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# FEDERAL RESERVE statistical release

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## Industrial Production and Capacity Utilization: A Revision

The Federal Reserve has revised the index of industrial production (IP) and the related measures of capacity and utilization for the period 1992 to date. For the third quarter of 1999, the revision places the production index at 137.5 percent of output in 1992, compared with 135.2 percent reported previously and the capacity index at 170.7 percent of output in 1992, compared with 167.9 percent reported previously. As a result, the rate of industrial capacity utilization—the ratio of production to capacity—was revised up 0.1 percentage point, to 80.6 percent for the third quarter of 1999 (chart 1 and table 1).

Total industrial output increased 4.5 percent per year, on average, over 1995–99. The output of computers, semiconductors and communications equipment accounted for more than half the growth. The rate of increase in the output and capacity of these industries is now estimated to have been more rapid than previously shown, especially in 1998 (table 4). The key factor in the upward revision of the production index for semiconductors was the incorporation of 1998 price data for memory chips and computational microprocessors, which indicated that the prices of these chips had declined faster than previously estimated. The production index for computers was revised up in 1998 and 1999 because of the incorporation of new source data. Outside of computers and semiconductors, revisions to the individual output indexes were largely offsetting from 1995 on. Excluding computers and semiconductors, industrial production increased about 2 percent annually over the period, with no change in 1998 and a gain of 0.9 percent in 1999 (table 3).

The updated measures reflect both the incorporation of newly available, more comprehensive source data typical of annual revisions and the introduction of improved methods for compiling a few series. The new source data are for recent years, primarily from 1997 on, and the modified methods affect data from 1992 onward. In addition, the supplementary series on the gross value of products leaving the industrial sector are now expressed in 1996 dollars; these series begin in 1977.

The updated IP measures include annual data from selected editions of the Bureau of the Census's 1998 Current Industrial Reports and available preliminary data for about 15 percent of manufacturing from the 1997 Census of Manufactures. Annual data from the U.S. Geological Survey on metallic and nonmetallic minerals (except fuels) for 1997 and 1998 have also been introduced. The updating includes revisions to the monthly indicator for each industry (either physical product data, production worker hours, or electric power usage) and revised seasonal factors.

The revision introduces improved methods for measuring the production of computer and office equipment and of motor vehicles. The new monthly production measure for computers is derived from detailed information on the major products produced by the industry. The new measures of motor vehicle production incorporate price weights for the different models of light vehicles; previously, all models of autos and light trucks were weighted equally in compiling an aggregate figure that was eventually benchmarked to comprehensive Census data.

Capacity indexes and capacity utilization rates now incorporate preliminary data from the 1998 Survey of Plant Capacity of the Bureau of the Census, which covers manufacturing, along with other new data on capacity, expressed in physical units, from the U.S. Geological Survey, the Department of Energy, and other organizations.

The Census Bureau's survey is the source of utilization rates for most manufacturing industries. The preliminary results of the 1998 Survey of Plant Capacity, which provided industry utilization rates for the fourth quarter of the year, suggested that trends in manufacturing utilization rates were generally in line with those previously estimated by the Federal Reserve. However, dividing the upwardly-revised industrial production indexes for the computer, semiconductor, and communications equipment industries by the Census utilization rates yielded a noticeable upward revision of capacity in those industries.

The capacity utilization rate for mining was revised very little; the rate of utilization in electric utilities was revised down.

## **Production by Market Groups**

As previously shown, the rate of increase of industrial production accelerated in 1996 and 1997 and then slowed between 1998:Q1 and 1999:Q1 (table 1). The slowing reflects the effects of the economic turmoil in Asia on a number of industries. As Asian economies began to recover in 1999, the economic outlook for some of the weakened U.S. industries brightened as well.

Among major market groups, the revised production index for consumer durable goods has advanced strongly in recent years as the low rate of unemployment and rising income have bolstered the demand for consumer goods. The index, which had risen at an annual rate of 5 percent or more during 1997 and 1998, rose at an annual rate of 7.5 percent over the first three quarters of 1999. During 1999, the output of automotive products, especially light trucks, has continued upward from a high level, with a temporary interruption in September caused by Hurricane Floyd, while the volatile series for household appliances has fluctuated at a high level and the series for carpeting and furniture has, on balance, moved upward. After a pause in mid-1997, the production of home electronics, including computers, surged upward at an annual rate of about 45 percent. The nondurable consumer goods group, which endured a broadly based decline in the second half of 1998, has shown signs of stabilizing in 1999 as an increase in the output of consumer energy products has offset ongoing weakness elsewhere. Producers of cigarettes, clothing, and paper products have suffered setbacks in the past two years.

Although boosted by gains in the output of business computers and office equipment that averaged more than 50 percent per year from 1996 on, the rise in the production of business equipment slowed in 1999 because of declines in the output of industrial equipment, farm equipment, and transit equipment, particularly railroad equipment and commercial aircraft and ships. The production of defense and space equipment resumed its decline in 1999 after an uptick in 1998.

After having risen more slowly in 1997, the output of construction supplies accelerated in 1998 and early 1999, when it was lifted to an elevated level by strong demand for housing and by unusually mild weather, and then flattened in mid-1999. Before recovering in 1999, the output of industrial materials slowed in 1998 reflecting increased import competition and decreased foreign demand as a result of the Asian economic crisis. As a result, the output of several internationally traded commodities, such as steel, paper, and chemicals, was reduced in 1998. Nevertheless, the output of durable materials, which includes the fast-growing series for computer parts and semiconductors, recorded an advance of 7.3 percent in 1998 and 9.4 percent in 1999. With a solid rebound in the production of chemical materials, the output of nondurable goods materials, after declining in 1998, increased 3.4 percent in 1999. The output of energy materials fell about a percent in 1998 and has been about flat so far this year.

## **Capacity and Capacity Utilization**

The annual rate of capacity growth in manufacturing, which averaged 6.1 percent per year in 1996 and 1997, accelerated to 7.0 percent in 1998 and then eased to 4.7 percent in 1999 (table 5). The most rapid expansion of capacity and the upward revisions were again concentrated in durable manufacturing, especially in the computer, communications equipment, and semiconductor industries. The capacity increase in these industries averaged

more than 40 percent per year over the 1995–99 period. The rest of manufacturing increased capacity approximately 2-2/3 percent in 1995 and 1996, 3 percent in 1997 and 1998, and 1-1/3 percent in 1999. The capacity expansion in mining and utilities was slower. In particular, the capacity in oil and gas extraction and metal mining declined in 1999, while that for utilities increased 1.4 percent. The North American Electric Reliability Council continues to project increases in capacity that fall short of probable increases in demand.

The rate of manufacturing capacity utilization—the ratio of output to capacity—was revised up 0.1 percentage point in the fourth quarter of 1998 and 0.2 percentage point in the third quarter of 1999 (table 6). Utilization in manufacturing in the third quarter of this year was 79.6 percent, a level 1.5 percentage points less than the 1967–98 average. The rates in both primary- and advanced-processing industries fell a few percentage points from the fourth quarter of 1997 to the third quarter of 1999.

Utilization in mining fell substantially in 1998 and 1999 because of declines in oil and gas well drilling and in metal mining. In the third quarter, utilization rates in mining and gas utilities were at below-average levels; in contrast, the rate of utilization in electric utilities was 95.8 percent, still a high level.

### **Aspects of the Annual Revision**

The revision incorporates the updating of the comprehensive annual data and of the revised monthly source data used in the estimation of production, capacity, and utilization. More up-to-date results were obtained from the 1997 Census of Manufactures, the 1998 Survey of Plant Capacity, other annual industry reports, recent information on prices, and revised monthly source data on physical products and on labor and electricity inputs.<sup>1</sup> Along with the individual production series and seasonal factors, the annual value-added weights used in aggregating the indexes to market and industry groups were also updated.

### ***Changes to Individual Production Series***

This revision includes a new method for estimating computer production. The index of the computer and office equipment industry (SIC 357) continues to be based on the aggregate of three individual components: office and computing equipment, business (part of the market group for business equipment); office and computing equipment, home (part of consumer durables), and computer parts (part of equipment parts within durable goods materials). But, whereas monthly input measures were previously used, now quarterly data from Dataquest covering unit sales and unit values for about 1,100 distinct computer models are used to estimate the real output of the computer industry. These new data show a faster rise in output in recent years and indicate that a larger share of output has been sold for home use than did the indexes previously published.

The method for deriving the output of autos and light trucks (SIC 3711pt, 3pt) was improved in order to capture shifts in the product mix and relative values on a more timely basis. Before this revision, the production indexes for autos and for light trucks were calculated from simple counts of units assembled, benchmarked to comprehensive output measures derived from data contained in the Census of Manufactures and the Annual Survey of Manufactures. In this procedure, variations in relative values, resulting at least in part from shifts in the product mix, were often captured only during the annual revision process.

For this revision, the IP indexes for autos and light trucks starting in 1992 are chained Fisher quantity indexes that are calculated using data for each vehicle model that include the number of units assembled monthly and the list price at the beginning of the new model year. Compared with the previous index, the output index for autos is now shown to have increased more slowly, and the production of light trucks, to have risen more rapidly over the entire 1992–99 period. These revisions reflect the changes in the product mix that have occurred in the

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1. Information about the sources of monthly data used to calculate the indexes can be found in Table 1 “Industry structure of industrial production: classification, value-added weights, and description of series” on the Board’s Web site (<http://www.federalreserve.gov/g17/About.htm>).

1990s. For example, during this time, the production and demand for light trucks, particularly expensive sport utility vehicles, have skyrocketed and have resulted in a pronounced shift in the product mix and in the relative prices of light vehicles. These revisions to the indexes for autos and light trucks were largely offsetting.

The monthly indicators for three other series have changed in this revision. The series on bolts and fasteners (SIC 345) and metalworking machinery (SIC 354) now use production-worker hours in the respective industry as a monthly indicator; previously the series had been based on electric power consumption. The monthly indicator for railroad equipment (SIC 374) now is also production-worker hours; previously, it had been based on quarterly physical product data that are no longer collected.

### ***Weights***

The IP index is an annually weighted Fisher index.<sup>2</sup> The annual value-added weights for the aggregation of IP and capacity utilization, which are derived from annual estimates of industry value added, were updated and extrapolated. Some available reports from the 1997 Census of Manufactures as well as revenue and expense data reported by the Department of Energy and the American Gas Association provided industry value-added data for selected manufacturing industries and utilities through 1997. The latest value-added data for mining comes from selected reports from the Census of Mineral Industries for 1997; otherwise, the 1992 Census was the source. The weights are expressed as unit value added. Generally, the unit value-added measures track broad changes in corresponding producer prices. The weights required for aggregating IP in the most recent period are (1) estimated from available data on producer prices through the most recent year and (2) extrapolated for the following year, given the persistence of many relative price trends.

### ***Revised Monthly Data***

The monthly physical product data that are used to measure the monthly movements of many IP indexes have been updated to capture data that became available after the closing of the regular four-month reporting window. Monthly data on production-worker hours or sales of electric power in kilowatt-hours to industry groups, along with estimates of trends in output per worker-hour or kilowatt-hour, are used to indicate the monthly change in output for many individual IP indexes. The Bureau of Labor Statistics' benchmark of the employment data for March 1998 was incorporated in this revision. Revised data on the sales of electricity to industries since 1992 were incorporated as well. Because of offsetting revisions among the components series, the annual revisions of the growth of total electric power use were generally small, except for 1998 (table 8). Seasonal factors for the electric power series have been reestimated using data through April 1999.<sup>3</sup>

### ***Measurement of Capacity***

The revisions to capacity and utilization incorporated the revised production indexes, the preliminary results of the 1998 Survey of Plant Capacity conducted by the Bureau of the Census, updated measures of capacity in physical units for selected industries, and revised estimates of industry capital input. Improvements in the capital input measures and in the models used to estimate manufacturing capacity were introduced. The new 1992 benchmark capital flows table from the Bureau of Economic Analysis, which is an important determinant of the estimates of the asset composition of each industry's capital stock, was used to refine the estimates of capital input.

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2. The aggregation procedures are described in Carol Corrado, Charles Gilbert, and Richard Raddock, "Industrial Production and Capacity Utilization: Historical Revision and Recent Developments," Federal Reserve Bulletin, vol.83 (February 1997), pp.67-92.

3. Seasonal factors for the worker hours were based on data through October; factors for the monthly physical product series were based on data through June or later in the summer.

The improved specification of the models better captures advances in technology that are “embodied” in capital goods. These refinements in the Federal Reserve’s method of calculating capacity and capacity utilization will be described in more detail in a forthcoming article in the *Federal Reserve Bulletin*.

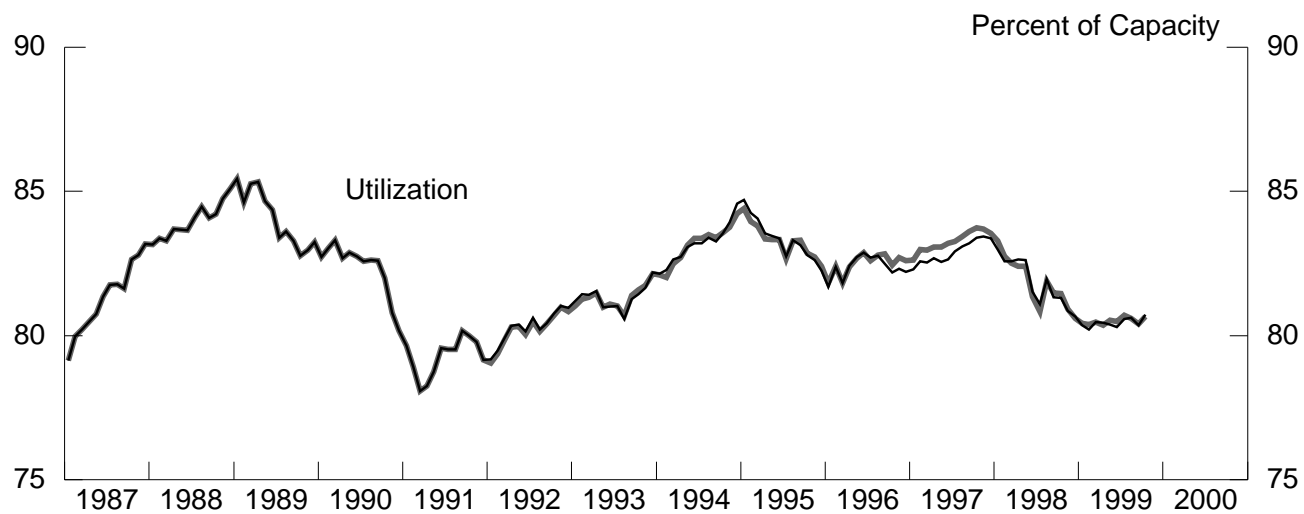
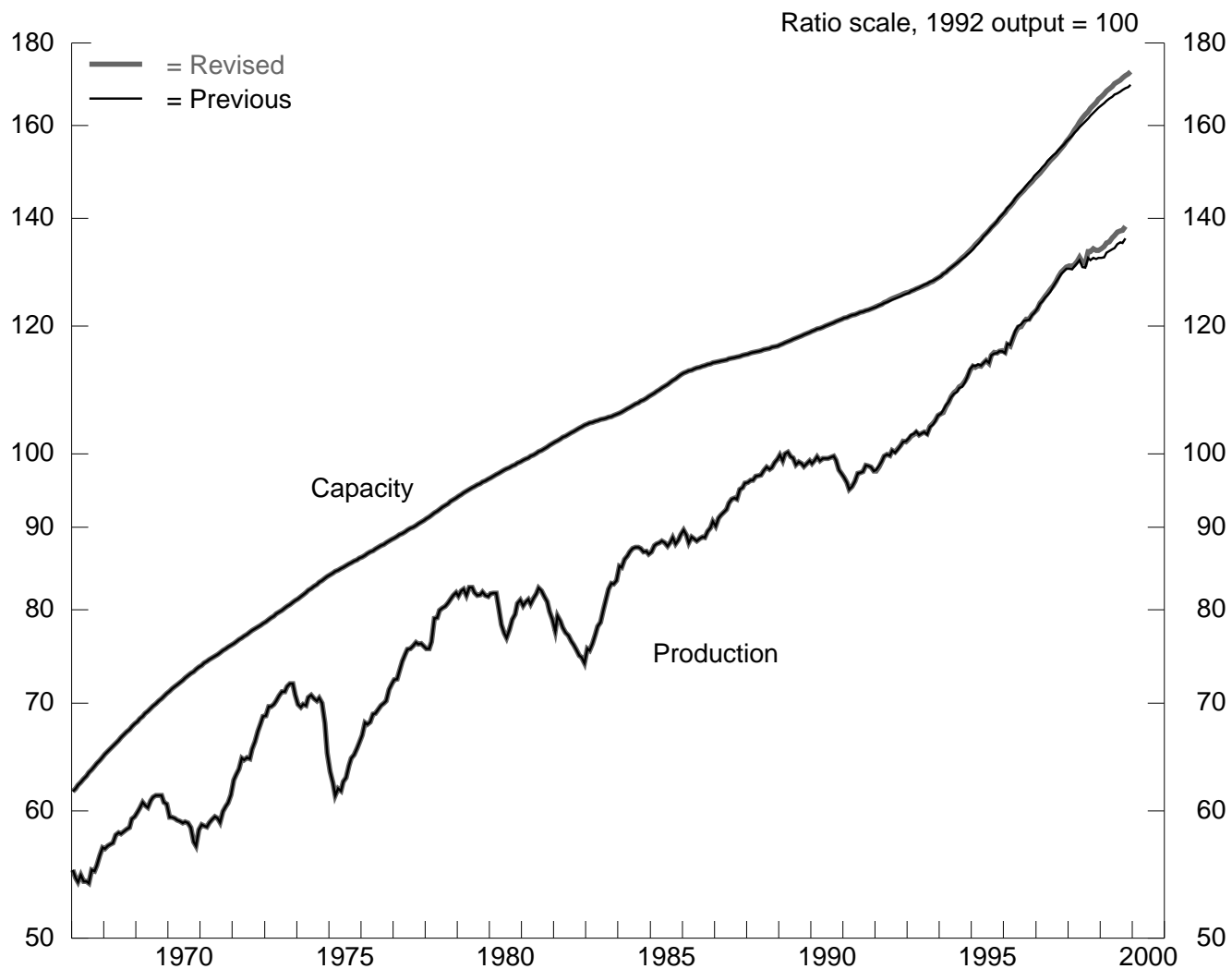
**NOTICE: Data Availability and Publication Changes**

Files containing the revised data and the text and tables from this release are available on the Board’s web site, at [www.federalreserve.gov/releases/g17](http://www.federalreserve.gov/releases/g17), and on diskettes from Publications Services (telephone 202-452-3245). The revised data will also be available through the STAT-USA web site of the Department of Commerce ([www.stat-usa.gov](http://www.stat-usa.gov)). Further information on these revisions is available from the Board’s Industrial Output Section (telephone 202-452-3197).

A document with printed tables of the revised estimates of series shown in the G.17 release is available upon 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.

An expanded version of this release will be published in a forthcoming article in the *Federal Reserve Bulletin*.

# 1. Industrial production, capacity, and utilization





**Table 1**  
**INDUSTRIAL PRODUCTION, CAPACITY AND UTILIZATION: 1987–1999<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>																	
1987	-.6	1.2	.4	.4	.4	.9	.6	.1	-.1	1.4	.3	.6	4.2	6.7	5.6	7.1	4.6
1988	.1	.3	.0	.6	.1	.1	.7	.5	-.4	.3	.8	.5	3.2	3.1	3.9	3.6	4.5
1989	.6	-.8	.9	.2	-.6	-.2	-1.0	.4	-.2	-.5	.4	.5	3.8	.5	-4.4	-.1	1.8
1990	-.5	.5	.5	-.6	.4	.0	.0	.2	.1	-.6	-1.3	-.6	2.0	.6	1.0	-5.8	-.2
1991	-.5	-.8	-.9	.3	.8	1.2	.1	.1	1.0	-.1	-.1	-.6	-8.3	1.5	6.2	1.1	-2.0
1992	.0	.6	.8	.8	.2	-.1	.7	-.3	.5	.5	.5	.0	.9	6.5	2.8	4.5	3.1
1993	.4	.4	.2	.4	-.5	.3	.1	-.2	1.1	.5	.4	.7	3.7	1.8	1.4	6.6	3.4
1994	.2	.2	.9	.6	.8	.6	.3	.5	.2	.6	.6	.9	5.1	8.1	5.9	6.6	5.5
1995	.6	-.1	.2	-.1	.4	.5	-.4	1.2	.4	-.1	.3	.0	5.7	1.6	3.8	3.0	4.9
1996	-.3	1.2	-.2	1.2	.9	.7	.1	.7	.5	-.1	.7	.3	2.3	9.1	5.8	4.3	4.4
1997	.5	.9	.4	.6	.4	.6	.5	.6	.6	.6	.4	.3	6.5	6.7	6.9	6.9	6.4
1998	.2	-.1	.3	.4	.6	-.7	-.1	1.8	.0	.4	-.2	.0	2.4	3.0	2.9	3.3	4.2
1999	.2	.3	.5	.2	.5	.3	.5	.2	.0	.6			2.0	4.7	4.3		
<b>Industrial Production</b>																	
1987	90.2	91.2	91.6	92.0	92.4	93.2	93.7	93.8	93.7	95.0	95.3	95.9	91.0	92.5	93.8	95.4	93.2
1988	95.9	96.2	96.3	96.8	96.9	97.0	97.6	98.1	97.8	98.0	98.8	99.3	96.1	96.9	97.8	98.7	97.4
1989	99.8	99.0	100.0	100.2	99.6	99.4	98.4	98.8	98.6	98.2	98.6	99.0	99.6	99.7	98.6	98.6	99.1
1990	98.6	99.1	99.6	99.0	99.4	99.3	99.3	99.5	99.6	99.1	97.7	97.2	99.1	99.2	99.5	98.0	98.9
1991	96.7	95.9	95.0	95.4	96.1	97.2	97.3	97.4	98.4	98.3	98.1	97.5	95.9	96.2	97.7	98.0	97.0
1992	97.6	98.1	98.9	99.7	99.9	99.7	100.5	100.2	100.7	101.2	101.8	101.7	98.2	99.8	100.5	101.6	100.0
1993	102.1	102.6	102.8	103.2	102.7	103.0	103.1	102.9	104.0	104.5	104.9	105.6	102.5	103.0	103.3	105.0	103.4
1994	105.9	106.1	107.0	107.6	108.5	109.2	109.5	110.1	110.3	110.9	111.6	112.7	106.3	108.4	110.0	111.8	109.1
1995	113.3	113.2	113.4	113.3	113.8	114.3	113.8	115.1	115.6	115.5	115.8	115.9	113.3	113.8	114.9	115.7	114.4
1996	115.6	116.9	116.6	118.0	119.0	119.8	119.9	120.7	121.2	121.2	122.1	122.4	116.4	118.9	120.6	121.9	119.4
1997	123.0	124.0	124.5	125.2	125.8	126.6	127.2	128.0	128.8	129.6	130.2	130.6	123.8	125.9	128.0	130.1	127.1
1998	130.9	130.7	131.1	131.7	132.4	131.5	131.3	133.6	133.5	134.1	133.8	133.8	130.9	131.9	132.8	133.9	132.4
1999	134.1	134.5	135.1	135.5	136.2	136.6	137.4	137.6	137.6	138.5			134.6	136.1	137.5		
<b>Capacity</b>																	
1987	114.0	114.1	114.2	114.3	114.4	114.5	114.6	114.7	114.9	115.0	115.1	115.2	114.1	114.4	114.7	115.1	114.6
1988	115.3	115.5	115.6	115.7	115.8	115.9	116.0	116.2	116.3	116.4	116.5	116.7	115.5	115.8	116.2	116.5	116.0
1989	116.8	117.0	117.2	117.4	117.6	117.8	118.0	118.2	118.4	118.6	118.8	119.0	117.0	117.6	118.2	118.8	117.9
1990	119.2	119.3	119.5	119.7	119.9	120.1	120.2	120.4	120.6	120.8	121.0	121.2	119.3	119.9	120.4	121.0	120.2
1991	121.4	121.6	121.7	121.9	122.1	122.2	122.4	122.6	122.7	122.9	123.0	123.2	121.6	122.1	122.6	123.0	122.3
1992	123.4	123.6	123.9	124.1	124.4	124.6	124.8	125.0	125.2	125.4	125.6	125.8	123.6	124.4	125.0	125.6	124.7
1993	126.0	126.2	126.4	126.6	126.8	127.0	127.3	127.5	127.7	128.0	128.3	128.6	126.2	126.8	127.5	128.3	127.2
1994	129.0	129.3	129.7	130.1	130.5	130.9	131.4	131.8	132.3	132.8	133.3	133.8	129.3	130.5	131.8	133.3	131.2
1995	134.3	134.8	135.4	135.9	136.5	137.1	137.7	138.2	138.8	139.4	140.0	140.6	134.8	136.5	138.2	140.0	137.4
1996	141.2	141.9	142.5	143.2	143.9	144.6	145.2	145.8	146.4	147.0	147.6	148.2	141.9	143.9	145.8	147.6	144.8
1997	148.8	149.5	150.1	150.7	151.4	152.1	152.7	153.4	154.1	154.8	155.5	156.3	149.5	151.4	153.4	155.6	152.5
1998	157.1	158.0	158.9	159.8	160.7	161.6	162.4	163.2	163.9	164.6	165.3	166.0	158.0	160.7	163.2	165.3	161.8
1999	166.7	167.4	168.0	168.6	169.2	169.8	170.2	170.7	171.2	171.7			167.3	169.2	170.7		
<b>Utilization</b>																	
1987	79.1	80.0	80.2	80.5	80.7	81.4	81.8	81.8	81.6	82.6	82.8	83.2	79.8	80.8	81.7	82.9	81.3
1988	83.2	83.4	83.3	83.7	83.7	83.6	84.1	84.5	84.1	84.2	84.8	85.1	83.3	83.7	84.2	84.7	84.0
1989	85.4	84.6	85.3	85.3	84.7	84.4	83.4	83.6	83.3	82.8	83.0	83.2	85.1	84.8	83.4	83.0	84.1
1990	82.7	83.0	83.3	82.7	82.9	82.7	82.6	82.6	82.6	82.0	80.8	80.2	83.0	82.8	82.6	81.0	82.3
1991	79.6	78.9	78.1	78.2	78.7	79.6	79.5	79.5	80.2	80.0	79.8	79.2	78.9	78.8	79.7	79.6	79.3
1992	79.1	79.4	79.8	80.3	80.3	80.0	80.5	80.1	80.4	80.7	81.0	80.8	79.4	80.2	80.3	80.8	80.2
1993	81.0	81.3	81.3	81.5	81.0	81.1	81.0	80.7	81.4	81.6	81.7	82.1	81.2	81.2	81.0	81.8	81.3
1994	82.1	82.0	82.5	82.7	83.1	83.4	83.4	83.5	83.4	83.6	83.8	84.2	82.2	83.1	83.4	83.9	83.1
1995	84.4	83.9	83.8	83.3	83.3	83.3	82.7	83.3	83.3	82.9	82.7	82.4	84.0	83.3	83.1	82.7	83.3
1996	81.8	82.4	81.8	82.4	82.7	82.9	82.6	82.8	82.8	82.4	82.7	82.6	82.0	82.6	82.7	82.6	82.5
1997	82.6	83.0	83.0	83.1	83.1	83.2	83.3	83.4	83.6	83.7	83.7	83.5	82.9	83.1	83.4	83.7	83.3
1998	83.3	82.7	82.5	82.4	82.4	81.3	80.8	81.9	81.5	81.5	80.9	80.6	82.8	82.1	81.4	81.0	81.8
1999	80.4	80.4	80.5	80.4	80.5	80.5	80.7	80.6	80.4	80.7			80.4	80.5	80.6		

1. Estimates from August 1999 through October 1999 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: 1987–1999<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>																	
1987	-.8	1.6	.2	.5	.3	1.0	.7	-.2	.1	1.3	.5	.6	5.0	7.0	5.5	7.6	5.3
1988	-.2	.4	-.1	1.0	-.1	.0	.7	.3	.2	.2	.9	.6	2.3	4.1	3.7	5.2	4.7
1989	.9	-1.2	.8	.1	-.7	.0	-1.1	.3	-.3	-.6	.4	.1	4.3	-.7	-4.5	-1.4	1.9
1990	-.2	.9	.3	-.8	.4	-.1	.0	.3	-.1	-.6	-1.3	-.6	2.9	-.1	.8	-6.3	-.5
1991	-.9	-.7	-1.1	.3	.7	1.4	.2	.2	1.1	-.1	-.2	-.5	-9.7	1.2	7.8	1.7	-2.4
1992	.2	.8	.9	.7	.4	.0	.7	-.2	.4	.5	.6	-.2	2.3	7.3	3.5	3.9	4.0
1993	.7	.2	.3	.5	-.4	.1	.1	-.4	1.3	.4	.5	.8	4.2	2.4	.8	7.1	3.7
1994	.0	.2	1.1	.8	1.0	.4	.5	.7	.3	.7	.8	.9	5.2	10.0	6.7	8.0	6.1
1995	.7	-.3	.3	-.2	.3	.6	-.6	1.1	.8	-.1	.1	.0	6.1	1.4	3.3	3.6	5.3
1996	-.3	1.1	-.4	1.4	.9	.8	.4	.7	.5	-.1	.8	.4	1.6	9.9	7.7	4.6	4.7
1997	.4	1.0	.5	.5	.5	.8	.4	.8	.6	.6	.6	.4	7.1	7.4	7.8	7.4	7.3
1998	.4	-.1	.2	.6	.5	-.8	-.1	2.0	-.1	.7	.0	.1	3.3	2.6	3.4	5.6	4.9
1999	.1	.5	.3	.3	.6	.3	.4	.3	.1	.6			2.5	4.9	4.2		
<b>Industrial Production</b>																	
1987	89.6	91.0	91.2	91.6	91.9	92.8	93.4	93.3	93.4	94.6	95.1	95.6	90.6	92.1	93.4	95.1	92.8
1988	95.4	95.8	95.7	96.7	96.6	96.6	97.3	97.5	97.7	97.9	98.9	99.4	95.6	96.6	97.5	98.7	97.1
1989	100.3	99.1	99.9	100.0	99.4	99.4	98.3	98.7	98.4	97.8	98.2	98.3	99.8	99.6	98.5	98.1	99.0
1990	98.1	99.0	99.3	98.6	99.0	98.9	98.8	99.1	99.0	98.4	97.2	96.6	98.8	98.8	99.0	97.4	98.5
1991	95.8	95.1	94.1	94.4	95.0	96.3	96.6	96.8	97.8	97.8	97.6	97.1	95.0	95.2	97.0	97.5	96.2
1992	97.2	98.0	98.8	99.5	99.9	99.9	100.6	100.4	100.8	101.3	101.9	101.7	98.0	99.8	100.6	101.6	100.0
1993	102.4	102.6	102.9	103.5	103.1	103.2	103.3	102.9	104.2	104.7	105.1	106.0	102.7	103.3	103.5	105.3	103.7
1994	106.1	106.3	107.5	108.4	109.4	109.8	110.4	111.1	111.5	112.2	113.1	114.1	106.6	109.2	111.0	113.1	110.0
1995	114.9	114.6	115.0	114.8	115.1	115.7	115.0	116.3	117.2	117.1	117.2	117.3	114.8	115.2	116.2	117.2	115.8
1996	117.0	118.3	117.8	119.4	120.5	121.5	122.0	122.8	123.5	123.4	124.3	124.8	117.7	120.5	122.8	124.1	121.3
1997	125.3	126.5	127.1	127.8	128.4	129.5	130.1	131.1	131.8	132.7	133.5	134.0	126.3	128.6	131.0	133.4	130.1
1998	134.5	134.3	134.5	135.3	135.9	134.8	134.7	137.4	137.3	138.3	138.3	138.4	134.5	135.3	136.5	138.3	136.4
1999	138.6	139.3	139.7	140.2	141.0	141.4	142.0	142.4	142.6	143.4			139.2	140.9	142.3		
<b>Capacity</b>																	
1987	113.2	113.4	113.6	113.8	113.9	114.1	114.2	114.4	114.6	114.7	114.9	115.0	113.4	113.9	114.4	114.9	114.1
1988	115.2	115.3	115.4	115.6	115.7	115.8	116.0	116.1	116.3	116.5	116.6	116.8	115.3	115.7	116.1	116.6	115.9
1989	117.0	117.3	117.5	117.8	118.0	118.3	118.5	118.7	119.0	119.2	119.5	119.7	117.3	118.0	118.7	119.5	118.4
1990	119.9	120.1	120.3	120.5	120.7	120.9	121.1	121.3	121.5	121.7	122.0	122.2	120.1	120.7	121.3	122.0	121.0
1991	122.4	122.6	122.8	123.0	123.1	123.3	123.5	123.7	123.8	124.0	124.2	124.3	122.6	123.1	123.7	124.2	123.4
1992	124.6	124.8	125.1	125.4	125.6	125.9	126.1	126.4	126.6	126.8	127.1	127.3	124.8	125.6	126.4	127.1	126.0
1993	127.5	127.7	127.9	128.2	128.4	128.6	128.9	129.1	129.4	129.7	130.0	130.4	127.7	128.4	129.1	130.0	128.8
1994	130.7	131.1	131.6	132.0	132.5	133.0	133.4	133.9	134.5	135.0	135.6	136.1	131.2	132.5	133.9	135.6	133.3
1995	136.7	137.3	138.0	138.6	139.3	140.0	140.6	141.2	141.9	142.5	143.2	143.9	137.3	139.3	141.2	143.2	140.3
1996	144.6	145.4	146.1	146.9	147.7	148.5	149.2	149.9	150.6	151.3	152.0	152.7	145.4	147.7	149.9	152.0	148.7
1997	153.4	154.1	154.9	155.6	156.4	157.2	157.9	158.7	159.5	160.3	161.2	162.1	154.1	156.4	158.7	161.2	157.6
1998	163.0	164.0	165.0	166.1	167.1	168.2	169.1	170.0	170.8	171.7	172.5	173.3	164.0	167.1	170.0	172.5	168.4
1999	174.1	174.8	175.5	176.2	176.9	177.6	178.2	178.7	179.3	179.9			174.8	176.9	178.7		
<b>Utilization</b>																	
1987	79.1	80.2	80.3	80.6	80.7	81.4	81.8	81.5	81.5	82.5	82.8	83.1	79.9	80.9	81.6	82.8	81.3
1988	82.9	83.1	82.9	83.7	83.5	83.4	83.8	84.0	84.0	84.1	84.8	85.1	83.0	83.5	83.9	84.7	83.8
1989	85.7	84.5	85.0	85.0	84.2	84.1	83.0	83.1	82.7	82.1	82.2	82.1	85.1	84.4	82.9	82.1	83.6
1990	81.8	82.5	82.6	81.8	82.0	81.8	81.6	81.7	81.5	80.9	79.7	79.0	82.3	81.9	81.6	79.9	81.4
1991	78.2	77.5	76.6	76.8	77.1	78.1	78.2	78.2	79.0	78.9	78.6	78.1	77.5	77.3	78.5	78.5	77.9
1992	78.0	78.5	79.0	79.4	79.5	79.3	79.8	79.5	79.6	79.9	80.2	79.9	78.5	79.4	79.6	80.0	79.4
1993	80.3	80.4	80.5	80.7	80.3	80.2	80.2	79.7	80.5	80.7	80.9	81.3	80.4	80.4	80.1	81.0	80.5
1994	81.1	81.1	81.7	82.1	82.6	82.6	82.7	82.9	82.9	83.1	83.4	83.8	81.3	82.4	82.9	83.4	82.5
1995	84.0	83.4	83.3	82.8	82.6	82.7	81.8	82.3	82.6	82.2	81.9	81.5	83.6	82.7	82.3	81.8	82.6
1996	80.9	81.4	80.6	81.3	81.6	81.8	81.8	81.9	82.0	81.6	81.8	81.7	80.9	81.6	81.9	81.7	81.5
1997	81.7	82.1	82.1	82.1	82.1	82.4	82.4	82.6	82.7	82.8	82.8	82.6	81.9	82.2	82.5	82.7	82.4
1998	82.5	81.9	81.5	81.5	81.3	80.1	79.7	80.8	80.4	80.5	80.2	79.9	82.0	81.0	80.3	80.2	80.9
1999	79.6	79.7	79.6	79.5	79.7	79.6	79.7	79.7	79.5	79.7			79.6	79.6	79.6		

1. Estimates from August 1999 through October 1999 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, 1995–1999<sup>1</sup>**

Item	Revised growth rate (percent)					Difference between revised and earlier growth rates (percentage points)				
	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
<b>Total index</b>	3.5	5.3	6.8	2.9	3.6	.0	.0	.2	1.0	.7
<b>Products, total</b>	1.9	4.3	5.2	2.5	1.9	−1	.0	.1	.4	.3
<b>Final products</b>	2.4	4.4	5.7	2.3	2.1	−2	.1	.1	.3	.5
<b>Consumer goods</b>	1.6	2.0	2.8	−.9	1.5	.3	−.2	.1	−.5	.2
<b>Durable</b>	1.6	1.8	5.5	5.0	7.5	1.3	−.5	−1.0	.1	.0
Automotive products	−3.3	2.4	10.3	4.7	4.0	−8	.4	1.0	.8	−1
Autos and trucks	−6.3	2.5	13.0	4.2	4.4	−1.6	.0	.7	1.2	−.2
Autos	−12.8	−6.2	3.6	2.7	−7.2	−5.6	−2.4	.2	2.0	−2.2
Trucks	.2	9.2	19.1	5.0	10.7	−1.1	1.1	3.5	.0	.9
Auto parts and allied goods	2.4	2.2	5.9	6.0	3.0	.6	1.1	1.3	−.1	−.1
Other durable goods	5.5	1.3	1.8	5.1	10.6	3.0	−1.2	−2.5	−.6	.2
Appliances and electronics	19.2	4.1	1.4	23.8	23.6	10.3	−4.8	−10.4	4.3	−1.7
Appliances and air cond.	−2.1	−.9	−2.2	9.8	.6	−.1	−.7	−1.7	−1.5	−1.0
Home electronics	42.3	9.4	5.6	39.4	57.4	22.2	−8.9	−18.6	11.6	5.7
Carpeting and furniture	−3.0	3.1	3.0	2.5	6.1	.0	.1	.6	−1.1	1.4
Miscellaneous	.9	−1.3	1.8	−3.3	5.8	−.2	.5	.9	−2.0	1.6
<b>Nondurable</b>	1.6	2.0	2.1	−2.5	−.1	.0	−.2	.4	−.7	.3
Nonenergy	.9	1.9	2.1	−2.3	−1.3	.0	−.2	.4	−.7	.9
Foods and tobacco	−.2	1.2	2.2	−1.3	−1.7	.2	−.2	.9	−1.9	1.2
Clothing	−3.9	−.4	−2.4	−8.1	−3.9	−.4	−.2	−.3	−2.4	3.6
Chemical products	5.0	4.8	2.4	−.2	−.3	−.1	−.1	−.4	2.2	−.1
Paper products	1.8	1.4	4.6	−5.4	−.4	−.3	−.4	.7	−.6	−.7
Energy products	6.4	2.5	1.8	−3.9	9.3	.1	.1	.3	−.4	−2.8
Fuels	1.5	3.6	1.8	−.6	1.9	.1	.1	.1	.0	−.9
Utilities	8.7	2.0	1.6	−5.1	12.6	.1	.2	.2	−.3	−4.6
<b>Equipment, total</b>	3.7	8.6	10.3	7.3	3.0	−.9	.6	−.1	1.6	1.0
<b>Business equipment</b>	5.7	10.8	12.8	10.0	4.4	−1.3	1.0	−.3	1.7	1.2
Information processing & related	12.2	18.5	16.0	20.0	22.4	−2.8	2.0	−.2	5.6	2.4
Computer and office	31.8	53.5	32.2	77.7	49.7	−12.9	11.6	−11.5	23.0	13.6
Industrial	8.4	1.1	4.8	.7	−4.4	−.1	−.1	−.3	−.8	−1.7
Transit	−10.9	15.8	21.7	10.7	−9.9	−1.4	1.5	−1.1	−1.4	.5
Autos and trucks	−8.2	−3.7	11.7	6.4	−.7	−2.2	−.7	−.6	1.3	−1.8
Other	2.0	6.0	10.7	−1.6	−12.9	.1	.5	.3	−.2	−.1
<b>Defense and space equipment</b>	−6.4	−2.5	−4.0	.6	−2.5	.7	−1.6	−.1	.9	.6
Oil and gas well drilling	2.6	7.8	9.6	−25.3	−7.7	.2	.3	.3	.0	−1.9
Manufactured homes	7.3	3.8	8.9	6.7	−15.8	−1.3	4.4	9.6	−2.4	1.9
<b>Intermediate products</b>	.5	3.8	3.6	3.0	1.4	.0	.0	.3	.6	−.2
Construction supplies	−.4	5.8	2.8	5.6	2.6	−.1	.0	.4	.5	−.6
Business supplies	1.1	2.4	4.1	1.4	.5	.0	.0	.3	.7	.1
<b>Materials</b>	6.0	6.9	9.2	3.5	6.5	.3	.0	.2	1.9	1.4
<b>Durable</b>	11.4	10.6	14.3	7.3	9.4	.4	.4	1.0	3.5	2.2
Consumer parts	3.0	1.8	9.5	−2.8	5.3	−.6	.6	2.2	−1.4	.7
Equipment parts	28.2	23.4	26.5	22.2	21.3	1.9	.7	.1	10.3	6.7
Semiconductors, printed circuit boards, and oth. elec. comps.	71.7	52.2	54.2	56.6	50.8	6.3	2.8	.9	26.8	14.8
Other	2.1	4.0	6.0	−.7	1.1	−.3	.1	1.0	.1	−1.2
Basic metals	.9	4.7	5.5	−5.6	4.3	−.7	.8	1.2	.1	−1.0
<b>Nondurable</b>	−2.6	3.4	4.2	−2.9	3.4	−.1	−.3	−.2	−.1	1.2
Textile	−7.2	2.3	3.1	−9.5	−1.2	.0	−.4	−.1	−2.3	2.2
Paper	−2.8	4.3	4.6	−2.6	3.5	.0	−.1	−.2	.0	.0
Chemical	−1.1	4.6	4.4	−3.5	6.9	−.2	−.5	−.6	.2	2.9
Other	−3.0	.6	4.3	1.6	−1.2	−.1	.1	.5	.3	−1.1
<b>Energy</b>	.7	.7	.1	−1.0	−.1	.1	−.1	−.2	−.3	−1.1
Primary	.4	−.9	−.1	−.4	−.5	.1	−.2	−.3	−.5	−1.4
Converted fuel	1.2	3.7	.4	−2.2	.7	.1	.1	−.1	.0	−.6
<b>SPECIAL AGGREGATES</b>										
<b>Total excluding:</b>										
Autos and trucks	3.9	5.5	6.6	2.8	3.7	.1	.1	.2	1.0	.8
Motor vehicles and parts	3.8	5.7	6.4	3.0	3.6	.1	.1	.1	1.0	.8
Computers	2.9	4.6	6.3	1.5	2.5	.0	.0	.4	.7	.4
Computers and semiconductors <sup>2</sup>	1.0	3.0	4.7	−.1	.9	−.1	.0	.5	−.1	−.1
<b>Consumer goods excluding:</b>										
Autos and trucks	2.1	1.9	2.2	−1.2	1.3	.4	−.3	.0	−.6	.2
Energy	1.1	1.9	2.9	−.6	.7	.3	−.3	.1	−.6	.6
<b>Business equipment excluding:</b>										
Autos and trucks	7.3	12.4	12.9	10.3	4.9	−1.2	1.2	−.3	1.8	1.4
Computer and office equipment	3.4	7.2	10.9	4.0	−.9	−.4	.3	.5	−.2	−.9
<b>Materials excluding:</b>										
Energy	7.2	8.5	11.4	4.5	7.9	.3	.1	.3	2.5	2.0

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 1999, the growth rates are calculated from the fourth quarter of 1998 to the third quarter of 1999 and annualized.

**Table 4**  
**RATES OF GROWTH IN INDUSTRIAL PRODUCTION, BY INDUSTRY GROUPS, 1995–1999<sup>1</sup>**

Item	SIC	Revised growth rate (percent)					Difference between revised and earlier growth rates (percentage points)				
		1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
<b>Total index</b>		3.5	5.3	6.8	2.9	3.6	.0	.0	.2	1.0	.7
<b>Manufacturing</b>		3.6	5.9	7.4	3.7	3.9	.0	.0	.1	1.2	1.0
<b>Primary processing</b>		−.5	4.1	4.5	−.5	2.6	−.2	.0	.6	−.2	.1
<b>Advanced processing</b>		5.6	6.8	9.0	5.7	4.4	.1	.1	.2	1.8	1.4
<b>Durable</b>		7.0	8.9	11.4	7.7	6.9	.1	.3	.3	2.4	1.4
Lumber and products	24	.6	1.8	4.5	4.2	−.2	−.2	.0	1.4	.0	−.2
Furniture and fixtures	25	−.8	4.6	3.7	3.3	3.3	.0	−.1	.4	−.1	1.0
Stone, clay, and glass products	32	2.6	5.8	3.3	5.0	−.2	−.1	−.5	.7	.0	.6
Primary metals	33	−1.2	5.6	6.0	−6.4	7.7	−1.0	1.0	1.1	.7	−1.8
Iron and steel	331,2	−2.0	5.2	6.1	−11.6	13.7	−1.7	1.6	1.1	.1	−2.2
Raw steel		−1.1	−.1	7.2	−12.8	10.8	−1.8	1.6	−.1	.1	−2.4
Nonferrous	333–6,9	−.2	6.2	6.0	.0	1.1	−.1	.3	1.1	1.7	−1.7
Fabricated metal products	34	1.0	4.2	5.9	.0	.0	−.2	.1	1.4	−.6	−1.0
Industrial machinery and equipment	35	13.7	10.5	11.1	16.1	9.4	−.4	.7	−2.3	3.2	2.4
Computer and office equip.	357	40.2	46.5	27.8	78.9	50.9	−1.4	3.6	−15.8	25.9	11.7
Electrical machinery	36	27.6	23.4	26.2	21.5	24.3	1.7	1.2	2.0	10.1	5.1
Semiconductors and related electronic components	3672–9	63.4	46.9	49.9	48.5	43.3	5.4	2.3	1.3	22.8	11.9
Transportation equipment	37	−4.8	4.8	13.2	2.2	−2.5	−.6	−.1	.1	−.9	.4
Motor vehicles and parts	371	−1.8	−1.4	13.8	1.0	4.1	−1.2	.0	1.0	.3	.0
Autos and light trucks		−7.1	1.6	11.3	4.0	2.5	−2.0	−.3	.4	1.4	−.5
Aerospace and misc.	372–6,9	−9.4	15.0	12.3	4.1	−10.8	.3	−.3	−1.1	−2.5	.4
Instruments	38	4.2	2.4	3.3	1.9	4.2	.0	−.6	−.3	.0	−.2
Miscellaneous	39	2.5	2.6	3.1	−.6	5.6	.0	−.1	1.7	2.8	1.2
<b>Nondurable</b>		−.3	2.5	2.9	−1.1	−.1	.0	−.1	.3	−.2	.4
Foods	20	.7	.8	1.9	1.8	−1.4	.2	−.3	.0	.0	.7
Tobacco products	21	−4.3	.6	5.3	−18.4	−2.8	.1	.7	6.1	−9.7	3.7
Textile mill products	22	−4.5	1.9	3.8	−6.4	5.6	.1	.0	.3	−3.5	4.7
Apparel products	23	−4.1	−1.2	−2.5	−7.3	−7.0	−.5	−.3	−.5	−1.2	1.4
Paper and products	26	−2.4	3.0	4.1	−1.2	1.8	.1	.0	−.1	.0	−.3
Printing and publishing	27	−.3	1.8	3.9	−1.6	−2.1	−.1	−.1	.3	.2	−.2
Chemicals and products	28	1.5	4.7	2.6	−.7	1.4	−.1	−.2	−.5	1.6	.1
Petroleum products	29	.7	4.1	2.7	2.1	1.0	.0	.4	.7	.6	−.7
Rubber and plastics products	30	.2	4.0	4.6	3.1	3.6	.0	.0	.3	−.3	−.1
Leather and products	31	−5.8	2.0	−7.1	−8.2	−8.2	−.2	.7	1.6	−.8	−1.5
<b>Mining</b>		−.8	1.9	1.9	−5.0	−3.0	.1	−.1	−.2	−.1	−.9
Metal mining	10	4.5	4.0	2.9	−2.1	−15.9	−.1	−.6	−1.5	−.9	5.1
Coal mining	12	−1.0	2.6	1.9	2.8	−.9	.4	−1.7	−.3	−.2	.7
Oil and gas extraction	13	−1.4	1.1	1.7	−8.4	−1.8	.0	.1	−.1	.1	−2.2
Stone and earth minerals	14	−1.2	4.8	3.1	3.8	−5.0	−.1	.0	−.3	.3	−.8
<b>Utilities</b>		6.4	1.2	2.1	−1.4	6.0	.1	.1	.2	−.3	−1.9
Electric	491,3pt	5.3	1.0	2.9	.8	4.4	.1	.0	.3	−.6	−1.6
Gas	492,3pt	10.9	2.2	−1.8	−12.2	15.2	.1	.4	−.5	1.2	−4.0
<b>SPECIAL AGGREGATES</b>											
Computers, communications eq., and semiconductors <sup>2</sup>		43.8	39.1	36.6	43.9	39.0	1.8	2.4	−1.9	17.2	7.1
<b>Manufacturing excluding:</b>											
Motor vehicles and parts		4.0	6.4	7.1	3.9	3.8	.1	.0	.2	1.3	1.1
Computer and office equipment		2.9	5.1	7.0	2.2	2.5	.0	.0	.5	.8	.6
Computers and semiconductors <sup>2</sup>		.6	3.3	5.1	.3	.7	−.2	.0	.5	.0	.1
Computers, communications eq., and semiconductors <sup>2</sup>		.4	3.0	4.7	.0	.2	−.1	.0	.4	−.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 1999, the growth rates are calculated from the fourth quarter of 1998 to the third quarter of 1999 and annualized.

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 5**  
**RATES OF GROWTH IN CAPACITY, BY INDUSTRY GROUPS, 1995–1999<sup>1</sup>**

Item	SIC	Revised growth rate (percent)					Difference between revised and earlier growth rates (percentage points)				
		1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
<b>Total index</b>		5.0	5.4	5.4	6.3	4.2	−3	−3	.3	1.3	.8
<b>Manufacturing</b>		5.6	6.1	6.1	7.0	4.7	−4	−3	.3	1.4	.9
<b>Primary processing</b>		3.1	3.5	3.9	3.8	2.4	−2	−3	.0	.8	.4
<b>Advanced processing</b>		6.9	7.2	7.0	8.5	5.6	−5	−3	.6	1.8	1.2
<b>Durable</b>		8.8	9.3	8.7	10.7	7.3	−6	−4	.2	2.8	1.8
Lumber and products	24	3.3	3.6	3.4	3.1	2.9	.2	−2	−.8	.2	−.2
Furniture and fixtures	25	4.4	4.3	3.8	3.2	2.0	1.9	−1.6	−1.3	1.3	.1
Stone, clay, and glass products	32	2.0	3.3	3.1	2.8	3.5	−3.7	−1.5	.2	2.1	.7
Primary metals	33	2.5	5.7	3.5	3.5	2.5	−2	2.1	.0	.1	.9
Iron and steel	331,2	1.9	5.2	3.8	5.2	3.9	−1	.2	−.1	.1	1.7
Raw steel		3.2	2.7	6.0	6.2	1.5	.1	.0	.2	−.7	−.7
Nonferrous	333–6,9	3.2	6.4	3.1	1.5	.8	−4	4.4	.3	.1	.1
Primary copper	3331	1.6	−5.1	.7	−.5	−2.2	−4	−4	1.3	−1.2	−2.6
Primary aluminum	3334	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0
Fabricated metal products	34	6.0	5.1	6.1	5.8	.3	.8	−3	−4	1.6	.0
Industrial machinery and equipment	35	10.0	12.3	14.2	15.8	15.3	−1.5	−.7	2.2	1.2	4.5
Computer and office equip.	357	30.3	42.5	50.9	58.8	61.9	−4.3	−3.6	7.7	−6	20.6
Electrical machinery	36	29.8	30.9	22.9	30.5	17.3	1.0	.7	−.7	12.2	4.0
Semiconductors and related electronic components	3672–9	63.0	59.1	43.0	61.1	31.6	4.3	2.6	−3.6	27.6	4.2
Transportation equipment	37	2.2	.5	2.4	2.7	−.1	−2.1	−2.0	.4	.6	−.6
Motor vehicles and parts	371	5.3	1.5	3.6	2.8	.2	−3.1	−2.4	.4	.2	−.7
Autos and light trucks		.2	−4.5	4.2	2.6	−1.7	−4.4	−4.0	3.4	−.2	−1.0
Aerospace and misc.	372–6,9	−1.4	−1.0	.7	2.7	−.7	−1.1	−1.6	.4	1.3	−.5
Instruments	38	2.5	.3	.8	2.2	4.0	−.2	.2	−.5	−.2	.7
Miscellaneous	39	2.6	2.4	.5	1.4	1.1	.9	.5	−1.4	−.5	−.9
<b>Nondurable</b>		2.0	2.2	2.6	2.4	1.3	−.1	−.1	.6	−.1	−.1
Foods	20	2.4	2.2	2.3	2.2	1.9	.2	.2	1.1	−.6	.0
Textile mill products	22	2.6	1.9	2.1	.3	.3	.7	−.3	−2.4	−.6	1.4
Apparel products	23	1.6	.3	.6	.6	−.8	−.7	−.4	−1.2	1.3	.8
Paper and products	26	3.0	1.4	3.3	3.1	2.4	.5	−1.5	.9	.1	.0
Pulp and paper	261–3	2.9	1.2	2.3	1.4	1.2	.0	−.4	.8	−.3	.1
Printing and publishing	27	.3	.7	1.9	1.6	−.2	−.4	.4	1.8	−1.5	−.9
Chemicals and products	28	2.5	3.4	2.8	2.9	1.0	−.2	−.1	.1	.4	−.2
Plastics materials	2821	3.0	3.3	1.7	3.7	3.7	−1.9	−2.5	−2.4	.0	.3
Synthetic fibers	2823,4	−.7	−2.0	1.1	.5	1.6	−1.1	−1.7	−1.4	−2.4	−2.0
Petroleum products	29	−.2	1.4	2.3	2.9	1.6	.0	.6	1.0	1.8	.5
Rubber and plastics products	30	4.1	4.2	5.3	5.1	5.4	−.3	−.7	.2	.3	.1
Leather and products	31	−2.2	−1.5	−1.9	−2.8	−4.9	−5.6	−5.0	1.5	−2.4	1.5
<b>Mining</b>		−.4	.4	1.6	.9	−.2	.0	.0	.0	.0	−1.2
Metal mining	10	.7	1.6	3.2	1.1	−1.5	.1	−.1	.3	.3	−2.0
Coal mining	12	.3	1.8	.2	.4	.4	−.2	.1	−1.5	−1.3	−1.6
Oil and gas extraction	13	−1.0	−.3	1.2	.6	−.6	.0	−.1	.2	.1	−.7
Oil and gas well drilling	138	−1.6	−1.2	1.0	1.9	−3.1	.0	.0	.1	.0	−2.1
Stone and earth minerals	14	2.3	3.6	4.3	2.9	1.6	.0	.0	−.1	−1.2	−2.6
<b>Utilities</b>		1.7	1.8	.2	.7	1.4	.0	−.1	−.1	.0	.9
Electric	491,3pt	2.3	1.9	−.2	.7	1.4	.1	.0	−.1	.0	.8
Gas	492,3pt	.5	1.9	1.5	1.1	1.0	.0	−.2	−.5	−.4	−.4
<b>SPECIAL AGGREGATES</b>											
Computers, communications eq, and semiconductors <sup>2</sup>		42.0	45.6	37.9	48.2	35.7	1.1	−.7	.5	13.3	9.4
Manufacturing ex. computers, communications eq., and semiconductors <sup>2</sup>		2.7	2.6	3.0	3.0	1.3	−.5	−.3	.3	.4	−.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.

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 rate						Difference between revised and earlier rates (percentage points)		
		1967-1998 Ave.	1988-1989 High	1990-1991 Low	1997 Q4	1998 Q4	1999 Q3	1997 Q4	1998 Q4	1999 Q3
<b>Total index</b>		82.1	85.4	78.1	83.7	81.0	80.6	.2	.0	.0
<b>Manufacturing</b>		81.1	85.7	76.6	82.7	80.2	79.6	.3	.1	.2
<b>Primary processing</b>		82.4	88.9	77.7	86.3	82.8	82.9	1.0	.2	.1
<b>Advanced processing</b>		80.5	84.2	76.1	81.5	79.4	78.5	.1	.1	.2
<b>Durable</b>		79.5	84.6	73.1	82.7	80.5	80.1	.7	.3	.2
Lumber and products	24	82.6	93.6	75.5	82.9	83.7	81.8	1.6	1.4	1.4
Furniture and fixtures	25	81.2	86.6	72.5	78.5	78.7	79.4	.6	-.4	.0
Stone, clay, and glass products	32	78.5	83.5	69.7	83.7	85.5	83.2	3.0	1.3	1.1
<b>Primary metals</b>	33	81.2	92.7	73.7	92.0	83.2	86.3	.0	.6	-1.0
Iron and steel	331,2	81.2	95.2	71.8	93.1	78.3	83.7	1.3	1.2	-.8
Raw steel		80.9	92.7	71.5	90.3	74.2	79.1	.3	.8	.1
Nonferrous	333-6,9	81.5	89.3	74.2	90.7	89.3	89.5	-1.6	-.2	-1.4
Primary copper	3331	75.5	86.3	73.5	94.6	86.8	74.2	-.9	.8	7.2
Primary aluminum	3334	88.4	100.4	97.3	86.4	88.6	90.3	.1	.1	-.2
<b>Fabricated metal products</b>	34	78.0	82.0	71.9	79.9	75.5	75.1	1.1	-.5	-1.1
Industrial machinery and equipment	35	81.4	85.4	72.3	83.8	84.1	80.9	-1.6	.0	-.7
Computer and office equip.	357	81.2	86.9	66.9	76.0	85.7	81.3	-7.6	5.5	2.9
Electrical machinery	36	81.1	84.0	75.0	83.7	77.9	80.7	2.0	1.0	1.1
Semiconductors and related electronic components	3672-9	79.9	81.1	75.6	85.1	78.5	82.5	1.3	-.4	1.9
<b>Transportation equipment</b>	37	75.9	85.8	68.5	81.1	80.6	79.2	1.0	-.1	.5
Motor vehicles and parts	371	76.7	89.1	55.9	82.0	80.6	82.9	.7	.7	1.2
Autos and light trucks <sup>1</sup>			92.3	53.3	85.9	87.0	89.9	-1.8	-.5	.0
Aerospace and misc.	372-6,9	75.3	87.3	79.2	79.8	80.9	74.4	1.4	-1.5	-.9
Instruments	38	81.6	81.4	77.2	80.6	80.5	80.7	-.2	.0	-.5
Miscellaneous	39	75.7	79.0	71.7	80.8	79.1	81.7	1.1	3.5	4.8
<b>Nondurable</b>		83.4	87.3	80.7	83.2	80.3	79.5	-.1	-.2	.2
Foods	20	82.9	85.4	82.7	80.5	80.2	78.2	-1.6	-1.1	-.6
Textile mill products	22	85.6	90.4	77.7	87.0	81.2	84.4	2.3	-.3	1.8
Apparel products	23	80.9	85.1	75.5	77.1	71.0	67.6	.9	-1.0	-.6
Paper and products	26	89.2	93.5	85.0	89.8	86.1	85.7	.4	.4	.2
Pulp and paper	261-3	92.4	98.0	89.9	94.6	90.7	92.4	-.4	-.1	-.1
Printing and publishing	27	85.7	91.7	79.6	83.8	81.1	79.9	-1.3	.1	.6
Chemicals and products	28	79.5	86.2	79.3	79.8	77.0	77.2	.0	.9	1.1
Plastics materials	2821	86.7	97.0	74.8	92.4	91.7	89.2	-.4	-.3	-.4
Synthetic fibers	2823,4	84.8	99.7	77.6	80.0	77.0	80.1	-5.9	-2.2	-2.7
Petroleum products	29	86.8	88.5	85.1	94.8	94.1	93.7	-.4	-1.4	-2.3
Rubber and plastics products	30	84.6	89.6	77.4	86.7	85.0	84.0	1.2	.6	.5
Leather and products	31	81.1	83.3	76.1	74.9	70.7	68.8	8.0	8.5	7.0
<b>Mining</b>		87.5	88.0	87.0	88.6	83.3	81.6	-.1	-.2	.0
Metal mining	10	79.5	89.4	79.9	90.6	87.7	77.9	-1.5	-2.6	2.4
Coal mining	12	86.7	91.5	83.4	85.7	87.7	86.8	1.2	2.1	3.5
Oil and gas extraction	13	88.5	88.2	88.7	89.5	81.5	80.8	-.1	-.1	-1.0
Oil and gas well drilling	138	74.2	69.3	60.0	86.3	63.3	60.9	.6	.4	.4
Stone and earth minerals	14	84.8	89.0	79.4	85.0	85.8	81.5	-.5	.8	1.7
<b>Utilities</b>		87.4	92.6	83.4	91.3	89.3	92.4	.5	.2	-1.6
Electric	491,3pt	89.3	95.0	87.1	93.6	93.7	95.8	.4	-.2	-1.9
Gas	492,3pt	82.1	85.0	67.1	81.7	70.9	78.2	.6	1.7	.2
<b>SPECIAL AGGREGATES</b>										
Computers, communications eq, and semiconductors <sup>2</sup>		80.3	81.9	72.4	81.9	79.5	80.5	-.1	2.4	1.4
Manufacturing ex. computers, communications eq., and semiconductors <sup>2</sup>		81.2	86.1	76.8	83.0	80.5	79.8	.4	-.1	.0

1. Series begins in 1977.

Note—The “high” column refers to periods in which utilization generally peaked; the “low” column refers 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.

**Table 7**  
**ANNUAL PROPORTIONS IN INDUSTRIAL PRODUCTION, BY INDUSTRY GROUPS**

Item	SIC	1991	1992	1993	1994	1995	1996	1997	1998
<b>Total index</b>		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Manufacturing</b>		84.5	85.4	85.9	86.7	86.8	86.8	87.7	88.3
<b>Primary processing</b>		26.1	26.6	27.0	28.2	28.0	27.6	27.5	27.0
<b>Advanced processing</b>		58.4	58.9	58.9	58.5	58.8	59.3	60.3	61.3
<b>Durable</b>		44.2	44.9	45.6	46.3	46.7	47.6	48.6	49.4
Lumber and products	24	1.8	2.1	2.2	2.2	2.1	2.1	2.1	2.2
Furniture and fixtures	25	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Stone, clay, and glass products	32	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.4
Primary metals	33	3.1	3.1	3.3	3.6	3.5	3.5	3.6	3.4
Iron and steel	331,2	1.7	1.8	1.9	2.0	1.9	1.9	2.0	1.8
Raw steel		.1	.1	.1	.1	.1	.1	.1	.1
Nonferrous	333-6,9	1.4	1.4	1.4	1.6	1.6	1.6	1.6	1.5
Fabricated metal products	34	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6
Industrial machinery and equipment	35	7.9	7.8	8.1	8.4	8.9	9.2	9.4	10.0
Computer and office equip.	357	1.6	1.6	1.6	1.6	1.7	1.8	1.8	2.2
Electrical machinery	36	6.8	7.1	7.4	7.8	8.3	8.6	8.9	8.8
Semiconductors and related electronic components	3672-9	2.3	2.5	2.6	2.9	3.4	3.6	3.7	3.5
Transportation equipment	37	9.6	9.5	9.4	9.3	8.9	8.8	9.2	9.4
Motor vehicles and parts	371	4.6	4.7	5.1	5.5	5.5	5.3	5.3	5.2
Autos and light trucks		2.6	2.5	2.6	2.8	2.8	2.7	2.7	2.6
Aerospace and misc.	372-6,9	5.0	4.7	4.4	3.8	3.5	3.5	3.9	4.2
Instruments	38	5.4	5.4	5.3	4.9	4.8	4.9	4.8	4.9
Miscellaneous	39	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4
<b>Nondurable</b>		40.3	40.5	40.3	40.4	40.1	39.2	39.2	38.9
Foods	20	9.4	9.6	9.6	9.3	9.2	9.0	8.9	8.8
Tobacco products	21	1.6	1.6	1.1	1.2	1.3	1.3	1.4	1.6
Textile mill products	22	1.7	1.8	1.8	1.8	1.7	1.6	1.6	1.5
Apparel products	23	2.2	2.2	2.1	2.1	2.0	1.9	1.8	1.7
Paper and products	26	3.7	3.5	3.4	3.8	3.9	3.5	3.5	3.4
Printing and publishing	27	6.8	6.8	6.8	6.6	6.6	6.6	6.8	6.8
Chemicals and products	28	9.9	9.9	9.9	10.0	9.9	9.7	9.8	9.7
Petroleum products	29	1.5	1.4	1.5	1.6	1.5	1.6	1.4	1.4
Rubber and plastics products	30	3.3	3.5	3.6	3.8	3.7	3.7	3.7	3.8
Leather and products	31	.3	.3	.3	.2	.2	.2	.2	.2
<b>Mining</b>		7.5	6.8	6.4	6.0	6.1	6.5	5.9	5.4
Metal mining	10	.5	.5	.4	.5	.5	.4	.4	.4
Coal mining	12	1.1	1.0	.9	.9	.9	.9	.9	.8
Oil and gas extraction	13	5.3	4.7	4.4	4.0	4.1	4.6	4.1	3.6
Stone and earth minerals	14	.6	.6	.6	.6	.6	.6	.6	.6
<b>Utilities</b>		8.0	7.8	7.7	7.4	7.1	6.7	6.3	6.3
Electric	491,3pt	6.5	6.2	6.1	5.8	5.6	5.4	5.2	5.3
Gas	492,3pt	1.5	1.6	1.6	1.5	1.5	1.3	1.1	1.0
<b>SPECIAL AGGREGATES</b>									
Computers, communications eq., and semiconductors <sup>2</sup>		5.3	5.7	5.8	6.2	6.9	7.3	7.7	8.1
<b>Manufacturing excluding:</b>									
Motor vehicles and parts		80.0	80.7	80.8	81.1	81.4	81.6	82.4	83.0
Computer and office equipment		82.9	83.8	84.3	85.0	85.1	85.0	85.9	86.1
Computers and semiconductors <sup>2</sup>		80.6	81.3	81.7	82.1	81.7	81.4	82.3	82.5
Computers, communications eq., and semiconductors <sup>2</sup>		79.2	79.8	80.1	80.4	80.0	79.5	80.1	80.2

Note— The IP proportion data are estimates of the industries' relative contributions to overall IP growth in the following year. For example, a 1 percent increase in durable goods manufacturing in 1999 would account for a 0.494 percent increase in total IP.

**Table 8**  
**RATES OF GROWTH IN ELECTRIC POWER USE, 1995–1999<sup>1</sup>**

Item	Revised growth rate (percent)					Difference between revised and earlier growth rates (percentage points)					
	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999	
<b>Total</b>	-.8	1.5	1.2	-.9	-2.9	.0	.1	.2	-.6	.5	
<b>Manufacturing</b>	-.9	1.4	1.3	-.9	-3.0	.0	.1	.2	-.6	.5	
<b>Durable</b>	.5	-.3	4.7	-1.2	-.1	.0	-.1	1.6	-1.3	.4	
Lumber and products	24	1.5	4.1	3.4	1.7	1.5	.0	-.2	3.6	-1.4	.3
Furniture and fixtures	25	-3.7	4.2	1.6	.6	4.0	-.1	-.1	.2	.4	1.7
Stone, clay, & glass products	32	.2	3.5	1.5	2.6	-.8	.0	.1	.8	.0	1.3
Primary metals	33	1.5	-3.8	6.7	-3.8	.0	-.1	.0	2.6	-2.4	.2
Fabricated metal products	34	.1	3.7	4.6	-1.2	-.2	.0	.0	1.5	-.8	-.5
Industrial machinery and equipment	35	.5	1.3	4.2	1.0	-2.2	.1	-.1	1.2	-2.5	-.8
Electrical machinery	36	1.4	2.4	3.0	-2.0	-4.4	-.1	-.1	.7	-.9	.6
Transportation equipment	37	-1.9	-.7	5.6	-.8	2.9	.1	-.3	.4	-.8	.9
Instruments	38	.4	-2.9	1.0	3.8	.1	.0	-.1	.4	2.2	2.0
Miscellaneous manufactures	39	-4.8	7.2	2.1	8.3	7.4	-.1	.3	1.8	6.5	-1.6
<b>Nondurable</b>	-2.0	2.8	-1.4	-.7	-5.4	.0	.2	-.9	.1	.6	
Foods	20	2.5	1.7	3.3	2.3	-3.2	.0	.0	1.1	-.1	-.4
Tobacco products	21	6.4	.0	.7	-1.7	-6.3	.1	.2	.2	.0	-1.5
Textile mill products	22	-3.3	2.7	3.2	-1.4	-3.6	.0	-.2	1.1	-3.3	.4
Apparel products	23	-6.3	-1.8	-1.7	-3.4	-9.1	.0	.0	.2	-1.0	1.7
Paper and products	26	-.3	1.1	2.4	-.8	-.3	.3	.7	.2	.8	3.1
Printing and publishing	27	.6	.8	2.9	2.2	-5.0	-.1	.0	-.1	.3	.2
Chemicals and products	28	-6.5	6.0	-5.6	-2.3	-11.8	-.1	.3	-1.5	.2	.4
Petroleum products	29	7.4	-3.2	-3.4	-1.2	.9	.1	.1	-5.9	1.8	-.5
Rubber and plastics products	30	-.5	3.3	1.9	3.6	.9	.0	-.2	1.3	-1.2	-.2
Leather and products	31	-9.3	-1.5	-1.3	-3.8	-6.0	-.1	-.1	.3	-.8	.9
<b>Mining</b>	1.1	3.0	-.2	-.6	-1.0	.0	.2	.2	-.9	1.1	
Metal mining	10	8.3	2.6	.4	-.1	-2.2	-.1	.1	-.1	-.1	2.2
Coal mining	12	-1.3	.0	.0	1.0	-1.7	.0	.0	.7	-.6	.6
Oil and gas extraction	13	-5.0	4.5	1.5	-6.6	2.2	.0	.1	.5	-1.3	-.5
Stone and earth minerals	14	6.0	4.4	-4.8	9.5	-4.1	.3	.7	-.6	-2.0	2.9
<b>SUPPLEMENTARY GROUPS</b>											
Total, excluding nuclear nondefense	.6	1.0	2.4	-1.3	-.9	.0	.1	.2	-.6	.5	
Utility sales to industry	-1.1	2.1	1.2	-.8	-2.9	.0	.1	.2	-.6	.4	
Industrial generation	4.8	-5.7	.7	-1.9	3.9	.0	.0	-.1	-.7	.7	

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 1999, the growth rates are calculated from the fourth quarter of 1998 to the third quarter of 1999 and annualized.



## 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. The release also includes monthly indexes on the use of electric power in manufacturing and mining. Files containing data in the release and historical data are available under statistical releases at <http://www.federalreserve.gov>, the Board's World Wide Web site. For paid access to these files through the Department of Commerce's Economic Bulletin Board or World Wide Web site, please call STAT-USA at 1-800-STAT-USA or (202) 452-1986. 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; the reference period for the index is 1992. For the period since 1992, the total IP index has been constructed from 267 individual series based on the 1987 Standard Industrial Classification (SIC). These individual series are classified 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 Department of the Interior; 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 as an annually weighted chain-type index since 1977. The components of IP are combined using estimates of value added per unit of output. For months from January to June, the weights are drawn from the year containing the month being estimated and the preceding year; for months from July to December, the weights are drawn from the current and following year. The IP proportions shown in column 1 of tables 1A, 2A, and 6 are estimates of the industries' relative contributions to overall growth in the following year. For example, a 1 percent increase in durable goods manufacturing in 1997 would account for an increase in total IP of nearly 1/2 percent.

**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 1999; for other series, the factors were estimated with data through at least June 1999. In some cases, series were preadjusted for the effects of holidays or the business cycle before using X-11 ARIMA. For the data since 1977, all seasonally adjusted aggregate indexes are calculated by aggregating the seasonally adjusted indexes of the individual series.

**Reliability.** The average revision to the *level* of the total IP index, without regard to sign, between the first and the fourth estimates was 0.28 percent during the 1987-97 period. The average revision to the *percent change* in total IP, without regard to sign, from the first to the fourth estimates was 0.21 percentage point during the 1987-97

period. In most cases (about 83 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.

### 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 76 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.** 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 current-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 have exceeded 90 percent only in wartime.

### 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 1992. 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 1992 censuses of those industries. The supplementary group, "Total, less nuclear nondefense," is shown separately because the value-added proportion for the nondefense nuclear material series (part of SIC 2819) 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.

### References

This annual revision will be described more completely in the February 2000 *Federal Reserve Bulletin*.

A description of the aggregation methods for industrial production and capacity utilization is included in an article in the *Federal Reserve Bulletin*, vol. 83 (February 1997), pp. 67-92. *Industrial Production—1986 Edition* contains a more detailed description of the other methods used to compile the industrial production 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 major revisions to the IP indexes and capacity utilization since 1990 have been described in the *Federal Reserve Bulletin* (April 1990, June 1990, June 1993, March 1994, January 1995, January 1996, February 1997, and February 1998). The basic methodology used to estimate capacity and utilization is discussed in the June 1990 *Federal Reserve Bulletin*.

### Release Schedule for 1999 and 2000

At 9:15 a.m. on:

1999: January 15, February 17, March 16, April 16, May 14, June 16, July 16, August 17, September 16, October 15, November 16, and December 15.

2000: January 14, February 15, March 15, April 14, May 15, June 15, July 14, August 15, September 15, October 17, November 15, and December 15.