noninstitutional population [1, 2]	182,293	184,490	184,079	184,259	184,421	184,605	184,738	184,904	185,052	185,225	185,370	185,571	185,705	185,847	185,964
Labor force [2]	119,540	121,602	121,098	121,633	121,326	121,610	122,042	121,706	122,128	122,349	122,472	122,924	123,084	122,639	123,055
Participation rate [3]	65.6	65.9	65.8	66.0	65.8	65.9	66.1	65.8	66.0	66.1	66.1	66.2	66.3	66.0	66.2
Total employed [2]	111,303	114,177	113,541	114,060	114,018	114,359	114,786	114,615	114,951	115,259	115,494	115,878	116,145	115,839	116,445
Employment-population ratio [4]	61.1	61.9	61.7	61.9	61.8	61.9	62.1	62.0	62.1	62.2	62.3	62.4	62.5	62.3	62.6
Resident Armed Forces [1]	1,706	1,737	1,735	1,726	1,718	1,720	1,736	1,743	1,741	1,755	1,750	1,749	1,736	1,736	1,732
Civilian employed	109,597	112,440	111,806	112,334	112,300	112,639	113,050	112,872	113,210	113,504	113,744	114,129	114,409	114,103	114,713
Agriculture	3,163	3,208	3,250	3,269	3,192	3,212	3,143	3,184	3,249	3,172	3,215	3,293	3,228	3,204	3,228
Nonagricultural industries	106,434	109,232	108,556	109,065	109,108	109,427	109,907	109,688	109,961	110,332	110,529	110,836	111,182	110,899	111,485
Unemployed	8,237	7,425	7,557	7,573	7,308	7,251	7,256	7,091	7,177	7,090	6,978	7,046	6,938	6,801	6,610
Unemployment rate [5]	6.9	6.1	6.2	6.2	6.0	6.0	5.9	5.8	5.9	5.8	5.7	5.7	5.6	5.5	5.4
Not in labor force	62,752	62,888	62,981	62,626	63,095	62,995	62,696	63,198	62,924	62,876	62,898	62,647	62,621	63,208	62,909
Men, 16 years and over															
Noninstitutional population [1, 2]	87,349	88,476	88,271	88,361	88,442	88,534	88,598	88,683	88,756	88,849	88,924	89,033	89,099	89,168	89,225
Labor force [2]	66,973	67,784	67,604	67,802	67,623	67,671	67,937	67,776	67,947	68,019	68,030	68,243	68,343	68,148	68,445
Participation rate [3]	76.7	76.6	76.6	76.7	76.5	76.4	76.7	76.4	76.6	76.6	76.5	76.6	76.7	76.4	76.7
Total employed [2]	62,443	63,684	63,390	63,543	63,543	63,711	63,916	63,949	64,048	64,174	64,245	64,396	64,636	64,332	64,892
Employment-population ratio [4]	71.5	72.0	71.8	71.9	71.8	72.0	72.1	72.1	72.2	72.2	72.2	72.3	72.5	72.1	72.7
Resident Armed Forces [1]	1,551	1,577	1,575	1,566	1,559	1,561	1,575	1,581	1,580	1,593	1,589	1,588	1,577	1,573	1,569
Civilian employed	60,892	62,107	61,815	61,977	61,984	62,150	62,341	62,368	62,468	62,581	62,656	62,808	63,059	62,759	63,323
Unemployed	4,530	4,101	4,214	4,259	4,080	3,960	4,021	3,827	3,899	3,845	3,785	3,847	3,707	3,816	3,553
Unemployment rate [5]	6.8	6.1	6.2	6.3	6.0	5.9	5.9	5.6	5.7	5.7	5.6	5.6	5.4	5.6	5.2
Women, 16 years and over															
Noninstitutional population [1, 2]	94,944	96,013	95,808	95,898	95,979	96,071	96,140	96,221	96,295	96,376	96,446	96,538	96,606	96,679	96,739
Labor force [2]	52,568	53,818	53,494	53,831	53,703	53,939	54,105	53,930	54,181	54,330	54,442	54,681	54,740	54,491	54,610
Participation rate [3]	55.4	56.1	55.8	56.1	56.0	56.1	56.3	56.0	56.3	56.4	56.4	56.6	56.7	56.4	56.5
Total employed [2]	48,861	50,494	50,151	50,517	50,475	50,648	50,870	50,666	50,903	51,085	51,249	51,482	51,509	51,507	51,553
Employment-population ratio [4]	51.5	52.6	52.3	52.7	52.6	52.7	52.9	52.7	52.9	53.0	53.1	53.3	53.3	53.3	53.3
Resident Armed Forces [1]	155	160	160	160	159	159	161	162	161	162	161	161	159	163	163
Civilian employed	48,706	50,334	49,991	50,357	50,316	50,489	50,709	50,504	50,742	50,923	51,088	51,321	51,350	51,344	51,390
Unemployed	3,707	3,324	3,343	3,314	3,228	3,291	3,235	3,264	3,278	3,245	3,193	3,200	3,231	2,985	3,057
Unemployment rate [5]	7.1	6.2	6.2	6.2	6.0	6.1	6.0	6.1	6.1	6.0	5.9	5.9	5.9	5.5	5.6

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

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

(Numbers in thousands)

Employment status	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
TOTAL															
Civilian noninstitutional population[1]	180,587	182,753	182,344	182,533	182,703	182,885	183,002	183,161	183,311	183,470	183,620	183,822	183,969	184,111	184,232
Civilian labor force	117,834	119,865	119,363	119,907	119,608	119,890	120,306	119,963	120,387	120,594	120,722	121,175	121,348	120,903	121,323
Participation rate	65.3	65.6	65.5	65.7	65.5	65.6	65.7	65.5	65.7	65.7	65.7	65.9	66.0	65.7	65.9
Employed	109,597	112,440	111,806	112,334	112,300	112,639	113,050	112,872	113,210	113,504	113,744	114,129	114,409	114,103	114,713
Employment-population ratio[2]	60.7	61.5	61.3	61.5	61.5	61.6	61.8	61.6	61.8	61.9	61.9	62.1	62.2	62.0	62.3
Unemployed	8,237	7,425	7,557	7,573	7,308	7,251	7,256	7,091	7,177	7,090	6,978	7,046	6,938	6,801	6,610
Unemployment rate	7.0	6.2	6.3	6.3	6.1	6.0	6.0	5.9	6.0	5.9	5.8	5.8	5.7	5.6	5.4
Not in labor force	62,752	62,888	62,981	62,626	63,095	62,995	62,696	63,198	62,924	62,876	62,898	62,647	62,621	63,208	62,909
Men, 20 years and over															
Civilian noninstitutional population[1]	78,523	79,565	79,387	79,474	79,536	79,625	79,668	79,740	79,807	79,885	80,002	80,120	80,203	80,260	80,326
Civilian labor force	61,320	62,095	61,970	62,129	62,054	62,106	62,083	62,085	62,211	62,299	62,248	62,440	62,696	62,497	62,791
Participation rate	78.1	78.0	78.1	78.2	78.0	78.0	77.9	77.9	78.0	78.0	77.8	77.9	78.2	77.9	78.2
Employed	57,569	58,726	58,516	58,673	58,632	58,783	58,825	58,967	59,037	59,164	59,185	59,287	59,625	59,407	59,883
Employment-population ratio[2]	73.3	73.8	73.7	73.8	73.7	73.8	73.8	73.9	74.0	74.1	74.0	74.0	74.3	74.0	74.5
Agriculture	2,292	2,329	2,378	2,383	2,316	2,333	2,289	2,345	2,343	2,297	2,298	2,323	2,280	2,253	2,255
Nonagricultural industries	55,277	56,397	56,138	56,290	56,316	56,450	56,536	56,622	56,694	56,867	56,887	56,964	57,344	57,154	57,627
Unemployed	3,751	3,369	3,454	3,456	3,422	3,323	3,258	3,118	3,174	3,135	3,063	3,154	3,071	3,089	2,909
Unemployment rate	6.1	5.4	5.6	5.6	5.5	5.4	5.2	5.0	5.1	5.0	4.9	5.1	4.9	4.9	4.6
Women, 20 years ond over															
Civilian noninstitutional population[1]	87,567	88,583	88,395	88,464	88,546	88,632	88,685	88,785	88,843	88,923	89,010	89,110	89,178	89,261	89,307
Civilian labor force	48,589	49,783	49,494	49,728	49,722	49,886	49,969	49,922	50,095	50,254	50,361	50,558	50,640	50,542	50,612
Participation rate	55.5	56.2	56.0	56.2	56.2	56.3	56.3	56.2	56.4	56.5	56.6	56.7	56.8	56.6	56.7
Employed	45,556	47,074	46,761	47,028	47,088	47,206	47,308	47,251	47,480	47,634	47,750	47,977	48,005	48,132	48,170
Employment-population ratio[2]	52.0	53.1	52.9	53.2	53.2	53.3	53.3	53.2	53.4	53.6	53.6	53.8	53.8	53.9	53.9
Agriculture	614	622	603	629	619	620	609	600	636	636	643	646	654	656	692
Nonagricultural industries	44,943	46,453	46,158	46,399	46,469	46,586	46,699	46,651	46,844	46,998	47,107	47,331	47,351	47,476	47,478
Unemployed	3,032	2,709	2,733	2,700	2,634	2,680	2,661	2,671	2,615	2,620	2,611	2,581	2,635	2,411	2,442
Unemployment rate	6.2	5.4	5.5	5.4	5.3	5.4	5.3	5.4	5.2	5.2	5.2	5.1	5.2	4.8	4.8
Both sexes, 16 to 19 years															
Civilian noninstitutional population[1]	14,496	14,606	14,562	14,595	14,621	14,628	14,649	14,637	14,661	14,663	14,609	14,592	14,588	14,591	14,598
Civilian labor force	7,926	7,988	7,899	8,050	7,832	7,898	8,254	7,956	8,081	8,041	8,113	8,177	8,011	7,865	7,919
Participation rate	54.7	54.7	54.2	55.2	53.6	54.0	56.3	54.4	55.1	54.8	55.5	56.0	54.9	53.9	54.2
Employed	6,472	6,640	6,529	6,633	6,580	6,650	6,917	6,654	6,693	6,706	6,809	6,865	6,779	6,564	6,660
Employment-population ratio[2]	44.6	45.5	44.8	45.4	45.0	45.5	47.2	45.5	45.7	45.7	46.6	47.0	46.5	45.0	45.6
Agriculture	258	258	269	257	257	259	245	239	270	239	274	323	293	295	280
Nonagricultural industries	6,215	6,382	6,260	6,376	6,323	6,391	6,672	6,415	6,423	6,467	6,535	6,542	6,486	6,269	6,380
Unemployed	1,454	1,347	1,370	1,417	1,252	1,248	1,337	1,302	1,388	1,335	1,304	1,312	1,232	1,301	1,259
Unemployment rate	18.3	16.9	17.3	17.6	16.0	15.8	16.2	16.4	17.2	16.6	16.1	16.0	15.4	16.5	15.9
White															
Civilian noninstitutional population[1]	155,432	156,958	156,676	156,811	156,930	157,058	157,134	157,242	157,342	157,449	157,552	157,676	157,773	157,868	157,943
Civilian labor force	101,801	103,290	102,972	103,416	103,150	103,248	103,516	103,357	103,669	103,731	103,907	104,252	104,530	104,171	104,574
Participation rate	65.5	65.8	65.7	65.9	65.7	65.7	65.9	65.7	65.9	65.9	66.0	66.1	66.3	66.0	66.2
Employed	95,660	97,789	97,338	97,829	97,698	97,917	98,181	98,069	98,317	98,492	98,779	99,044	99,474	99,274	99,751
Employment-population ratio[2]	61.5	62.3	62.1	62.4	62.3	62.3	62.5	62.4	62.5	62.6	62.7	62.8	63.0	62.9	63.2
Unemployed	6,140	5,501	5,634	5,587	5,452	5,331	5,335	5,288	5,352	5,239	5,128	5,208	5,056	4,897	4,824
Unemployment rate	6.0	5.3	5.5	5.4	5.3	5.2	5.2	5.1	5.2	5.1	4.9	5.0	4.8	4.7	4.6
Black															
Civilian noninstitutional population[1]	19,989	20,352	20,279	20,312	20,341	20,373	20,396	20,426	20,453	20,482	20,508	20,539	20,569	20,596	20,622
Civilian labor force	12,654	12,993	12,778	12,889	12,892	13,039	13,150	13,028	13,152	13,193	13,215	13,222	13,168	13,098	13,078
Participation rate	63.3	63.8	63.0	63.5	63.4	64.0	64.5	63.8	64.3	64.4	64.4	64.4	64.0	63.6	63.4
Employed	10,814	11,309	11,114	11,129	11,238	11,381	11,513	11,421	11,556	11,589	11,605	11,608	11,504	11,420	11,482
Employment-population ratio[2]	54.1	55.6	54.8	54.8	55.2	55.9	56.4	55.9	56.5	56.6	56.6	56.5	55.9	55.4	55.7
Unemployed	1,840	1,684	1,664	1,760	1,654	1,658	1,637	1,607	1,596	1,604	1,610	1,614	1,663	1,678	1,597
Unemployment rate	14.5	13.0	13.0	13.7	12.8	12.7	12.4	12.3	12.1	12.2	12.2	12.2	12.6	12.8	12.2

See footnotes at end of table.

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

(Numbers in thousands)

Employment status	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Hispanic origin															
Civilian noninstitutional population[1]	12,344	12,867	12,770	12,809	12,848	12,887	12,925	12,965	13,003	13,043	13,082	13,115	13,153	13,192	13,230
Civilian labor force	8,076	8,541	8,468	8,549	8,468	8,447	8,549	8,581	8,654	8,763	8,772	8,879	9,017	8,803	8,828
Participation rate	65.4	66.4	66.3	66.7	65.9	65.5	66.1	66.2	66.6	67.2	67.1	67.7	68.6	66.7	66.7
Employed	7,219	7,790	7,686	7,797	7,738	7,762	7,856	7,877	7,935	7,978	8,058	8,238	8,268	8,079	8,010
Employment-population ratio[2]	58.5	60.5	60.2	60.9	60.2	60.2	60.8	60.8	61.0	61.2	61.6	62.8	62.9	61.2	60.5
Unemployed	857	751	782	752	730	685	693	704	719	785	714	642	749	724	818
Unemployment rate	10.6	8.8	9.2	8.8	8.6	8.1	8.1	8.2	8.3	9.0	8.1	7.2	8.3	8.2	9.3

[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		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
CHARACTERISTIC															
Civilian employed, 16 years and over	109,597	112,440	111,806	112,334	112,300	112,639	113,050	112,872	113,210	113,504	113,744	114,129	114,409	114,103	114,713
Men	60,892	62,107	61,815	61,977	61,984	62,150	62,341	62,368	62,468	62,581	62,656	62,808	63,059	62,759	63,323
Women	48,706	50,334	49,991	50,357	50,316	50,489	50,709	50,504	50,742	50,923	51,088	51,321	51,350	51,344	51,390
Married men, spouse present	39,658	40,265	40,021	40,075	40,120	40,262	40,308	40,404	40,556	40,645	40,711	40,404	40,475	40,481	40,459
Married women, spouse present	27,144	28,107	28,130	28,314	28,282	28,283	28,189	28,069	28,099	28,175	28,249	28,441	28,707	28,805	28,859
Women who maintain families	5,837	6,060	5,971	5,963	6,011	6,033	6,107	6,151	6,178	6,237	6,227	6,168	6,157	6,160	6,055
MAJOR INDUSTRY AND CLASS OF WORKER															
Agriculture:															
Wage and salary workers	1,547	1,632	1,599	1,672	1,622	1,625	1,591	1,624	1,705	1,595	1,599	1,666	1,677	1,648	1,678
Self-employed workers	1,447	1,423	1,488	1,429	1,403	1,424	1,393	1,415	1,430	1,407	1,450	1,454	1,414	1,423	1,385
Unpaid family workers	169	153	170	165	162	153	155	139	140	155	156	138	114	142	155
Nonagricultural industries:															
Wage and salary workers	98,299	100,771	100,106	100,634	100,510	100,825	101,241	101,282	101,522	101,943	101,997	102,507	102,683	102,279	102,538
Government	16,342	16,800	16,518	16,708	16,920	16,876	16,794	16,928	17,033	17,118	17,064	17,197	16,948	16,908	17,015
Private industries	81,957	83,970	83,588	83,926	83,590	83,949	84,447	84,354	84,489	84,825	84,933	85,310	85,735	85,371	85,523
Private households	1,235	1,208	1,234	1,240	1,163	1,212	1,175	1,100	1,222	1,286	1,200	1,147	1,170	1,175	1,092
Other	80,722	82,762	82,354	82,686	82,427	82,737	83,272	83,254	83,267	83,539	83,733	84,163	84,565	84,196	84,431
Self-employed workers	7,881	8,201	8,139	8,157	8,293	8,216	8,214	8,204	8,274	8,222	8,280	8,150	8,312	8,366	8,637
Unpaid family workers	255	260	268	276	274	266	248	297	242	235	248	237	228	248	281
PERSONS AT WORK PART TIME[1]															
All industries:															
Part time for economic reasons	5,588	5,401	5,394	5,333	5,254	5,428	5,283	5,261	5,353	5,534	5,262	5,367	5,566	5,343	5,194
Slack work	2,456	2,385	2,345	2,292	2,345	2,429	2,468	2,213	2,377	2,408	2,284	2,396	2,478	2,520	2,236
Could only find part-time work	2,800	2,672	2,725	2,677	2,623	2,683	2,526	2,683	2,655	2,696	2,638	2,640	2,598	2,535	2,502
Voluntary part time	13,935	14,395	13,940	14,498	14,836	14,437	14,573	14,415	14,488	14,523	14,711	14,571	14,572	14,603	15,016
Nonagricultural industries:															
Part time for economic reasons	5,345	5,122	5,104	5,058	4,979	5,154	5,016	4,986	5,067	5,241	5,004	5,145	5,254	5,106	4,924
Slack work	2,305	2,201	2,163	2,126	2,176	2,261	2,265	2,034	2,196	2,209	2,111	2,260	2,327	2,325	2,121
Could only find part-time work	2,719	2,587	2,648	2,603	2,530	2,599	2,463	2,603	2,557	2,597	2,552	2,566	2,457	2,475	2,397
Voluntary part time	13,502	13,928	13,544	13,995	14,334	13,953	14,099	13,987	14,011	14,064	14,222	14,096	14,123	14,141	14,592

[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		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
CHARACTERISTIC															
Total, all civilian workers	7.0	6.2	6.3	6.3	6.1	6.0	6.0	5.9	6.0	5.9	5.8	5.8	5.7	5.6	5.4
Both sexes, 16 to 19 years	18.3	16.9	17.3	17.6	16.0	15.8	16.2	16.4	17.2	16.6	16.1	16.0	15.4	16.5	15.9
Men, 20 years and over	6.1	5.4	5.6	5.6	5.5	5.4	5.2	5.0	5.1	5.0	4.9	5.1	4.9	4.9	4.6
Women, 20 years and over	6.2	5.4	5.5	5.4	5.3	5.4	5.3	5.4	5.2	5.2	5.2	5.1	5.2	4.8	4.8
White, total	6.0	5.3	5.5	5.4	5.3	5.2	5.2	5.1	5.2	5.1	4.9	5.0	4.8	4.7	4.6
Both sexes, 16 to 19 years	15.6	14.4	14.8	15.2	13.9	13.3	14.1	14.3	14.5	14.1	13.6	14.0	12.4	14.1	14.1
Men, 16 to 19 years	16.3	15.5	16.3	17.0	14.8	13.5	15.2	15.1	15.1	14.8	14.9	14.4	12.2	15.7	14.5
Women, 16 to 19 years	14.9	13.4	13.3	13.3	13.0	13.1	12.9	13.4	13.8	13.3	12.3	13.6	12.7	12.4	13.7
Men, 20 years and over	5.3	4.8	4.9	4.8	4.9	4.7	4.6	4.4	4.6	4.4	4.3	4.4	4.1	4.2	4.0
Women, 20 years and over	5.4	4.6	4.6	4.5	4.4	4.5	4.4	4.5	4.3	4.4	4.4	4.2	4.5	3.9	3.9
Black, total	14.5	13.0	13.0	13.7	12.8	12.7	12.4	12.3	12.1	12.2	12.2	12.2	12.6	12.8	12.2
Both sexes, 16 to 19 years	39.3	34.7	37.1	37.5	33.4	32.7	30.6	30.8	33.8	33.9	33.4	35.0	38.3	36.9	31.4
Men, 16 to 19 years	39.3	34.4	37.8	38.3	31.4	32.4	33.7	31.5	32.5	32.2	33.5	35.1	42.0	39.0	27.6
Women, 16 to 19 years	39.2	34.9	36.3	36.6	35.4	33.1	27.1	30.0	35.2	35.8	33.4	34.9	34.7	35.0	35.5
Men, 20 years and over	12.9	11.1	11.0	12.3	11.4	11.2	10.7	10.1	9.8	10.2	10.1	10.1	11.3	11.4	10.6
Women, 20 years and over	12.4	11.6	11.6	11.6	11.3	11.4	11.3	11.7	11.0	10.8	10.9	11.1	10.4	10.9	11.3
Hispanic origin, total	10.6	8.8	9.2	8.8	8.6	8.1	8.1	8.2	8.3	9.0	8.1	7.2	8.3	8.2	9.3
Married men, spouse present	4.4	3.9	4.1	4.0	4.0	3.8	3.7	3.7	3.7	3.5	3.4	3.6	3.4	3.4	3.0
Married women, spouse present	5.2	4.3	4.4	4.2	4.0	4.2	4.3	4.2	4.2	4.2	4.3	4.2	4.1	4.0	3.8
Women who maintain families	9.8	9.2	9.4	9.5	9.5	9.3	9.0	8.8	8.9	8.5	8.4	8.9	8.3	7.5	8.7
Full-time workers	6.6	5.8	5.9	5.9	5.9	5.7	5.6	5.5	5.6	5.5	5.4	5.4	5.3	5.3	5.1
Part-time workers	9.1	8.4	8.6	8.7	7.3	8.1	8.2	8.4	8.3	8.2	8.0	8.3	7.9	7.7	7.4
Unemployed 15 weeks and over	1.9	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.3
Labor force time lost[1]	7.9	7.1	7.3	7.2	7.1	6.9	6.9	6.8	6.8	6.8	6.6	6.6	6.6	6.5	6.2
INDUSTRY															
Nonagricultural private wage and salary workers	7.0	6.2	6.3	6.3	6.1	6.1	6.0	5.9	5.9	5.8	5.7	5.8	5.7	5.6	5.3
Mining	13.5	10.0	11.2	13.0	9.5	7.9	8.6	7.4	8.3	7.0	8.0	7.7	7.8	7.9	8.4
Construction	13.1	11.6	12.0	12.1	11.7	10.8	11.3	11.9	11.2	10.6	10.6	12.2	11.0	10.7	10.6
Manufacturing	7.1	6.0	6.3	6.3	5.7	6.0	5.6	5.6	5.7	5.3	5.1	5.6	5.6	5.2	5.3
Durable goods	6.9	5.8	6.2	6.2	5.4	6.0	5.5	5.4	5.2	4.8	4.8	5.5	5.9	5.2	4.8
Nondurable goods	7.4	6.3	6.4	6.5	6.1	5.9	5.8	5.9	6.5	5.9	5.6	5.8	5.3	5.3	6.0
Transportation and public utilities	5.1	4.5	4.7	4.4	4.8	4.4	4.4	4.1	4.4	4.5	4.6	3.6	3.6	4.2	3.8
Wholesale and retail trade	7.6	6.9	7.1	7.0	7.1	6.8	7.0	6.4	6.5	6.8	6.2	6.1	6.4	6.8	5.9
Finance and service industries	5.5	4.9	4.8	4.9	4.9	5.1	4.7	4.8	4.7	4.8	4.8	4.9	4.5	4.2	4.1
Government workers	3.6	3.5	3.5	3.4	3.4	3.4	3.7	3.4	3.3	3.4	3.2	3.0	2.8	2.8	3.0
Agricultural wage and salary workers	12.5	10.5	9.5	9.4	9.3	10.9	10.6	8.6	10.6	11.1	10.9	11.5	10.2	11.0	10.6

[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		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Total, 16 years and over	7.0	6.2	6.3	6.3	6.1	6.0	6.0	5.9	6.0	5.9	5.8	5.8	5.7	5.6	5.4
16 to 24 years	13.3	12.2	12.6	12.5	12.1	11.8	11.8	11.8	11.8	11.6	11.2	11.6	11.1	11.7	11.2
16 to 19 years	18.3	16.9	17.3	17.6	16.0	15.8	16.2	16.4	17.2	16.6	16.1	16.0	15.4	16.5	15.9
16 to 17 years	20.2	19.1	18.9	21.0	18.8	17.5	18.3	18.3	20.4	19.2	17.8	18.7	17.4	17.6	17.8
18 to 19 years	17.0	15.2	15.9	15.2	14.5	13.9	14.7	15.2	14.7	14.8	14.7	14.5	13.9	15.8	14.2
20 to 24 years	10.7	9.7	10.1	9.8	10.0	9.7	9.4	9.4	8.8	8.9	8.5	9.1	8.7	9.1	8.7
25 years and over	5.4	4.8	4.8	4.8	4.7	4.7	4.7	4.6	4.6	4.5	4.5	4.5	4.5	4.2	4.1
25 to 54 years	5.7	5.0	5.1	5.1	4.9	5.0	4.9	4.8	4.8	4.7	4.8	4.7	4.7	4.5	4.3
55 years and over	3.9	3.3	3.4	3.6	3.2	3.1	3.2	3.3	3.1	3.4	3.2	3.5	3.3	2.9	2.9
Men, 16 years and over	6.9	6.2	6.4	6.4	6.2	6.0	6.1	5.8	5.9	5.8	5.7	5.8	5.6	5.7	5.3
16 to 24 years	13.7	12.6	13.1	13.2	12.4	11.9	12.5	12.1	12.1	12.0	11.7	12.2	11.3	12.1	11.2
16 to 19 years	19.0	17.8	18.7	19.6	16.4	15.9	17.8	17.3	17.4	17.2	17.2	16.4	15.6	17.8	15.8
16 to 17 years	20.8	20.2	21.0	22.7	19.1	17.1	20.5	19.7	20.9	20.4	19.3	19.4	16.9	18.5	17.2
18 to 19 years	17.7	16.0	17.1	17.2	15.4	13.7	15.9	15.9	14.8	14.8	15.3	14.9	14.7	17.3	14.7
20 to 24 years	11.0	9.9	10.3	9.9	10.4	9.9	9.6	9.3	9.2	9.2	8.7	9.9	9.0	9.1	8.8
25 years and over	5.4	4.8	4.9	4.9	4.8	4.7	4.7	4.5	4.5	4.4	4.4	4.4	4.3	4.3	4.1
25 to 54 years	5.6	5.0	5.1	5.1	5.0	4.9	4.9	4.7	4.8	4.6	4.6	4.5	4.5	4.5	4.2
55 years and over	4.1	3.5	3.7	3.9	3.4	3.4	3.4	3.2	3.1	3.5	3.2	4.0	3.4	3.4	3.1
Women, 16 years and over	7.1	6.2	6.3	6.2	6.0	6.1	6.0	6.1	6.1	6.0	5.9	5.9	5.9	5.5	5.6
16 to 24 years	12.8	11.7	12.0	11.8	11.7	11.7	11.0	11.5	11.5	11.2	10.7	10.9	10.8	11.3	11.3
16 to 19 years	17.6	15.9	15.9	15.6	15.5	15.7	14.4	15.4	16.9	16.0	14.8	15.6	15.1	15.2	16.0
16 to 17 years	19.6	18.0	16.6	19.1	18.4	18.0	16.0	16.9	19.9	17.9	16.2	17.9	18.0	16.6	18.4
18 to 19 years	16.3	14.3	14.7	13.1	13.6	14.1	13.4	14.4	14.6	14.7	14.1	14.1	13.1	14.2	13.7
20 to 24 years	10.3	9.4	10.0	9.7	9.6	9.5	9.0	9.4	8.5	8.6	8.4	8.2	8.4	9.1	8.7
25 years and over	5.5	4.8	4.8	4.7	4.5	4.7	4.7	4.7	4.7	4.7	4.7	4.6	4.7	4.1	4.2
25 to 54 years	5.9	5.1	5.1	5.0	4.9	5.0	5.0	4.9	4.9	4.9	4.9	4.9	4.9	4.4	4.5
55 years and over	3.6	3.0	2.9	3.0	2.8	2.6	2.9	3.5	3.1	3.2	3.3	2.8	3.1	2.3	2.7

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

(Numbers in thousands)

Reason for unemployment	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Job losers	4,033	3,566	3,705	3,612	3,554	3,529	3,389	3,313	3,388	3,307	3,200	3,209	3,207	3,139	2,916
On layoff	1,090	943	963	924	919	916	874	820	944	878	856	888	884	899	821
Other job losers	2,943	2,623	2,742	2,688	2,635	2,613	2,515	2,493	2,444	2,429	2,344	2,320	2,323	2,240	2,095
Job leavers	1,015	965	955	931	959	989	992	981	960	926	946	1,082	961	1,075	993
Reentrants	2,160	1,974	1,965	1,995	1,980	1,930	1,969	1,908	1,845	1,974	1,945	1,917	1,951	1,756	1,784
New entrants	1,029	920	918	999	854	844	855	882	914	855	909	885	864	887	915
PERCENT OF UNEMPLOYED															
Job losers	48.9	48.0	49.1	47.9	48.4	48.4	47.0	46.8	47.7	46.8	45.7	45.2	45.9	45.8	44.1
On layoff	13.2	12.7	12.8	12.3	12.5	12.6	12.1	11.6	13.3	12.4	12.2	12.5	12.7	13.1	12.4
Other job losers	35.7	35.3	36.4	35.7	35.9	35.8	34.9	35.2	34.4	34.4	33.5	32.7	33.3	32.7	31.7
Job leavers	12.3	13.0	12.7	12.4	13.1	13.6	13.8	13.8	13.5	13.1	13.5	15.3	13.8	15.7	15.0
Reentrants	26.2	26.6	26.1	26.5	26.9	26.5	27.3	26.9	26.0	28.0	27.8	27.0	27.9	25.6	27.0
New entrants	12.5	12.4	12.2	13.3	11.6	11.6	11.9	12.5	12.9	12.1	13.0	12.5	12.4	12.9	13.8
PERCENT OF CIVILIAN LABOR FORCE															
Job losers	3.4	3.0	3.1	3.0	3.0	2.9	2.8	2.8	2.8	2.7	2.7	2.6	2.6	2.6	2.4
Job leavers	.9	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.9	.8	.9	.8
Reentrants	1.8	1.6	1.6	1.7	1.7	1.6	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.5	1.5
New entrants	.9	.8	.8	.8	.7	.7	.7	.7	.8	.7	.8	.7	.7	.7	.8

10. Duration of unemployment, monthly data seasonally adjusted

(Numbers in thousands)

Weeks of unemployment	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Less than 5 weeks	3,448	3,246	3,195	3,308	3,138	3,186	3,203	3,220	3,223	3,218	3,229	3,089	3,084	3,009	3,125
5 to 14 weeks	2,557	2,196	2,256	2,165	2,151	2,144	2,142	1,949	2,093	2,029	1,968	2,263	2,145	2,101	1,956
15 weeks and over	2,232	1,983	2,060	2,067	2,029	1,920	1,896	1,904	1,801	1,834	1,791	1,733	1,740	1,722	1,540
15 to 26 weeks	1,045	943	984	974	973	945	834	917	844	899	892	839	841	887	725
27 weeks and over	1,187	1,040	1,076	1,093	1,056	975	1,062	987	957	935	899	894	899	835	816
Mean duration in weeks	15.0	14.5	14.8	14.8	14.7	14.2	14.3	14.2	14.1	14.0	14.2	14.4	14.4	13.7	13.4
Median duration in weeks	6.9	6.5	6.9	6.6	6.6	6.6	6.4	5.8	6.2	6.1	6.0	6.4	6.4	6.6	5.6

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

State	Mar. 1987	Mar. 1988	State	Mar. 1987	Mar. 1988
Alabama	9.0	7.4	Montana	9.7	9.2
Alaska	13.4	10.8	Nebraska	6.0	4.4
Arizona	6.4	5.5	Nevada	7.0	6.2
Arkansas	9.2	8.2	New Hampshire	2.9	2.8
California	6.3	5.3	New Jersey	4.3	4.4
Colorado	8.8	7.7	New Mexico	9.9	8.6
Connecticut	3.8	3.1	New York	5.3	4.3
Delaware	3.5	3.6	North Carolina	4.9	4.0
District of Columbia	7.0	5.3	North Dakota	7.0	5.6
Florida	5.4	4.7	Ohio	7.9	7.9
Georgia	6.0	5.8	Oklahoma	8.6	6.7
Hawaii	3.8	3.2	Oregon	7.6	6.7
Idaho	10.1	8.4	Pennsylvania	6.2	5.6
Illinois	8.1	7.8	Rhode Island	4.7	4.1
Indiana	7.2	5.8	South Carolina	6.1	5.1
Iowa	7.3	5.7	South Dakota	4.9	3.7
Kansas	5.7	5.0	Tennessee	7.4	5.9
Kentucky	10.2	9.4	Texas	8.2	8.3
Louisiana	14.0	11.7	Utah	7.3	5.8
Maine	5.5	5.2	Vermont	4.7	3.7
Maryland	4.7	4.6	Virginia	4.6	3.8
Massachusetts	4.5	3.6	Washington	8.5	7.3
Michigan	8.4	8.6	West Virginia	13.1	11.8
Minnesota	6.8	4.8	Wisconsin	7.8	6.2
Mississippi	12.0	8.6			
Missouri	6.8	5.4	Wyoming	12.1	7.9

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. 1987	Feb. 1988	Mar. 1988[p]	State	Mar. 1987	Feb. 1988	Mar. 1988[p]
Alabama	1,473.2	1,511.4	1,514.8	Nebraska	652.5	658.5	664.5
Alaska	200.8	199.1	201.0	Nevada	483.7	510.2	515.4
Arizona	1,378.5	1,417.8	1,422.7	New Hampshire	497.8	516.9	519.1
Arkansas	816.3	844.4	851.5				
California	11,503.5	11,886.0	11,965.5	New Jersey	3,519.2	3,577.1	3,610.4
				New Mexico	523.6	530.8	534.7
Colorado	1,398.4	1,393.1	1,393.4	New York	7,932.1	8,051.4	8,101.4
Connecticut	1,617.4	1,645.6	1,657.9	North Carolina	2,817.0	2,902.5	2,920.5
Delaware	307.9	322.5	326.5	North Dakota	245.5	248.9	250.4
District of Columbia	643.3	656.9	661.7				
Florida	4,823.3	5,061.7	5,099.9	Ohio	4,485.0	4,568.8	4,596.4
				Oklahoma	1,102.3	1,088.5	1,093.8
Georgia	2,725.5	2,777.3	2,783.9	Oregon	1,067.2	1,105.3	1,113.5
Hawaii	456.4	466.0	467.9	Pennsylvania	4,815.5	4,911.2	4,946.2
Idaho	323.5	332.7	334.4	Rhode Island	441.2	445.6	449.4
Illinois	4,840.2	4,914.9	4,942.3				
Indiana	2,239.5	2,321.4	2,340.5	South Carolina	1,366.6	1,409.0	1,423.9
				South Dakota	249.1	250.5	252.9
Iowa	1,083.6	1,117.0	1,125.7	Tennessee	1,967.1	2,029.4	2,042.0
Kansas	991.7	1,002.9	1,011.2	Texas	6,468.2	6,523.0	6,531.7
Kentucky	1,290.6	1,332.2	1,337.7	Utah	632.6	637.0	641.5
Louisiana	1,464.9	1,489.7	1,494.6				
Maine	479.7	507.1	507.0	Vermont	239.7	249.5	249.4
				Virginia	2,622.3	2,709.9	2,737.4
Maryland	1,982.0	2,014.6	2,026.0	Washington	1,792.2	1,858.2	1,874.7
Massachusetts	2,996.7	3,039.0	3,067.8	West Virginia	588.2	591.2	594.6
Michigan	3,678.1	3,683.6	3,696.4	Wisconsin	2,027.3	2,084.3	2,091.3
Minnesota	1,906.6	1,955.1	1,964.3				
Mississippi	850.0	877.3	880.4	Wyoming	174.7	173.3	173.2
Missouri	2,154.0	2,172.8	2,200.0	Puerto Rico	743.6	766.5	769.3
Montana	267.5	268.3	269.9	Virgin Islands	39.4	40.6	40.8

[p] = preliminary

NOTE: Some data in this table may differ from data published elsewhere because of the continual updating of the database.

13. Employment of workers on nonagricultural payrolls by industry, monthly data seasonally adjusted

(In thousands)

Industry	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[p]	Apr.[p]
TOTAL	99,610	102,112	101,598	101,708	101,818	102,126	102,275	102,434	102,983	103,285	103,612	103,827	104,365	104,661	104,835
PRIVATE SECTOR	82,900	85,049	84,560	84,677	84,787	85,106	85,229	85,386	85,795	86,072	86,341	86,560	87,063	87,290	87,461
GOODS-PRODUCING	24,681	24,884	24,759	24,752	24,761	24,850	24,886	24,917	25,064	25,169	25,259	25,205	25,354	25,449	25,506
Mining	783	741	729	735	738	744	751	759	764	759	756	746	748	751	767
Oil and gas extraction	457	425	416	420	425	430	434	439	443	439	436	430	431	436	450
Construction	4,904	5,031	5,019	4,999	5,008	5,002	5,006	4,989	5,053	5,074	5,121	5,058	5,185	5,265	5,262
General building contractors	1,293	1,278	1,272	1,267	1,266	1,261	1,262	1,260	1,279	1,280	1,290	1,303	1,324	1,328	1,326
Manufacturing	18,994	19,112	19,011	19,018	19,015	19,104	19,129	19,169	19,247	19,336	19,382	19,401	19,421	19,433	19,477
Production workers	12,895	13,021	12,939	12,946	12,958	13,020	13,038	13,072	13,129	13,197	13,241	13,250	13,274	13,268	13,304
Durable goods	11,244	11,237	11,175	11,175	11,176	11,195	11,248	11,268	11,319	11,367	11,403	11,403	11,415	11,422	11,462
Production workers	7,432	7,457	7,406	7,409	7,421	7,425	7,475	7,494	7,530	7,568	7,597	7,588	7,606	7,601	7,638
Lumber and wood products	711	739	736	738	735	740	736	740	741	750	753	753	754	752	752
Furniture and fixtures	497	514	504	509	510	518	518	520	524	526	530	533	532	531	531
Stone, clay, and glass products	586	585	586	584	582	582	582	581	583	588	590	585	588	588	591
Primary metal industries	753	751	743	742	746	750	754	764	768	771	771	768	770	771	771
Blast furnaces and basic steel products	275	275	272	272	275	277	278	283	286	287	285	284	285	285	284
Fabricated metal products	1,431	1,428	1,423	1,420	1,424	1,424	1,425	1,429	1,438	1,446	1,451	1,452	1,456	1,457	1,464
Machinery, except electrical	2,060	2,039	2,022	2,025	2,028	2,033	2,044	2,053	2,064	2,074	2,085	2,097	2,102	2,110	2,126
Electrical and electronic equipment	2,123	2,101	2,092	2,087	2,080	2,088	2,095	2,096	2,111	2,118	2,128	2,130	2,128	2,134	2,133
Transportation equipment	2,015	2,015	2,011	2,011	2,010	1,995	2,028	2,018	2,019	2,016	2,018	2,005	2,001	1,997	2,010
Motor vehicles and equipment	865	842	847	843	842	814	848	837	838	835	832	820	819	820	830
Instruments and related products	707	696	694	693	693	695	695	695	697	701	701	702	704	703	704
Miscellaneous manufacturing industries	362	369	364	366	368	370	371	372	374	377	376	378	380	379	380
Nondurable goods	7,750	7,875	7,836	7,843	7,839	7,909	7,881	7,901	7,928	7,969	7,979	7,998	8,006	8,011	8,015
Production workers	5,463	5,564	5,533	5,537	5,537	5,595	5,563	5,578	5,599	5,629	5,644	5,662	5,668	5,667	5,666
Food and kindred products	1,617	1,636	1,642	1,633	1,634	1,644	1,632	1,631	1,635	1,645	1,645	1,661	1,662	1,659	1,658
Tobacco manufactures	59	57	56	57	57	57	56	55	55	56	56	57	56	55	54
Textile mill products	705	730	724	727	729	736	732	735	736	738	739	736	738	736	730
Apparel and other textile products	1,106	1,113	1,104	1,107	1,108	1,130	1,110	1,117	1,123	1,128	1,121	1,117	1,114	1,115	1,113
Paper and allied products	674	678	677	677	676	678	677	681	678	680	681	681	683	682	681
Printing and publishing	1,457	1,501	1,493	1,497	1,498	1,504	1,508	1,509	1,514	1,522	1,525	1,530	1,536	1,541	1,549
Chemicals and allied products	1,023	1,027	1,018	1,022	1,014	1,026	1,031	1,031	1,035	1,041	1,047	1,048	1,049	1,053	1,059
Petroleum and coal products	169	165	164	164	164	164	164	166	167	167	167	167	165	164	164
Rubber and misc. plastics products	790	818	809	809	810	815	819	824	833	840	845	847	849	852	855
Leather and leather products	151	151	149	150	149	155	152	152	152	152	153	154	154	154	152
SERVICE-PRODUCING	74,930	77,228	76,839	76,956	77,057	77,276	77,389	77,517	77,919	78,116	78,353	78,622	79,011	79,212	79,329
Transportation and public utilities	5,244	5,378	5,348	5,344	5,350	5,363	5,377	5,416	5,436	5,459	5,473	5,485	5,507	5,533	5,545
Transportation	3,041	3,150	3,124	3,120	3,128	3,133	3,147	3,183	3,198	3,218	3,233	3,244	3,261	3,282	3,288
Communication and public utilities	2,203	2,228	2,224	2,224	2,222	2,230	2,230	2,233	2,238	2,241	2,240	2,241	2,246	2,251	2,257
Wholesale trade	5,735	5,797	5,772	5,775	5,781	5,797	5,807	5,815	5,831	5,851	5,871	5,884	5,905	5,930	5,945
Durable goods	3,383	3,419	3,397	3,401	3,405	3,418	3,422	3,431	3,444	3,456	3,473	3,481	3,495	3,513	3,517
Nondurable goods	2,351	2,379	2,375	2,374	2,376	2,379	2,385	2,384	2,387	2,395	2,398	2,403	2,410	2,417	2,428
Retail trade	17,845	18,264	18,197	18,205	18,226	18,274	18,256	18,314	18,408	18,443	18,458	18,619	18,706	18,687	18,703
General merchandise stores	2,363	2,406	2,385	2,390	2,387	2,407	2,411	2,415	2,459	2,454	2,453	2,490	2,521	2,474	2,475
Food stores	2,873	2,959	2,953	2,956	2,960	2,959	2,962	2,958	2,969	2,982	2,996	3,019	3,032	3,042	3,037
Automotive dealers and service stations	1,943	1,987	1,978	1,978	1,983	1,985	1,985	1,988	2,000	2,003	2,013	2,023	2,041	2,053	2,050
Eating and drinking places	5,879	5,994	5,962	5,976	5,982	5,985	5,992	6,018	6,032	6,047	6,064	6,083	6,097	6,114	6,129
Finance, insurance, and real estate	6,297	6,589	6,558	6,576	6,586	6,608	6,624	6,629	6,650	6,657	6,668	6,684	6,689	6,701	6,718
Finance	3,152	3,278	3,272	3,276	3,280	3,291	3,293	3,292	3,296	3,301	3,301	3,309	3,304	3,297	3,301
Insurance	1,945	2,044	2,032	2,037	2,037	2,043	2,050	2,054	2,068	2,069	2,082	2,086	2,091	2,099	2,109
Real estate	1,200	1,267	1,254	1,263	1,269	1,274	1,281	1,283	1,286	1,287	1,285	1,289	1,294	1,305	1,308
Services	23,099	24,137	23,926	24,025	24,083	24,214	24,279	24,295	24,406	24,493	24,612	24,683	24,902	24,990	25,044
Business services	4,781	5,097	5,044	5,083	5,086	5,105	5,133	5,152	5,194	5,195	5,217	5,228	5,304	5,324	5,340
Health services	6,551	6,879	6,800	6,822	6,853	6,887	6,923	6,943	6,987	7,023	7,063	7,085	7,132	7,165	7,206
Government	16,711	17,063	17,038	17,031	17,031	17,020	17,046	17,048	17,188	17,213	17,271	17,267	17,302	17,371	17,374
Federal	2,899	2,943	2,933	2,935	2,935	2,936	2,940	2,962	2,965	2,977	2,981	2,977	2,976	2,969	2,962
State	3,888	3,952	3,943	3,947	3,932	3,952	3,964	3,957	3,973	3,978	3,996	3,996	4,002	4,019	4,035
Local	9,923	10,167	10,162	10,149	10,164	10,132	10,142	10,129	10,250	10,258	10,294	10,294	10,324	10,383	10,377

[p] = preliminary

NOTE: See notes on the data for a description of the most recent benchmark revision.

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

Industry	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[p]	Apr.[p]
PRIVATE SECTOR	34.8	34.8	34.7	34.9	34.8	34.8	34.9	34.6	34.9	34.9	34.6	34.8	34.9	34.6	34.9
MANUFACTURING	40.7	41.0	40.6	41.0	41.0	41.0	41.0	40.6	41.3	41.2	41.0	41.2	41.0	41.0	41.2
Overtime hours	3.4	3.7	3.5	3.8	3.7	3.8	3.8	3.6	4.0	3.9	3.8	3.9	3.7	3.7	4.0
Durable goods	41.3	41.5	41.2	41.6	41.5	41.6	41.6	41.0	41.9	41.9	41.5	41.7	41.6	41.6	41.9
Overtime hours	3.5	3.8	3.6	3.9	3.8	3.8	4.0	3.7	4.1	4.0	3.9	4.0	3.8	3.8	4.2
Lumber and wood products	40.3	40.6	40.6	41.0	40.6	40.6	40.4	39.4	40.4	40.8	40.4	40.1	40.4	40.1	40.3
Furniture and fixtures	39.8	39.9	39.1	39.9	40.0	40.0	40.1	39.3	40.0	40.0	39.8	39.4	39.7	39.3	39.3
Stone, clay, and glass products	42.2	42.3	41.9	42.3	42.0	42.2	42.1	41.9	42.6	42.5	42.5	42.0	42.4	42.5	42.4
Primary metal industries	41.9	43.1	42.3	43.1	43.1	43.4	43.5	43.4	43.7	43.7	43.6	43.5	43.2	43.2	43.4
Blast furnaces and basic steel products	41.7	43.6	42.4	43.3	43.5	44.1	44.0	45.2	44.3	44.0	44.3	44.0	43.7	43.5	43.5
Fabricated metal products	41.3	41.5	41.2	41.6	41.5	41.4	41.5	40.8	42.0	42.1	41.7	41.9	41.5	41.5	42.0
Machinery except electrical	41.6	42.2	41.8	42.2	42.2	42.4	42.2	41.6	42.6	42.7	42.5	42.8	42.6	42.5	42.8
Electrical and electronic equipment	41.0	40.9	40.6	40.8	41.1	41.1	41.0	40.4	41.1	41.0	40.9	41.2	40.9	41.0	41.2
Transportation equipment	42.3	42.1	41.9	42.2	41.9	41.7	41.9	41.3	42.5	42.4	41.4	42.3	42.1	42.3	43.0
Motor vehicles and equipment	42.6	42.3	42.1	42.5	42.0	41.9	41.9	41.3	43.0	43.1	41.4	42.4	42.6	42.8	43.8
Instruments and related products	41.0	41.4	41.0	41.5	41.5	41.6	41.7	41.1	42.1	41.7	41.3	41.9	41.3	41.4	41.8
Nondurable goods	39.9	40.2	39.7	40.2	40.2	40.3	40.3	40.1	40.5	40.4	40.3	40.4	40.3	40.1	40.2
Overtime hours	3.3	3.6	3.3	3.7	3.6	3.7	3.7	3.6	3.8	3.8	3.7	3.8	3.6	3.5	3.6
Food and kindred products	40.0	40.2	39.8	40.1	40.1	39.9	40.3	40.2	40.5	40.6	40.6	40.8	40.4	40.0	40.2
Textile mill products	41.1	41.9	41.4	42.0	42.1	42.4	42.1	41.3	41.9	41.8	41.7	41.7	41.9	41.4	41.7
Apparel and other textile products	36.7	37.1	36.1	37.2	37.1	37.3	37.4	36.3	37.4	37.1	37.2	36.9	37.0	37.1	37.2
Paper and allied products	43.2	43.4	43.0	43.5	43.3	43.5	43.4	43.8	43.7	43.5	43.2	43.6	43.3	43.1	43.3
Printing and publishing	38.0	38.0	37.7	37.9	38.1	38.1	37.9	38.2	38.0	38.0	37.9	38.0	38.1	38.1	38.0
Chemicals and allied products	41.9	42.3	42.2	42.1	42.0	42.2	42.4	42.8	42.7	42.7	42.7	42.7	42.6	42.5	42.4
Petroleum and coal products	43.8	43.9	43.9	44.3	43.3	44.4	43.3	43.2	43.5	43.6	44.3	44.2	43.6	43.7	44.2
TRANSPORTATION AND PUBLIC UTILITIES	39.2	39.1	39.0	39.2	38.8	39.2	39.3	39.1	39.3	39.1	39.0	39.4	39.1	38.7	39.1
WHOLESALE TRADE	37.7	37.5	38.2	38.3	38.2	38.1	38.3	38.0	38.4	38.3	38.1	38.2	38.3	38.2	38.4
RETAIL TRADE	29.2	29.3	29.5	29.4	29.2	29.3	29.6	29.6	29.3	29.2	28.8	29.0	29.2	29.0	29.3
SERVICES	32.5	32.5	32.4	32.5	32.5	32.5	32.5	32.5	32.5	32.6	32.4	32.6	32.9	32.4	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

Industry	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[p]	Apr.[p]
PRIVATE SECTOR	$8.76	$8.98	$8.91	$8.93	$8.92	$8.91	$8.94	$9.06	$9.09	$9.14	$9.13	$9.18	$9.18	$9.19	$9.22
Seasonally adjusted	–	–	8.91	8.95	8.94	8.96	9.02	9.02	9.08	9.12	9.11	9.15	9.13	9.17	9.22
MINING	12.44	12.45	12.43	12.42	12.44	12.31	12.32	12.43	12.34	12.47	12.50	12.69	12.61	12.50	12.44
CONSTRUCTION	12.47	12.66	12.55	12.60	12.61	12.57	12.67	12.77	12.79	12.80	12.78	12.93	12.77	12.83	12.83
MANUFACTURING	9.73	9.91	9.87	9.87	9.87	9.87	9.86	10.00	9.95	10.01	10.08	10.07	10.06	10.07	10.12
Durable goods	10.29	10.45	10.39	10.40	10.42	10.40	10.42	10.53	10.51	10.57	10.63	10.62	10.60	10.61	10.66
Lumber and wood products	8.33	8.40	8.34	8.37	8.44	8.46	8.49	8.48	8.44	8.49	8.45	8.52	8.54	8.46	8.48
Furniture and fixtures	7.46	7.67	7.58	7.64	7.66	7.67	7.74	7.75	7.73	7.73	7.79	7.82	7.75	7.78	7.81
Stone, clay, and glass products	10.05	10.27	10.23	10.26	10.29	10.33	10.31	10.40	10.31	10.34	10.33	10.37	10.35	10.37	10.40
Primary metal industries	11.86	11.98	11.96	11.96	11.97	11.97	11.98	12.24	12.05	12.08	12.15	12.10	12.08	12.10	12.20
Blast furnaces and basic steel products	13.73	13.84	13.84	13.80	13.83	13.70	13.81	14.17	13.97	13.97	14.03	13.92	13.99	13.98	14.10
Fabricated metal products	9.89	10.03	9.98	9.97	10.00	9.95	9.97	10.04	10.11	10.15	10.24	10.17	10.18	10.19	10.27
Machinery, except electrical	10.59	10.77	10.70	10.70	10.76	10.74	10.76	10.81	10.86	10.89	10.96	10.92	10.88	10.89	10.96
Electrical and electronic equipment	9.65	9.90	9.82	9.83	9.84	9.89	9.90	9.98	9.95	10.00	10.05	10.03	10.04	10.05	10.10
Transportation equipment	12.81	12.96	12.80	12.85	12.88	12.83	12.90	13.07	13.09	13.18	13.26	13.19	13.18	13.20	13.26
Motor vehicles and equipment	13.45	13.57	13.40	13.42	13.47	13.36	13.43	13.69	13.73	13.82	13.90	13.90	13.88	13.94	14.07
Instruments and related products	9.47	9.74	9.67	9.69	9.70	9.74	9.78	9.80	9.81	9.87	9.88	9.97	9.95	9.87	9.85
Miscellaneous manufacturing	7.54	7.74	7.67	7.72	7.74	7.72	7.70	7.76	7.77	7.81	7.91	7.97	7.88	7.89	7.90
Nondurable goods	8.94	9.16	9.14	9.13	9.11	9.16	9.12	9.28	9.18	9.24	9.30	9.30	9.29	9.31	9.34
Food and kindred products	8.74	8.92	8.95	8.96	8.91	8.88	8.80	8.92	8.86	8.96	9.05	9.05	9.05	9.05	9.10
Tobacco manufactures	12.85	13.81	14.28	14.53	15.57	14.85	14.20	12.89	12.77	13.44	13.56	13.70	13.91	14.20	14.74
Textile mill products	6.93	7.18	7.12	7.13	7.15	7.14	7.16	7.23	7.24	7.31	7.33	7.36	7.31	7.33	7.36
Apparel and other textile products	5.84	5.95	5.94	5.89	5.91	5.89	5.90	6.01	5.99	6.00	6.01	6.04	6.03	6.05	6.06
Paper and allied products	11.18	11.42	11.37	11.40	11.41	11.48	11.41	11.67	11.48	11.50	11.54	11.52	11.49	11.50	11.57
Printing and publishing	9.99	10.28	10.14	10.19	10.19	10.25	10.31	10.48	10.42	10.39	10.44	10.39	10.41	10.44	10.40
Chemicals and allied products	11.98	12.37	12.30	12.31	12.27	12.37	12.34	12.56	12.52	12.56	12.62	12.56	12.55	12.55	12.52
Petroleum and coal products	14.18	14.57	14.50	14.52	14.43	14.48	14.52	14.71	14.66	14.75	14.72	14.83	14.91	14.92	15.10
Rubber and miscellaneous plastics products	8.73	8.88	8.82	8.84	8.87	8.93	8.90	8.98	8.91	8.93	9.00	8.97	8.97	8.97	9.00
Leather and leather products	5.92	6.06	6.12	6.05	6.04	5.98	6.01	6.09	6.09	6.11	6.11	6.10	6.14	6.19	6.27
TRANSPORTATION AND PUBLIC UTILITIES	11.70	12.01	11.94	11.95	11.91	12.00	12.04	12.09	12.09	12.17	12.17	12.11	12.18	12.12	12.09
WHOLESALE TRADE	9.35	9.61	9.53	9.57	9.57	9.57	9.62	9.67	9.67	9.74	9.74	9.79	9.80	9.78	9.88
RETAIL TRADE	6.03	6.12	6.09	6.09	6.08	6.07	6.06	6.20	6.16	6.19	6.19	6.25	6.24	6.25	6.27
FINANCE, INSURANCE, AND REAL ESTATE	8.35	8.76	8.71	8.72	8.68	8.69	8.81	8.79	8.81	8.94	8.87	9.00	9.06	9.01	9.03
SERVICES	8.16	8.47	8.40	8.38	8.35	8.33	8.40	8.55	8.61	8.71	8.73	8.79	8.79	8.79	8.81

– Data not available.
[p] = preliminary

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

16. Average weekly earnings of production or nonsupervisory workers on private nonagricultural payrolls by industry

Industry	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[p]	Apr.[p]
PRIVATE SECTOR															
Current dollars	$304.85	$312.50	$308.29	$310.76	$312.20	$312.74	$315.58	$314.38	$317.24	$318.07	$318.64	$315.79	$316.71	$317.06	$320.86
Seasonally adjusted	–	–	309.18	312.36	311.11	311.81	314.80	312.09	316.89	318.29	315.21	318.42	318.64	317.28	321.78
Constant (1977) dollars	171.07	169.28	168.28	169.17	169.21	169.14	169.76	168.30	169.38	169.64	170.03	167.97	168.19	167.76	–
MINING	524.97	526.64	519.57	526.61	527.46	518.25	522.37	523.30	526.92	527.48	535.00	531.71	525.84	520.00	529.94
CONSTRUCTION	466.38	477.28	469.37	485.10	480.44	485.20	489.06	464.83	496.25	474.88	480.53	465.48	462.27	481.13	487.54
MANUFACTURING															
Current dollars	396.01	406.31	398.75	403.68	405.66	400.72	403.27	408.00	410.94	414.41	421.34	412.87	409.44	412.87	414.92
Constant (1977) dollars	222.23	220.10	217.78	219.75	219.87	216.72	216.93	218.42	219.40	221.02	224.83	219.61	217.44	218.45	–
Durable goods	424.98	433.68	427.03	431.60	434.51	426.40	430.35	432.78	439.32	443.94	450.71	441.79	437.78	441.38	444.52
Lumber and wood products	335.70	341.04	338.60	345.68	348.57	341.78	345.54	338.35	342.66	343.00	341.38	336.54	339.89	337.55	341.74
Furniture and fixtures	296.91	306.03	294.10	301.78	306.40	300.66	311.92	308.45	313.84	312.29	319.39	304.98	302.25	304.20	304.59
Stone, clay, and glass products	424.11	434.42	430.68	439.13	437.33	439.03	439.21	442.00	443.33	438.42	435.93	424.13	427.46	435.54	443.04
Primary metal industries	496.93	516.34	508.30	514.28	517.10	514.71	515.14	531.22	522.97	529.10	537.03	526.35	523.06	525.14	531.92
Blast furnaces and basic steel products	572.54	603.42	593.74	598.92	605.75	602.80	600.74	639.07	610.49	613.28	625.74	609.70	614.16	610.93	620.40
Fabricated metal products	408.46	416.25	408.18	412.76	417.00	405.96	411.76	410.64	424.62	429.35	437.25	425.11	420.43	422.89	428.26
Machinery, except electrical	440.54	454.49	445.12	449.40	455.15	447.86	449.77	449.70	460.46	467.18	477.86	467.38	462.40	465.00	466.90
Electrical and electronic equipment	395.65	404.91	395.75	399.10	404.42	399.56	403.92	404.19	408.95	414.00	422.10	414.24	408.63	412.05	413.09
Transportation equipment	541.86	545.62	536.32	542.27	539.67	526.03	530.19	538.48	553.71	561.47	566.20	560.58	553.56	562.32	570.18
Motor vehicles and equipment	572.97	574.01	566.82	571.69	567.09	549.10	547.94	562.66	586.27	594.26	596.31	593.53	588.51	600.81	619.08
Instruments and related products	388.27	403.24	394.54	399.23	402.55	398.37	403.91	402.78	410.06	414.54	418.91	417.74	410.94	411.58	408.78
Miscellaneous manufacturing	298.58	304.18	297.60	302.62	304.18	299.54	303.38	302.64	310.80	309.28	314.82	310.03	305.74	308.50	306.52
Nondurable goods	356.71	368.23	361.03	366.11	367.13	366.40	368.45	374.91	371.79	375.14	380.37	373.86	370.67	372.40	373.60
Food and kindred products	349.60	358.58	351.74	359.30	357.29	354.31	358.16	363.94	360.60	365.57	371.96	367.43	359.29	357.48	361.27
Tobacco manufactures	480.59	531.69	536.93	571.03	624.36	527.18	512.62	501.42	526.12	551.04	549.18	537.04	538.32	565.16	561.59
Textile mill products	284.82	300.84	291.21	298.75	303.16	297.02	302.87	301.49	305.53	308.48	310.06	305.44	303.37	302.00	303.23
Apparel and other textile products	214.33	220.75	212.65	219.11	221.03	217.93	220.66	218.16	224.63	224.40	225.98	221.67	221.30	224.46	223.61
Paper and allied products	482.98	495.63	486.64	493.62	494.05	495.94	492.91	514.65	501.68	502.55	508.91	502.27	494.07	494.50	498.67
Printing and publishing	379.62	390.64	381.26	384.16	384.16	387.45	392.81	403.48	397.00	397.94	404.03	391.70	393.50	398.81	394.16
Chemicals and allied products	501.96	523.25	519.06	518.25	516.57	518.30	519.51	537.57	530.85	537.57	545.18	536.31	533.38	534.63	530.85
Petroleum and coal products	621.08	639.62	635.10	637.43	624.82	645.81	631.62	644.30	642.11	646.05	652.10	651.04	641.13	650.51	665.91
Rubber and miscellaneous plastics products	360.55	369.41	360.74	366.86	370.77	366.13	368.46	371.77	373.33	375.95	382.50	374.95	371.36	373.15	375.30
Leather and leather products	218.45	230.89	224.60	233.53	237.37	230.83	233.79	229.59	235.68	234.01	235.24	229.97	226.57	232.13	230.11
TRANSPORTATION AND PUBLIC UTILITIES	458.64	469.59	463.27	466.05	465.68	472.80	476.78	473.93	475.14	477.06	477.06	471.08	473.80	469.04	470.30
WHOLESALE TRADE	359.04	367.10	363.09	366.53	367.49	366.53	369.41	368.43	371.33	373.04	373.04	372.02	372.40	371.64	378.40
RETAIL TRADE	176.08	179.32	177.83	178.44	179.97	182.10	183.62	183.52	179.87	179.51	181.37	177.50	178.46	179.38	181.83
FINANCE, INSURANCE, AND REAL ESTATE	303.94	317.11	316.17	316.54	315.95	314.58	320.68	316.44	318.92	324.52	319.32	326.70	329.78	322.56	326.89
SERVICES	265.20	275.28	271.32	271.51	272.21	273.22	276.36	277.02	279.83	283.08	282.85	284.80	287.43	283.92	287.21

– Data not available.
[p] = preliminary

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

17. The Hourly Earnings Index for production or nonsupervisory workers on private nonagricultural payrolls by industry

Industry	Not seasonally adjusted				Seasonally adjusted					
	Apr. 1987	Feb. 1988	Mar. 1988[p]	Apr. 1988[p]	Apr. 1987	Dec. 1987	Jan. 1988	Feb. 1988	Mar. 1988[p]	Apr. 1988[p]
PRIVATE SECTOR (in current dollars)	172.7	177.0	177.0	177.7	172.6	175.7	176.4	176.5	176.8	177.6
Mining[1]	181.3	184.4	183.5	183.4	–	–	–	–	–	–
Construction	153.0	155.2	156.1	156.6	153.7	154.4	157.1	155.8	156.9	157.3
Manufacturing	175.3	177.6	177.8	178.3	175.0	176.9	176.9	177.3	177.5	178.0
Transportation and public utilities	174.8	178.5	177.6	177.3	175.2	177.4	176.9	177.8	177.8	177.7
Wholesale trade[1]	175.9	180.5	180.3	182.2	–	–	–	–	–	–
Retail trade	160.2	163.2	163.8	164.8	159.8	162.7	163.1	162.7	163.3	164.5
Finance, insurance, and real estate[1]	186.7	195.0	194.2	194.6	–	–	–	–	–	–
Services	179.4	187.3	187.4	188.4	179.4	185.1	186.4	186.0	187.1	188.4
PRIVATE SECTOR [in constant (1977) dollars]	94.3	94.0	93.6	–	94.2	93.6	93.7	93.6	93.4	–

[1] This series is not seasonally adjusted because the seasonal component is small relative to the trend-cycle, irregular components, or both, and consequently cannot be separated with sufficient precision.
– Data not available.

[p] = preliminary.
NOTE: See "Notes on the data" for a description of the most recent benchmark revision.

18. Indexes of diffusion: industries in which employment increased, data seasonally adjusted

(In percent)

Time span and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Over 1-month span:												
1986	53.2	48.1	48.1	53.5	52.4	46.8	52.4	56.2	55.1	53.2	59.7	59.7
1987	53.5	56.8	58.6	58.4	58.6	55.7	68.6	54.6	65.4	65.4	71.9	63.2
1988	60.0	62.7	58.1	56.5	–	–	–	–	–	–	–	–
Over 3-month span:												
1986	49.7	44.9	45.7	48.4	47.6	45.4	48.4	55.1	55.9	58.1	58.6	60.3
1987	58.6	59.5	61.1	61.6	61.4	67.3	66.2	75.1	69.7	77.8	75.9	70.5
1988	67.0	64.9	61.4	–	–	–	–	–	–	–	–	–
Over 6-month span:												
1986	47.6	47.6	43.0	43.2	45.4	48.4	47.3	53.0	59.2	58.9	57.8	58.9
1987	61.9	62.7	58.9	67.3	67.6	71.1	76.2	78.6	80.3	75.7	76.8	73.8
1988	70.3	–	–	–	–	–	–	–	–	–	–	–
Over 12-month span:												
1986	43.2	44.1	46.2	45.7	47.8	49.5	49.5	51.6	54.9	52.2	55.1	56.5
1987	62.2	63.5	67.3	68.9	73.8	72.4	76.2	77.0	76.5	77.6	–	–
1988	–	–	–	–	–	–	–	–	–	–	–	–

– Data not available.

NOTE: Figures are the percent of industries with employment rising. (Half of the unchanged components are counted as rising.) Data are centered within the spans. Data for the 2 most recent months shown in each span are preliminary. See the "Definitions" in this section. See "Notes on the data" for a description of the most recent benchmark revision.

19. Annual data: Employment status of the noninstitutional population

(Numbers in thousands)

Employment status	1979	1980	1981	1982	1983	1984	1985	1986	1987
Noninstitutional population	166,460	169,349	171,775	173,939	175,891	178,080	179,912	182,293	184,490
Labor force:									
Total (number)	106,559	108,544	110,315	111,872	113,226	115,241	117,167	119,540	121,602
Percent of population	64.0	64.1	64.2	64.3	64.4	64.7	65.1	65.6	65.9
Employed:									
Total (number)	100,421	100,907	102,042	101,194	102,510	106,702	108,856	111,303	114,177
Percent of population	60.3	59.6	59.4	58.2	58.3	59.9	60.5	61.1	61.9
Resident Armed Forces	1,597	1,604	1,645	1,668	1,676	1,697	1,706	1,706	1,737
Civilian									
Total	98,824	99,303	100,397	99,526	100,834	105,005	107,150	109,597	112,440
Agriculture	3,347	3,364	3,368	3,401	3,383	3,321	3,179	3,163	3,208
Nonagricultural industries	95,477	95,938	97,030	96,125	97,450	101,685	103,971	106,434	109,232
Unemployed:									
Total (number)	6,137	7,637	8,273	10,678	10,717	8,539	8,312	8,237	7,425
Percent of labor force	5.8	7.0	7.5	9.5	9.5	7.4	7.1	6.9	6.1
Not in labor force (number)	59,900	60,806	61,460	62,067	62,665	62,839	62,744	62,752	62,888

20. Annual data: Employment levels by industry

(Numbers in thousands)

Industry	1979	1980	1981	1982	1983	1984	1985	1986	1987
Total employment	89,823	90,406	91,156	89,566	90,200	94,496	97,519	99,610	102,112
Private sector	73,876	74,166	75,126	73,729	74,330	78,472	81,125	82,900	85,049
Goods-producing	26,461	25,658	25,497	23,813	23,334	24,727	24,859	24,681	24,884
Mining	958	1,027	1,139	1,128	952	966	927	783	741
Construction	4,463	4,346	4,188	3,905	3,948	4,383	4,673	4,904	5,031
Manufacturing	21,040	20,285	20,170	18,781	18,434	19,378	19,260	18,994	19,112
Service-producing	63,363	64,748	65,659	65,753	66,866	69,769	72,660	74,930	77,228
Transportation and public utilities	5,136	5,146	5,165	5,082	4,954	5,159	5,238	5,244	5,378
Wholesale trade	5,204	5,275	5,358	5,278	5,268	5,555	5,717	5,735	5,797
Retail trade	14,989	15,035	15,189	15,179	15,613	16,545	17,356	17,845	18,264
Finance, insurance, and real estate	4,975	5,160	5,298	5,341	5,468	5,689	5,955	6,297	6,589
Services	17,112	17,890	18,619	19,036	19,694	20,797	22,000	23,099	24,137
Government	15,947	16,241	16,031	15,837	15,869	16,024	16,394	16,711	17,063
Federal	2,773	2,866	2,772	2,739	2,774	2,807	2,875	2,899	2,943
State	3,541	3,610	3,640	3,640	3,662	3,734	3,832	3,888	3,952
Local	9,633	9,765	9,619	9,458	9,434	9,482	9,687	9,923	10,167

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	1979	1980	1981	1982	1983	1984	1985	1986	1987
Private sector									
Average weekly hours	35.7	35.3	35.2	34.8	35.0	35.2	34.9	34.8	34.8
Average hourly earnings (in dollars)	6.16	6.66	7.25	7.68	8.02	8.32	8.57	8.76	8.98
Average weekly earnings (in dollars)	219.91	235.10	255.20	267.26	280.70	292.86	299.09	304.85	312.50
Mining									
Average weekly hours	43.0	43.3	43.7	42.7	42.5	43.3	43.4	42.2	42.3
Average hourly earnings (in dollars)	8.49	9.17	10.04	10.77	11.28	11.63	11.98	12.44	12.45
Average weekly earnings (in dollars)	365.07	397.06	438.75	459.88	479.40	503.58	519.93	524.97	526.64
Construction									
Average weekly hours	37.0	37.0	36.9	36.7	37.1	37.8	37.7	37.4	37.7
Average hourly earnings (in dollars)	9.27	9.94	10.82	11.63	11.94	12.13	12.32	12.47	12.66
Average weekly earnings (in dollars)	342.99	367.78	399.26	426.82	442.97	458.51	464.46	466.38	477.28
Manufacturing									
Average weekly hours	40.2	39.7	39.8	38.9	40.1	40.7	40.5	40.7	41.0
Average hourly earnings (in dollars)	6.70	7.27	7.99	8.49	8.83	9.19	9.54	9.73	9.91
Average weekly earnings (in dollars)	269.34	288.62	318.00	330.26	354.08	374.03	386.37	396.01	406.31
Transportation and public utilities									
Average weekly hours	39.9	39.6	39.4	39.0	39.0	39.4	39.5	39.2	39.1
Average hourly earnings (in dollars)	8.16	8.87	9.70	10.32	10.79	11.12	11.40	11.70	12.01
Average weekly earnings (in dollars)	325.58	351.25	382.18	402.48	420.81	438.13	450.30	458.64	469.59
Wholesale trade									
Average weekly hours	38.8	38.5	38.5	38.3	38.5	38.5	38.4	38.4	38.2
Average hourly earnings (in dollars)	6.39	6.96	7.56	8.09	8.55	8.89	9.16	9.35	9.61
Average weekly earnings (in dollars)	247.93	267.96	291.06	309.85	329.18	342.27	351.74	359.04	367.10
Retail trade									
Average weekly hours	30.6	30.2	30.1	29.9	29.8	29.8	29.4	29.2	29.3
Average hourly earnings (in dollars)	4.53	4.88	5.25	5.48	5.74	5.85	5.94	6.03	6.12
Average weekly earnings (in dollars)	138.62	147.38	158.03	163.85	171.05	174.33	174.64	176.08	179.32
Finance, insurance, and real estate									
Average weekly hours	36.2	36.2	36.3	36.2	36.2	36.5	36.4	36.4	36.2
Average hourly earnings (in dollars)	5.27	5.79	6.31	6.78	7.29	7.63	7.94	8.35	8.76
Average weekly earnings (in dollars)	190.77	209.60	229.05	245.44	263.90	278.50	289.02	303.94	317.11
Services									
Average weekly hours	32.7	32.6	32.6	32.6	32.7	32.6	32.5	32.5	32.5
Average hourly earnings (in dollars)	5.36	5.85	6.41	6.92	7.31	7.59	7.90	8.16	8.47
Average weekly earnings (in dollars)	175.27	190.71	208.97	225.59	239.04	247.43	256.75	265.20	275.28

22. Employment Cost Index, compensation,[1] by occupation and industry group

(June 1981=100)

Series	1986				1987				1988	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
										Mar. 1988	
Civilian workers [2]	130.6	131.5	133.0	133.8	135.0	135.9	137.5	138.6	140.6	1.4	4.1
Workers, by occupational group:											
White-collar workers	133.1	134.2	136.0	136.9	138.5	139.3	141.2	142.2	144.2	1.4	4.1
Blue-collar workers	126.2	126.8	127.8	128.4	129.1	130.1	131.3	132.5	134.7	1.7	4.3
Service occupations	133.1	133.7	135.4	136.6	138.0	138.5	139.9	140.8	142.9	1.5	3.6
Workers, by industry division:											
Goods-producing	126.9	128.1	128.8	129.5	130.2	131.1	132.2	133.5	135.8	1.7	4.3
Manufacturing	127.7	128.7	129.3	130.1	130.7	131.5	132.7	134.1	136.8	2.0	4.7
Service-producing	132.9	133.7	135.6	136.5	138.1	138.9	140.8	141.7	143.6	1.3	4.0
Services	138.8	139.4	142.4	143.6	145.2	145.8	149.2	150.6	152.8	1.5	5.2
Health services	–	–	–	–	–	–	–	–	–	1.2	4.3
Hospitals	–	–	–	–	–	–	–	–	–	1.3	5.1
Public administration [3]	136.8	138.0	140.6	141.6	144.1	144.7	146.4	148.1	150.3	1.5	4.3
Nonmanufacturing	131.9	132.8	134.6	135.4	136.9	137.8	139.6	140.5	142.3	1.3	3.9
Private industry workers	128.9	129.9	130.8	131.6	132.9	133.8	135.1	136.0	138.1	1.5	3.9
Workers, by occupational group:											
White-collar workers	131.3	132.5	133.5	134.3	136.1	137.0	138.5	139.3	141.2	1.4	3.7
Professional specialty and technical occupations	–	–	–	–	–	–	–	–	–	1.5	4.4
Executive, administrative, and managerial occupations	–	–	–	–	–	–	–	–	–	.9	3.5
Sales occupations	–	–	–	–	–	–	–	–	–	1.4	1.5
Administrative support occupations, including clerical	–	–	–	–	–	–	–	–	–	1.9	4.9
Blue-collar workers	125.7	126.3	127.2	127.8	128.4	129.5	130.6	131.8	134.1	1.7	4.4
Precision production, craft, and repair occupation	–	–	–	–	–	–	–	–	–	1.4	4.1
Machine operators, assemblers, and inspectors	–	–	–	–	–	–	–	–	–	2.1	5.0
Transportation and material moving occupations	–	–	–	–	–	–	–	–	–	1.6	4.0
Handlers, equipment cleaners, helpers, and laborers	–	–	–	–	–	–	–	–	–	2.2	4.6
Service occupations	130.9	131.1	132.3	133.5	134.7	135.2	135.9	136.7	138.6	1.4	2.9
Workers, by industry division:											
Goods-producing	126.7	127.8	128.6	129.2	129.9	130.8	131.9	133.2	135.6	1.8	4.4
Construction	–	–	–	–	–	–	–	–	–	1.2	4.0
Manufacturing	127.7	128.7	129.3	130.1	130.7	131.5	132.7	134.1	136.8	2.0	4.7
Durables	–	–	–	–	–	–	–	–	–	2.3	4.7
Nondurables	–	–	–	–	–	–	–	–	–	1.5	4.5
Service-producing	130.8	131.6	132.7	133.5	135.3	136.3	137.7	138.4	140.2	1.3	3.6
Transportation and public utilities	–	–	–	–	–	–	–	–	–	1.1	3.2
Transportation	–	–	–	–	–	–	–	–	–	1.4	3.2
Public utilities	–	–	–	–	–	–	–	–	–	.7	3.1
Wholesale and retail trade	–	–	–	–	–	–	–	–	–	1.3	3.6
Wholesale trade	–	–	–	–	–	–	–	–	–	.9	3.6
Retail trade	–	–	–	–	–	–	–	–	–	1.5	3.5
Finance, insurance, and real estate	–	–	–	–	–	–	–	–	–	1.2	.6
Service	–	–	–	–	–	–	–	–	–	1.5	5.2
Health services	–	–	–	–	–	–	–	–	–	1.2	4.2
Hospitals	–	–	–	–	–	–	–	–	–	1.3	5.1
Nonmanufacturing	129.7	130.6	131.7	132.4	134.1	135.1	136.4	137.1	138.9	1.3	3.6
State and local government workers	138.9	139.7	143.6	144.7	145.9	146.3	149.7	151.1	153.1	1.3	4.9
Workers, by occupational group:											
White-collar workers	140.0	140.5	145.0	146.0	147.2	147.5	151.2	152.7	154.8	1.4	5.2
Blue-collar workers	134.7	136.3	138.5	139.5	140.8	141.3	143.3	144.3	145.9	1.1	3.6
Workers, by industry division:											
Services	140.4	140.8	145.5	146.6	147.3	147.6	151.8	153.1	155.2	1.4	5.4
Hospitals and other services [4]	136.8	137.9	139.4	141.1	142.5	143.3	145.1	146.3	150.3	2.7	5.5
Health services	–	–	–	–	–	–	–	–	–	1.1	5.0
Schools	141.5	141.7	147.6	148.4	148.9	149.1	154.1	155.5	156.8	.8	5.3
Elementary and secondary	143.0	143.2	149.4	150.3	150.5	150.7	156.5	157.8	158.9	.7	5.6
Public administration [3]	136.8	138.0	140.6	141.6	144.1	144.7	146.4	148.1	150.3	1.5	4.3

[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	1986				1987				1988	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
										Mar. 1988	
Civilian workers [1]	128.3	129.3	130.7	131.5	132.8	133.5	135.2	136.1	137.4	1.0	3.5
Workers, by occupational group:											
White-collar workers	131.2	132.4	134.1	135.0	136.6	137.3	139.4	140.2	141.5	.9	3.6
Blue-collar workers	123.4	124.1	125.0	125.6	126.2	127.1	128.3	129.4	130.4	.8	3.3
Service occupations	129.8	130.0	131.7	132.8	134.2	134.7	136.0	136.6	138.0	1.0	2.8
Workers, by industry division											
Goods-producing	124.4	125.6	126.3	127.0	127.8	128.5	129.8	131.0	132.2	.9	3.4
Manufacturing	125.3	126.5	127.2	127.9	128.7	129.5	130.8	132.2	133.3	.8	3.6
Service-producing	130.7	131.5	133.4	134.2	135.8	136.5	138.5	139.2	140.5	.9	3.5
Services	136.4	137.0	139.9	141.1	142.7	143.4	146.8	148.2	149.5	.9	4.8
Health services	–	–	–	–	–	–	–	–	–	.7	4.0
Hospitals	–	–	–	–	–	–	–	–	–	1.0	4.8
Public administration [2]	133.8	134.6	137.5	138.1	140.5	141.0	142.6	143.8	145.5	1.2	3.6
Nonmanufacturing	129.6	130.4	132.2	133.0	134.5	135.2	137.1	137.8	139.0	.9	3.3
Private industry workers	126.8	127.9	128.8	129.5	130.8	131.7	133.0	133.8	135.1	1.0	3.3
Workers, by occupational group:											
White-collar workers	129.6	131.1	132.0	132.7	134.6	135.4	137.0	137.6	139.0	1.0	3.3
Professional specialty and technical occupations	132.7	134.0	135.4	136.4	138.4	139.1	141.2	142.6	144.0	1.0	4.0
Executive, administrative, and managerial occupations	130.5	132.1	132.4	133.5	135.6	136.4	138.6	139.2	139.9	.5	3.2
Sales occupations	122.4	124.3	125.2	124.9	126.7	127.1	127.0	126.1	127.5	1.1	.6
Administrative support occupations, including clerical	129.6	130.8	131.7	132.7	134.3	135.5	137.1	138.1	140.2	1.5	4.4
Blue-collar workers	123.1	123.7	124.5	125.1	125.6	126.6	127.7	128.9	129.9	.8	3.4
Precision production, craft, and repair occupations	125.3	125.7	126.7	127.4	127.9	128.8	130.2	131.1	132.1	.8	3.3
Machine operators, assemblers, and inspectors	122.6	123.6	124.1	124.9	125.5	126.7	127.5	129.2	129.9	.5	3.5
Transportation and material moving occupations	118.0	118.9	119.8	120.1	120.5	121.5	122.3	122.9	123.7	.7	2.7
Handlers, equipment cleaners, helpers, and laborers	120.0	120.3	120.9	121.4	121.9	122.6	123.7	125.0	126.7	1.4	3.9
Service occupations	128.0	128.0	128.9	130.1	131.4	131.9	132.6	133.2	134.5	1.0	2.4
Workers, by industry division:											
Goods-producing	124.2	125.4	126.1	126.8	127.5	128.3	129.6	130.8	132.0	.9	3.5
Construction	118.3	119.8	120.5	120.8	121.7	122.7	123.8	124.7	125.9	1.0	3.5
Manufacturing	125.3	126.5	127.2	127.9	128.7	129.5	130.8	132.2	133.3	.8	3.6
Durables	124.8	125.8	126.4	127.2	127.7	128.7	129.7	131.1	132.1	.8	3.4
Nondurables	126.1	127.9	128.5	129.3	130.5	131.0	132.8	134.1	135.6	1.1	3.9
Service-producing	129.0	129.9	130.9	131.6	133.4	134.3	135.7	136.2	137.5	1.0	3.1
Transportation and public utilities	126.3	126.6	127.3	127.5	128.1	129.3	130.0	130.2	131.3	.8	2.5
Transportation	–	–	–	–	–	–	–	–	–	.9	2.3
Public utilities	–	–	–	–	–	–	–	–	–	.8	2.7
Wholesale and retail trade	124.5	125.8	126.5	126.9	127.9	129.9	130.6	130.7	131.9	.9	3.1
Wholesale trade	129.7	131.2	131.8	133.1	134.8	137.2	137.8	138.5	139.0	.4	3.1
Retail trade	122.5	123.7	124.4	124.5	125.2	127.1	127.8	127.7	129.2	1.2	3.2
Finance, insurance, and real estate	126.6	128.0	129.0	130.0	133.5	131.5	131.8	131.6	132.9	1.0	-.4
Services	136.2	136.9	138.2	139.5	141.8	142.8	145.9	147.1	148.6	1.0	4.8
Health services	–	–	–	–	–	–	–	–	–	.7	3.9
Hospitals	–	–	–	–	–	–	–	–	–	1.1	4.9
Nonmanufacturing	127.7	128.7	129.7	130.4	131.9	132.8	134.2	134.8	136.0	.9	3.1
State and local government workers	135.5	136.0	140.4	141.4	142.5	142.8	146.1	147.4	148.7	.9	4.4
Workers, by occupational group											
White-collar workers	136.6	137.0	141.8	142.8	143.9	144.1	147.7	149.3	150.5	.8	4.6
Blue-collar workers	130.4	131.9	134.5	135.1	136.3	136.9	139.0	139.6	141.1	1.1	3.5
Workers, by industry division											
Services	136.8	137.1	142.1	143.3	143.9	144.2	148.2	149.5	150.7	.8	4.7
Hospitals and other services [3]	132.4	133.3	135.8	137.3	138.6	139.4	141.2	142.2	144.5	1.6	4.3
Health services	–	–	–	–	–	–	–	–	–	.6	4.3
Schools	138.0	138.2	144.1	145.1	145.5	145.6	150.3	151.8	152.6	.5	4.9
Elementary and secondary	139.4	139.4	145.7	146.4	146.5	146.6	152.0	153.4	154.0	.4	5.1
Public administration [2]	133.8	134.6	137.5	138.1	140.5	141.0	142.6	143.8	145.5	1.2	3.6

[1] Consists of private industry workers (excluding farm and household workers) and State and local government (excluding Federal Government) workers.
[2] Consists of legislative, judicial, administrative, and regulatory activities.
[3] Includes, for example, library, social and health services.
– Data not available.

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

(June 1981 = 100)

Series	1986				1987				1988	Percent change	
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	3 months ended	12 months ended
										Mar. 1988	
COMPENSATION											
Workers, by bargaining status[1]											
Union	128.4	128.7	129.4	129.8	130.5	131.2	132.0	133.4	135.6	1.6	3.9
Goods-producing	126.4	126.7	127.3	127.5	128.0	128.7	129.5	131.3	134.1	2.1	4.8
Service-producing	131.6	131.9	132.8	133.4	134.4	135.2	135.9	136.7	138.0	1.0	2.7
Manufacturing	127.0	126.9	127.5	127.9	128.0	128.7	129.5	131.5	135.0	2.7	5.5
Nonmanufacturing	129.7	130.4	131.2	131.5	132.6	133.5	134.3	135.1	136.2	.8	2.7
Nonunion	129.0	130.2	131.2	132.1	133.6	134.6	136.1	136.9	138.9	1.5	4.0
Goods-producing	126.7	128.2	129.1	130.0	130.8	131.8	133.1	134.1	136.2	1.6	4.1
Service-producing	130.4	131.4	132.5	133.4	135.3	136.4	137.9	138.6	140.5	1.4	3.8
Manufacturing	128.1	129.7	130.4	131.4	132.2	133.2	134.6	135.6	137.8	1.6	4.2
Nonmanufacturing	129.5	130.4	131.6	132.5	134.3	135.3	136.8	137.5	139.4	1.4	3.8
Workers, by region [1]											
Northeast	131.6	133.3	134.2	135.2	137.4	138.6	140.3	141.9	143.7	1.3	4.6
South	128.7	129.6	130.7	131.4	132.1	133.2	134.2	135.4	137.1	1.3	3.8
Midwest (formerly North Central)	125.9	126.2	127.3	128.1	129.1	130.2	131.2	131.7	134.4	2.1	4.1
West	130.8	131.6	132.1	132.8	134.1	134.2	135.8	136.3	138.3	1.5	3.1
Workers, by area size [1]											
Metropolitan areas	129.5	130.5	131.4	132.2	133.5	134.4	135.8	136.7	138.9	1.6	4.0
Other areas	125.5	126.4	127.2	127.9	129.0	130.2	131.3	132.0	133.6	1.2	3.6
WAGES AND SALARIES											
Workers, by bargaining status [1]											
Union	125.6	126.1	126.9	127.2	127.7	128.3	129.1	130.5	131.0	.4	2.6
Goods-producing	123.4	124.1	124.5	124.8	125.0	125.8	126.5	128.5	128.7	.2	3.0
Service-producing	129.0	129.3	130.5	130.9	131.7	132.2	132.9	133.6	134.4	.6	2.1
Manufacturing	124.2	124.6	125.0	125.5	125.6	126.2	127.0	129.3	129.6	.2	3.2
Nonmanufacturing	126.9	127.4	128.5	128.7	129.5	130.1	130.8	131.5	132.1	.5	2.0
Nonunion	127.3	128.5	129.4	130.3	131.8	132.8	134.3	135.0	136.4	1.0	3.5
Goods-producing	124.5	126.1	127.0	127.8	128.8	129.6	131.1	132.1	133.6	1.1	3.7
Service-producing	128.9	129.9	130.8	131.7	133.6	134.6	136.2	136.7	138.0	1.0	3.3
Manufacturing	126.1	127.7	128.5	129.5	130.6	131.5	133.0	133.9	135.5	1.2	3.8
Nonmanufacturing	127.8	128.9	129.8	130.6	132.4	133.4	134.9	135.4	136.8	1.0	3.3
Workers, by region [1]											
Northeast	129.2	131.3	132.3	133.1	135.4	136.6	138.3	139.7	140.9	.9	4.1
South	126.8	127.8	128.8	129.4	130.1	131.1	132.1	133.0	134.0	.8	3.0
Midwest (formerly North Central)	124.2	124.4	125.3	126.2	127.4	128.5	129.6	129.9	131.3	1.1	3.1
West	128.1	128.9	129.3	130.1	131.2	131.1	133.1	133.5	134.9	1.0	2.8
Workers, by area size[1]											
Metropolitan areas	127.4	128.5	129.4	130.2	131.6	132.4	133.7	134.6	135.8	.9	3.2
Other areas	123.6	124.5	125.0	125.6	126.6	127.8	129.1	129.8	130.9	.8	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.

25. Specified compensation and wage adjustments from contract settlements, and effective wage adjustments, private industry collective bargaining situations covering 1,000 workers or more (in percent)

Measure	Annual average		Quarterly average							
	1985	1986	1986			1987				1988
			II	III	IV	I	II	IIIp	IVp	Ip
Specified adjustments:										
Total compensation [1] adjustments, [2] settlements covering 5,000 workers or more:										
First year of contract	2.6	1.1	0.7	0.7	2.7	1.1	4.1	2.5	3.4	1.7
Annual rate over life of contract	2.7	1.6	1.6	1.2	2.4	2.1	3.9	2.1	2.4	1.8
Wage adjustments, settlements covering 1,000 workers or more:										
First year of contract	2.3	1.2	1.3	.8	2.0	.8	2.6	2.1	2.4	2.1
Annual rate over life of contract	2.7	1.8	2.0	1.5	2.1	1.6	2.9	2.0	1.8	2.3
Effective adjustments:										
Total effective wage adjustment [3]	3.3	2.3	.7	.5	.5	.4	1.0	.9	.8	.4
From settlements reached in period	.7	.5	.2	.1	.2	([4])	.2	.2	.3	.1
Deferred from settlements reached in earlier periods	1.8	1.7	.6	.5	.2	.3	.7	.6	.3	.3
From cost-of-living-adjustments clauses	.7	.2	([4])	([4])	.1	.1	.2	.1	.2	.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.

[4] Between −0.05 and 0.05 percent.

p = preliminary.

26. Average specified compensation and wage adjustments, major collective bargaining settlements in private industry situations covering 1,000 workers or more during 4-quarter periods (in percent)

Measure	Average for four quarters ending--							
	1986			1987				1988
	II	III	IV	I	II	IIIp	IVp	Ip
Specified total compensation adjustments, settlements covering 5,000 workers or more, all industries:								
First year of contract	1.4	0.9	1.1	1.2	1.8	2.7	3.0	3.1
Annual rate over life of contract	2.0	1.4	1.6	1.7	2.1	2.6	2.6	2.5
Specified wage adjustments, settlements covering 1,000 workers or more:								
All industries								
First year of contract	1.6	1.2	1.2	1.2	1.5	2.0	2.2	2.4
Contracts with COLA clauses	1.8	2.2	1.9	2.0	1.8	2.1	2.3	2.2
Contracts without COLA clauses	1.5	.8	.9	.8	1.3	2.0	2.1	2.5
Annual rate over life of contract	2.2	1.7	1.8	1.8	2.0	2.2	2.1	2.2
Contracts with COLA clauses	2.5	2.0	1.7	1.8	1.7	1.7	1.5	1.4
Contracts without COLA clauses	2.1	1.6	1.8	1.8	2.1	2.5	2.5	2.7
Manufacturing								
First year of contract	.1	−1.0	−1.2	−1.5	−.8	1.1	2.1	2.4
Contracts with COLA clauses	.7	1.1	1.3	1.3	1.3	2.1	2.4	2.4
Contracts without COLA clauses	−.4	−2.0	−2.8	−3.5	−2.7	−.1	1.3	2.4
Annual rate over life of contract	1.4	.3	.2	([2])	.3	1.0	1.3	1.5
Contracts with COLA clauses	2.0	1.1	.9	.8	.8	1.0	1.0	1.0
Contracts without COLA clauses	.9	−.1	−.2	−.6	−.2	1.2	2.1	2.7
Nonmanufacturing								
First year of contract	2.6	2.1	2.0	2.2	2.3	2.4	2.3	2.3
Contracts with COLA clauses	3.4	2.7	2.1	2.2	2.1	2.1	1.9	1.5
Contracts without COLA clauses	2.4	1.9	2.0	2.1	2.3	2.6	2.4	2.5
Annual rate over life of contract	2.8	2.3	2.3	2.4	2.6	2.8	2.7	2.7
Contracts with COLA clauses	3.3	2.5	2.1	2.2	2.2	2.4	2.7	2.4
Contracts without COLA clauses	2.6	2.2	2.4	2.5	2.7	2.9	2.7	2.7
Construction								
First year of contract	2.3	2.3	2.2	2.4	2.7	3.0	2.9	2.9
Contracts with COLA clauses	1.1	1.4	1.4	1.6	3.7	([1])	([1])	([1])
Contracts without COLA clauses	2.4	2.4	2.3	2.4	2.7	([1])	([1])	([1])
Annual rate over life of contract	2.5	2.6	2.5	2.5	2.9	3.2	3.1	3.1
Contracts with COLA clauses	1.2	1.6	1.6	1.4	3.8	([1])	([1])	([1])
Contracts without COLA clauses	2.6	2.6	2.5	2.6	2.9	([1])	([1])	([1])

[1] Data do not meet publication standards.

[2] Between −0.05 and 0.05 percent.

p = preliminary.

27. Average effective wage adjustments, private industry collective bargaining situations covering 1,000 workers or more during 4-quarter periods (in percent)

Effective wage adjustment	Average for four quarters ending--						
	1986		1987				1988
	III	IV	I	II	III[p]	IV[p]	I[p]
For all workers:[1]							
Total	2.3	2.3	2.0	2.2	2.6	3.1	3.2
From settlements reached in period	.5	.5	.3	.3	.4	.7	.8
Deferred from settlements reached in earlier period	1.6	1.7	1.5	1.6	1.7	1.8	1.8
From cost-of-living-adjustments clauses	.2	.2	.1	.3	.4	.5	.5
For workers receiving changes:							
Total	3.1	2.8	2.4	2.8	3.2	3.6	3.8
From settlements reached in period	1.7	1.6	1.1	.9	1.8	2.9	2.9
Deferred from settlements reached in earlier period	3.8	3.9	3.7	3.5	3.3	3.3	3.3
From cost-of-living-adjustments clauses	1.0	1.0	.6	1.8	2.3	2.6	2.7

[1] Because of rounding, total may not equal sum of parts.

[p] = preliminary.

28. Specified compensation and wage adjustments from contract settlements, and effective wage adjustments, State and local government collective bargaining situations covering 1,000 workers or more (in percent)

Measure	Annual average		
	1985	1986	1987
Specified adjustments:			
Total compensation [1] adjustments, [2] settlements covering 5,000 workers or more:			
First year of contract	4.2	6.2	4.9
Annual rate over life of contract	5.1	6.0	4.8
Wage adjustments, settlements covering 1,000 workers or more:			
First year of contract	4.6	5.7	4.9
Annual rate over life of contract	5.4	5.7	5.1
Effective adjustments:			
Total effective wage adjustment [3]	5.7	5.5	4.9
From settlements reached in period	4.1	2.4	2.7
Deferred from settlements reached in earlier periods	1.6	3.0	2.2
From cost-of-living-adjustment clauses	([4])	([4])	([4])

[1] Compensation includes wages, salaries, and employers' cost of employee benefits when contract is negotiated.

[2] Adjustments are the net result of increases, decreases, and no changes in compensation or wages.

[3] Because of rounding, total may not equal sum of parts.

[4] Less than 0.05 percent.

29. Work stoppages involving 1,000 workers or more

Measure	Annual totals		1987									1988 [p]			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.[p]	Dec.[p]	Jan.	Feb.	Mar.	Apr.[p]
Number of stoppages:															
Beginning in period	69	46	2	3	8	6	3	7	1	6	0	3	5	1	0
In effect during period	72	51	5	7	12	14	11	15	12	11	5	6	8	6	6
Workers involved:															
Beginning in period (in thousands)	533.0	174.4	2.7	7.0	16.1	14.1	18.4	45.2	1.3	11.8	.0	7.2	17.5	6.7	0
In effect during period (in thousands)	899.5	377.7	8.9	13.9	25.8	31.1	36.0	71.9	53.7	22.2	8.9	10.8	21.1	24.2	14.9
Days idle:															
Number (in thousands)	1,186.1	4,480.7	151.3	201.2	278.0	471.0	361.4	1,155.1	353.3	222.9	159.4	36.6	337.0	203.6	207.9
Percent of estimated working time[1]	.05	.02	.01	.01	.01	.02	.02	.05	.02	.01	.01	.02	.02	.08	.09

[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

30. Consumer Price Indexes for All Urban Consumers and for Urban Wage Earners and Clerical Workers: U.S. city average, by expenditure category and commodity or service group

(1982-84=100, unless otherwise indicated)

Series	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
CONSUMER PRICE INDEX FOR ALL URBAN CONSUMERS:															
All items	109.6	113.6	112.7	113.1	113.5	113.8	114.4	115.0	115.3	115.4	115.4	115.7	116.0	116.5	117.1
All items (1967=100)	328.4	340.4	337.7	338.7	340.1	340.8	342.7	344.4	345.3	345.8	345.7	346.7	347.4	349.0	350.8
Food and beverages	109.1	113.5	112.8	113.3	113.8	113.7	113.8	114.2	114.3	114.3	114.8	115.7	115.8	116.0	116.7
Food	109.0	113.5	112.8	113.3	113.8	113.7	113.8	114.1	114.3	114.2	114.7	115.7	115.7	115.9	116.6
Food at home	107.3	111.9	111.3	112.0	112.6	112.1	112.1	112.4	112.4	112.1	112.8	114.1	113.9	113.9	114.6
Cereals and bakery products	110.9	114.8	114.3	114.6	114.7	115.2	115.3	115.4	115.6	116.2	116.8	118.1	118.7	118.9	119.8
Meats, poultry, fish, and eggs	104.5	110.5	108.6	109.6	110.4	111.4	111.9	112.7	112.0	111.2	110.3	111.0	110.6	111.2	111.5
Dairy products	103.3	105.9	105.3	105.7	105.5	105.3	105.7	106.4	106.9	106.9	106.7	107.4	107.3	107.2	107.1
Fruits and vegetables	109.4	119.1	120.1	121.8	124.1	119.6	117.4	117.4	117.8	117.4	123.4	126.4	124.7	123.0	126.0
Other foods at home	109.4	110.5	110.6	110.5	110.2	110.0	110.4	110.3	110.6	110.2	110.0	111.3	111.8	112.0	112.1
Sugar and sweets	109.0	111.0	110.7	110.8	111.2	111.1	111.3	111.6	111.6	111.4	111.0	112.2	112.2	112.6	112.3
Fats and oils	106.5	108.1	108.0	108.5	107.8	108.4	108.3	107.8	107.4	108.0	107.7	108.5	109.5	110.3	110.3
Nonalcoholic beverages	110.4	107.5	108.5	108.0	106.8	105.9	105.9	105.8	106.7	105.0	104.8	106.9	107.7	107.7	107.8
Other prepared foods	109.2	113.8	113.3	113.4	113.7	114.1	114.8	114.6	114.7	115.1	115.0	115.9	116.1	116.3	116.6
Food away from home	112.5	117.0	116.1	116.4	116.8	117.2	117.5	118.0	118.3	118.6	118.9	119.3	119.7	120.2	120.7
Alcoholic beverages	111.1	114.1	113.3	113.6	114.0	114.4	114.7	114.9	115.2	115.4	115.4	115.8	116.8	117.4	118.0
Housing	110.9	114.2	113.2	113.6	114.3	114.7	115.4	115.6	115.5	115.5	115.6	116.2	116.6	117.0	117.3
Shelter	115.8	121.3	120.2	120.5	120.8	121.3	122.2	122.5	123.2	123.4	123.7	124.6	125.0	125.6	125.8
Renters' costs (12/82=100)	121.9	128.1	127.1	127.3	127.9	129.3	130.1	129.8	129.4	129.2	129.1	130.8	131.3	132.9	132.9
Rent, residential	118.3	123.1	122.0	122.3	122.3	123.0	123.8	124.4	124.8	124.8	125.6	126.0	126.3	126.4	126.6
Other renters' costs	118.6	127.4	127.1	127.1	129.1	132.8	133.3	130.5	127.7	126.7	124.1	129.4	130.4	136.6	136.0
Homeowners' costs (12/82=100)	119.4	124.8	123.6	124.0	124.2	124.4	125.4	126.0	127.1	127.4	128.0	128.5	129.0	129.2	129.4
Owners' equivalent rent (12/82=100)	119.4	124.8	123.6	124.1	124.2	124.4	125.4	126.0	127.2	127.5	128.0	128.6	129.0	129.2	129.5
Household insurance (12/82=100)	119.2	124.0	122.4	123.0	123.6	124.5	125.1	125.5	125.8	125.9	126.2	126.9	127.1	127.8	128.2
Maintenance and repairs	107.9	111.8	110.3	110.2	111.1	113.2	112.9	112.7	112.8	113.5	113.3	113.7	114.3	113.3	115.3
Maintenance and repair services	111.2	114.8	112.8	112.3	113.7	116.8	116.5	116.3	116.4	116.9	116.6	117.4	117.9	116.4	119.4
Maintenance and repair commodities	103.7	107.8	107.2	107.5	107.8	108.4	108.2	107.8	108.1	108.9	109.1	108.7	109.5	109.2	109.7
Fuel and other utilities	104.1	103.0	101.3	102.2	104.9	105.0	105.9	105.5	103.2	102.4	102.0	102.4	102.8	102.7	102.8
Fuels	99.2	97.3	94.7	96.1	100.8	100.4	101.4	101.0	96.9	95.5	95.1	95.6	96.0	95.8	95.7
Fuel oil, coal, and bottled gas	77.6	77.9	77.5	77.1	77.2	77.1	77.8	77.6	78.5	80.3	80.5	80.8	80.9	80.5	80.2
Gas (piped) and electricity	105.7	103.8	100.8	102.5	108.1	107.6	108.7	108.2	103.3	101.4	100.9	101.5	101.9	101.7	101.6
Other utilities and public services	117.9	120.1	119.7	119.8	119.4	120.5	121.1	120.8	121.2	121.3	120.9	121.3	121.8	121.7	122.3
Household furnishings and operations	105.2	107.1	107.2	107.1	107.1	107.2	107.3	107.5	107.4	107.4	107.3	107.5	107.7	108.3	109.1
Housefurnishings	102.2	103.6	104.0	103.5	103.5	103.6	103.8	103.9	103.6	103.6	103.3	103.5	103.7	104.7	104.9
Housekeeping supplies	108.2	111.5	111.1	111.7	111.9	111.7	111.5	111.8	112.3	112.4	112.5	113.1	113.2	112.9	113.8
Housekeeping services	108.5	110.6	110.3	110.6	110.5	110.8	110.9	111.0	111.2	111.2	111.4	111.5	111.6	111.7	114.7
Apparel and upkeep	105.9	110.6	111.5	111.1	109.3	107.3	109.4	113.3	115.4	115.4	112.7	110.4	110.2	114.3	117.0
Apparel commodities	104.2	108.9	110.0	109.5	107.6	105.3	107.6	111.8	114.0	114.0	111.0	108.6	108.3	112.7	115.5
Men's and boys' apparel	106.2	109.1	109.2	109.9	109.0	107.8	108.3	110.6	112.0	112.5	110.7	109.0	109.1	111.6	112.9
Women's and girls' apparel	104.0	110.4	112.8	111.2	107.6	104.2	108.4	115.3	118.3	117.7	112.6	108.2	107.8	115.3	119.6
Infants' and toddlers' apparel	111.8	112.1	114.1	113.1	110.1	107.7	109.0	112.1	116.2	116.7	114.5	113.6	111.4	114.0	117.1
Footwear	101.9	105.1	105.8	106.5	105.6	103.4	104.2	105.7	107.3	108.0	107.2	106.1	105.8	107.3	109.4
Other apparel commodities	101.7	108.0	105.9	105.8	107.6	108.2	109.3	110.3	110.7	110.7	111.3	112.9	113.1	113.6	114.6
Apparel services	115.1	119.6	118.6	119.3	119.5	120.0	119.8	119.9	120.8	121.1	121.4	121.6	122.0	122.2	122.6
Transportation	102.3	105.4	104.2	104.7	105.4	106.0	106.5	106.6	107.1	107.8	107.6	107.1	106.8	106.5	107.2
Private transportation	101.2	104.2	103.0	103.5	104.3	104.9	105.4	105.4	106.0	106.8	106.5	106.0	105.7	105.4	106.0
New vehicles	110.6	114.4	113.5	113.8	114.1	114.4	114.0	113.8	115.0	116.3	116.4	116.1	116.0	115.7	115.6
New cars	110.6	114.6	113.6	114.0	114.3	114.7	114.4	114.1	115.2	116.6	116.6	116.2	116.2	116.0	115.9
Used cars	108.8	113.1	111.3	113.4	114.7	115.4	115.5	116.0	116.2	116.5	116.3	116.0	116.0	116.1	116.6
Motor fuel	77.1	80.2	78.5	79.1	80.8	82.2	84.3	84.0	83.2	83.2	82.0	79.7	78.3	77.5	79.4
Gasoline	77.0	80.1	78.4	79.0	80.7	82.1	84.3	84.0	83.1	83.1	81.8	79.5	78.1	77.3	79.2
Maintenance and repair	110.3	114.8	114.3	114.3	114.4	114.5	115.1	115.7	116.1	116.5	116.9	117.2	117.7	118.5	118.8
Other private transportation	115.1	120.8	119.4	119.7	120.3	120.8	120.7	121.1	122.8	123.8	123.8	124.7	125.0	124.9	125.0
Other private transportation commodities	96.3	96.9	96.0	96.7	96.7	96.3	96.8	97.6	98.0	97.6	97.5	98.2	98.1	98.3	98.2
Other private transportation services	118.8	125.6	124.0	124.2	125.0	125.7	125.5	125.8	127.8	129.2	129.2	130.1	130.6	130.3	130.5
Public transportation	117.0	121.1	120.9	120.6	120.2	120.2	121.5	122.1	121.2	122.0	122.1	121.8	120.8	121.4	122.4
Medical care	122.0	130.1	128.7	129.2	129.9	130.7	131.2	131.7	132.3	132.8	133.1	134.4	135.5	136.3	136.9
Medical care commodities	122.8	131.0	129.0	129.9	130.8	131.6	132.2	132.7	133.5	134.2	134.9	135.4	136.1	137.0	138.1
Medical care services	121.9	130.0	128.7	129.0	129.6	130.4	131.0	131.5	132.0	132.5	132.7	134.1	135.3	136.1	136.6
Professional services	120.8	128.8	127.5	127.9	128.8	129.5	130.0	130.7	131.2	131.5	131.8	133.2	134.5	135.4	136.0
Hospital and related services	123.1	131.6	129.7	130.1	130.6	132.0	133.0	133.3	134.2	135.4	135.9	137.6	139.0	140.0	140.7
Entertainment	111.6	115.3	114.5	114.8	114.9	115.4	115.6	116.1	116.9	117.3	117.4	118.1	118.3	119.0	119.6
Entertainment commodities	107.9	110.5	109.9	110.3	110.3	110.7	110.6	110.7	111.2	112.2	112.6	112.9	112.9	113.4	114.2
Entertainment services	116.8	122.0	121.0	121.2	121.4	122.0	122.5	123.5	124.5	124.3	124.3	125.4	125.7	126.5	127.0
Other goods and services	121.4	128.5	126.6	126.9	127.2	128.0	128.5	131.1	131.6	131.8	132.1	133.4	134.2	134.6	134.8
Tobacco products	124.7	133.6	131.6	131.8	132.4	135.0	135.3	135.9	136.3	136.5	137.0	140.8	142.2	142.8	142.9
Personal care	111.9	115.1	114.2	114.9	114.9	115.3	115.6	116.0	116.2	116.3	116.5	117.3	117.8	118.1	118.5
Toilet goods and personal care appliances	111.3	113.9	113.2	113.7	113.7	114.3	114.3	114.7	114.9	115.0	115.0	116.1	116.4	116.8	117.4
Personal care services	112.5	116.2	115.1	116.0	116.1	116.2	116.8	117.2	117.4	117.5	117.9	118.4	119.1	119.2	119.5
Personal and educational expenses	128.6	138.5	136.1	136.3	136.7	136.9	137.7	142.1	142.8	143.1	143.4	143.9	144.7	145.0	145.2
School books and supplies	128.1	138.1	136.2	136.4	136.5	136.5	136.7	141.3	142.3	142.3	142.4	144.6	146.3	146.2	146.3
Personal and educational services	128.7	138.7	136.3	136.5	136.8	137.2	137.9	142.3	143.1	143.4	143.6	144.0	144.8	145.1	145.3

See footnotes at end of table.

30. Continued— Consumer Price Indexes for All Urban Consumers and for Urban Wage Earners and Clerical Workers: U.S. city average, by expenditure category and commodity or service group

(1982-84=100, unless otherwise indicated)

Series	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
All items	109.6	113.6	112.7	113.1	113.5	113.8	114.4	115.0	115.3	115.4	115.4	115.7	116.0	116.5	117.1
Commodities	104.4	107.7	107.2	107.5	107.7	107.6	108.2	108.9	109.3	109.5	109.3	109.2	109.1	109.8	110.7
Food and beverages	109.1	113.5	112.8	113.3	113.8	113.7	113.8	114.2	114.3	114.3	114.8	115.7	115.8	116.0	116.7
Commodities less food and beverages	101.4	104.0	103.6	103.7	103.8	103.8	104.6	105.5	106.1	106.5	105.7	105.1	105.0	105.9	106.9
Nondurables less food and beverages	97.8	101.1	100.7	100.9	100.7	100.6	102.0	103.5	104.2	104.3	103.1	102.1	101.9	103.4	105.0
Apparel commodities	104.2	108.9	110.0	109.5	107.6	105.3	107.6	111.8	114.0	114.0	111.0	108.6	108.3	112.7	115.5
Nondurables less food, beverages, and apparel	95.9	99.5	98.3	98.7	99.6	100.5	101.5	101.6	101.5	101.8	101.5	101.2	101.0	101.0	102.0
Durables	106.6	108.2	107.7	107.9	108.2	108.4	108.3	108.3	108.8	109.6	109.5	109.4	109.4	109.5	109.7
Services	115.4	120.2	118.9	119.3	120.1	120.5	121.2	121.7	121.9	122.0	122.2	122.9	123.4	123.8	124.1
Rent of shelter (12/82=100)	120.2	125.9	124.8	125.1	125.4	126.0	126.9	127.2	128.0	128.1	128.5	129.4	129.8	130.4	130.6
Household services less rent of' shelter (12/82=100)	112.8	113.1	111.4	112.3	114.8	115.1	115.8	115.5	113.5	112.6	112.3	112.7	113.1	113.0	113.7
Transportation services	116.3	121.9	120.9	120.9	121.3	121.7	122.0	122.5	123.4	124.5	124.6	125.1	125.2	125.4	125.8
Medical care services	121.9	130.0	128.7	129.0	129.6	130.4	131.0	131.5	132.0	132.5	132.7	134.1	135.3	136.1	136.6
Other services	119.4	125.7	124.1	124.4	124.7	125.1	125.6	127.9	128.7	128.8	129.0	129.6	130.2	130.7	131.0
Special indexes:															
All items less food	109.8	113.6	112.7	113.0	113.5	113.8	114.5	115.1	115.5	115.7	115.5	115.7	116.0	116.6	117.2
All items less shelter	108.0	111.6	110.8	111.1	111.7	111.8	112.3	113.0	113.2	113.3	113.2	113.3	113.5	114.0	114.7
All items less homeowners' costs (12/82=100)	111.2	115.1	114.2	114.6	115.1	115.3	115.9	116.5	116.6	116.8	116.6	116.9	117.1	117.7	118.4
All items less medical care	108.8	112.6	111.7	112.1	112.5	112.7	113.3	113.9	114.2	114.4	114.3	114.6	114.8	115.3	115.9
Commodities less food	101.7	104.3	103.9	104.0	104.1	104.1	104.9	105.7	106.3	106.7	106.0	105.5	105.4	106.3	107.3
Nondurables less food	98.5	101.8	101.3	101.4	101.4	101.3	102.6	104.0	104.6	104.8	103.7	102.8	102.7	104.1	105.6
Nondurables less food and apparel	96.9	100.3	99.1	99.5	100.3	101.1	102.0	102.2	102.1	102.4	102.1	101.9	101.9	101.9	102.9
Nondurables	103.5	107.5	106.9	107.2	107.4	107.3	108.1	109.0	109.4	109.5	109.1	109.1	109.0	109.8	111.0
Services less rent of' shelter (12/82=100)	118.7	123.1	121.6	122.1	123.2	123.7	124.2	124.9	124.6	124.6	124.6	125.3	125.8	126.0	126.5
Services less medical care	114.6	119.1	117.8	118.2	119.0	119.4	120.1	120.6	120.8	120.8	121.0	121.7	122.1	122.4	122.8
Energy	88.2	88.6	86.4	87.4	90.7	91.1	92.7	92.3	89.8	89.0	88.3	87.4	87.0	86.5	87.3
All items less energy	112.6	117.2	116.4	116.7	116.9	117.1	117.6	118.3	118.9	119.2	119.2	119.7	120.0	120.6	121.2
All items less food and energy	113.5	118.2	117.4	117.6	117.7	118.0	118.6	119.4	120.1	120.5	120.4	120.8	121.1	121.9	122.4
Commodities less food and energy	108.6	111.8	111.5	111.7	111.4	111.2	111.6	112.9	113.7	114.1	113.5	113.2	113.3	114.6	115.5
Energy commodities	77.2	80.2	78.5	79.1	80.6	81.8	83.8	83.5	82.9	83.1	82.0	80.0	78.8	78.0	79.7
Services less energy	116.5	122.0	120.9	121.2	121.4	122.0	122.7	123.2	123.9	124.2	124.4	125.2	125.7	126.1	126.5
Purchasing power of the consumer dollar:															
1982-84=$1.00	91.3	88.0	88.6	88.4	88.0	87.8	87.3	86.9	86.7	86.5	86.6	86.4	86.2	85.8	85.4
1967=$1.00	30.5	29.4	29.6	29.5	29.4	29.3	29.2	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.5
CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS AND CLERICAL WORKERS:															
All items	108.6	112.5	111.6	111.9	112.4	112.7	113.3	113.8	114.1	114.3	114.2	114.5	114.7	115.1	115.7
All items (1967=100)	323.4	335.0	332.3	333.4	334.9	335.6	337.4	339.1	340.0	340.4	340.2	341.0	341.6	343.0	344.7
Food and beverages	108.9	113.3	112.6	113.1	113.6	113.5	113.6	114.0	114.1	114.1	114.5	115.4	115.5	115.7	116.3
Food	108.8	113.3	112.5	113.1	113.6	113.5	113.6	114.0	114.1	114.0	114.5	115.4	115.4	115.6	116.2
Food at home	107.1	111.7	111.0	111.7	112.3	111.9	111.9	112.2	112.2	111.9	112.5	113.7	113.5	113.5	114.2
Cereals and bakery products	110.9	114.8	114.3	114.5	114.8	115.2	115.3	115.4	115.7	116.2	116.9	118.1	118.8	118.9	119.9
Meats, poultry, fish, and eggs	104.4	110.4	108.5	109.5	110.4	111.3	111.8	112.7	112.0	111.2	110.1	110.8	110.5	111.1	111.4
Dairy products	103.2	105.7	105.1	105.6	105.3	105.1	105.5	106.2	106.7	106.7	106.4	107.1	107.0	106.9	106.9
Fruits and vegetables	109.4	118.8	119.5	121.1	123.9	119.6	117.3	117.1	117.5	117.4	123.0	125.7	124.0	122.2	125.2
Other foods at home	109.1	110.4	110.4	110.4	110.1	109.9	110.3	110.2	110.5	110.1	109.8	111.3	111.7	111.9	112.0
Sugar and sweets	109.0	110.9	110.5	110.7	111.1	111.0	111.3	111.5	111.6	111.2	110.9	112.1	112.1	112.4	112.2
Fats and oils	106.4	107.9	107.9	108.3	107.6	108.2	108.1	107.6	107.3	107.9	107.6	108.4	109.5	110.3	110.2
Nonalcoholic beverages	110.0	107.5	108.4	108.1	106.8	105.9	106.0	106.0	106.9	105.2	104.9	107.2	107.9	108.0	107.9
Other prepared foods	109.0	113.6	113.1	113.2	113.5	113.9	114.6	114.4	114.5	114.9	114.8	115.7	115.8	116.0	116.4
Food away from home	112.5	116.9	116.0	116.2	116.7	117.0	117.4	117.9	118.2	118.5	118.8	119.1	119.6	120.0	120.6
Alcoholic beverages	111.1	113.9	113.2	113.5	113.9	114.2	114.4	114.6	114.9	115.2	115.1	115.6	116.6	117.3	117.9
Housing	109.7	112.8	111.8	112.2	112.9	113.2	114.0	114.1	114.0	113.9	114.1	114.6	115.0	115.4	115.6
Shelter	113.5	118.8	117.7	118.1	118.2	118.8	119.6	120.0	120.7	120.9	121.2	121.9	122.4	122.9	123.0
Renters' costs (12/84=100)	109.5	114.6	113.8	114.0	114.2	115.3	116.0	116.2	116.0	115.9	115.9	116.9	117.3	118.4	118.4
Rent, residential	118.2	122.9	121.9	122.1	122.2	122.8	123.6	124.2	124.5	124.6	125.3	125.7	126.1	126.2	126.3
Other renters' costs	119.1	128.2	128.3	128.6	129.7	133.6	134.2	132.2	129.3	128.1	124.5	129.2	130.0	136.9	136.1
Homeowners' costs (12/84=100)	108.8	113.8	112.7	113.1	113.2	113.4	114.3	114.8	115.9	116.2	116.6	117.1	117.6	117.8	118.0
Owners' equivalent rent (12/84=100)	108.8	113.7	112.7	113.1	113.2	113.4	114.3	114.8	115.9	116.2	116.6	117.1	117.6	117.8	118.0
Household insurance (12/84=100)	109.4	114.1	112.5	113.1	113.8	114.6	115.1	115.5	115.8	115.9	116.1	116.7	116.7	117.2	117.3
Maintenance and repairs	107.7	111.3	110.2	110.2	111.0	112.6	112.4	112.1	112.2	112.7	112.5	113.0	113.6	112.8	114.7
Maintenance and repair services	110.5	114.7	113.2	112.5	113.9	116.9	116.6	116.4	116.0	116.5	115.9	117.1	117.6	116.6	119.8
Maintenance and repair commodities	103.1	106.0	105.2	106.0	106.3	106.3	106.2	105.8	106.3	106.9	107.1	106.9	107.5	107.1	107.5
Fuel and other utilities	103.9	102.7	101.0	101.8	104.6	104.7	105.6	105.2	102.8	102.0	101.7	102.0	102.5	102.3	102.5
Fuels	99.2	97.1	94.4	95.8	100.7	100.2	101.3	100.8	96.5	95.1	94.8	95.2	95.6	95.4	95.4
Fuel oil, coal, and bottled gas	77.8	77.6	77.3	76.8	77.0	76.9	77.5	77.3	78.2	80.1	80.2	80.4	80.6	80.2	79.9
Gas (piped) and electricity	105.7	103.6	100.6	102.2	108.0	107.4	108.6	108.1	103.0	101.1	100.7	101.2	101.6	101.4	101.4
Other utilities and public services	117.7	120.1	119.6	119.7	119.4	120.4	121.0	120.7	121.1	121.2	120.9	121.2	121.8	121.7	122.3
Household furnishings and operations	105.0	106.7	106.9	106.7	106.7	106.8	106.9	107.1	107.0	107.0	106.9	107.1	107.2	107.8	108.7
Housefurnishings	101.9	103.1	103.4	103.0	102.9	103.1	103.3	103.4	103.1	103.1	102.9	103.0	103.1	104.1	104.2
Housekeeping supplies	108.5	111.8	111.5	112.0	112.1	112.1	111.9	112.2	112.7	112.8	112.9	113.5	113.6	113.4	114.3
Housekeeping services	109.1	110.9	110.7	110.9	110.9	111.1	111.2	111.3	111.4	111.4	111.6	111.7	111.8	111.9	115.6
Apparel and upkeep	105.8	110.4	111.4	110.9	109.1	107.1	109.1	112.9	115.2	115.2	112.6	110.3	110.0	113.9	116.3

See footnotes at end of table.

30. Continued— Consumer Price Indexes for All Urban Consumers and for Urban Wage Earners and Clerical Workers: U.S. city average, by expenditure category and commodity or service group

(1982-84=100, unless otherwise indicated)

Series	Annual average		1987									1988			
	1986	1987	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Apparel commodities	104.2	108.8	109.9	109.4	107.4	105.3	107.4	111.5	113.9	113.9	111.1	108.6	108.3	112.4	114.9
Men's and boys' apparel	105.9	108.5	108.3	109.0	108.2	106.9	107.7	109.8	111.5	112.0	110.4	108.6	108.7	111.1	112.2
Women's and girls' apparel	103.8	110.3	113.0	111.4	107.7	104.4	108.2	115.2	118.2	117.6	112.6	108.2	107.9	114.9	118.8
Infants' and toddlers' apparel	113.5	114.0	115.9	115.3	111.7	109.7	110.6	113.9	118.6	118.7	116.4	115.2	113.3	116.0	119.1
Footwear	102.1	105.5	106.1	106.7	105.8	103.9	104.7	106.0	107.9	108.6	108.0	106.8	106.4	107.7	109.6
Other apparel commodities	101.6	107.4	105.5	105.1	107.0	107.3	108.2	109.8	110.4	110.5	110.6	112.2	112.0	112.8	113.9
Apparel services	115.0	119.2	118.4	118.9	119.1	119.5	119.3	119.4	120.3	120.7	120.9	121.1	121.5	121.6	122.0
Transportation	101.7	105.1	103.8	104.4	105.1	105.8	106.3	106.4	106.9	107.6	107.3	106.8	106.4	106.2	106.8
Private transportation	100.9	104.1	102.8	103.4	104.3	104.9	105.5	105.5	106.1	106.7	106.4	105.9	105.6	105.3	105.9
New vehicles	110.4	114.0	113.2	113.5	113.7	113.9	113.5	113.3	114.5	115.9	116.1	115.8	115.7	115.3	115.3
New cars	110.4	114.3	113.3	113.7	114.0	114.4	114.0	113.8	114.9	116.2	116.3	115.9	116.0	115.7	115.7
Used cars	108.8	113.1	111.3	113.4	114.7	115.4	115.5	115.9	116.1	116.4	116.2	115.9	116.0	116.1	116.6
Motor fuel	77.1	80.3	78.5	79.2	80.9	82.3	84.5	84.1	83.3	83.3	82.0	79.7	78.3	77.5	79.4
Gasoline	76.9	80.2	78.5	79.1	80.8	82.2	84.4	84.1	83.2	83.2	81.9	79.5	78.1	77.3	79.2
Maintenance and repair	110.6	115.1	114.6	114.6	114.7	114.9	115.4	116.0	116.3	116.7	117.0	117.4	117.8	118.6	118.9
Other private transportation	113.8	119.0	117.5	117.8	118.5	118.9	118.7	119.1	121.0	122.0	122.0	122.9	123.2	123.1	123.0
Other private transportation commodities	96.3	96.7	95.7	96.4	96.6	96.3	96.7	97.3	97.7	97.2	97.4	98.1	98.0	98.1	97.9
Other private transportation services	117.1	123.4	121.8	122.0	122.8	123.4	123.1	123.4	125.8	127.1	127.1	128.0	128.5	128.2	128.3
Public transportation	116.8	120.4	120.3	120.3	119.7	119.7	120.8	121.4	120.7	121.2	121.3	121.2	120.4	120.8	121.7
Medical care	122.0	130.2	128.8	129.3	130.0	130.8	131.4	132.0	132.6	133.0	133.4	134.6	135.8	136.5	137.1
Medical care commodities	122.2	130.2	128.2	129.1	130.1	130.9	131.3	131.9	132.6	133.4	134.1	134.7	135.4	136.1	137.2
Medical care services	122.0	130.3	128.9	129.3	130.0	130.8	131.4	132.0	132.6	133.0	133.2	134.6	135.8	136.6	137.1
Professional services	120.9	129.0	127.6	128.1	128.9	129.6	130.2	130.9	131.4	131.7	132.0	133.4	134.7	135.5	136.1
Hospital and related services	122.6	131.1	129.1	129.5	130.0	131.4	132.4	132.8	133.7	134.9	135.4	136.9	138.4	139.3	140.1
Entertainment	111.0	114.8	114.0	114.4	114.5	115.0	115.1	115.6	116.3	116.7	116.9	117.4	117.6	118.2	118.9
Entertainment commodities	107.8	110.6	110.0	110.5	110.5	110.9	110.8	110.9	111.3	112.2	112.6	112.8	112.9	113.5	114.2
Entertainment services	116.5	121.8	120.8	121.1	121.2	121.8	122.2	123.2	124.3	124.1	124.0	124.9	125.2	126.0	126.5
Other goods and services	120.9	127.8	125.9	126.2	126.6	127.5	128.0	130.3	130.8	131.0	131.3	132.7	133.6	134.0	134.2
Tobacco products	124.8	133.7	131.7	131.8	132.5	135.1	135.4	136.0	136.5	136.7	137.2	141.0	142.3	143.0	143.1
Personal care	111.9	115.0	114.1	114.7	114.8	115.1	115.4	115.8	116.1	116.2	116.4	117.1	117.5	117.7	118.1
Toilet goods and personal care appliances	111.2	113.9	113.1	113.6	113.6	114.1	114.3	114.6	115.0	115.0	115.1	116.0	116.2	116.5	117.0
Personal care services	112.6	116.1	115.0	115.9	116.0	116.2	116.7	117.1	117.3	117.4	117.8	118.3	118.9	119.0	119.3
Personal and educational expenses	128.5	138.2	135.9	136.1	136.4	136.7	137.4	141.8	142.4	142.8	143.0	143.4	144.3	144.6	144.7
School books and supplies	127.8	137.9	136.2	136.3	136.4	136.4	136.6	140.7	141.8	141.8	141.9	143.9	145.3	145.2	145.4
Personal and educational services	128.6	138.4	136.1	136.3	136.7	137.0	137.7	142.1	142.7	143.1	143.3	143.6	144.5	144.8	144.9
All items	108.6	112.5	111.6	111.9	112.4	112.7	113.3	113.8	114.1	114.3	114.2	114.5	114.7	115.1	115.7
Commodities	103.9	107.3	106.7	107.0	107.3	107.3	107.9	108.5	108.9	109.1	108.9	108.8	108.7	109.3	110.1
Food and beverages	108.9	113.3	112.6	113.1	113.6	113.5	113.6	114.0	114.1	114.1	114.5	115.4	115.5	115.7	116.3
Commodities less food and beverages	100.8	103.6	103.0	103.3	103.4	103.5	104.3	105.1	105.7	106.0	105.4	104.7	104.5	105.3	106.3
Nondurables less food and beverages	97.3	100.8	100.2	100.4	100.4	100.4	101.8	103.1	103.8	104.0	102.8	101.7	101.4	102.7	104.3
Apparel commodities	104.2	108.8	109.9	109.4	107.4	105.3	107.4	111.5	113.9	113.9	111.1	108.6	108.3	112.4	114.9
Nondurables less food, beverages, and apparel	95.3	99.2	97.9	98.4	99.3	100.3	101.4	101.5	101.3	101.6	101.2	100.8	100.5	100.4	101.6
Durables	104.9	106.6	106.0	106.4	106.6	106.9	106.8	106.9	107.4	108.0	108.0	107.9	107.9	108.0	108.1
Services	114.7	119.4	118.1	118.5	119.3	119.7	120.4	120.9	121.1	121.2	121.3	122.0	122.5	122.8	123.1
Rent of shelter (12/84=100)	109.0	114.0	113.0	113.4	113.5	114.0	114.9	115.2	115.9	116.1	116.4	117.1	117.5	118.0	118.2
Household services less rent of shelter (12/84=100)	103.9	104.0	102.4	103.2	105.7	105.9	106.6	106.3	104.2	103.4	103.1	103.5	103.9	103.8	104.4
Transportation services	115.4	120.8	119.7	119.8	120.2	120.6	120.7	121.2	122.5	123.5	123.6	124.1	124.4	124.5	124.8
Medical care services	122.0	130.3	128.9	129.3	130.0	130.8	131.4	132.0	132.6	133.0	133.2	134.6	135.8	136.6	137.1
Other services	118.7	124.7	123.2	123.5	123.7	124.1	124.6	126.9	127.7	127.8	127.9	128.5	129.0	129.5	129.8
Special indexes:															
All items less food	108.5	112.2	111.3	111.6	112.1	112.4	113.1	113.7	114.0	114.3	114.1	114.2	114.4	115.0	115.5
All items less shelter	107.4	111.0	110.1	110.5	111.1	111.2	111.8	112.4	112.6	112.7	112.5	112.7	112.8	113.2	113.9
All items less homeowners' costs (12/84=100)	102.8	106.4	105.5	105.9	106.4	106.6	107.1	107.7	107.8	108.0	107.8	108.0	108.1	108.6	109.2
All items less medical care	107.8	111.5	110.6	111.0	111.5	111.7	112.3	112.9	113.1	113.3	113.2	113.4	113.6	114.0	114.6
Commodities less food	101.2	103.9	103.3	103.6	103.7	103.8	104.6	105.4	105.9	106.3	105.6	105.0	104.9	105.7	106.6
Nondurables less food	98.0	101.4	100.8	101.0	101.0	101.1	102.4	103.6	104.2	104.4	103.3	102.4	102.2	103.4	104.9
Nondurables less food and apparel	96.4	100.0	98.7	99.2	100.0	101.0	101.9	102.0	101.9	102.2	101.8	101.5	101.4	101.4	102.5
Nondurables	103.3	107.2	106.6	106.9	107.2	107.2	107.9	108.8	109.2	109.2	108.8	108.8	108.7	109.4	110.5
Services less rent of shelter (12/84=100)	107.1	110.8	109.5	109.9	111.1	111.5	112.0	112.5	112.2	112.2	112.2	112.8	113.2	113.4	113.9
Services less medical care	113.9	118.2	116.9	117.4	118.1	118.5	119.2	119.7	119.9	119.9	120.1	120.7	121.1	121.4	121.7
Energy	87.4	88.0	85.8	86.8	90.1	90.5	92.2	91.8	89.3	88.6	87.8	86.8	86.3	85.8	86.7
All items less energy	111.5	116.0	115.3	115.6	115.7	115.9	116.4	117.1	117.7	118.0	118.0	118.5	118.7	119.3	119.9
All items less food and energy	112.3	116.8	116.0	116.3	116.3	116.6	117.2	117.9	118.7	119.1	119.0	119.3	119.6	120.3	120.8
Commodities less food and energy	107.6	110.8	110.5	110.7	110.5	110.3	110.8	111.8	112.7	113.1	112.6	112.3	112.4	113.5	114.3
Energy commodities	77.2	80.3	78.6	79.2	80.7	82.0	84.1	83.8	83.0	83.2	82.1	80.0	78.7	77.9	79.7
Services less energy	115.8	121.2	120.1	120.4	120.6	121.1	121.8	122.4	123.1	123.4	123.7	124.3	124.8	125.2	125.6
Purchasing power of the consumer dollar:															
1982-84=$1.00	92.0	89.0	89.6	89.3	88.9	88.7	88.2	87.8	87.6	87.4	87.5	87.3	87.2	86.8	86.4
1967=$1.00	30.9	29.9	30.1	30.0	29.9	29.8	29.6	29.5	29.4	29.4	29.4	29.3	29.3	29.2	29.0

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

(1982-84=100, unless otherwise indicated)

Area[1]	Pricing schedule[2]	Other index base	All Urban Consumers							Urban Wage Earners						
			1987			1988				1987			1988			
			Apr.	May	Dec.	Jan.	Feb.	Mar.	Apr.	Apr.	May	Dec.	Jan.	Feb.	Mar.	Apr.
U.S. city average	M	-	112.7	113.1	115.4	115.7	116.0	116.5	117.1	111.6	111.9	114.2	114.5	114.7	115.1	115.7
Region and area size[3]																
Northeast urban	M	-	115.0	115.4	118.3	118.9	119.2	119.6	120.4	114.1	114.5	117.4	117.9	118.1	118.4	119.2
Size A - More than 1,200,000	M	-	115.7	116.2	119.4	120.0	119.9	120.4	121.3	114.1	114.7	117.8	118.1	118.0	118.5	119.3
Size B - 500,000 to 1,200,000	M	-	113.3	113.6	115.6	116.2	117.0	117.5	118.2	112.3	112.6	114.5	115.1	116.0	116.4	117.0
Size C - 50,000 to 500,000	M	-	113.8	113.8	116.2	117.1	117.2	117.2	118.2	116.1	116.3	118.8	119.6	119.8	119.8	120.7
North Central urban	M	-	110.9	111.1	113.3	113.4	113.7	114.3	114.9	109.0	109.3	111.4	111.5	111.8	112.3	113.0
Size A - More than 1,200,000	M	-	111.5	111.7	113.9	114.1	114.7	115.1	115.7	109.1	109.3	111.4	111.6	112.1	112.5	113.1
Size B - 360,000 to 1,200,000	M	-	111.1	111.1	113.0	113.3	113.5	114.2	115.0	108.4	108.5	110.7	110.9	111.1	111.8	112.6
Size C - 50,000 to 360,000	M	-	110.6	111.1	113.6	113.4	113.4	114.6	115.2	109.5	110.0	112.6	112.4	112.3	113.4	114.0
Size D - Nonmetropolitan (less than 50,0000	M	-	108.9	109.1	110.9	110.6	110.5	111.1	111.8	108.5	108.7	110.7	110.4	110.2	110.6	111.3
South urban	M	-	111.5	111.8	114.0	114.1	114.4	114.8	115.4	110.9	111.3	113.5	113.6	113.8	114.2	114.7
Size A - More than 1,200,000	M	-	112.4	112.8	114.9	114.9	115.2	115.5	116.0	111.6	112.0	114.2	114.1	114.4	114.7	115.1
Size B - 450,000 to 1,200,000	M	-	112.1	112.2	114.5	114.8	115.1	115.8	116.3	110.3	110.5	112.7	112.9	113.0	113.6	114.1
Size C - 50,000 to 450,000	M	-	110.7	111.1	112.8	113.3	113.4	114.0	114.5	111.1	111.5	113.3	113.6	113.8	114.3	114.9
Size D - Nonmetropolitan (less than 50,000)	M	-	109.6	110.2	112.6	112.8	112.7	112.7	113.6	110.3	110.9	113.3	113.5	113.4	113.4	114.2
West urban	M	-	113.7	114.1	116.2	116.7	116.9	117.5	117.9	112.6	113.0	115.0	115.5	115.6	116.2	116.6
Size A - More than 1,250,000	M	-	114.8	115.3	117.2	117.9	118.2	118.9	119.2	112.5	113.0	114.8	115.3	115.6	116.2	116.6
Size B - 330,000 to 1,250,000	M	-	112.3	112.6	115.0	115.8	115.6	115.9	-	112.5	112.9	115.2	116.0	115.7	116.0	-
Size C - 50,000 to 330,000	M	-	113.3	112.9	116.0	116.0	115.9	116.2	116.8	112.7	112.3	115.4	115.3	115.3	115.6	116.2
Size classes:																
A	M	12/86	102.2	102.5	104.7	105.0	105.3	105.7	106.3	102.2	102.6	104.7	105.0	105.2	105.6	106.1
B	M	-	112.2	112.3	114.5	115.0	115.2	115.8	116.4	110.8	111.1	113.2	113.6	113.8	114.3	114.9
C	M	-	111.7	111.9	114.2	114.5	114.6	115.1	115.8	112.0	112.2	114.6	114.8	114.9	115.4	116.1
D	M	-	110.0	110.5	112.7	112.9	113.1	113.5	114.1	110.2	110.7	113.1	113.2	113.4	113.7	114.3
Selected local areas																
Chicago, IL-Northwestern IN	M	-	112.8	113.3	115.7	115.3	116.6	116.9	117.1	109.5	109.9	112.2	111.9	112.9	113.2	113.3
Los Angeles-Long Beach, Anaheim, CA	M	-	116.0	116.8	118.5	118.9	119.7	120.6	121.1	113.3	114.1	115.7	115.9	116.6	117.5	118.0
New York, NY-Northeastern NJ	M	-	116.6	117.3	120.6	121.3	121.1	121.5	122.6	115.3	116.0	119.1	119.6	119.3	119.7	120.6
Philadelphia, PA-NJ	M	-	115.5	116.4	118.9	119.3	119.3	119.6	120.0	115.3	116.2	119.0	119.3	119.0	119.5	119.8
San Francisco-Oakland, CA	M	-	114.8	115.0	117.4	118.4	117.9	119.1	118.7	113.9	113.9	116.4	117.5	117.0	117.9	117.8
Baltimore, MD	1	-	-	113.7	-	116.8	-	117.7	-	-	113.2	-	116.2	-	117.3	-
Boston, MA	1	-	-	115.3	-	120.1	-	122.1	-	-	115.2	-	120.2	-	121.8	-
Cleveland, OH	1	-	-	111.6	-	113.9	-	115.1	-	-	107.0	-	109.3	-	110.2	-
Miami, FL	1	-	-	111.1	-	114.5	-	115.1	-	-	110.3	-	113.8	-	114.3	-
St. Louis, MO-IL	1	-	-	111.3	-	113.4	-	114.2	-	-	110.9	-	113.0	-	113.8	-
Washington, DC-MD-VA	1	-	-	115.3	-	118.3	-	119.2	-	-	114.6	-	117.6	-	118.5	-
Dallas-Ft. Worth, TX	2	-	112.2	-	113.9	-	114.0	-	115.4	111.7	-	113.8	-	113.8	-	114.8
Detroit, MI	2	-	111.2	-	112.6	-	113.7	-	114.4	108.6	-	109.8	-	110.9	-	111.9
Houston, TX	2	-	106.4	-	107.3	-	108.0	-	108.2	106.1	-	107.4	-	108.1	-	108.1
Pittsburgh, PA	2	-	110.8	-	113.0	-	113.3	-	114.5	106.4	-	108.6	-	108.9	-	110.1

[1] Area is the Consolidated Metropolitan Statistical Area (CMSA), exclusive of farms and military. Area definitions are those established by the Office of Management and Budget in 1983, except for Boston-Lawrence-Salem, MA-NH Area (excludes Monroe County); and Milwaukee, WI Area (includes only the Milwaukee MSA). Definitions do not include revisions made since 1983.

[2] Foods, fuels, and several other items priced every month in all areas; most other goods and services priced as indicated:.

M - Every month.

1 - January, March, May, July, September, and November.

2 - February, April, June, August, October, and December.

[3] Regions are defined as the four Census regions.

- Data not available.

NOTE: Local area CPI indexes are byproducts of the national CPI program. Because each local index is a small subset of the national index, it has a smaller sample size and is, therefore, subject to substantially more sampling and other measurement error than the national index. As a result, local area indexes show greater volatility than the national index, although their long-term trends are quite similar. Therefore, the Bureau of Labor Statistics strongly urges users to consider adopting the national average CPI for use in escalator clauses.

32. Annual data: Consumer Price Index, U.S. city average, all items and major groups

(1982-84=100)

Series	1979	1980	1981	1982	1983	1984	1985	1986	1987
Consumer Price Index for All Urban Consumers:									
All items:									
Index	72.6	82.4	90.9	96.5	99.6	103.9	107.6	109.6	113.6
Percent change	11.3	13.5	10.3	6.2	3.2	4.3	3.6	1.9	3.6
Food and beverages:									
Index	79.9	86.7	93.5	97.3	99.5	103.2	105.6	109.1	113.5
Percent change	10.7	8.5	7.8	4.1	2.3	3.7	2.3	3.3	4.0
Housing:									
Index	70.1	81.1	90.4	96.9	99.5	103.6	107.7	110.9	114.2
Percent change	12.3	15.7	11.5	7.2	2.7	4.1	4.0	3.0	3.0
Apparel and upkeep:									
Index	84.9	90.9	95.3	97.8	100.2	102.1	105.0	105.9	110.6
Percent change	4.3	7.1	4.8	2.6	2.5	1.9	2.8	.9	4.4
Transportation:									
Index	70.5	83.1	93.2	97.0	99.3	103.7	106.4	102.3	105.4
Percent change	14.3	17.9	12.2	4.1	2.4	4.4	2.6	-3.9	3.0
Medical care:									
Index	67.5	74.9	82.9	92.5	100.6	106.8	113.5	122.0	130.1
Percent change	9.2	11.0	10.7	11.6	8.8	6.2	6.3	7.5	6.6
Entertainment:									
Index	76.7	83.6	90.1	96.0	100.1	103.8	107.9	111.6	115.3
Percent change	6.7	9.0	7.8	6.5	4.3	3.7	3.9	3.4	3.3
Other goods and services:									
Index	68.9	75.2	82.6	91.1	101.1	107.9	114.5	121.4	128.5
Percent change	7.2	9.1	9.8	10.3	11.0	6.7	6.1	6.0	5.8
Consumer Price Index for Urban Wage Earners and Clerical Workers:									
All items:									
Index	73.1	82.9	91.4	96.9	99.8	103.3	106.9	108.6	112.5
Percent change	11.4	13.4	10.3	6.0	3.0	3.5	3.5	1.6	3.6

33. Producer Price Indexes, by stage of processing

(1982=100)

Grouping	Annual average		1987								1988			
	1986	1987	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Finished goods	103.2	105.4	105.4	105.5	106.0	105.9	105.7	106.2	106.3	105.8	106.2	105.9	106.2	106.9
Finished consumer goods	101.4	103.6	103.7	103.9	104.4	104.3	104.2	104.4	104.5	104.0	104.3	104.0	104.3	105.1
Finished consumer foods	107.3	109.5	110.6	110.6	110.9	109.5	110.5	109.7	109.8	108.9	110.6	109.4	110.0	110.2
Finished consumer goods excluding foods	98.5	100.7	100.3	100.6	101.2	101.8	101.1	101.9	101.9	101.6	101.3	101.3	101.4	102.5
Nondurable goods less food	93.3	94.9	94.4	94.8	95.7	96.6	96.1	95.8	95.9	95.9	95.3	95.4	95.4	96.9
Durable goods	108.9	111.5	111.2	111.2	111.3	110.9	110.0	113.4	113.0	112.2	112.5	112.5	112.7	112.8
Capital equipment	109.7	111.7	111.6	111.4	111.6	111.7	111.2	112.5	112.5	112.4	112.7	112.9	113.2	113.6
Intermediate materials, supplies, and components	99.1	101.5	100.9	101.5	102.1	102.5	102.7	103.1	103.4	103.6	104.2	104.1	104.6	105.5
Materials and components for manufacturing	102.2	105.3	104.6	105.1	105.5	105.8	106.3	107.2	107.5	108.1	109.3	109.5	110.4	111.5
Materials for food manufacturing	98.4	100.8	102.7	102.3	102.7	101.5	102.8	101.9	100.6	99.9	102.0	101.9	101.7	102.8
Materials for nondurable manufacturing	98.1	102.2	101.3	102.5	102.6	102.9	103.4	104.5	104.9	105.5	107.0	107.6	109.5	110.9
Materials for durable manufacturing	101.2	106.2	104.5	104.9	106.2	107.1	108.1	110.2	111.1	112.9	114.4	113.9	114.5	116.6
Components for manufacturing	107.5	108.8	108.5	108.5	108.7	108.8	109.0	109.3	109.5	109.8	110.3	110.7	111.1	111.4
Materials and components for construction	108.1	109.8	108.9	109.3	109.8	110.2	110.7	111.2	111.9	112.4	113.5	113.7	114.2	115.0
Processed fuels and lubricants	72.7	73.3	72.5	74.5	76.0	77.3	75.9	74.6	74.4	72.9	71.2	70.2	69.7	70.5
Containers	110.3	114.5	114.0	114.2	114.2	114.4	115.4	116.1	116.5	116.1	116.7	116.9	117.5	118.2
Supplies	105.6	107.7	107.3	107.6	107.8	107.8	108.2	108.8	109.5	109.9	110.6	110.5	111.1	111.7
Crude materials for further processing	87.7	93.7	94.8	95.1	96.0	96.5	95.7	95.3	94.7	94.4	93.4	94.6	94.1	95.7
Foodstuffs and feedstuffs	93.2	96.2	101.6	99.7	98.4	97.1	96.6	96.1	95.3	95.9	96.9	99.6	99.7	101.2
Crude nonfood materials	81.6	87.9	86.4	88.0	90.3	91.8	90.8	90.5	90.1	89.2	87.1	87.3	86.4	88.0
Special groupings														
Finished goods, excluding foods	101.9	104.0	103.7	103.9	104.3	104.7	104.2	105.1	105.1	104.9	104.7	104.8	105.0	105.8
Finished energy goods	63.0	61.8	61.6	62.5	63.4	64.9	63.4	62.4	62.5	61.4	59.0	58.4	58.1	60.9
Finished goods less energy	109.7	112.3	112.4	112.3	112.7	112.3	112.4	113.1	113.2	112.9	113.8	113.6	114.0	114.3
Finished consumer goods less energy	109.7	112.5	112.6	112.7	113.1	112.6	112.8	113.4	113.4	113.1	114.2	113.9	114.3	114.5
Finished goods less food and energy	110.6	113.3	113.0	112.9	113.3	113.4	113.1	114.5	114.5	114.5	115.0	115.3	115.6	115.9
Finished consumer goods less food and energy	111.1	114.2	113.7	113.7	114.2	114.3	114.1	115.6	115.6	115.7	116.3	116.7	117.0	117.2
Consumer nondurable goods less food and energy	113.1	116.3	115.6	115.7	116.5	116.9	117.3	117.4	117.6	118.4	119.2	119.8	120.2	120.5
Intermediate materials less foods and feeds	99.3	101.7	100.9	101.6	102.2	102.7	102.8	103.2	103.6	103.7	104.2	104.2	104.8	105.7
Intermediate foods and feeds	96.2	99.2	100.4	100.7	100.7	99.6	101.0	100.6	101.4	102.0	103.1	101.7	102.0	103.5
Intermediate energy goods	72.6	73.0	72.2	74.1	75.7	77.0	75.6	74.4	74.1	72.7	70.9	70.0	69.4	70.2
Intermediate goods less energy	104.5	107.3	106.7	107.1	107.4	107.7	108.3	109.1	109.5	110.1	110.9	111.1	111.8	112.8
Intermediate materials less foods and energy	104.9	107.8	107.0	107.5	107.9	108.2	108.7	109.6	110.1	110.6	111.7	111.9	112.8	113.7
Crude energy materials	71.8	75.0	74.5	75.6	77.8	78.9	76.7	75.4	74.7	73.6	70.7	70.5	68.8	70.5
Crude materials less energy	95.4	100.9	103.5	102.8	102.4	102.3	103.0	103.6	103.1	103.7	104.8	107.2	107.9	109.2
Crude nonfood materials less energy	103.1	115.7	110.5	113.5	115.7	118.7	122.9	126.4	127.1	127.3	128.6	130.6	132.8	133.6

34. Producer Price indexes, by durability of product

(1982=100)

Grouping	Annual average		1987								1988			
	1986	1987	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Total durable goods	107.5	109.9	109.2	109.3	109.7	110.0	110.2	111.4	111.7	112.0	112.6	112.8	113.2	113.8
Total nondurable goods	94.8	97.5	97.6	98.2	98.8	99.0	98.8	98.5	98.6	98.3	98.5	98.5	98.7	99.8
Total manufactures	101.7	104.4	104.0	104.3	104.8	105.1	105.1	105.8	106.0	106.0	106.5	106.5	107.0	107.8
Durable	107.5	109.6	109.1	109.1	109.4	109.7	109.7	110.9	111.1	111.4	112.0	112.1	112.5	113.1
Nondurable	96.0	99.2	98.9	99.5	100.1	100.5	100.4	100.7	100.9	100.6	101.0	101.0	101.6	102.6
Total raw or slightly processed goods	92.3	94.2	94.8	95.4	96.2	96.2	95.9	94.9	94.7	94.5	94.1	94.2	93.8	94.9
Durable	107.8	122.6	114.6	118.6	121.8	125.7	130.9	137.3	138.0	138.3	139.5	143.4	145.7	146.6
Nondurable	91.5	92.9	93.8	94.2	95.0	94.7	94.3	92.9	92.6	92.4	92.0	91.9	91.4	92.5

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

(1982=100)

Index	1978	1979	1980	1981	1982	1983	1984	1985	1986
Finished goods:									
Total	69.8	77.6	88.0	96.1	100.0	101.6	103.7	104.7	103.2
Consumer goods	69.4	77.5	88.6	96.6	100.0	101.3	103.3	103.8	101.4
Capital equipment	71.3	77.5	85.8	94.6	100.0	102.8	105.2	107.5	109.7
Intermediate materials, supplies, and components:									
Total	69.5	78.4	90.3	98.6	100.0	100.6	103.1	102.7	99.1
Materials and components for manufacturing	72.0	80.9	91.7	98.7	100.0	101.2	104.1	103.3	102.2
Materials and components for construction	76.5	84.2	91.3	97.9	100.0	102.8	105.6	107.3	108.1
Processed fuels and lubricants	49.9	61.6	85.0	100.6	100.0	95.4	95.7	92.8	72.7
Containers	71.0	79.4	89.1	96.7	100.0	100.4	105.9	109.0	110.3
Supplies	72.9	80.2	89.9	96.9	100.0	101.8	104.1	104.4	105.6
Crude materials for further processing:									
Total	73.4	85.9	95.3	103.0	100.0	101.3	103.5	95.8	87.7
Foodstuffs and feedstuffs	87.3	100.0	104.6	103.9	100.0	101.8	104.7	94.8	93.2
Nonfood materials except fuel	57.5	69.6	84.6	101.8	100.0	100.7	102.2	96.9	81.6
Fuel	48.2	57.3	69.4	84.8	100.0	105.1	105.1	102.7	92.2

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

(June 1977=100, unless otherwise indicated)

Category	1974 SITC	1985		1986				1987				1988
		Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
ALL COMMODITIES (9/83=100)		99.6	99.7	99.4	99.1	97.9	99.0	99.9	102.2	102.8	104.9	106.4
Food (3/83=100)	0	97.3	100.7	97.2	97.1	86.0	90.1	87.3	89.9	86.7	94.6	95.2
Meat (3/83=100)	01	99.7	103.6	102.5	105.2	111.3	114.5	115.0	121.2	118.8	116.8	122.8
Fish (3/83=100)	03	100.7	100.6	100.2	108.6	111.9	115.9	117.1	125.8	131.1	138.5	139.7
Grain and grain preparations (3/80=100)	04	93.8	98.8	91.7	89.0	66.3	72.5	68.3	71.0	67.8	77.4	79.8
Vegetables and fruit (3/83=100)	05	104.8	98.2	98.6	108.6	114.6	117.5	115.3	112.4	101.1	100.5	97.5
Feedstuffs for animals (3/83=100)	08	101.7	114.0	120.0	114.8	123.9	119.7	117.0	123.8	123.1	145.2	134.6
Misc. food products (3/83=100)	09	99.9	99.5	98.0	97.0	98.7	99.9	100.1	100.6	100.3	100.3	102.3
Beverages and tobacco (6/83=100)	1	100.2	99.4	96.6	97.4	97.3	102.6	102.6	105.0	105.5	107.0	109.6
Beverages (9/83=100)	11	–	–	–	–	–	–	–	–	–	–	–
Tobacco and tobacco products (6/83=100)	12	100.2	99.5	96.3	97.1	97.0	102.6	102.6	105.0	105.5	107.0	109.8
Crude materials (6/83=100)	2	98.3	98.1	101.4	102.2	99.6	102.4	105.7	114.5	118.7	125.2	129.7
Raw hides and skins (6/80=100)	21	100.8	110.0	108.7	117.1	108.3	115.9	131.9	149.6	147.7	157.1	171.4
Oilseeds and oleaginous fruit (9/77=100)	22	94.9	94.7	99.1	98.1	97.5	95.2	90.4	101.6	95.1	109.6	115.6
Crude rubber (including synthetic and reclaimed) (9/83=100)	23	100.6	99.7	99.7	99.9	99.6	98.9	99.9	101.0	102.8	105.3	104.5
Wood	24	98.0	101.9	101.5	101.2	102.9	107.9	111.2	116.2	141.7	146.0	150.2
Pulp and waste paper (6/83=100)	25	97.3	96.7	104.2	116.4	129.0	129.4	144.2	149.9	153.0	160.4	169.6
Textile fibers	26	101.7	96.4	100.2	98.0	73.0	90.9	97.8	112.4	116.5	111.6	107.5
Crude fertilizers and minerals	27	100.8	99.2	100.0	98.4	98.0	96.8	94.4	94.0	91.6	91.6	92.4
Metalliferous ores and metal scrap	28	97.4	94.8	100.3	98.0	100.4	96.8	98.8	107.0	117.4	125.9	131.0
Mineral fuels	3	99.5	97.0	83.6	76.8	77.4	77.8	81.3	82.8	84.6	82.5	79.4
Animal and vegetables oils, fats, and waxes	4	91.2	82.5	74.3	67.7	62.1	71.8	73.9	78.8	78.5	81.6	92.7
Fixed vegetable oils and fats (6/83=100)	42	93.3	80.3	71.3	70.6	60.2	64.6	67.3	71.9	71.2	75.4	85.7
Chemicals (3/83=100)	5	100.2	99.6	99.8	98.0	95.7	95.2	99.6	106.7	107.7	112.9	117.9
Organic chemicals (12/83=100)	51	101.0	99.2	98.5	93.1	91.6	92.4	101.9	118.4	116.1	123.5	135.1
Fertilizers, manufactured (3/83=100)	56	99.9	100.5	98.9	93.0	85.1	77.4	85.6	91.6	100.9	106.5	110.6
Intermediate manufactured products (9/81=100)	6	99.8	99.8	101.3	102.5	103.8	104.2	106.4	107.9	110.3	111.2	114.4
Leather and furskins (9/79=100)	61	97.0	98.0	97.3	103.8	104.2	107.8	123.6	126.9	128.7	118.0	125.7
Rubber manufactures	62	99.5	99.7	100.7	100.1	100.5	100.9	102.0	102.5	103.9	104.1	105.2
Paper and paperboard products (6/78=100)	64	99.2	97.9	100.5	104.7	109.1	110.8	114.7	117.0	120.1	122.4	126.2
Iron and steel (3/82=100)	67	99.7	100.9	100.3	100.2	102.3	101.9	102.9	102.9	100.7	102.9	106.1
Nonferrous metals (9/81=100)	68	99.3	98.9	104.2	103.1	105.3	102.6	106.6	113.0	123.0	124.4	134.0
Metal manufactures, n.e.s. (3/82=100)	69	100.0	100.2	100.4	100.8	100.8	100.8	101.5	101.3	102.3	103.4	104.5
Machinery and transport equipment, excluding military and commercial aircraft (12/78=100)	7	100.1	100.2	100.7	100.8	101.0	101.6	101.7	101.8	102.1	102.4	103.2
Power generating machinery and equipment (12/78=100)	71	100.1	101.3	102.3	102.4	102.5	103.7	104.6	103.7	104.8	105.2	107.1
Machinery specialized for particular industries (9/78=100)	72	100.2	100.4	100.6	100.3	100.4	100.6	100.0	100.1	100.5	100.9	102.1
Metalworking machinery (6/78=100)	73	100.4	101.3	101.9	102.0	103.0	104.2	105.8	106.7	107.8	108.2	109.3
General industrial machines and parts n.e.s. 9/78=100)	74	100.4	100.4	100.9	101.6	102.5	103.3	104.2	104.5	104.6	105.4	107.0
Office machines and automatic data processing equipment	75	99.7	99.1	99.9	99.0	98.8	98.2	96.0	96.1	95.7	95.5	95.8
Telecommunications, sound recording and reproducing equipment	76	99.9	100.1	99.2	98.9	99.7	101.3	101.9	101.4	101.4	101.9	102.3
Electrical machinery and equipment	77	100.0	98.9	99.5	99.2	99.7	100.3	101.7	102.1	102.5	101.8	103.1
Road vehicles and parts (3/80=100)	78	100.1	100.9	101.0	101.7	101.9	103.3	103.1	103.5	103.8	104.6	104.5
Other transport equipment, excl. military and commercial aviation	79	100.8	101.1	102.1	103.1	102.8	103.5	104.5	105.5	105.8	106.6	107.4
Other manufactured articles	8	100.1	100.3	102.3	103.5	103.4	103.8	104.6	105.2	105.4	105.6	106.8
Apparel (9/83=100)	84	–	–	–	–	–	–	–	–	–	–	–
Professional, scientific, and controlling instruments and apparatus	87	100.5	100.6	102.0	103.1	103.0	103.5	104.4	105.5	106.3	107.1	109.4
Photographic apparatus and supplies, optical goods, watches and clocks (12/77=100)	88	99.2	100.1	101.9	102.6	102.4	102.1	102.7	102.5	99.0	97.9	97.6
Miscellaneous manufactured articles, n.e.s.	89	–	–	–	–	–	–	–	–	–	–	–
Gold, non-monetary (6/83=100)	971	–	–	–	–	–	–	–	–	–	–	–

– Data not available.

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

(June 1977=100, unless otherwise indicated)

Category	1974 SITC	1986				1987				1988
		Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
ALL COMMODITIES (9/82=100)		98.6	98.7	101.1	102.3	106.5	110.0	110.9	112.7	114.1
Food (9/77=100)	0	113.7	107.3	112.0	109.1	105.2	108.3	109.1	112.5	114.1
Meat	01	98.7	96.0	104.3	109.2	105.0	108.0	114.4	113.4	111.5
Dairy products and eggs (6/81=100)	02	108.0	108.7	111.3	113.8	119.3	122.3	121.7	125.1	125.6
Fish	03	107.0	110.5	114.1	119.1	121.8	126.0	130.4	131.0	132.5
Bakery goods, pasta products, grain and grain preparations (9/77=100)	04	110.4	112.5	117.8	118.8	122.3	126.2	124.8	130.7	135.8
Fruits and vegetables	05	97.6	100.0	106.0	104.3	101.9	110.1	110.0	116.2	115.4
Sugar, sugar preparations, and honey (3/82=100)	06	106.8	104.6	106.2	106.5	107.4	109.6	109.0	107.0	109.6
Coffee, tea, cocoa	07	143.7	117.2	121.5	104.9	89.9	87.0	85.1	90.6	94.3
Beverages and tobacco	1	103.4	105.2	103.9	106.8	107.8	112.8	112.2	113.5	116.0
Beverages	11	104.4	106.1	107.5	109.5	112.1	114.2	114.8	116.2	118.7
Crude materials	2	103.2	106.4	109.5	109.1	115.1	116.2	120.3	122.1	129.2
Crude rubber (inc. synthetic & reclaimed) (3/84=100)	23	104.8	99.5	97.7	98.4	98.4	103.7	110.7	120.1	121.7
Wood (9/81=100)	24	101.8	104.3	107.6	104.8	113.5	110.2	117.4	108.8	112.4
Pulp and waste paper (12/81=100)	25	94.1	100.3	108.0	116.9	127.0	132.0	133.4	141.0	151.0
Crude fertilizers and crude minerals (12/83=100)	27	99.5	99.0	98.4	98.6	98.2	99.6	99.2	99.9	100.4
Metalliferous ores and metal scrap (3/84=100)	28	112.1	121.6	124.8	118.3	122.8	124.5	128.7	137.9	151.2
Crude vegetable and animal materials, n.e.s.	29	111.4	111.3	112.4	111.9	113.0	109.0	107.6	118.3	135.8
Fuels and related products (6/82=100)	3	60.8	51.5	52.2	55.9	67.4	74.1	74.3	67.2	61.8
Petroleum and petroleum products (6/82=100)	33	58.4	49.0	50.0	55.0	67.4	74.4	75.2	67.8	62.0
Fats and oils (9/83=100)	4	68.3	66.7	61.2	83.4	82.9	87.9	96.4	102.1	106.4
Vegetable oils (9/83=100)	42	–	–	–	–	–	–	–	–	–
Chemicals (9/82=100)	5	100.3	99.7	99.8	99.0	102.6	104.8	105.6	110.1	114.2
Medicinal and pharmaceutical products (3/84=100)	54	109.5	111.2	115.9	113.6	120.1	123.4	124.3	126.3	135.3
Manufactured fertilizers (3/84=100)	56	91.4	93.0	89.8	89.9	92.9	94.6	109.3	133.6	133.7
Chemical materials and products, n.e.s. (9/84=100)	59	108.8	110.1	111.3	112.7	115.1	117.7	120.6	124.8	138.7
Intermediate manufactured products (12/77=100)	6	102.1	103.6	105.8	106.7	108.6	112.5	116.3	121.3	125.4
Leather and furskins	61	105.3	106.3	108.8	107.2	110.9	116.6	117.8	124.4	131.8
Rubber manufactures, n.e.s.	62	100.2	101.2	102.0	101.8	104.3	104.6	103.2	104.6	106.0
Cork and wood manufactures	63	108.0	111.0	112.7	117.4	118.0	124.3	128.3	128.2	133.8
Paper and paperboard products	64	100.5	100.8	101.0	104.9	104.8	104.9	110.3	112.3	117.2
Textiles	65	103.9	105.4	107.4	107.9	110.4	111.8	114.6	118.6	120.0
Nonmetallic mineral manufactures, n.e.s.	66	106.9	110.5	116.6	117.9	120.5	126.7	130.4	133.4	137.4
Iron and steel (9/78=100)	67	99.1	98.9	100.0	100.9	102.7	106.6	109.4	114.0	120.0
Nonferrous metals (12/81=100)	68	98.0	98.9	103.3	101.5	102.5	112.4	120.9	135.7	139.4
Metal manufactures, n.e.s.	69	104.8	107.9	107.7	108.3	112.1	112.7	114.6	117.8	121.1
Machinery and transport equipment (6/81=100)	7	107.0	110.4	113.0	114.4	117.5	119.9	119.9	123.1	125.2
Machinery specialized for particular industries (9/78=100)	72	113.2	116.9	122.7	123.0	130.4	136.1	134.3	142.1	146.8
Metalworking machinery (3/80=100)	73	113.6	113.0	117.7	120.9	126.4	128.1	130.2	135.5	138.5
General industrial machinery and parts, n.e.s. (6/81=100)	74	111.2	116.2	119.9	120.9	127.9	130.8	130.1	137.0	140.3
Office machines and automatic data processing equipment (3/80=100)	75	104.8	109.1	109.9	108.9	110.0	114.0	114.8	118.3	117.9
Telecommunications, sound recording and reproducing apparatus (3/80=100)	76	102.8	106.4	109.2	108.9	110.5	110.3	110.2	112.1	112.8
Electrical machinery and equipment (12/81=100)	77	103.1	106.4	108.8	109.8	112.4	115.8	115.1	118.2	122.4
Road vehicles and parts (6/81=100)	78	107.9	110.8	112.9	116.1	118.6	120.5	120.6	122.6	125.2
Misc. manufactured articles (3/80=100)	8	105.1	106.8	109.7	110.3	114.5	117.8	118.5	121.8	124.1
Plumbing, heating, and lighting fixtures (6/80=100)	81	105.7	108.6	111.1	110.8	111.6	117.0	116.2	121.0	123.4
Furniture and parts (6/80=100)	82	107.1	108.0	110.7	112.3	114.8	119.8	119.0	124.3	125.4
Clothing (9/77=100)	84	100.4	100.7	101.7	102.6	106.4	109.2	111.9	112.3	115.0
Footwear	85	107.1	108.0	110.7	112.3	114.8	119.8	119.0	124.3	125.4
Professional, scientific, and controlling instruments and apparatus (12/79=100)	87	112.1	117.9	122.6	122.5	131.3	135.9	132.7	138.7	140.0
Photographic apparatus and supplies, optical goods, watches, and clocks (3/80=100)	88	110.5	113.8	118.0	119.0	123.7	126.0	122.1	127.3	129.2
Misc. manufactured articles, n.e.s. (6/82=100)	89	–	–	–	–	–	–	–	–	–
Gold, non-monetary (6/82=100)	971	–	–	–	–	–	–	–	–	–

– Data not available.

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

(September 1983 = 100 unless otherwise indicated)

Category	Percentage of 1980 trade value	1986				1987				1988
		Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
Foods, feeds, and beverages	16.294	96.7	96.2	87.2	90.2	87.4	91.5	88.0	96.6	98.4
Raw materials	30.696	97.7	96.0	95.1	96.3	100.8	106.1	109.1	111.8	114.2
Capital goods (12/82=100)	30.186	100.6	100.6	100.7	101.1	101.4	101.6	101.8	102.1	103.3
Automotive vehicles, parts and engines (12/82=100)	7.483	101.2	101.9	102.3	103.5	103.4	103.6	104.0	104.5	104.3
Consumer goods	7.467	102.2	103.3	103.6	105.2	105.9	106.3	106.9	108.0	110.1
Durables	3.965	101.1	102.8	102.9	104.9	105.5	106.6	107.3	107.9	110.5
Nondurables	3.501	103.7	103.7	103.8	104.3	105.4	104.3	104.6	106.3	107.4

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

(December 1982=100)

Category	Percentage of 1980 trade value	1986				1987				1988
		Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
Foods, feeds, and beverages	7.477	111.0	106.1	109.8	108.4	105.2	107.8	109.0	112.1	113.7
Petroleum and petroleum products, excl. natural gas	31.108	58.5	49.1	50.0	54.7	67.2	74.1	74.7	67.6	61.9
Raw materials, excluding petroleum	19.205	–	–	–	–	–	–	–	–	–
Raw materials, nondurable	9.391	–	–	–	–	–	–	–	–	–
Raw materials, durable	9.814	–	–	–	–	–	–	–	–	–
Capital goods	13.164	106.7	110.7	113.5	114.2	118.7	122.2	121.9	126.6	128.5
Automotive vehicles, parts and engines	11.750	107.7	110.4	112.7	114.6	116.5	118.4	118.4	120.6	123.7
Consumer goods	14.250	104.9	107.1	110.1	110.5	114.2	116.9	118.2	121.4	124.2
Durable	5.507	–	–	–	–	–	–	–	–	–
Nondurable	8.743	–	–	–	–	–	–	–	–	–

– Data not available.

40. U.S. export price indexes by Standard Industrial Classification [1]

Industry group	1986				1987				1988
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
Manufacturing:									
Food and kindred products (6/83=100)	98.0	97.2	97.4	100.2	102.0	107.4	107.1	116.3	120.7
Lumber and wood products, except furniture (6/83=100)	103.6	103.4	104.8	108.8	112.8	116.2	138.9	142.5	146.1
Furniture and fixtures (9/83=100)	103.0	103.7	104.0	104.1	108.0	108.6	108.7	111.2	112.5
Paper and allied products (3/81=100)	91.8	97.9	102.3	104.9	109.3	112.3	115.5	119.3	124.6
Chemicals and allied products (12/84=100)	99.2	98.0	95.8	95.8	100.5	107.6	108.7	113.8	118.4
Petroleum and coal products (12/83=100)	75.4	61.8	65.1	67.6	73.5	80.5	81.4	78.8	73.4
Primary metal products (3/82=100)	102.6	102.6	109.3	106.9	110.6	117.2	122.3	126.6	126.9
Machinery, except electrical (9/78=100)	100.5	100.1	100.1	100.1	99.6	99.4	99.4	99.7	100.7
Electrical machinery (12/80=100)	99.6	99.5	99.9	100.8	101.9	102.1	102.5	102.2	103.2
Transportation equipment (12/78=100)	103.8	104.7	104.8	106.0	106.2	106.7	106.9	107.8	108.0
Scientific instruments; optical goods; clocks (6/77=100)	103.4	104.5	104.7	105.3	105.8	106.8	106.6	107.1	108.7

[1] SIC - based classification.

41. U.S. import price indexes by Standard Industrial Classification [1]

Industry group	1986				1987				1988
	Mar.	June	Sept.	Dec.	Mar.	June	Sept.	Dec.	Mar.
Manufacturing:									
Food and kindred products (6/77=100)	98.0	97.3	99.7	103.0	103.8	106.3	108.4	110.6	114.0
Textile mill products (9/82=100)	104.6	106.8	109.2	110.6	114.1	116.1	119.4	124.3	127.4
Apparel and related products (6/77=100)	100.5	101.2	102.4	103.0	107.0	109.4	112.3	113.4	116.2
Lumber and wood products, except furniture (6/77=100)	103.7	106.3	109.0	109.0	114.8	115.0	120.3	115.4	119.5
Furniture and fixtures (6/80=100)	107.2	109.4	111.4	111.6	116.1	117.0	118.3	118.9	122.2
Paper and allied products (6/77=100)	96.4	97.3	98.6	103.3	105.1	105.9	110.9	113.6	119.1
Chemicals and allied products (9/82=100)	100.6	103.3	104.3	102.6	105.7	106.2	107.2	112.2	116.8
Rubber and miscellaneous plastic products (12/80=100)	103.6	105.3	106.6	107.9	110.6	113.6	112.3	115.7	117.2
Leather and leather products	102.4	103.2	105.3	106.4	109.3	113.3	113.3	118.4	120.7
Primary metal products (6/81=100)	96.5	97.1	102.3	101.3	102.7	110.4	115.2	123.8	125.2
Fabricated metal products (12/84=100)	107.2	110.5	111.1	111.7	116.7	117.5	119.8	123.2	127.7
Machinery, except electrical (3/80=100)	111.1	114.9	118.2	118.9	123.4	127.4	127.8	133.9	135.8
Electrical machinery (9/84=100)	100.9	104.3	106.9	107.0	109.4	110.7	110.2	112.5	114.8
Transportation equipment (6/81=100)	109.8	112.8	114.7	117.3	119.9	122.1	122.5	124.6	127.0
Scientific instruments; optical goods; clocks (12/79=100)	112.6	117.8	122.6	122.4	128.8	132.5	128.8	134.0	135.7
Miscellaneous manufactured commodities (9/82=100)	102.4	104.7	110.7	112.2	115.1	118.1	121.4	123.8	127.7

[1] SIC - based classification.

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

(1977=100)

Item	Quarterly Indexes										
	1985		1986				1987				1988
	III	IV	I	II	III	IV	I	II	III	IV	I
Business:											
Output per hour of all persons	108.2	107.9	109.5	109.7	109.6	109.6	109.7	110.1	111.3	110.9	111.1
Compensation per hour	177.0	179.3	180.7	182.2	183.6	185.2	185.8	187.3	189.1	190.6	192.2
Real compensation per hour	99.5	99.7	100.1	101.3	101.5	101.7	100.7	100.3	100.3	100.2	100.2
Unit labor costs	163.6	166.1	165.0	166.2	167.5	169.0	169.4	170.2	169.8	171.8	173.0
Unit nonlabor payments	161.8	160.2	163.1	163.9	165.7	162.4	166.0	168.6	172.2	170.8	170.2
Implicit price deflator	163.0	164.0	164.3	165.4	166.9	166.7	168.2	169.6	170.7	171.4	172.0
Nonfarm business:											
Output per hour of all persons	106.4	105.9	107.7	107.7	107.5	107.5	107.6	108.0	109.1	108.8	109.1
Compensation per hour	176.2	178.3	180.0	181.3	182.6	184.4	184.9	186.3	187.9	189.5	191.1
Real compensation per hour	99.0	99.2	99.8	100.8	100.9	101.2	100.2	99.7	99.7	99.6	99.7
Unit labor costs	165.7	168.3	167.2	168.4	169.8	171.5	171.8	172.5	172.2	174.1	175.2
Unit nonlabor payments	163.4	160.8	164.7	165.2	167.0	163.9	167.4	169.2	173.0	171.8	171.3
Implicit price deflator	164.9	165.7	166.4	167.3	168.8	168.8	170.3	171.4	172.5	173.3	173.8
Nonfinancial corporations:											
Output per hour of all employees	109.2	108.9	109.8	109.7	109.9	110.5	109.7	109.9	110.8	110.5	–
Compensation per hour	173.8	175.7	177.2	178.4	179.5	181.0	180.8	182.0	183.3	184.8	–
Real compensation per hour	97.6	97.8	98.2	99.2	99.2	99.4	98.0	97.5	97.2	97.1	–
Total unit costs	163.7	166.0	166.3	167.2	168.5	168.7	169.7	170.9	171.0	172.5	–
Unit labor costs	159.1	161.4	161.5	162.6	163.2	163.8	164.8	165.6	165.5	167.2	–
Unit nonlabor costs	177.5	179.4	180.7	180.6	184.2	183.2	184.1	186.6	187.3	188.0	–
Unit profits	142.5	128.7	129.7	129.5	130.6	127.7	132.2	132.9	142.1	137.0	–
Unit nonlabor payments	165.2	161.6	162.8	162.7	165.4	163.7	165.9	167.8	171.4	170.2	–
Implicit price deflator	161.2	161.5	161.9	162.7	164.0	163.8	165.2	166.3	167.5	168.2	–
Manufacturing:											
Output per hour of all persons	125.3	126.1	127.6	128.4	129.3	129.8	130.8	132.9	134.1	134.3	135.3
Compensation per hour	178.0	180.2	181.0	182.1	183.1	184.3	183.9	184.8	185.4	186.3	188.1
Real compensation per hour	100.0	100.3	100.3	101.3	101.2	101.2	99.6	98.9	98.3	97.9	98.1
Unit labor costs	142.1	142.9	141.9	141.8	141.7	142.0	140.5	139.0	138.2	138.7	139.0

– Data not available.

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

(1977=100)

Item	1960	1970	1973	1976	1978	1980	1981	1982	1983	1984	1985	1986
Private business												
Productivity:												
Output per hour of all persons	67.3	88.4	95.9	98.4	100.8	99.2	100.6	100.3	103.1	105.7	107.6	109.7
Output per unit of capital services	102.1	101.9	105.3	97.2	102.0	94.2	92.4	86.7	88.4	92.8	92.8	92.8
Multifactor productivity	78.1	92.9	99.1	98.0	101.2	97.4	97.7	95.3	97.7	101.0	102.2	103.4
Output	55.3	80.2	93.0	94.5	105.8	106.6	108.9	105.4	109.9	119.2	124.0	128.1
Inputs:												
Hours of all persons	82.2	90.8	96.9	96.1	105.0	107.5	108.2	105.2	106.7	112.8	115.2	116.8
Capital services	54.2	78.7	88.3	97.2	103.8	113.1	117.8	121.7	124.4	128.5	133.6	138.0
Combined units of labor and capital input	70.8	86.3	93.8	96.5	104.5	109.4	111.5	110.7	112.6	118.1	121.3	123.8
Capital per hour of all persons	65.9	86.7	91.1	101.2	98.8	105.3	108.8	115.7	116.6	113.9	116.0	118.2
Private nonfarm business												
Productivity:												
Output per hour of all persons	70.7	89.2	96.4	98.5	100.8	98.7	99.6	99.1	102.5	104.7	105.9	107.6
Output per unit of capital services	103.6	102.8	106.0	97.3	101.9	93.4	91.1	85.1	87.3	91.3	90.8	90.5
Multifactor productivity	80.9	93.7	99.6	98.1	101.2	96.9	96.7	94.1	97.0	99.9	100.5	101.4
Output	54.4	79.9	92.9	94.4	106.0	106.6	108.4	104.8	110.1	119.3	123.7	127.6
Inputs:												
Hours of all persons	77.0	89.6	96.3	95.8	105.1	108.0	108.8	105.7	107.4	114.0	116.8	118.5
Capital services	52.5	77.8	87.6	97.0	104.0	114.1	119.0	123.2	126.1	130.6	136.3	141.0
Combined units of labor and capital input	67.3	85.3	93.3	96.2	104.7	110.0	112.2	111.4	113.5	119.4	123.1	125.8
Capital per hour of all persons	68.2	86.8	91.0	101.3	98.9	105.6	109.4	116.5	117.4	114.6	116.7	119.0
Manufacturing												
Productivity:												
Output per hour of all persons	62.2	80.8	93.4	97.1	101.5	101.4	103.6	105.9	112.0	118.1	124.2	128.8
Output per unit of capital services	102.5	98.6	111.4	96.2	102.1	91.2	89.2	81.8	86.9	95.7	97.8	99.3
Multifactor productivity	71.9	85.2	97.9	96.8	101.7	98.7	99.8	99.2	105.1	112.2	117.0	120.6
Output	52.5	78.6	96.3	93.1	106.0	103.2	104.8	98.4	104.7	117.5	122.5	125.9
Inputs:												
Hours of all persons	84.4	97.3	103.1	95.9	104.4	101.7	101.1	92.9	93.5	99.5	98.7	97.8
Capital services	51.2	79.7	86.4	96.7	103.7	113.1	117.5	120.3	120.6	122.8	125.3	126.8
Combined units of labor and capital inputs	73.0	92.2	98.4	96.1	104.2	104.5	105.0	99.2	99.7	104.7	104.8	104.4
Capital per hour of all persons	60.7	82.0	83.8	100.9	99.4	111.2	116.2	129.4	129.0	123.5	127.0	129.7

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

(1977=100)

Item	1960	1970	1973	1976	1978	1980	1981	1982	1983	1984	1985	1986	1987
Business:													
Output per hour of all persons	67.6	88.4	95.9	98.3	100.8	99.3	100.7	100.3	103.0	105.6	107.5	109.5	110.5
Compensation per hour	33.6	57.8	70.9	92.8	108.5	131.5	143.7	154.9	161.5	168.0	175.9	182.8	188.2
Real compensation per hour	68.9	90.3	96.8	98.8	100.9	96.7	95.8	97.3	98.2	98.0	99.1	101.1	100.4
Unit labor costs	49.7	65.4	73.9	94.3	107.6	132.5	142.7	154.5	156.7	159.1	163.6	166.9	170.3
Unit nonlabor payments	46.4	59.4	72.5	93.3	106.7	118.7	134.6	136.6	146.4	156.5	160.3	163.8	169.4
Implicit price deflator	48.5	63.2	73.4	94.0	107.3	127.6	139.8	148.1	153.0	158.2	162.4	165.8	170.0
Nonfarm business:													
Output per hour of all persons	71.0	89.3	96.4	98.5	100.8	98.8	99.8	99.2	102.5	104.6	105.8	107.5	108.4
Compensation per hour	35.3	58.2	71.2	92.8	108.6	131.3	143.6	154.8	161.5	167.8	175.2	182.0	187.1
Real compensation per hour	72.3	90.9	97.2	98.9	100.9	96.6	95.8	97.2	98.3	97.9	98.7	100.6	99.8
Unit labor costs	49.7	65.2	73.9	94.3	107.7	132.9	144.0	156.0	157.6	160.4	165.6	169.3	172.7
Unit nonlabor payments	46.3	60.0	69.3	93.0	105.6	118.5	133.5	136.5	148.3	156.4	161.3	165.2	170.4
Implicit price deflator	48.5	63.4	72.3	93.8	107.0	127.8	140.3	149.2	154.3	159.0	164.1	167.8	171.9
Nonfinancial corporations:													
Output per hour of all employees	73.4	91.1	97.5	98.4	100.6	99.1	99.6	100.4	103.5	106.0	108.2	109.9	110.2
Compensation per hour	36.9	59.2	71.6	92.9	108.4	131.1	143.3	154.3	159.9	165.8	172.8	178.9	182.7
Real compensation per hour	75.5	92.5	97.7	98.9	100.8	96.4	95.5	96.9	97.3	96.7	97.3	98.9	97.5
Total unit costs	49.4	64.8	72.7	94.8	107.3	133.4	147.7	159.5	159.5	160.8	164.4	167.7	171.0
Unit labor costs	50.2	65.0	73.4	94.3	107.8	132.3	143.8	153.8	154.5	156.5	159.7	162.8	165.8
Unit nonlabor costs	47.0	64.2	70.7	96.2	105.7	136.7	159.1	176.4	174.3	173.6	178.3	182.2	186.5
Unit profits	59.8	52.3	65.6	89.4	102.0	85.2	98.1	78.5	110.9	136.5	133.9	129.3	136.1
Unit nonlabor payments	51.5	60.1	68.9	93.8	104.4	118.6	137.8	142.1	152.1	160.6	162.7	163.7	168.9
Implicit price deflator	50.7	63.3	71.9	94.2	106.6	127.6	141.7	149.8	153.7	157.9	160.7	163.1	166.8
Manufacturing:													
Output per hour of all persons	62.2	80.8	93.4	97.1	101.5	101.4	103.6	105.9	112.0	118.1	124.2	128.8	133.1
Compensation per hour	36.5	57.4	68.8	92.1	108.2	132.4	145.2	157.5	162.4	168.0	176.9	182.7	185.1
Real compensation per hour	74.8	89.6	93.9	98.1	100.6	97.4	96.8	98.9	98.8	98.0	99.6	101.0	98.7
Unit labor costs	58.7	71.0	73.7	94.9	106.6	130.6	140.1	148.7	145.0	142.2	142.4	141.8	139.1
Unit nonlabor payments	60.0	64.1	70.7	93.5	101.9	97.8	111.8	114.0	128.5	138.6	134.7	137.9	–
Implicit price deflator	59.1	69.0	72.8	94.5	105.2	121.0	131.8	138.6	140.2	141.2	140.2	140.7	–

– Data not available.

45. Unemployment rates, approximating U.S. concepts, in nine countries, quarterly data seasonally adjusted

Country	Annual average		1986		1987				1988
	1986	1987	III	IV	I	II	III	IV	I
Total labor force basis									
United States	6.9	6.1	6.9	6.8	6.5	6.2	5.9	5.8	5.6
Canada	9.5	8.8	9.6	9.4	9.6	9.0	8.8	8.2	7.8
Australia	8.0	8.1	8.2	8.3	8.3	8.1	8.0	7.9	–
Japan	2.8	2.9	2.9	2.9	3.0	3.1	2.8	2.7	–
France	10.4	10.8	10.6	10.6	10.9	11.0	10.8	10.6	10.6
Germany	7.1	6.8	6.8	6.7	6.7	6.8	6.8	6.8	6.8
Italy [1, 2]	6.2	7.7	7.3	7.7	7.4	7.6	7.9	7.9	7.8
Sweden [3]	2.6	1.9	2.6	2.6	2.0	1.9	1.9	1.7	1.7
United Kingdom	11.2	10.2	11.2	11.1	10.9	10.5	10.0	9.4	9.0
Civilian labor force basis									
United States	7.0	6.2	7.0	6.8	6.6	6.3	6.0	5.9	5.7
Canada	9.6	8.9	9.7	9.4	9.6	9.1	8.8	8.2	7.9
Australia	8.1	8.1	8.3	8.4	8.3	8.2	8.0	8.0	–
Japan	2.8	2.9	2.9	2.9	3.0	3.1	2.8	2.8	–
France	10.7	11.1	10.8	10.8	11.2	11.2	11.1	10.8	10.8
Germany	7.2	6.9	6.9	6.8	6.8	6.9	7.0	7.0	6.9
Italy [1, 2]	6.3	7.9	7.4	7.8	7.6	7.8	8.1	8.0	8.0
Sweden [3]	2.7	1.9	2.6	2.6	2.0	1.9	1.9	1.7	1.7
United Kingdom	11.2	10.3	11.3	11.2	11.0	10.6	10.0	9.5	9.0

[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.

[3] Break in series beginning in 1987. The 1986 rate based on the new series was 2.2 percent.

– Data not available.

NOTE: Quarterly figures for France, Germany, and the United Kingdom are calculated by applying annual adjustment factors to current published data and therefore should be viewed as less precise indicators of unemployment under U.S. concepts than the annual figures.

46. Annual data: Employment status of the civilian working-age population, approximating U.S. concepts, 10 countries

(Numbers in thousands)

Employment status and country	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Labor force										
United States	102,251	104,962	106,940	108,670	110,204	111,550	113,544	115,461	117,834	119,865
Canada	10,895	11,231	11,573	11,904	11,958	12,183	12,399	12,639	12,870	13,121
Australia	6,443	6,519	6,693	6,810	6,910	6,997	7,133	7,272	7,562	7,736
Japan	54,610	55,210	55,740	56,320	56,980	58,110	58,480	58,820	59,410	60,050
France	22,460	22,670	22,800	22,930	23,160	23,130	23,290	23,340	23,480	23,610
Germany	26,000	26,250	26,520	26,650	26,700	26,650	26,760	26,980	27,180	27,260
Italy	20,570	20,850	21,120	21,320	21,410	21,590	21,670	21,800	21,990	22,340
Netherlands	5,010	5,100	5,310	5,520	5,570	5,600	5,620	5,710	5,760	5,780
Sweden	4,203	4,262	4,312	4,327	4,350	4,369	4,385	4,418	4,437	4,480
United Kingdom	26,260	26,350	26,520	26,590	26,740	26,790	27,180	27,370	27,540	27,760
Participation rate[1]										
United States	63.2	63.7	63.8	63.9	64.0	64.0	64.4	64.8	65.3	65.6
Canada	62.7	63.4	64.1	64.8	64.1	64.4	64.8	65.2	65.7	66.2
Australia	61.9	61.6	62.1	61.9	61.7	61.4	61.5	61.8	63.0	63.0
Japan	62.8	62.7	62.6	62.6	62.7	63.1	62.7	62.3	62.1	61.9
France	57.5	57.5	57.2	57.1	57.1	56.6	56.6	56.2	56.2	56.0
Germany	53.3	53.3	53.2	52.9	52.6	52.3	52.4	52.6	53.0	53.1
Italy	47.8	48.0	48.2	48.3	47.7	47.5	47.3	47.2	47.5	48.2
Netherlands	48.8	49.0	50.2	51.4	51.2	50.9	50.5	50.7	50.8	50.5
Sweden	66.1	66.6	66.9	66.8	66.8	66.7	66.6	66.9	67.2	67.4
United Kingdom	62.8	62.6	62.5	62.2	62.3	62.1	62.6	62.7	62.7	63.0
Employed										
United States	96,048	98,824	99,303	100,397	99,526	100,834	105,005	107,150	109,597	112,440
Canada	9,987	10,395	10,708	11,006	10,644	10,734	11,000	11,311	11,634	11,955
Australia	6,038	6,111	6,284	6,416	6,415	6,300	6,490	6,670	6,952	7,177
Japan	53,370	54,040	54,600	55,060	55,620	56,550	56,870	57,260	57,740	58,320
France	21,250	21,300	21,330	21,200	21,240	21,170	20,980	20,900	20,970	20,970
Germany	25,130	25,470	25,750	25,560	25,140	24,750	24,790	24,950	25,210	25,370
Italy	19,720	19,930	20,200	20,280	20,250	20,320	20,390	20,490	20,610	20,590
Netherlands	4,750	4,830	4,980	5,010	4,980	4,890	4,930	5,110	5,200	5,240
Sweden	4,109	4,174	4,226	4,219	4,213	4,218	4,249	4,293	4,319	4,396
United Kingdom	24,610	24,940	24,670	23,800	23,710	23,600	24,000	24,310	24,450	24,910
Employment-population ratio[2]										
United States	59.3	59.9	59.2	59.0	57.8	57.9	59.5	60.1	60.7	61.5
Canada	57.5	58.7	59.3	59.9	57.0	56.7	57.4	58.4	59.4	60.3
Australia	58.0	57.8	58.3	58.4	57.3	55.3	56.0	56.6	57.9	57.9
Japan	61.3	61.4	61.3	61.2	61.2	61.4	61.0	60.6	60.4	60.1
France	54.4	54.0	53.5	52.8	52.3	51.8	51.0	50.4	50.2	49.7
Germany	51.5	51.7	51.7	50.8	49.6	48.6	48.5	48.7	49.1	49.4
Italy	45.9	45.9	46.1	45.9	45.2	44.7	44.5	44.4	44.6	44.4
Netherlands	46.3	46.4	47.0	46.6	45.8	44.5	44.3	45.4	45.9	45.8
Sweden	64.6	65.3	65.6	65.1	64.7	64.4	64.5	65.0	65.4	66.2
United Kingdom	58.8	59.2	58.1	55.7	55.3	54.7	55.3	55.7	55.7	56.6
Unemployed										
United States	6,202	6,137	7,637	8,273	10,678	10,717	8,539	8,312	8,237	7,425
Canada	908	836	865	898	1,314	1,448	1,399	1,328	1,236	1,167
Australia	405	408	409	394	495	697	642	602	610	629
Japan	1,240	1,170	1,140	1,260	1,360	1,560	1,610	1,560	1,670	1,730
France	1,210	1,370	1,470	1,730	1,920	1,960	2,310	2,440	2,510	2,620
Germany	870	780	770	1,090	1,560	1,900	1,970	2,030	1,970	1,890
Italy	850	920	920	1,040	1,160	1,270	1,280	1,310	1,380	1,760
Netherlands	260	270	330	510	590	710	690	600	560	540
Sweden	94	88	86	108	137	151	136	125	118	84
United Kingdom	1,650	1,420	1,850	2,790	3,030	3,190	3,180	3,060	3,090	2,850
Unemployment rate										
United States	6.1	5.8	7.1	7.6	9.7	9.6	7.5	7.2	7.0	6.2
Canada	8.3	7.4	7.5	7.5	11.0	11.9	11.3	10.5	9.6	8.9
Australia	6.3	6.3	6.1	5.8	7.2	10.0	9.0	8.3	8.1	8.1
Japan	2.3	2.1	2.0	2.2	2.4	2.7	2.8	2.6	2.8	2.9
France	5.4	6.0	6.4	7.5	8.3	8.5	9.9	10.4	10.7	11.1
Germany	3.3	3.0	2.9	4.1	5.8	7.1	7.4	7.5	7.2	6.9
Italy	4.1	4.4	4.4	4.9	5.4	5.9	5.9	6.0	6.3	7.9
Netherlands	5.2	5.3	6.2	9.2	10.6	12.7	12.3	10.5	9.7	9.3
Sweden	2.2	2.1	2.0	2.5	3.1	3.5	3.1	2.8	2.7	1.9
United Kingdom	6.3	5.4	7.0	10.5	11.3	11.9	11.7	11.2	11.2	10.3

[1] Labor force as a percent of the civilian working-age population.

[2] Employment as a percent of the civilian working-age population.

NOTE: See notes for information on breaks in series for Germany, Italy, the Netherlands, and Sweden.

47. Annual indexes of manufacturing productivity and related measures, 12 countries

(1977=100)

Item and country	1960	1970	1973	1975	1976	1977	1979	1980	1981	1982	1983	1984	1985	1986
Output per hour														
United States	62.2	80.8	93.4	92.9	97.1	100.0	101.4	101.4	103.6	105.9	112.0	118.1	124.2	128.8
Canada	50.7	75.6	90.3	88.6	94.8	100.0	102.0	98.2	102.9	98.3	105.4	116.8	119.7	119.4
Japan	23.2	64.8	83.1	87.7	94.3	100.0	114.8	122.7	127.2	135.0	142.3	152.5	163.7	168.2
Belgium	33.0	60.4	78.8	86.5	95.3	100.0	111.9	119.2	127.6	135.2	148.2	154.4	159.0	163.1
Denmark	37.2	65.6	83.3	94.6	98.2	100.0	106.5	112.3	114.2	114.6	120.2	118.6	118.3	119.9
France	36.4	69.6	82.3	88.5	95.1	100.0	109.7	110.6	114.0	122.0	125.2	129.0	133.0	135.6
Germany	40.3	71.2	84.0	90.1	96.5	100.0	108.2	108.6	111.0	112.6	119.2	123.6	128.7	130.6
Italy	35.4	72.7	90.9	91.1	98.9	100.0	110.5	116.9	124.8	129.6	135.7	144.4	146.6	148.3
Netherlands	32.4	64.3	81.5	86.2	95.8	100.0	112.3	113.9	116.9	119.4	127.5	140.5	145.1	144.7
Norway	54.6	81.7	94.6	96.8	99.7	100.0	107.1	106.7	107.0	109.8	117.2	123.9	125.2	124.4
Sweden	42.3	80.7	94.8	100.2	101.7	100.0	110.9	112.7	113.2	116.5	125.5	131.0	136.1	136.4
United Kingdom	55.9	80.4	95.5	94.9	99.1	100.0	102.5	101.8	107.0	113.5	123.2	129.8	134.7	139.5
Output														
United States	52.5	78.6	96.3	84.9	93.1	100.0	108.1	103.2	104.8	98.4	104.7	117.5	122.5	125.9
Canada	41.3	73.5	93.5	89.9	96.5	100.0	108.5	103.6	107.4	93.6	99.6	114.9	121.2	123.9
Japan	19.2	69.9	91.9	86.2	94.8	100.0	113.9	124.1	129.8	137.3	148.2	165.4	179.3	182.1
Belgium	41.9	78.6	96.4	92.7	99.7	100.0	104.1	106.8	105.7	110.1	114.8	117.5	119.9	122.0
Denmark	49.2	82.0	95.9	95.0	99.6	100.0	105.4	110.1	106.6	108.3	115.6	119.7	123.4	126.7
France	35.4	73.3	88.6	90.0	96.1	100.0	105.3	104.6	102.9	104.0	103.8	104.0	103.3	103.0
Germany	50.0	86.6	96.1	91.0	98.0	100.0	106.6	106.6	104.9	102.4	103.6	106.4	110.1	112.8
Italy	36.4	78.0	90.5	86.9	97.9	100.0	108.6	115.4	115.1	113.4	111.5	116.2	118.0	121.9
Netherlands	44.8	84.4	95.8	92.7	99.0	100.0	106.1	106.6	106.7	105.0	107.0	113.3	116.0	117.3
Norway	55.1	86.9	99.5	101.0	101.4	100.0	100.3	98.8	97.7	97.4	97.2	102.6	105.2	107.0
Sweden	52.6	92.5	100.3	106.1	106.1	100.0	103.6	104.0	100.6	100.1	105.2	111.5	115.3	115.2
United Kingdom	71.2	95.0	104.8	96.3	98.2	100.0	100.5	91.7	86.2	86.4	88.9	92.5	95.2	96.2
Total hours														
United States	84.4	97.3	103.1	91.4	95.9	100.0	106.5	101.7	101.1	92.9	93.5	99.5	98.7	97.8
Canada	81.4	97.2	103.6	101.5	101.8	100.0	106.3	105.5	104.3	95.2	94.5	98.3	101.2	103.8
Japan	82.7	107.9	110.7	98.2	100.6	100.0	99.3	101.2	102.0	101.7	104.2	108.5	109.6	108.3
Belgium	127.1	130.2	122.3	107.1	104.6	100.0	93.0	89.6	82.8	81.4	77.5	76.1	75.4	74.8
Denmark	132.4	125.1	115.2	100.4	101.4	100.0	99.0	98.0	93.4	94.5	96.2	100.9	104.3	105.7
France	97.2	105.3	107.7	101.7	101.2	100.0	95.9	94.6	90.3	85.2	82.9	80.6	77.7	75.9
Germany	123.8	121.7	114.4	101.0	101.6	100.0	98.5	98.1	94.6	91.0	86.9	86.1	85.6	86.4
Italy	102.8	107.4	99.6	95.4	99.0	100.0	98.2	98.7	92.2	87.5	82.2	80.5	80.5	82.2
Netherlands	138.4	131.2	117.6	107.6	103.3	100.0	94.4	93.6	91.2	88.0	83.9	80.6	79.9	81.1
Norway	101.0	106.4	105.1	104.3	101.7	100.0	93.6	92.6	91.3	88.6	82.9	82.8	84.0	86.0
Sweden	124.4	114.6	105.7	105.9	104.3	100.0	93.4	92.3	88.9	85.9	83.9	85.1	84.7	84.5
United Kingdom	127.3	118.1	109.8	101.5	99.0	100.0	98.0	90.1	80.6	76.2	72.2	71.2	70.7	69.0
Compensation per hour														
United States	36.5	57.4	68.8	85.1	92.1	100.0	118.6	132.4	145.2	157.5	162.4	168.0	176.9	182.7
Canada	27.5	47.9	60.0	78.9	90.3	100.0	118.6	131.3	151.1	167.0	177.2	185.5	194.7	202.3
Japan	8.9	33.9	55.1	84.2	90.7	100.0	113.4	120.7	129.8	136.6	140.7	144.9	152.0	157.3
Belgium	13.8	34.9	53.5	79.0	89.5	100.0	117.5	130.4	144.5	150.7	159.7	173.0	184.9	191.8
Denmark	12.6	36.3	56.1	81.0	90.4	100.0	123.1	135.9	149.7	162.9	174.2	184.4	196.1	207.7
France	15.1	36.5	52.1	76.5	88.7	100.0	128.4	148.5	172.0	203.9	225.2	247.3	267.3	279.2
Germany	18.8	48.0	67.5	84.5	91.3	100.0	116.1	125.6	134.5	141.0	148.3	155.5	164.9	172.5
Italy	8.4	26.1	43.7	70.2	84.2	100.0	134.7	160.2	198.4	238.3	282.8	314.5	347.3	362.1
Netherlands	12.5	39.0	60.5	82.2	91.9	100.0	117.0	123.6	129.1	137.5	144.0	150.0	157.7	161.5
Norway	15.8	37.9	54.5	77.2	88.8	100.0	116.0	128.0	142.8	156.0	173.5	188.3	204.8	224.6
Sweden	14.7	38.5	54.2	77.3	91.5	100.0	120.1	133.6	148.1	158.9	173.3	189.7	212.4	228.1
United Kingdom	15.1	31.3	47.5	76.0	88.3	100.0	137.4	167.4	193.9	209.3	224.4	238.8	254.6	273.5
Unit labor costs: National currency basis														
United States	58.7	71.0	73.7	91.7	94.9	100.0	117.0	130.6	140.1	148.7	145.0	142.2	142.4	141.8
Canada	54.2	63.4	66.5	89.1	95.3	100.0	116.2	133.7	146.7	170.0	168.1	158.8	162.6	169.4
Japan	38.4	52.3	66.4	96.0	96.2	100.0	98.8	98.4	102.0	101.2	98.9	95.0	92.9	93.5
Belgium	41.7	57.8	67.9	91.2	93.9	100.0	105.0	109.4	113.2	111.4	107.8	112.1	116.3	117.6
Denmark	33.8	55.4	67.4	85.6	92.1	100.0	115.7	121.0	131.1	142.2	144.9	155.4	165.7	173.2
France	41.5	52.5	63.4	86.5	93.3	100.0	117.0	134.3	151.0	167.2	179.9	191.6	200.9	205.9
Germany	46.6	67.4	80.3	93.8	94.6	100.0	107.3	115.7	121.2	125.2	124.4	125.8	128.1	132.1
Italy	23.7	36.0	48.1	77.1	85.1	100.0	121.9	137.0	158.9	184.0	208.4	217.8	236.9	244.1
Netherlands	38.5	60.7	74.3	95.4	96.0	100.0	104.1	108.5	110.4	115.2	113.0	106.8	108.7	111.6
Norway	29.0	46.4	57.6	79.7	89.1	100.0	108.2	120.0	133.4	142.1	148.0	152.0	163.5	180.5
Sweden	34.8	47.7	57.2	77.1	90.0	100.0	108.3	118.6	130.9	136.3	138.1	144.8	156.1	167.3
United Kingdom	27.1	38.9	49.8	80.2	89.1	100.0	134.1	164.5	181.2	184.4	182.2	183.9	189.0	196.1
Unit labor costs: U.S. dollar basis														
United States	58.7	71.0	73.7	91.7	94.9	100.0	117.0	130.6	140.1	148.7	145.0	142.2	142.4	141.8
Canada	59.4	64.5	70.6	93.1	102.7	100.0	105.4	121.5	130.0	146.3	144.9	130.3	126.5	129.5
Japan	28.5	39.1	65.6	86.7	86.9	100.0	121.3	116.8	123.8	108.8	111.5	107.2	104.3	148.7
Belgium	30.0	41.7	62.7	89.1	87.2	100.0	128.3	134.3	109.6	87.2	75.5	69.5	70.2	94.3
Denmark	29.5	44.4	67.2	89.6	91.5	100.0	132.0	129.0	110.3	102.3	95.1	90.1	93.9	128.4
France	41.6	46.7	70.2	99.3	96.1	100.0	135.2	156.4	136.4	124.9	116.1	107.8	110.0	146.2
Germany	25.9	42.9	70.4	88.7	87.3	100.0	135.9	147.9	124.9	119.7	113.1	102.6	101.1	141.3
Italy	33.7	50.6	73.1	104.3	90.5	100.0	129.5	141.4	123.2	119.9	121.1	109.5	109.6	144.5
Netherlands	25.1	41.2	65.6	92.8	89.1	100.0	127.4	134.1	108.9	105.8	97.1	81.6	80.4	111.9
Norway	21.7	34.5	53.4	81.4	86.9	100.0	113.8	129.3	123.6	117.1	107.9	99.1	101.3	129.8
Sweden	30.1	41.1	58.7	83.2	92.3	100.0	112.9	125.3	115.4	96.9	80.4	78.2	81.1	104.9
United Kingdom	43.6	53.5	70.0	102.0	92.1	100.0	163.1	219.2	210.2	184.8	158.3	140.9	140.5	164.9

– Data not available.

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

Industry and type of case[1]	Incidence rates per 100 full-time workers[2]								
	1978	1979	1980	1981	1982	1983	1984	1985	1986
PRIVATE SECTOR[3]									
Total cases	9.4	9.5	8.7	8.3	7.7	7.6	8.0	7.9	7.9
Lost workday cases	4.1	4.3	4.0	3.8	3.5	3.4	3.7	3.6	3.6
Lost workdays	63.5	67.7	65.2	61.7	58.7	58.5	63.4	64.9	65.8
Agriculture, forestry, and fishing[3]									
Total cases	11.6	11.7	11.9	12.3	11.8	11.9	12.0	11.4	11.2
Lost workday cases	5.4	5.7	5.8	5.9	5.9	6.1	6.1	5.7	5.6
Lost workdays	80.7	83.7	82.7	82.8	86.0	90.8	90.7	91.3	93.6
Mining									
Total cases	11.5	11.4	11.2	11.6	10.5	8.4	9.7	8.4	7.4
Lost workday cases	6.4	6.8	6.5	6.2	5.4	4.5	5.3	4.8	4.1
Lost workdays	143.2	150.5	163.6	146.4	137.3	125.1	160.2	145.3	125.9
Construction									
Total cases	16.0	16.2	15.7	15.1	14.6	14.8	15.5	15.2	15.2
Lost workday cases	6.4	6.8	6.5	6.3	6.0	6.3	6.9	6.8	6.9
Lost workdays	109.4	120.4	117.0	113.1	115.7	118.2	128.1	128.9	134.5
General building contractors:									
Total cases	15.9	16.3	15.5	15.1	14.1	14.4	15.4	15.2	14.9
Lost workday cases	6.3	6.8	6.5	6.1	5.9	6.2	6.9	6.8	6.6
Lost workdays	105.3	111.2	113.0	107.1	112.0	113.0	121.3	120.4	122.7
Heavy construction contractors:									
Total cases	16.6	16.6	16.3	14.9	15.1	15.4	14.9	14.5	14.7
Lost workday cases	6.2	6.7	6.3	6.0	5.8	6.2	6.4	6.3	6.3
Lost workdays	110.9	123.1	117.6	106.0	113.1	122.4	131.7	127.3	132.9
Special trade contractors:									
Total cases	15.8	16.0	15.5	15.2	14.7	14.8	15.8	15.4	15.6
Lost workday cases	6.6	6.9	6.7	6.6	6.2	6.4	7.1	7.0	7.2
Lost workdays	111.0	124.3	118.9	119.3	118.6	119.0	130.1	133.3	140.4
Manufacturing									
Total cases	13.2	13.3	12.2	11.5	10.2	10.0	10.6	10.4	10.6
Lost workday cases	5.6	5.9	5.4	5.1	4.4	4.3	4.7	4.6	4.7
Lost workdays	84.9	90.2	86.7	82.0	75.0	73.5	77.9	80.2	85.2
Durable goods									
Lumber and wood products:									
Total cases	22.6	20.7	18.6	17.6	16.9	18.3	19.6	18.5	18.9
Lost workday cases	11.1	10.8	9.5	9.0	8.3	9.2	9.9	9.3	9.7
Lost workdays	178.8	175.9	171.8	158.4	153.3	163.5	172.0	171.4	177.2
Furniture and fixtures:									
Total cases	17.5	17.6	16.0	15.1	13.9	14.1	15.3	15.0	15.2
Lost workday cases	6.9	7.1	6.6	6.2	5.5	5.7	6.4	6.3	6.3
Lost workdays	95.9	99.6	97.6	91.9	85.6	83.0	101.5	100.4	103.0
Stone, clay, and glass products:									
Total cases	16.8	16.8	15.0	14.1	13.0	13.1	13.6	13.9	13.6
Lost workday cases	7.8	8.0	7.1	6.9	6.1	6.0	6.6	6.7	6.5
Lost workdays	126.3	133.7	128.1	122.2	112.2	112.0	120.8	127.8	126.0
Primary metal industries:									
Total cases	17.0	17.3	15.2	14.4	12.4	12.4	13.3	12.6	13.6
Lost workday cases	7.5	8.1	7.1	6.7	5.4	5.4	6.1	5.7	6.1
Lost workdays	123.6	134.7	128.3	121.3	101.6	103.4	115.3	113.8	125.5
Fabricated metal products:									
Total cases	19.3	19.9	18.5	17.5	15.3	15.1	16.1	16.3	16.0
Lost workday cases	8.0	8.7	8.0	7.5	6.4	6.1	6.7	6.9	6.8
Lost workdays	112.4	124.2	118.4	109.9	102.5	96.5	104.9	110.1	115.5
Machinery, except electrical:									
Total cases	14.4	14.7	13.7	12.9	10.7	9.8	10.7	10.8	10.7
Lost workday cases	5.4	5.9	5.5	5.1	4.2	3.6	4.1	4.2	4.2
Lost workdays	75.1	83.6	81.3	74.9	66.0	58.1	65.8	69.3	72.0
Electric and electronic equipment:									
Total cases	8.7	8.6	8.0	7.4	6.5	6.3	6.8	6.4	6.4
Lost workday cases	3.3	3.4	3.3	3.1	2.7	2.6	2.8	2.7	2.7
Lost workdays	50.3	51.9	51.8	48.4	42.2	41.4	45.0	45.7	49.8
Transportation equipment:									
Total cases	11.5	11.6	10.6	9.8	9.2	8.4	9.3	9.0	9.6
Lost workday cases	5.1	5.5	4.9	4.6	4.0	3.6	4.2	3.9	4.1
Lost workdays	78.0	85.9	82.4	78.1	72.2	64.5	68.8	71.6	79.1
Instruments and related products:									
Total cases	6.9	7.2	6.8	6.5	5.6	5.2	5.4	5.2	5.3
Lost workday cases	2.6	2.8	2.7	2.7	2.3	2.1	2.2	2.2	2.3
Lost workdays	37.0	40.0	41.8	39.2	37.0	35.6	37.5	37.9	42.2
Miscellaneous manufacturing industries:									
Total cases	11.8	11.7	10.9	10.7	9.9	9.9	10.5	9.7	10.2
Lost workday cases	4.5	4.7	4.4	4.4	4.1	4.0	4.3	4.2	4.3
Lost workdays	66.4	67.7	67.9	68.3	69.9	66.3	70.2	73.2	70.9

See footnotes at end of table.

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

Industry and type of case[1]	Incidence rates per 100 full-time workers[2]								
	1978	1979	1980	1981	1982	1983	1984	1985	1986
Nondurable goods									
Food and kindred products:									
Total cases	19.4	19.9	18.7	17.8	16.7	16.5	16.7	16.7	16.5
Lost workday cases	8.9	9.5	9.0	8.6	8.0	7.9	8.1	8.1	8.0
Lost workdays	132.2	141.8	136.8	130.7	129.3	131.2	131.6	138.0	137.8
Tobacco manufacturing:									
Total cases	8.7	9.3	8.1	8.2	7.2	6.5	7.7	7.3	6.7
Lost workday cases	4.0	4.2	3.8	3.9	3.2	3.0	3.2	3.0	2.5
Lost workdays	58.6	64.8	45.8	56.8	44.6	42.8	51.7	51.7	45.6
Textile mill products:									
Total cases	10.2	9.7	9.1	8.8	7.6	7.4	8.0	7.5	7.8
Lost workday cases	3.4	3.4	3.3	3.2	2.8	2.8	3.0	3.0	3.1
Lost workdays	61.5	61.3	62.8	59.2	53.8	51.4	54.0	57.4	59.3
Apparel and other textile products:									
Total cases	6.5	6.5	6.4	6.3	6.0	6.4	6.7	6.7	6.7
Lost workday cases	2.2	2.2	2.2	2.2	2.1	2.4	2.5	2.6	2.7
Lost workdays	32.4	34.1	34.9	35.0	36.4	40.6	40.9	44.1	49.4
Paper and allied products:									
Total cases	13.5	13.5	12.7	11.6	10.6	10.0	10.4	10.2	10.5
Lost workday cases	5.7	6.0	5.8	5.4	4.9	4.5	4.7	4.7	4.7
Lost workdays	103.3	108.4	112.3	103.6	99.1	90.3	93.8	94.6	99.5
Printing and publishing:									
Total cases	7.0	7.1	6.9	6.7	6.6	6.6	6.5	6.3	6.5
Lost workday cases	2.9	3.1	3.1	3.0	2.8	2.9	2.9	2.9	2.9
Lost workdays	43.8	45.1	46.5	47.4	45.7	44.6	46.0	49.2	50.8
Chemicals and allied products:									
Total cases	7.8	7.7	6.8	6.6	5.7	5.5	5.3	5.1	6.3
Lost workday cases	3.3	3.5	3.1	3.0	2.5	2.5	2.4	2.3	2.7
Lost workdays	50.9	54.9	50.3	48.1	39.4	42.3	40.8	38.8	49.4
Petroleum and coal products:									
Total cases	7.9	7.7	7.2	6.7	5.3	5.5	5.1	5.1	7.1
Lost workday cases	3.4	3.6	3.5	2.9	2.5	2.4	2.4	2.4	3.2
Lost workdays	58.3	62.0	59.1	51.2	46.4	46.8	53.5	49.9	67.5
Rubber and miscellaneous plastics products:									
Total cases	17.1	17.1	15.5	14.6	12.7	13.0	13.6	13.4	14.0
Lost workday cases	8.1	8.2	7.4	7.2	6.0	6.2	6.4	6.3	6.6
Lost workdays	125.5	127.1	118.6	117.4	100.9	101.4	104.3	107.4	118.2
Leather and leather products:									
Total cases	11.7	11.5	11.7	11.5	9.9	10.0	10.5	10.3	10.5
Lost workday cases	4.7	4.9	5.0	5.1	4.5	4.4	4.7	4.6	4.8
Lost workdays	72.5	76.2	82.7	82.6	86.5	87.3	94.4	88.3	83.4
Transportation and public utilities									
Total cases	10.1	10.0	9.4	9.0	8.5	8.2	8.8	8.6	8.2
Lost workday cases	5.7	5.9	5.5	5.3	4.9	4.7	5.2	5.0	4.8
Lost workdays	102.3	107.0	104.5	100.6	96.7	94.9	105.1	107.1	102.1
Wholesale and retail trade									
Total cases	7.9	8.0	7.4	7.3	7.2	7.2	7.4	7.4	7.7
Lost workday cases	3.2	3.4	3.2	3.1	3.1	3.1	3.3	3.2	3.3
Lost workdays	44.9	49.0	48.7	45.3	45.5	47.8	50.5	50.7	54.0
Wholesale trade:									
Total cases	8.9	8.8	8.2	7.7	7.1	7.0	7.2	7.2	7.2
Lost workday cases	3.9	4.1	3.9	3.6	3.4	3.2	3.5	3.5	3.6
Lost workdays	57.5	59.1	58.2	54.7	52.1	50.6	55.5	59.8	62.5
Retail trade:									
Total cases	7.5	7.7	7.1	7.1	7.2	7.3	7.5	7.5	7.8
Lost workday cases	2.8	3.1	2.9	2.9	2.9	3.0	3.2	3.1	3.2
Lost workdays	39.7	44.7	44.5	41.1	42.6	46.7	48.4	47.0	50.5
Finance, insurance, and real estate									
Total cases	2.1	2.1	2.0	1.9	2.0	2.0	1.9	2.0	2.0
Lost workday cases	.8	.9	.8	.8	.9	.9	.9	.9	.9
Lost workdays	12.5	13.3	12.2	11.6	13.2	12.8	13.6	15.4	17.1
Services									
Total cases	5.5	5.5	5.2	5.0	4.9	5.1	5.2	5.4	5.3
Lost workday cases	2.4	2.5	2.3	2.3	2.3	2.4	2.5	2.6	2.5
Lost workdays	36.2	38.1	35.8	35.9	35.8	37.0	41.1	45.4	43.0

[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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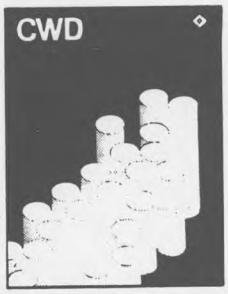

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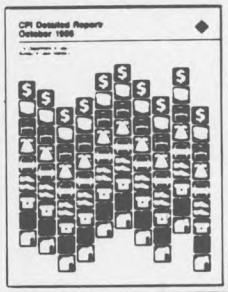

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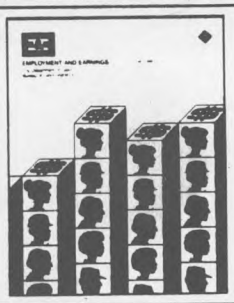

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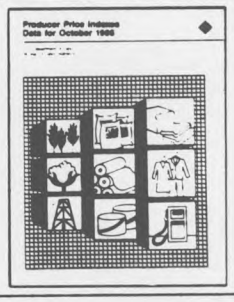

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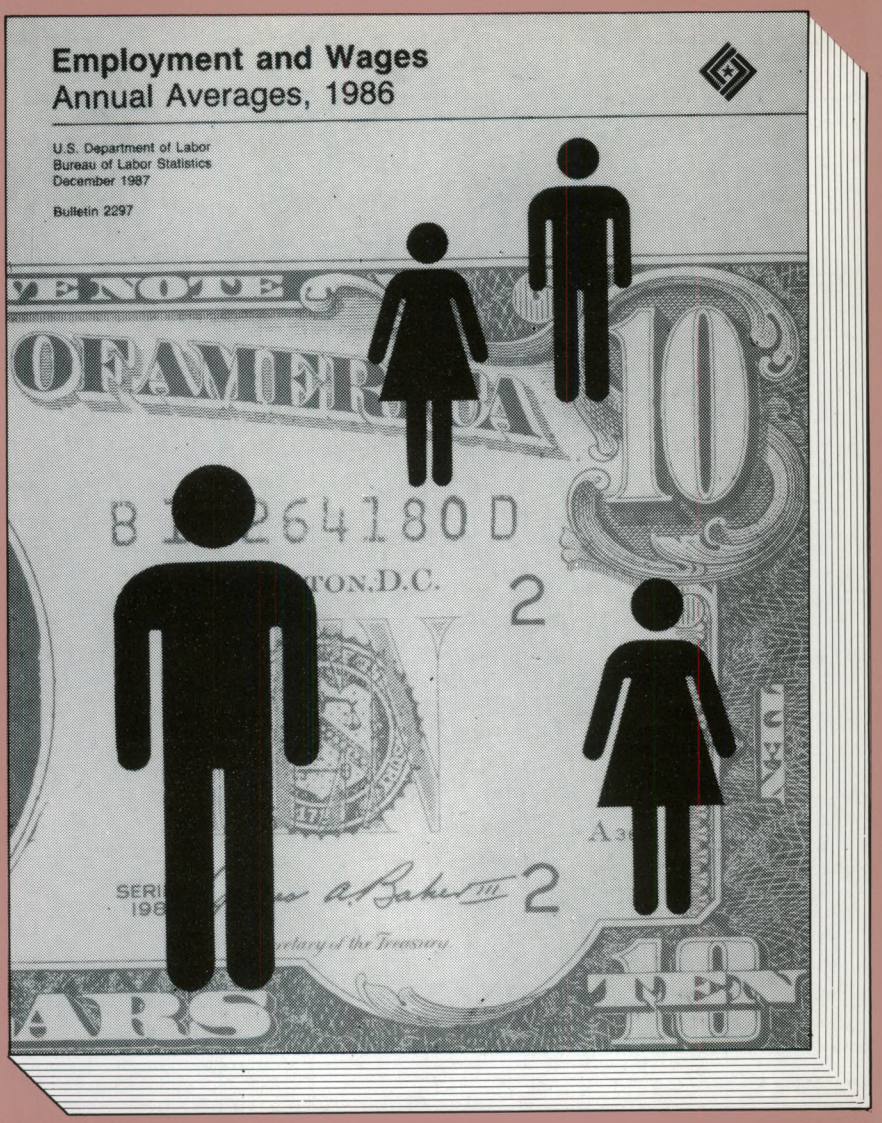

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