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# FEDERAL RESERVE statistical release

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G.17 (419)

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November 30, 1995

## INDUSTRIAL PRODUCTION AND CAPACITY UTILIZATION (ANNUAL REVISION)

The Federal Reserve's index of industrial production (IP) and its related measures of capacity and utilization for January 1991 onward have been revised. This revision has lowered growth in the total IP index for 1993 and raised it for 1994. For 1995, the level of the revised total IP index is, on balance, about the same as previously reported. Capacity growth has been revised upward a fraction of a percentage point so that the rate of capacity utilization last summer is now estimated to be slightly lower than was previously reported. The latest data continue to paint the same broad picture of recovery in industrial activity from the 1990 recession through 1994, followed by a slowdown in early 1995 (chart 1). The weights used since 1992 to aggregate the series continue to be proportions based on value added by industries in 1992. The production and capacity indexes continue to be expressed as percentages of output in 1987.

Revised monthly, quarterly, and annual data for total industry and for manufacturing are shown on tables 1 and 2. For the third quarter of 1995, the revised production index is 122.5 percent of output in 1987, the same as reported previously. The revised capacity index is 146.4 percent of output in 1987, compared with 145.8 percent reported previously. As a result, the rate of capacity utilization—the ratio of production to capacity—has been revised downward 0.4 percentage point, to an estimated 83.6 percent in the third quarter of 1995.

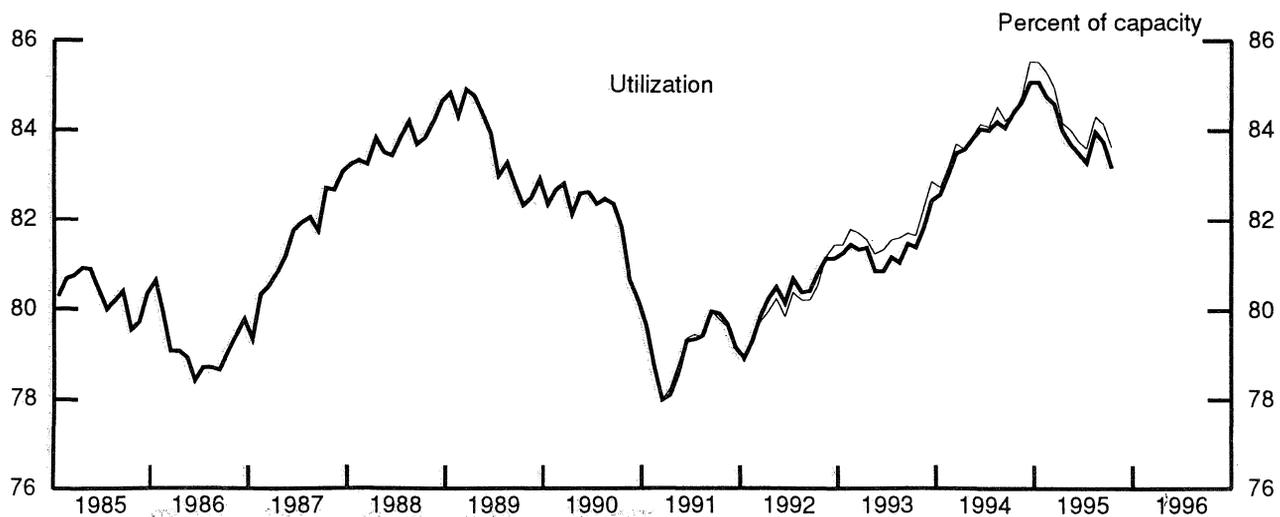
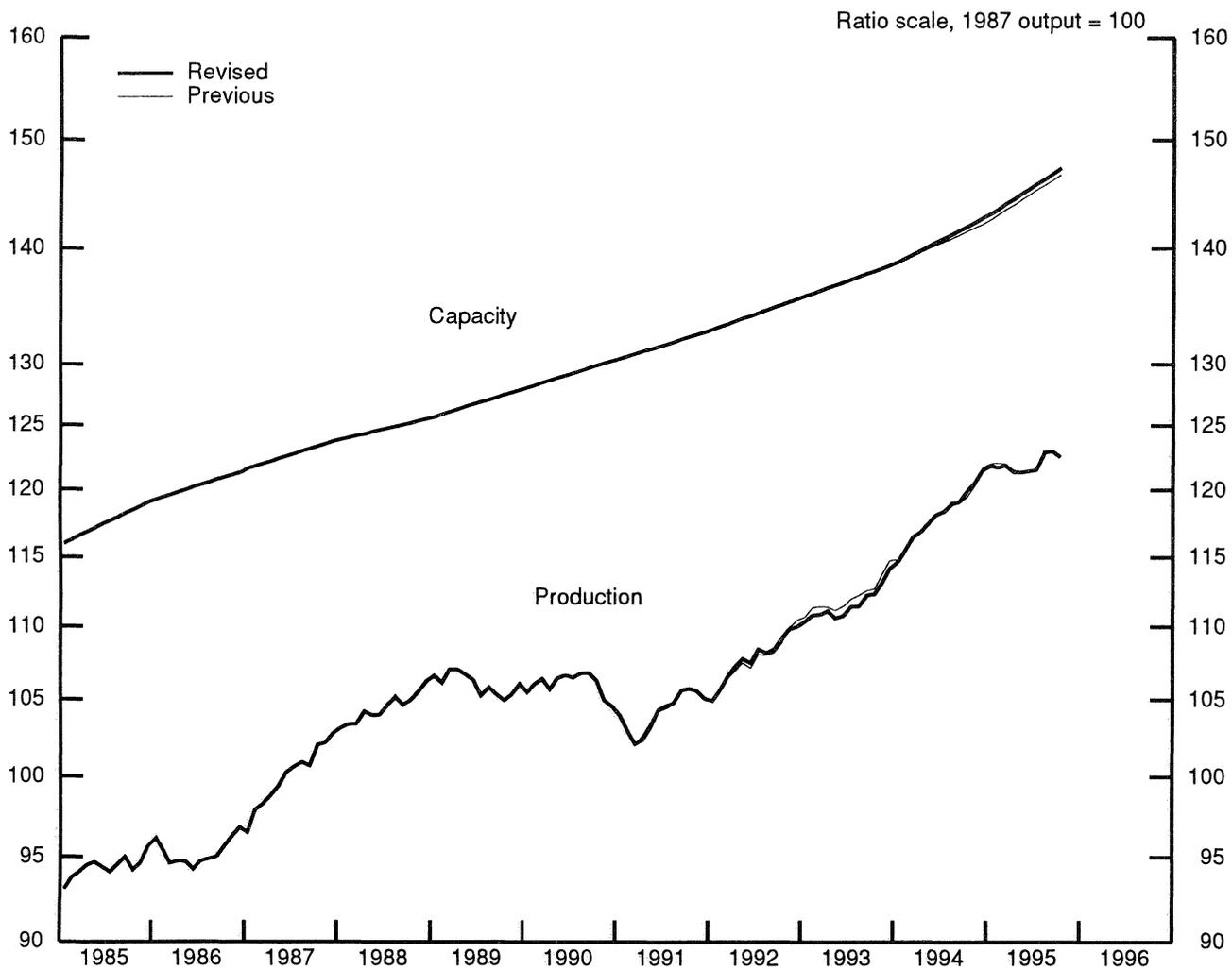
The new estimates of production incorporate additional or updated figures from the 1992 Census of Manufactures, preliminary results of the 1993 Annual Survey of Manufactures, annual physical data on mining for 1994, annual data for 1994 reported in selected Current Industrial Reports published by the Bureau of the Census, and updated monthly source data. Seasonal factors based on the X-11 ARIMA model were calculated through mid-1995, and the productivity relationships that are applied to input-based estimates were updated.

The IP index now shows slower growth in 1993 and faster growth in 1994 (table 3). The downward revision to IP growth for 1993 is largely a result of incorporating the data from the Annual Survey of Manufactures. The faster growth now shown for 1994 is due to the new annual and monthly data. Despite noticeable changes in some component series, the indexes for the output of business equipment and durable materials continue to show the strong upward trends beginning in 1991 (chart 2). The indexes for consumer durables and construction supplies still show a substantial falloff from the beginning of 1995, although the production of consumer durables is now estimated to have dropped from a higher level.

Among the major industry groupings, the bulk of the revisions to 1993 and 1994 were concentrated in manufacturing (table 4). Most notably, the growth in output of computer and office equipment was revised down sharply in 1993 and raised significantly in 1994 and 1995. Elsewhere, noticeable downward revisions to growth in 1993 occurred in electrical machinery and chemicals. Growth rates for these industries were revised up in 1994. The small downward revision to growth in 1995 reflected sizable revisions to both mining and utilities as well as a slight reduction in the growth in manufacturing.

The revisions to capacity and utilization incorporate the new IP indexes, preliminary survey data on manufacturing utilization rates (typically at the two-digit level) for the fourth quarters of 1993 and 1994 from the

# 1. Industrial production, capacity, and utilization



Bureau of the Census, and updated information on physical capacity and utilization in selected industries for 1994 and 1995 as reported mainly by trade associations. For most manufacturing industries, the annual growth in the capacity estimates is related to the growth in the industry's capital input. The revised capital input estimates incorporate investment data from the 1993 Annual Survey of Manufactures and updated results from the 1995 Investment Plans Survey by the Bureau of the Census.

Annual growth in industrial capacity has been revised up a bit over the 1991–95 period. As before, sharp increases in actual and planned investment spending led to an estimated acceleration of capacity growth in 1994 and 1995. The upward revision occurred in 1994 and was concentrated in durable goods manufacturing, notably for steel, motor vehicles and parts, and office and computing equipment (table 5). Survey results suggest that operating rates in the computer industry were much lower than those previously estimated and, given the revised estimates for production, imply that capacity growth was much higher. Among nondurable goods, capacity growth was revised upward for textiles, apparel, and paper products but was revised downward for chemicals and products.

As a result of the revisions to the production and capacity indexes, capacity utilization—the ratio of output to capacity—is a fraction of a percentage point lower than the earlier estimate for 1993–1995 (table 6). For the third quarter of this year, capacity utilization in manufacturing is 82.7 percent, 0.3 percentage point lower than the rate previously reported. Besides the large downward revision in utilization for computers, downward revisions occurred for plastics materials and electrical machinery industries. Within manufacturing, the downward revision to utilization is sizable both for durable manufacturing and for advanced-processing industries. Among primary-processing industries, operating rates were altered little, on balance, in 1994 and 1995; upward revisions to primary metals and to petroleum products offset downward revisions in other categories.

Capacity and utilization estimates for mining are little changed overall. The utilization rate for utilities was raised largely because the North American Electric Reliability Council reported slower growth in generating capacity. The strong demand for electricity to operate air conditioners during last summer's heat wave raised the operating rate at electric utilities to a relatively high level.

## **TECHNICAL ASPECTS OF THE REVISION**

The revision to the IP index and measures of capacity involved some small modifications to value-added weights, changes in series structure, and updated capital measures.

### **Weighting of the Indexes**

To combine individual series into market or industry aggregates, the individual indexes are multiplied by their proportionate contribution to industrial value added in 1992. As in the revision a year ago, the 1992 Census of Manufactures and the 1992 Census of Mineral Industries were used for measures of value added by individual manufacturing and mining industries in 1992. Value-added estimates for electric and gas utilities were compiled from income and expense information published by the Department of Energy, the Edison Electric Institute, and the American Gas Association.

Although the overall 1992 value-added weights were essentially unchanged in this revision, the weights of some series were modified to reflect small revisions to value added as initially reported in the 1992 preliminary Census of Manufactures and Mineral Industries. In addition, weights for detailed series (typically product series or series split according to market group) below the four-digit Standard Industrial Classification (SIC) level were adjusted to reflect some data, not available for the previous revision, on the 1992 value of product.

This revision updates the supplementary series on the gross value of products. The gross value series are derived from production indexes for products, and they exclude materials series to avoid double counting. Formerly in 1987 dollars, the gross value series are now expressed in 1992 dollars. The dollar weights that are applied to individual manufacturing series are derived from the value of products figures from the 1992 Census of Manufactures.

## Changes in Series Structure

The series structure of the index of industrial production, which now comprises 260 individual series, remains basically the same. To improve coverage and reliability, a net of five series were added and source data for three other series were modified. With the changes, the proportion of IP series derived from physical product data rises, in 1992 value-added terms, 2 percentage points, to 41 percent.

Industrial organic chemicals (SIC 286), formerly an input-based series, is now derived from quarterly production data, reported by the National Petroleum Refiners Association. These data cover major petrochemicals, such as benzene, ethylene, propylene, and styrene.

The service industry machines industry (SIC 358) was formerly represented by three unpublished series. Now, the industry's largest four-digit component, heating and refrigeration equipment (SIC 3585), is shown separately and constructed from six individual IP series, four of which are new. The following measures have been added to the series on room air conditioners and unitary air conditioners: (1) an estimate of air conditioners for motor vehicles that uses motor vehicle assemblies as a monthly indicator and that is based on the annual output in units reported by the Census Bureau, (2) an index for warm air furnaces based on data in units reported by the Gas Appliance Manufacturers Association, (3) an estimate of commercial heating and cooling equipment developed from annual output in units reported by the Census Bureau; and (4) an estimate of compressors, condensers, and other parts for heating and cooling equipment (including home appliances) based on unit output of the assembled equipment.

Plumbing and heating products (SIC 343), which had been covered by one input-based series, has been split into three series. They are plumbing fixtures (SIC 3431,2), which is based on monthly kilowatt hours, and two series that cover SIC 3433: (1) boilers, unit heaters, and furnaces, except warm air, a series based on units reported by the Gas Appliance Manufacturers Association, and (2) burners and parts for boilers, water heaters, and furnaces, a series based on source data for related IP indexes

The monthly series on household audio and video equipment (SIC 3651) is now based solely on units of direct-view color television sets, with screens that measure at least 19 inches as reported by the Electronic Industries Association, less comparable imports. Monochromatic TVs and smaller color TVs are no longer produced in the United States.

Formerly, the output of carpets (SIC 227) was represented by two series based on shipments of woven and tufted carpets. Because the Carpet and Rug Institute has discontinued issuing data on woven carpets, this small series has been dropped. In the IP index, the carpet industry is now represented only by production of tufted carpets, which accounts for the bulk of carpet output.

## Revised Electric Power Data

Monthly data on sales of electric power to three-digit industry groups, along with estimates of the trends in output per kilowatt-hour, are used to indicate the monthly change in output for many individual industrial production series. Revised data on the sales of electric power to industries since 1990 have been introduced in this revision. Seasonal factors for the electric power data were reestimated, based on data through March 1995. These kilowatt-hour data are part of a major revision of the electric power series back to 1972. The new estimates more accurately account for cogeneration and are benchmarked to electric power use reported in the Census and Annual Survey of Manufactures. Following the completion of review and documentation, the revised electric power series will be published in a supplement to Industrial Production and Capacity Utilization, Federal Reserve Statistical Release, G.17.

## Updated Capital Measures

Although the basic methodology used by the Federal Reserve to estimate capacity and utilization remains essentially the same, the capital measures used to calculate many series on manufacturing capacity have been reconfigured. Formerly, the real net stocks of diverse assets, such as computers, metalworking machinery, and industrial buildings, were summed to obtain an industry's total net capital stock. In this revision, a different

method of aggregation was used to estimate industry capital input. The new capital input measures are calculated using a Tornqvist index number formula. This formula weights growth rates in the net stocks of individual assets by an estimate of that asset's share of the aggregate marginal product of the industry's capital. <sup>1</sup>

#### Data Availability and Publication Changes

Diskettes containing either historical data (through 1985) or more recent data (1986 to those most recently published in the G.17 statistical release) are available from Publications Services, Board of Governors of the Federal Reserve System, Washington, DC 20551 (202-452-3245). Files containing the revised data and the text and tables from this release are also available through the Economic Bulletin Board of the Department of Commerce; for information, call 202-482-1986.

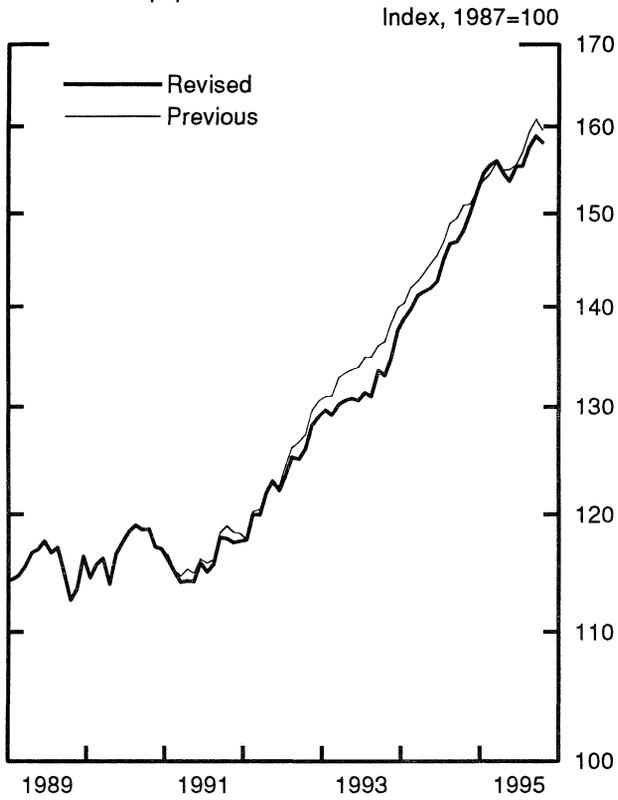
A document with printed tables of the revised estimates of series shown in the G.17 release will be sent to subscribers to the release. It is also available upon written request to the Industrial Output Section, Mail Stop 82, Division of Research and Statistics, Board of Governors of the Federal Reserve System, Washington, DC 20551.

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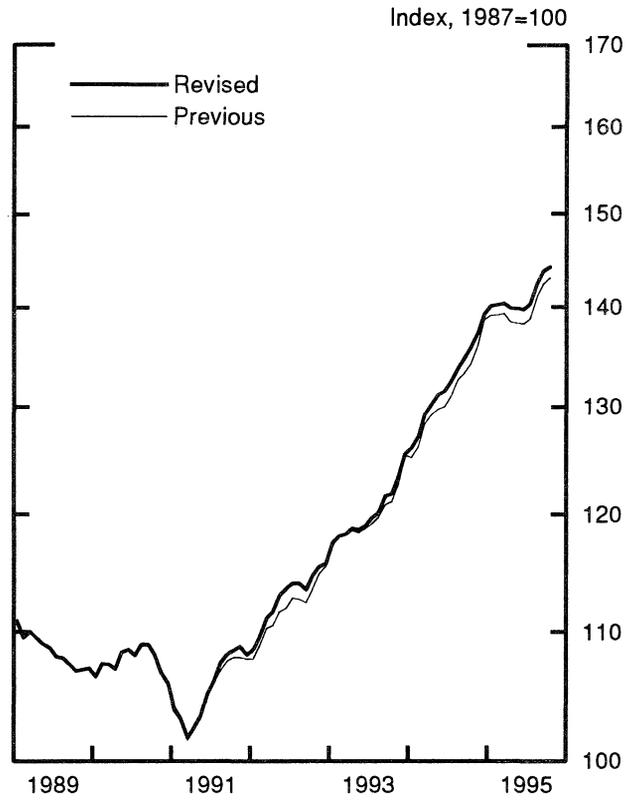
1. This method is the similar to the one used by the Bureau of Labor Statistics to calculate multifactor productivity. The BLS capital input measures are documented in appendix C of *Trends in Multifactor Productivity, 1948-81*, Bulletin 2178 (U.S. Department of Labor, Bureau of Labor Statistics, 1983). For an early application of this method, see L. R. Christensen and D. W. Jorgenson, "The Measurement of U.S. Real Capital Input, 1929-67," *Review of Income and Wealth*, Series 15, (December 1969), pp. 293-320.

## 2. Industrial production by market group

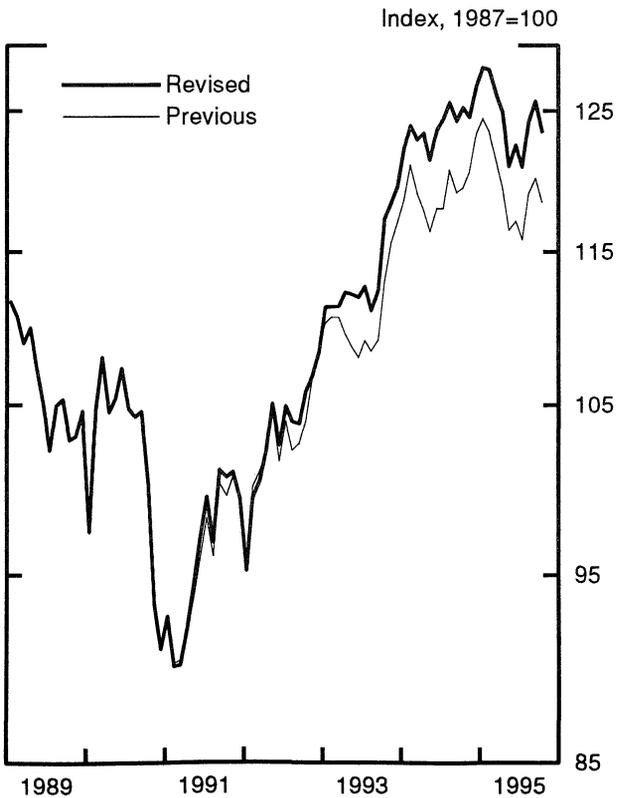
Business Equipment



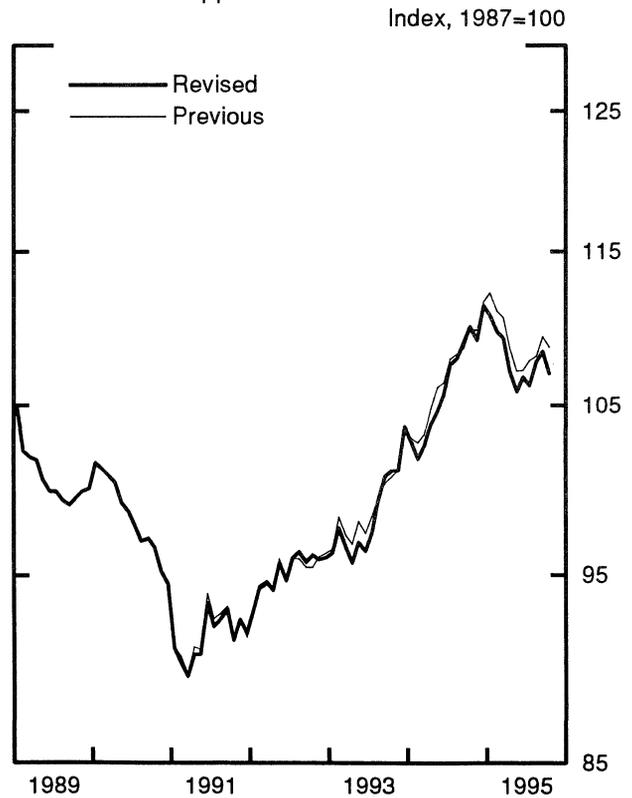
Durable Materials



Consumer Durables



Construction Supplies



**Table 1**  
**INDUSTRIAL PRODUCTION, CAPACITY AND UTILIZATION: 1988-1995<sup>1</sup>**

**TOTAL INDUSTRY**

Seasonally adjusted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Q1	Q2	Q3	Q4	Annual <sup>2</sup>
<b>Industrial Production, Percent Change</b>																	
1988	.3	.2	.0	.8	-.3	.0	.6	.6	-.5	.3	.6	.6	3.8	3.0	2.9	3.0	4.4
1989	.3	-.5	.9	.0	-.3	-.3	-1.0	.5	-.4	-.4	.4	.7	3.9	.3	-4.4	-.2	1.5
1990	-.5	.5	.3	-.7	.7	.2	-.2	.3	.0	-.5	-1.3	-.4	2.1	1.1	1.6	-5.2	.0
1991	-.5	-1.0	-.8	.3	.8	1.1	.2	.3	.8	.1	-.1	-.5	-8.4	1.1	6.7	2.0	-1.8
1992	-.1	.6	.9	.7	.5	-.3	.8	-.2	.2	.7	.6	.2	.8	7.0	3.1	4.9	3.4
1993	.3	.4	.0	.2	-.5	.2	.6	.0	.7	.1	.7	.9	3.7	.5	3.2	5.5	3.5
1994	.4	.8	.8	.3	.5	.5	.2	.5	.1	.7	.5	.8	8.4	7.0	4.6	6.4	5.9
1995	.3	-.1	.1	-.4	.0	.1	.1	1.1	.1	-.4			3.9	-1.4	3.6		
<b>Industrial Production</b>																	
1988	103.2	103.4	103.4	104.3	104.0	104.0	104.6	105.2	104.7	105.0	105.6	106.3	103.3	104.1	104.8	105.6	104.4
1989	106.6	106.2	107.1	107.1	106.7	106.4	105.3	105.8	105.4	105.0	105.4	106.1	106.6	106.7	105.5	105.5	106.0
1990	105.5	106.1	106.4	105.7	106.5	106.7	106.5	106.8	106.8	106.3	105.0	104.5	106.0	106.3	106.7	105.3	106.0
1991	104.0	102.9	102.1	102.4	103.2	104.3	104.5	104.8	105.7	105.8	105.6	105.1	103.0	103.3	105.0	105.5	104.2
1992	105.0	105.6	106.5	107.3	107.8	107.5	108.4	108.2	108.4	109.2	109.8	110.0	105.7	107.5	108.3	109.7	107.7
1993	110.4	110.8	110.8	111.1	110.6	110.8	111.4	111.4	112.2	112.3	113.1	114.1	110.7	110.8	111.7	113.2	111.5
1994	114.6	115.5	116.4	116.8	117.5	118.1	118.4	118.9	119.1	119.9	120.5	121.5	115.5	117.5	118.8	120.6	118.1
1995	121.8	121.7	121.9	121.4	121.3	121.4	121.5	122.9	123.0	122.5			121.8	121.4	122.5		
<b>Capacity</b>																	
1988	123.9	124.1	124.2	124.4	124.5	124.7	124.8	125.0	125.1	125.3	125.4	125.5	124.1	124.5	125.0	125.4	124.7
1989	125.7	125.9	126.1	126.3	126.5	126.7	126.9	127.1	127.3	127.5	127.7	127.9	125.9	126.5	127.1	127.7	126.8
1990	128.1	128.3	128.5	128.7	128.9	129.1	129.3	129.5	129.7	129.9	130.1	130.3	128.3	128.9	129.5	130.1	129.2
1991	130.5	130.7	130.9	131.1	131.3	131.5	131.7	131.9	132.1	132.3	132.5	132.7	130.7	131.3	131.9	132.5	131.6
1992	132.9	133.2	133.4	133.6	133.9	134.1	134.3	134.6	134.8	135.1	135.3	135.5	133.2	133.9	134.6	135.3	134.2
1993	135.8	136.0	136.3	136.5	136.7	137.0	137.2	137.5	137.7	137.9	138.2	138.4	136.0	136.7	137.5	138.2	137.1
1994	138.7	139.1	139.5	139.8	140.2	140.5	140.9	141.3	141.7	142.0	142.4	142.8	139.1	140.2	141.3	142.4	140.8
1995	143.2	143.6	144.1	144.5	145.0	145.5	145.9	146.4	146.9	147.3			143.7	145.0	146.4		
<b>Utilization</b>																	
1988	83.2	83.3	83.2	83.8	83.5	83.4	83.8	84.2	83.7	83.8	84.2	84.6	83.3	83.6	83.9	84.2	83.7
1989	84.8	84.3	84.9	84.8	84.3	83.9	83.0	83.3	82.8	82.3	82.5	82.9	84.7	84.3	83.0	82.6	83.7
1990	82.4	82.7	82.8	82.1	82.6	82.6	82.4	82.5	82.4	81.8	80.7	80.2	82.6	82.5	82.4	80.9	82.1
1991	79.7	78.7	78.0	78.1	78.6	79.3	79.4	79.4	80.0	79.9	79.7	79.2	78.8	78.7	79.6	79.6	79.2
1992	78.9	79.3	79.9	80.3	80.5	80.2	80.7	80.4	80.4	80.8	81.2	81.2	79.4	80.3	80.5	81.0	80.3
1993	81.3	81.5	81.4	81.4	80.9	80.9	81.2	81.1	81.5	81.4	81.8	82.4	81.4	81.0	81.2	81.9	81.4
1994	82.6	83.0	83.5	83.6	83.8	84.0	84.0	84.2	84.0	84.4	84.6	85.1	83.0	83.8	84.1	84.7	83.9
1995	85.1	84.7	84.6	84.0	83.7	83.5	83.3	83.9	83.7	83.2			84.8	83.7	83.6		

1. Estimates from August 1995 through October 1995 are subject to further revision in the upcoming monthly releases.

2. Annual averages of industrial production are calculated from not seasonally adjusted indexes.

**Table 2**  
**INDUSTRIAL PRODUCTION, CAPACITY AND UTILIZATION: 1988-1995<sup>1</sup>**

**MANUFACTURING**

Seasonally adjusted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Q1	Q2	Q3	Q4	Annual <sup>2</sup>
<b>Industrial Production, Percent Change</b>																	
1988	.2	.1	.2	.7	-.1	.0	.5	.4	.0	.1	.9	.6	3.6	3.3	3.0	4.4	4.7
1989	.8	-.9	.6	.2	-.5	-.2	-1.2	.4	-.4	-.5	.3	.2	4.3	-.3	-5.3	-1.3	1.6
1990	-.1	.9	.4	-.9	.5	.0	-.3	.5	-.1	-.6	-1.2	-.5	3.7	.2	1.0	-5.5	-.3
1991	-.9	-.9	-.9	.3	.7	1.3	.3	.3	1.0	.1	-.2	-.4	-9.8	1.0	8.1	2.5	-2.1
1992	.1	.8	.9	.6	.6	.0	.8	-.1	.1	.6	.6	.0	2.3	7.6	3.8	4.3	4.2
1993	.8	.3	.0	.4	-.4	.0	.6	-.1	.9	.0	.8	1.1	4.6	1.2	3.0	6.0	3.9
1994	.2	.9	1.0	.6	.6	.3	.4	.6	.2	.9	.6	.9	8.9	8.5	5.1	7.9	6.6
1995	.3	-.2	.1	-.4	-.3	.1	.0	.9	.5	-.3			3.9	-2.2	3.1		
<b>Industrial Production</b>																	
1988	103.2	103.4	103.6	104.3	104.2	104.2	104.7	105.1	105.2	105.3	106.2	106.8	103.4	104.2	105.0	106.1	104.7
1989	107.7	106.7	107.3	107.6	107.1	106.8	105.5	106.0	105.6	105.1	105.4	105.6	107.2	107.2	105.7	105.4	106.4
1990	105.5	106.5	107.0	106.0	106.6	106.6	106.3	106.9	106.8	106.2	104.9	104.4	106.3	106.4	106.6	105.1	106.1
1991	103.4	102.5	101.5	101.8	102.5	103.8	104.2	104.5	105.6	105.7	105.5	105.1	102.5	102.7	104.8	105.4	103.8
1992	105.1	105.9	106.9	107.6	108.2	108.1	109.0	108.9	109.0	109.7	110.4	110.3	106.0	108.0	109.0	110.1	108.2
1993	111.2	111.5	111.5	112.0	111.6	111.6	112.3	112.2	113.2	113.2	114.1	115.3	111.4	111.7	112.5	114.2	112.3
1994	115.5	116.6	117.8	118.5	119.1	119.5	120.0	120.7	120.9	122.0	122.7	123.8	116.6	119.0	120.5	122.8	119.7
1995	124.1	123.9	124.0	123.5	123.2	123.3	123.3	124.5	125.0	124.7			124.0	123.3	124.3		
<b>Capacity</b>																	
1988	124.1	124.3	124.5	124.7	124.9	125.1	125.3	125.5	125.7	125.9	126.0	126.2	124.3	124.9	125.5	126.0	125.2
1989	126.5	126.7	127.0	127.2	127.4	127.7	127.9	128.2	128.4	128.7	128.9	129.2	126.7	127.4	128.2	128.9	127.8
1990	129.4	129.6	129.8	130.1	130.3	130.5	130.7	130.9	131.2	131.4	131.6	131.8	129.6	130.3	130.9	131.6	130.6
1991	132.0	132.2	132.5	132.7	132.9	133.1	133.3	133.5	133.7	133.9	134.2	134.4	132.2	132.9	133.5	134.2	133.2
1992	134.6	134.9	135.2	135.5	135.7	136.0	136.3	136.6	136.8	137.1	137.4	137.7	134.9	135.7	136.6	137.4	136.1
1993	138.0	138.2	138.5	138.8	139.1	139.4	139.7	139.9	140.2	140.5	140.8	141.1	138.2	139.1	139.9	140.8	139.5
1994	141.5	141.9	142.3	142.7	143.1	143.6	144.0	144.4	144.9	145.3	145.7	146.2	141.9	143.1	144.4	145.7	143.8
1995	146.6	147.2	147.7	148.2	148.7	149.2	149.8	150.3	150.9	151.4			147.2	148.7	150.3		
<b>Utilization</b>																	
1988	83.2	83.1	83.2	83.6	83.4	83.3	83.6	83.8	83.7	83.7	84.3	84.6	83.2	83.5	83.7	84.2	83.6
1989	85.2	84.2	84.6	84.6	84.0	83.7	82.5	82.7	82.2	81.7	81.8	81.8	84.6	84.1	82.5	81.7	83.2
1990	81.6	82.2	82.4	81.5	81.8	81.7	81.3	81.6	81.4	80.8	79.7	79.2	82.0	81.7	81.4	79.9	81.3
1991	78.3	77.5	76.6	76.8	77.2	78.0	78.2	78.3	78.9	78.9	78.6	78.2	77.5	77.3	78.5	78.6	78.0
1992	78.1	78.5	79.1	79.4	79.7	79.5	80.0	79.8	79.7	80.0	80.3	80.1	78.6	79.6	79.8	80.2	79.5
1993	80.6	80.6	80.5	80.7	80.2	80.0	80.4	80.2	80.7	80.6	81.0	81.7	80.6	80.3	80.4	81.1	80.6
1994	81.7	82.2	82.8	83.0	83.2	83.2	83.3	83.6	83.5	83.9	84.2	84.7	82.2	83.2	83.4	84.3	83.3
1995	84.6	84.2	84.0	83.3	82.8	82.6	82.3	82.8	82.9	82.3			84.3	82.9	82.7		

1. Estimates from August 1995 through October 1995 are subject to further revision in the upcoming monthly releases.  
2. Annual averages of industrial production are calculated from not seasonally adjusted indexes.

**Table 3**  
**RATES OF GROWTH IN INDUSTRIAL PRODUCTION, BY MAJOR MARKET GROUPS, 1991-1995<sup>1</sup>**

Item	Revised index (percent)					Difference between revised and earlier indexes (percentage points)				
	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
<b>Total index</b>	.2	4.0	3.2	6.6	2.0	.0	.0	-.4	.6	-.2
<b>Products, total</b>	-.3	4.1	2.5	5.6	1.6	-.2	-.2	-.4	.6	-.5
<b>Final products</b>	.3	4.4	2.5	5.4	2.4	-.3	-.2	-.3	.8	-.5
<b>Consumer goods</b>	2.7	3.4	1.9	4.1	1.0	.2	.0	-.2	.7	-.4
<b>Durable</b>	5.9	6.9	10.6	6.1	-2.5	.5	.4	2.4	1.0	.6
Automotive products	6.7	11.4	14.4	7.3	-2.4	1.4	-.5	2.9	.0	1.3
Other durable goods	5.3	3.2	7.3	4.9	-2.5	-.1	.9	1.9	1.8	.0
<b>Nondurable</b>	1.8	2.6	-.2	3.5	2.0	.0	.0	-.9	.6	-.6
<b>Equipment, total</b>	-2.8	5.8	3.5	7.5	4.4	-.8	-.5	-.4	1.1	-.6
<b>Business equipment</b>	.1	8.2	5.9	11.4	6.3	-.7	-.8	-1.0	1.8	-.4
Industrial	-6.9	4.4	5.9	8.6	4.0	-.2	.9	-.1	-.1	-.7
Information processing & related	3.7	14.9	7.5	17.8	13.2	-.8	-1.6	-3.1	4.1	.6
Transit	5.8	.5	.9	2.6	-2.3	-2.1	-.6	3.6	2.4	-3.0
Other	-5.4	4.8	10.0	7.9	-3.2	-.1	-1.9	-1.8	-2.5	-1.2
<b>Defense and space equipment</b>	-9.3	-5.8	-7.0	-10.4	-6.6	-1.2	.2	2.8	-1.0	-1.1
<b>Intermediate products</b>	-2.2	3.2	2.6	6.3	-.8	.3	-.1	-.8	.0	-.5
Construction supplies	-3.6	4.0	6.0	8.0	-2.5	.0	-.3	-.2	-.4	-.2
Business supplies	-1.4	2.7	.6	5.3	.3	.5	-.1	-1.3	.2	-.6
<b>Materials</b>	.9	3.7	4.2	8.1	2.6	.2	.0	-.4	.6	.2
Durable	1.5	6.2	7.2	11.2	4.6	.6	.0	-.2	.5	.2
Nondurable	.4	2.3	2.3	6.9	-2.2	-.3	.2	-1.7	1.3	1.1
Energy	.1	.0	-.5	1.9	2.3	-.1	.1	.4	.1	-1.0
<b>SPECIAL AGGREGATES</b>										
<b>Total excluding:</b>										
Computer and office equipment	.0	3.3	2.8	6.1	1.2	.0	-.1	-.3	.5	-.4
<b>Business equipment excluding:</b>										
Computer and office equipment	-1.2	4.8	3.5	8.6	1.7	-.8	-.5	-.3	.7	-1.3

1. Growth rates are calculated as the percent change in the seasonally adjusted index from the fourth quarter of the previous year to the fourth quarter of the year specified in the column heading. For 1995, the growth rates are calculated from the fourth quarter of 1994 to the third quarter of 1995.

**Table 4**  
**RATES OF GROWTH IN INDUSTRIAL PRODUCTION, BY INDUSTRY GROUPS, 1991-1995<sup>1</sup>**

Item	SIC	Revised index (percent)					Difference between revised and earlier indexes (percentage points)				
		1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
<b>Total index</b>		.2	4.0	3.2	6.6	2.0	.0	.0	-.4	.6	-.2
<b>Manufacturing</b>		.3	4.5	3.7	7.6	1.6	.1	-.1	-.5	.7	-.1
<b>Primary processing</b>		-.6	4.0	4.3	7.0	-1.7	.0	.2	-.8	.6	.5
<b>Advanced processing</b>		.6	4.7	3.4	7.8	3.0	.0	-.3	-.3	.7	-.3
<b>Durable</b>		.0	5.5	6.2	9.3	3.3	.0	-.3	-.1	.8	.0
Lumber and products	24	-.5	5.8	3.9	5.7	-2.0	-.3	-1.5	-1.8	1.6	1.0
Furniture and fixtures	25	-.5	4.9	5.2	7.3	-3.0	.5	-.6	.7	-.7	-2.3
Stone, clay, and glass products	32	-5.7	3.8	4.2	4.0	-1.8	1.1	-1.9	-.8	-1.5	.5
<b>Primary metals</b>	33	-3.1	1.0	7.5	9.8	-4.3	-.2	-.1	.7	1.0	.5
Iron and steel	331,2	-5.4	1.1	9.1	8.3	-3.0	-.2	-.5	.9	.7	1.7
Raw steel		-8.5	1.6	5.8	6.4	.4	-.3	-.1	-.1	.0	1.2
Nonferrous	333-6,9	-.4	.9	5.4	11.8	-6.0	-.2	.6	-.3	1.4	-1.1
Fabricated metal products	34	-1.8	5.1	3.9	8.4	.8	-.4	.6	-1.0	.8	-.5
Industrial machinery and equipment	35	-1.6	10.4	12.9	14.9	10.7	-.4	-.9	-1.2	1.7	1.8
Computer and office equip.	357	5.5	28.0	26.7	29.6	32.7	-.1	-2.6	-6.8	9.4	4.6
Electrical machinery	36	5.3	9.9	8.2	17.7	12.5	1.3	-1.5	-4.9	1.2	-.5
Transportation equipment	37	.8	2.9	4.9	3.2	-3.3	-.4	.6	4.4	.7	-.5
Motor vehicles and parts	371	10.0	10.7	16.8	8.6	-3.4	-.2	-1.0	2.8	.7	1.5
Autos and light trucks		12.3	8.8	15.7	6.0	-3.9	-.4	.0	.8	-.1	2.1
Aerospace and misc.	372-6,9	-6.3	-4.3	-7.9	-4.1	-3.2	-.5	2.0	6.5	1.5	-3.8
Instruments	38	.0	1.0	-1.1	4.0	.9	-.7	.5	1.0	.8	.2
Miscellaneous	39	.3	2.1	6.0	6.2	.0	-.2	1.5	2.2	.1	1.4
<b>Nondurable</b>		.6	3.2	.9	5.5	-.6	.1	.0	-.9	.5	-.2
Foods	20	.9	1.6	2.6	3.6	1.2	.1	-.3	.5	.1	-1.1
Tobacco products	21	-11.8	5.6	-19.6	24.7	4.3	-.3	-4.4	-4.1	-2.2	4.5
Textile mill products	22	5.0	6.3	4.6	5.0	-6.3	-.6	1.9	3.2	-.5	2.2
Apparel products	23	5.8	.9	1.3	4.0	-9.1	-.1	.9	2.5	1.3	.6
Paper and products	26	2.0	.4	6.8	4.2	-2.6	.2	.8	-.4	.3	-.7
Printing and publishing	27	-1.9	2.3	-1.4	2.6	-1.1	.5	.2	-1.2	.0	.4
Chemicals and products	28	.2	4.4	-1.0	7.0	1.4	-.3	.0	-4.0	2.3	-1.0
Petroleum products	29	-1.6	3.6	3.1	.0	2.7	.4	.3	.6	-.4	1.6
Rubber and plastics products	30	3.4	8.7	6.7	10.4	-1.6	-.2	.3	.7	-.3	.1
Leather and products	31	-4.5	5.1	-2.6	-3.2	-9.4	1.2	-.2	2.2	-1.7	1.5
<b>Mining</b>		-3.1	.3	-.5	1.2	.4	.0	.0	.3	.4	-1.4
Metal mining	10	-.4	6.1	2.5	-2.8	7.5	-.6	.3	1.8	2.3	-.9
Coal mining	12	-2.0	-.5	-3.2	9.1	.5	.5	.2	.1	-.1	1.1
Oil and gas extraction	13	-3.5	-.5	-.6	-.7	-1.0	-.2	.1	.3	.4	-2.1
Stone and earth minerals	14	-4.5	4.5	2.9	6.4	4.8	.6	-.3	.2	-.4	-1.5
<b>Utilities</b>		2.7	2.0	1.5	.2	9.1	.1	.1	.4	.0	-1.1
Electric	491,3pt	1.6	1.9	.9	1.8	8.4	.1	.0	.3	-.1	-1.1
Gas	492,3pt	7.0	2.1	3.9	-6.0	11.9	.2	.2	.7	.0	-.9
<b>SPECIAL AGGREGATES</b>											
<b>Manufacturing excluding:</b>											
Computer and office equipment		.0	3.7	3.2	7.0	.6	.0	-.1	-.3	.5	-.2

1. Growth rates are calculated as the percent change in the seasonally adjusted index from the fourth quarter of the previous year to the fourth quarter of the year specified in the column heading. For 1995, the growth rates are calculated from the fourth quarter of 1994 to the third quarter of 1995.

**Table 5**  
**RATES OF GROWTH IN CAPACITY, BY INDUSTRY GROUPS, 1991-1995<sup>1</sup>**

Item	SIC	Revised index (percent)					Difference between revised and earlier indexes (percentage points)				
		1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
<b>Total index</b>		1.8	2.1	2.1	3.1	3.6	-.1	.0	.0	.4	.0
<b>Manufacturing</b>		1.9	2.4	2.5	3.5	4.1	-.2	.0	.1	.5	.1
<b>Primary processing</b>		1.2	1.4	1.5	2.2	2.6	.0	.0	.1	.2	-.1
<b>Advanced processing</b>		2.4	2.9	2.9	4.1	4.7	-.1	.0	.1	.6	.1
<b>Durable</b>		2.3	2.5	3.1	4.6	5.3	-.2	-.1	.5	.9	.1
Lumber and products	24	.0	.6	1.2	.9	1.6	.3	.3	.5	-.6	-.9
Furniture and fixtures	25	.5	.9	1.9	1.9	2.7	-.4	-.7	-.5	-.9	.3
Stone, clay, and glass products	32	.6	.7	.3	.9	1.4	.4	.2	-.7	-.7	-.2
<b>Primary metals</b>	33	-.8	-.1.2	-.3	1.8	1.5	-.2	-.2	.3	1.2	-.1.7
Iron and steel	331,2	-.1.2	-.2.3	-.1.0	2.8	2.0	.0	.0	.0	1.7	-.2.3
Raw steel		-.1.6	-.3.0	-.4.2	.9	.9	.0	-.4	-.5	3.1	-.3.1
Nonferrous	333-6,9	.1	.4	.5	.6	1.0	-.3	-.3	.5	.6	-.9
Fabricated metal products	34	-.2	.3	1.1	1.9	2.0	-.6	-.6	.2	.9	.3
Industrial machinery and equipment	35	5.1	4.1	5.8	8.7	9.9	-.4	-.7	1.4	3.0	.3
Computer and office equip.	357	14.1	14.0	18.6	24.9	25.0	-.1.3	-.1.6	4.2	9.5	3.4
Electrical machinery	36	4.8	6.4	7.3	9.7	12.0	-.9	-.2	-.2	.2	.1
<b>Transportation equipment</b>	37	1.5	2.0	2.0	3.4	3.1	.2	.5	1.5	1.6	.3
Motor vehicles and parts	371	2.9	3.8	4.5	6.6	5.8	-.1	.6	2.0	2.2	-.1
Autos and light trucks		1.0	2.4	2.7	5.8	3.9	.0	.0	1.9	1.2	-.8
Aerospace and misc.	372-6,9	-.1	.2	-.8	-.3	-.1	.1	.5	.8	.9	.7
Instruments	38	1.2	1.3	.9	.9	1.0	.0	.1	-.4	-.5	-.3
Miscellaneous	39	2.6	4.8	3.7	3.9	4.0	1.1	1.3	.5	.3	2.2
<b>Nondurable</b>		1.8	2.3	1.8	2.1	2.5	.1	.1	-.4	-.2	.1
Foods	20	1.7	2.2	2.1	2.0	2.0	-.2	.0	-.1	-.1	-.3
Tobacco products	21	-.2.1	-.1.0	.4	2.5	2.6	-.1.6	-.3	-.6	2.0	1.0
Textile mill products	22	1.5	2.5	3.4	3.1	3.1	1.0	1.3	1.7	1.0	.7
Apparel products	23	-.5	2.1	2.5	1.0	1.0	-.1	1.2	2.5	.5	-.2
Paper and products	26	2.7	2.3	2.2	2.1	2.6	.4	.4	.6	.3	.3
Printing and publishing	27	.8	.9	-.8	1.6	2.3	-.5	-.8	-.2.5	.5	1.5
Chemicals and products	28	3.1	4.0	2.6	2.2	2.4	.5	.5	-.7	-.1.5	-.1.3
Petroleum products	29	-.8	-.1.3	-.5	.3	.5	.0	.0	.0	.7	.1
Rubber and plastics products	30	3.5	4.2	4.1	4.6	6.5	.0	-.2	-.3	-.1	1.5
Leather and products	31	-.4.3	-.2.7	-.2.2	-.2.5	-.1.7	-.5	-.3	.5	-.3	1.2
<b>Mining</b>		-.3	-.1.1	-.1.0	-.1	.1	.0	.0	.4	.1	.2
Metal mining	10	2.2	2.5	1.7	-.4	.3	-.1	.0	.0	-.9	.2
Coal mining	12	2.1	1.0	1.1	1.1	1.1	.0	.0	.0	.0	.0
Oil and gas extraction	13	-.1.0	-.2.1	-.1.9	-.6	-.6	.0	.0	.5	.0	-.1
Stone and earth minerals	14	-.5	.5	.8	1.5	2.6	.0	.0	.8	1.7	2.6
<b>Utilities</b>		1.3	1.2	.6	.5	.9	.0	.0	-.5	-.7	-.5
Electric	491,3pt	1.8	1.5	.7	.5	1.0	.0	.0	-.7	-.1.0	-.6
Gas	492,3pt	.0	.0	.2	.5	.6	.0	.0	.2	.2	.0
<b>SPECIAL AGGREGATES</b>											
<b>Total excluding:</b>											
Computer and office equipment		1.4	1.9	1.8	2.5	3.0	-.1		.0		
<b>Manufacturing excluding:</b>											
Computer and office equipment		1.6	2.1	2.1	2.9	3.4	.0	.0	.0	.2	-.1

1. Growth rates are calculated as the percent change in the seasonally adjusted index from the fourth quarter of the previous year to the fourth quarter of the year specified in the column heading. For 1995, the growth rates are calculated from the fourth quarter of 1994 to the third quarter of 1995.

Note—Primary processing manufacturing includes textile mill products, paper and products, industrial chemicals, synthetic materials, and fertilizers, petroleum products, rubber and plastics products, lumber and products, primary metals, fabricated metals, and stone, clay, and glass products. Advanced processing manufacturing includes foods, tobacco products, apparel products, printing and publishing, chemical products and other agricultural chemicals, leather and products, furniture and fixtures, industrial and commercial machinery and computer equipment, electrical machinery, transportation equipment, instruments, and miscellaneous manufactures.

**Table 6**  
**REVISED AND EARLIER CAPACITY UTILIZATION RATES, BY INDUSTRY GROUPS**

Percent of capacity, seasonally adjusted

Item	SIC	Revised index					Difference between revised and earlier indexes (percentage points)				
		1967-1994 Ave.	1989-1990 High	1991-1992 Low	1993 Q4	1994 Q4	1995 Q3	1991-1992 Low	1993 Q4	1994 Q4	1995 Q3
<b>Total index</b>		81.8	84.9	78.0	81.9	84.7	83.6	.0	-.4	-.2	-.4
<b>Manufacturing</b>		81.1	85.2	76.6	81.1	84.3	82.7	.0	-.4	-.2	-.3
<b>Primary processing</b>		82.4	89.0	77.9	85.2	89.3	86.4	.0	-.6	-.2	.2
<b>Advanced processing</b>		80.5	83.5	76.1	79.3	82.1	81.1	.0	-.4	-.4	-.6
<b>Durable</b>		78.9	84.0	73.7	80.2	83.8	82.6	-.1	-.5	-.7	-.7
Lumber and products	24	83.0	91.1	76.1	86.4	90.6	88.0	-.3	-4.0	-2.1	-.7
Furniture and fixtures	25	81.5	84.7	72.2	81.7	86.0	82.9	1.2	1.8	2.1	1.1
Stone, clay, and glass products	32	78.0	83.8	71.0	78.4	80.8	78.8	-.5	-1.0	-1.8	-1.3
<b>Primary metals</b>	33	80.3	92.8	74.2	88.4	95.3	91.3	.2	.4	.1	1.6
Iron and steel	331,2	80.0	95.7	72.0	90.1	94.9	90.9	-.1	.1	-.9	1.1
Raw steel		79.6	89.9	71.5	90.6	95.5	95.4	.1	.3	-2.7	.3
Nonferrous	333-6,9	81.1	88.5	75.2	86.2	95.8	90.7	.2	.6	1.2	1.1
Fabricated metal products	34	77.2	82.0	71.3	79.7	84.8	84.5	-.4	.1	-.1	-.1
Industrial machinery and equipment	35	80.6	84.0	71.8	82.5	87.2	87.6	-.7	-2.4	-3.7	-2.9
Computer and office equip.	357	80.2	80.0	64.5	79.5	82.5	85.6	-.1	-7.1	-7.7	-8.3
Electrical machinery	36	80.3	84.2	77.0	81.6	87.7	87.6	1.5	-2.8	-2.2	-2.6
Transportation equipment	37	74.8	84.4	69.7	77.4	77.3	73.8	-.5	1.8	1.2	.7
Motor vehicles and parts	371	76.0	85.1	56.6	83.6	85.1	79.7	-1.0	-.8	-2.1	-1.0
Autos and light trucks			89.1	55.6	85.0	85.2	80.8	-2.1	-1.4	-2.4	-.4
Aerospace and misc.	372-6,9	74.9	88.4	75.6	70.4	67.8	66.2	1.2	4.9	5.2	3.0
Instruments	38	81.8	80.8	76.4	75.6	78.0	78.5	-.3	.9	1.9	2.8
Miscellaneous	39	75.1	79.8	72.1	74.1	75.8	73.4	-.8	.3	.2	-.4
<b>Nondurable</b>		83.4	86.7	80.3	82.0	84.7	82.8	-.1	-.4	.1	.0
Foods	20	82.2	83.3	80.8	81.6	82.9	82.3	.3	.6	.7	.0
Tobacco products	21	90.8	102.4	76.7	71.1	86.5	86.3	-.4	-4.5	-9.0	-7.9
Textile mill products	22	86.1	92.1	78.8	88.9	90.5	84.3	-.1	.4	-.9	.3
Apparel products	23	80.9	82.3	75.0	78.9	81.3	74.8	-.1	-.2	.3	.6
Paper and products	26	89.8	94.6	86.7	91.9	93.8	90.1	.2	-.6	-.6	-1.3
Printing and publishing	27	86.0	90.4	78.9	81.2	82.0	79.9	.7	2.5	2.2	1.5
Chemicals and products	28	79.9	85.5	78.5	77.1	80.7	80.1	-.4	-3.6	-.7	-.6
Petroleum products	29	85.4	91.4	84.6	93.0	92.7	94.1	.9	1.2	.2	1.2
Rubber and plastics products	30	84.1	90.5	78.0	88.8	93.7	88.0	-.4	1.4	1.8	.8
Leather and products	31	82.0	84.9	76.0	85.4	84.8	79.5	1.3	3.1	1.9	1.8
<b>Mining</b>		87.6	89.5	85.6	88.1	89.3	89.5	-.1	.0	.3	-.8
Metal mining	10	78.5	88.8	80.0	86.4	84.4	88.6	-.6	1.3	4.0	3.6
Coal mining	12	86.7	93.5	82.6	80.2	86.6	86.2	.3	.7	.7	1.4
Oil and gas extraction	13	88.4	90.7	86.0	90.3	90.2	90.0	.1	-.2	.3	-1.1
Stone and earth minerals	14	84.3	90.0	79.4	86.2	90.3	91.6	.0	-.5	-2.4	-5.3
<b>Utilities</b>		86.5	92.6	83.1	87.3	87.1	92.2	-.1	.9	1.4	1.2
Electric	491,3pt	88.5	94.8	84.4	88.3	89.5	94.3	-.4	.9	1.7	1.5
Gas	492,3pt	82.3	85.5	71.2	83.6	78.2	84.7	-.2	.7	.6	.1
<b>SPECIAL AGGREGATES</b>											
<b>Total excluding:</b>											
Computer and office equipment		81.5	85.0	78.3	81.9	84.7	83.5		-.2	.0	-.2
<b>Manufacturing excluding:</b>											
Computer and office equipment		80.7	85.3	76.9	81.0	84.2	82.4	.0	-.4	-.2	-.3

1. Series begins in 1977.

Note—The "high" columns refer to periods in which utilization generally peaked; the "low" columns refer to recession years in which utilization generally bottomed out. The monthly highs and lows are specific to each series, and all did not occur in the same month.

## Explanatory Note

The statistical release of **Industrial Production and Capacity Utilization** reports measures of output, capacity, and capacity utilization in manufacturing, mining, and the electric and gas utilities industries. It also includes survey data on the use of electric power in manufacturing and mining. Data in the release are available on-line on the day of issue through the Economic Bulletin Board of the Department of Commerce. For information, call (202) 482-1986. Diskettes containing historical data and the data published in this release are available from the Board of Governors of the Federal Reserve System, Publications Services, (202) 452-3245.

## Industrial Production

**Coverage.** The industrial production (IP) index measures output in the manufacturing, mining, and electric and gas utilities industries. For the period since 1992, the total IP index has been constructed from 260 individual series based on the 1987 Standard Industrial Classification (SIC). These individual series are classified and grouped in two ways: (1) market groups (shown in table 1), such as consumer goods, equipment, intermediate products, and materials; and (2) industry groups (shown in tables 2 and 6), such as two-digit SIC industries and major aggregates of these industries—for example, durable and nondurable manufacturing, mining, and utilities.

**Market groups.** For purposes of analysis, the individual IP series are grouped into final products, intermediate products, and materials. Final products are assumed to be purchased by consumers, businesses, or government for final use. Intermediate products are expected to become inputs in nonindustrial sectors, such as construction, agriculture, and services. Materials are industrial output requiring further processing within the industrial sector. Total products comprise final and intermediate products, and final products are divided into consumer goods and equipment.

**Timing.** The first estimate of output for a month is published around the 15th of the following month. The estimate is preliminary (denoted by the superscript "p" in tables) and subject to revision in each of the subsequent three months as new source data become available. (Revised estimates are denoted by the superscript "r" in tables.) After the fourth month, indexes are not revised further until the time of an annual revision or a benchmark revision. The last three benchmark revisions were published in 1990, 1985, and 1976.

**Source data.** In annual or benchmark revisions, the individual IP indexes are constructed from a variety of source data, such as the quinquennial *Censuses of Manufactures and Mineral Industries* and the *Annual Survey of Manufactures*, prepared by the Bureau of the Census; the *Minerals Yearbook*, prepared by the Bureau of Mines; and publications of the Department of Energy. On a monthly basis, the individual indexes of industrial production are constructed from two main types of source data: (1) output measured in physical units and (2) data on inputs to the production process, from which output is inferred. Data on physical products, such as tons of steel or barrels of oil, are obtained from private trade associations as well as from government agencies including those listed above; data of this type are used to estimate monthly IP where possible and appropriate. When suitable data on physical product are unavailable, estimates of output are based on either production-worker hours or electric power use by industry. Data on hours worked by production workers are collected in the monthly establishment survey conducted by the Bureau of Labor Statistics. The data on electric power use are described below. The factors used to convert inputs into estimates of production are based on historical relationships between the inputs and the comprehensive data used to benchmark the IP indexes; these factors also may be influenced by technological or cyclical developments. Especially for the first and second estimates for a given month, the available source data are limited and subject to revision.

**Weights.** In the index, series that measure the output of an individual industry are weighted according to their proportion in the total value-added output of all industries. The industrial production index, which extends back to 1919, is built in chronological segments that are linked together to form a continuous index expressed as a percentage of output in a comparison base year (currently 1987). Each segment, which usually spans five years, is a Laspeyres quantity index showing changes in quantities with prices (Census value added per unit of output) held at base-year values for the segment. For the period from 1992 to the present, IP is aggregated on the basis of 1992 value-added weights. The aggregation of the index for the 1987–91 period is based on 1987 weights, whereas 1982 weights are used for the 1982–86 period. The other weight years in the postwar period are 1977, 1972, 1967, 1963, 1958, 1954, and 1947. The 1992 value-added weights used to aggregate the index are shown in the first column of tables 1, 2, and 6, in the "Value added" column under the heading "1992."

**Seasonal adjustment.** Individual series are seasonally adjusted by the X–11 ARIMA method, developed at Statistics Canada. For series based on production-worker hours, the current seasonal factors were estimated with data through October 1995; for other series, the factors were estimated with data through at least June 1995. In some cases, series were preadjusted for the effects of holidays or the business cycle before using X–11 ARIMA. The seasonally adjusted total index is calculated by aggregating the seasonally adjusted major market groups, and may not precisely equal an aggregation of the seasonally adjusted industry groups.

**Reliability.** The average revision to the level of the total IP index, without regard to sign, between the preliminary estimate and its third revision (or from the first and the

fourth estimates) was 0.35 percent during the 1972–92 period. The average revision to the percent change in total IP, without regard to sign, from the first to the fourth estimates was 0.26 percentage point during the same period. In most cases (about 85 percent), the direction of change in output indicated by the first estimate for a given month is the same as that shown by the fourth estimate.

**Rounding.** The published percent changes are calculated from unrounded indexes, and may not be the same as percent changes calculated from the rounded indexes shown in the release.

**References.** *Industrial Production—1986 Edition* contains a more detailed description of the methods used to compile the index, plus a history of its development, a glossary of terms, and a bibliography. To obtain *Industrial Production—1986 Edition* (\$9.00 per copy), write to Board of Governors of the Federal Reserve System, Publications Services, Washington, DC 20551. The 1990 and 1993 revisions were described in the *Federal Reserve Bulletin*, vol. 76 (April 1990), pp. 187–204 and vol. 79 (June 1993), pp. 590–605, respectively. The early 1994 revision to the index was described in the *Federal Reserve Bulletin*, vol. 80 (March 1994), pp. 220–6. The later 1994 revision to the index was described in the *Federal Reserve Bulletin*, vol. 81 (January 1995), pp. 16–26. This revision to the index will be described in the January 1996 Federal Reserve Bulletin.

## Capacity Utilization

**Definition.** Capacity utilization is calculated for the manufacturing, mining, and electric and gas utilities industries. For a given industry, the utilization rate is equal to an output index divided by a capacity index. Output is measured by seasonally adjusted indexes of industrial production. The capacity indexes attempt to capture the concept of sustainable practical capacity, which is defined as the greatest level of output that a plant can maintain within the framework of a realistic work schedule, taking account of normal downtime, and assuming sufficient availability of inputs to operate the machinery and equipment in place. The 75 individual capacity indexes are based on a variety of data, including capacity data measured in physical units compiled by trade associations, surveys of utilization rates and investment, and estimates of growth of the capital input.

**Groups.** Estimates of capacity and utilization are available for a variety of groups, including primary and advanced processing industries within manufacturing, durable and nondurable manufacturing, total manufacturing, mining, utilities, and total industry. Component industries of the primary and advanced processing groups within manufacturing are listed in the note on tables 2 and 3 of the release.

**Weights.** Value-added proportions are used to weight the individual capacity indexes in aggregations in the same manner as individual IP series are aggregated to the total index of industrial production. Although each utilization rate is the result of dividing an IP series by a corresponding capacity index, aggregate utilization rates are equivalent to combinations of individual utilization rates aggregated with proportions that reflect current capacity levels of output valued in base-period value-added per unit of actual output. The implied proportions of individual industry operating rates in the rate for total industry for the most recent year are shown in the first column of table 3.

**Perspective.** The historical highs and lows in capacity utilization shown in the tables above are specific to each series and did not all occur in the same month. Industrial plants usually operate at capacity utilization rates that are well below 100 percent: none of the broad aggregates has ever reached 100 percent. For total industry and total manufacturing, utilization rates as high as 90 percent have been exceeded only in wartime.

**References.** The basic methodology used to estimate capacity and utilization is discussed in the *Federal Reserve Bulletin*, vol. 71 (October 1985), pp. 754–66. The 1990 and 1993 revisions were described in the *Federal Reserve Bulletin*, vol. 76 (June 1990), pp. 412–35 and vol. 79 (June 1993), pp. 590–605, respectively. The early 1994 revision to the index was described in the *Federal Reserve Bulletin*, vol. 80 (March 1994), pp. 220–6. The later 1994 revision to the index was described in the *Federal Reserve Bulletin*, vol. 81 (January 1995), pp. 16–26. This revision will be described in the January 1996 Federal Reserve Bulletin.

## Electric Power

Data on electric power (expressed in kilowatt hours) are collected by the Federal Reserve District Banks from electric utilities and also from manufacturing and mining establishments that generate electric power for their own use (cogenerators). The indexes of power use shown in table 9 are sums of kilowatt hours used by an industry or industry group expressed as a percentage of that industry's or group's usage in 1987. The first column of the table shows, for reference, electric power use in billions of kilowatt hours as reported by manufacturing and mining industries in the 1987 censuses of those industries. The supplementary group, "Total, less nuclear nondefense," is shown separately because the nondefense nuclear material series (part of SIC 2819) accounts for a disproportionately large part of total electric power use. Because the value-added proportion for this industry in total IP is considerably smaller than its share of total electric power use, excluding this component from total power use facilitates comparisons with total IP.

## Release Schedule for 1995

At 9:15 a.m. on January 17, February 15, March 15, April 14, May 16, June 15, July 14, August 15, September 15, October 17, November 15, and December 14.