

# Industrial Production and Capacity Utilization: The 2000 Annual Revision

*Carol Corrado, of the Board's Division of Research and Statistics, prepared this article. Matt Wilson provided research assistance.*

In late 2000, the Board of Governors of the Federal Reserve System published the annual revision of its index of industrial production (IP) and related measures of capacity and utilization for the period January 1992 through October 2000 (chart 1). The updated measures reflect the incorporation of newly available, more comprehensive source data, the introduction of new production series, and changes in methods. For this revision, two new years (1997 and 1998) of comprehensive data on manufacturing output became available; otherwise, the updating of the data was typical of annual revisions.

According to the revised data, total industrial output has increased, on average, 5.1 percent per year since 1995, and industrial capacity has expanded 5.4 percent per year. These revised rates of increase are more rapid than previously reported (table 1). The rate of industrial capacity utilization—the ratio of production to capacity—was little changed by the

revision for the third quarter of 2000 but was revised up 0.6 percentage point, to 81.6 percent, for the fourth quarter of 1999.

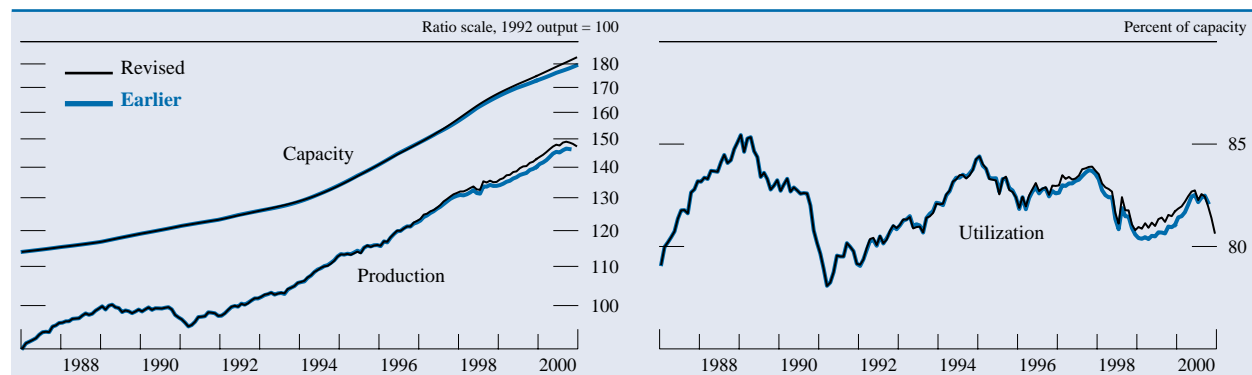
The overall picture of the industrial sector in recent years is unchanged by the revision. An exceptionally strong expansion of output in 1997 was followed by a notably weaker performance in 1998: The aftershocks stemming from economic turmoil in Asia—weak export demand and heightened import competition—sharply slowed the rise in manufacturing IP excluding selected high-technology industries.<sup>1</sup> Manufacturing IP picked up broadly in 1999, and production in the high-tech sector accelerated further in the first half of 2000. But output outside the high-tech industries stagnated in 2000, a reflection of renewed competition from abroad and some slackening in domestic demand; in the fourth quarter, total industrial production fell at an annual rate of about 1 percent. (Summary data as of January 17, 2001, for total industry and manufacturing are shown in appendix tables A.1 and A.2.)

Capacity utilization in manufacturing rose during 1997 and reached 83 percent in the fourth quarter of

NOTE. Charles Gilbert directed the 2000 annual revision and prepared the revised estimates of industrial production; Norman Morin prepared the revised measures of capacity and capacity utilization. Other contributors to the revision and this article are Ana Aizcorbe, William Cleveland, Mark Doms, Cynthia Bansak, and Susan Polatz.

1. High-tech industries include the manufacturers of semiconductors and related electronic components (Standard Industrial Classification [SIC] 3672-9), computers (SIC 357), and communications equipment (SIC 366).

## 1. Industrial production, capacity, and utilization



NOTE. The production indexes and utilization rates are seasonally adjusted. All the revised measures extend through December 2000; the earlier measures extend through October 2000.

## 1. Revised growth rates of industrial production and capacity and the revised rate of capacity utilization, 1996–2000

Item	Revised growth rate (percent)							Difference between revised and previous (percentage points)					
	1999 proportion	1996–2000 avg.	1996	1997	1998	1999	2000	1996–2000 avg.	1996	1997	1998	1999	2000
<i>Production</i>													
Total industry .....	100.0	5.1	5.6	7.2	3.2	5.1	4.2	.4	.3	.5	.3	.9	-.1
Manufacturing .....	88.4	5.6	6.3	8.0	4.0	5.6	4.1	.4	.3	.5	.3	.8	.0
Excluding selected high-tech industries .....	80.6	2.3	3.2	5.4	1.2	2.3	-.7	.6	.2	.8	1.2	1.0	.5
Selected high-tech industries .....	7.8	42.0	41.0	35.7	37.2	40.6	55.6	-.5	1.9	-.9	-6.7	3.2	3.4
Mining and utilities .....	11.6	1.2	1.4	1.9	-3.2	1.1	4.5	.2	.0	-.1	.0	1.3	-.6
<i>Capacity</i>													
Total industry .....	100.0	5.4	5.4	5.9	6.5	4.6	4.6	.4	-.1	.5	.3	.4	.8
Manufacturing .....	90.0	6.0	6.1	6.5	7.2	5.1	5.0	.4	-.1	.5	.2	.4	.8
Excluding selected high-tech industries .....	81.1	2.8	2.7	3.6	4.4	2.1	1.3	.7	.1	.5	1.4	.8	.8
Selected high-tech industries .....	8.9	42.0	44.2	40.3	39.5	37.8	48.0	.7	-1.4	2.4	-8.7	2.1	9.0
Mining and utilities .....	10.0	.9	.8	1.3	.5	.7	1.2	.2	-.5	.5	-.2	.2	1.0
<i>Capacity utilization (percent, end of period)</i>													
Total industry .....	100.0	82.1	82.8	83.8	81.2	81.6	81.3	.2	.2	.2	.2	.6	.1
Manufacturing .....	90.0	81.3	81.9	83.0	80.5	80.9	80.2	.3	.2	.3	.3	.6	.2
Excluding selected high-tech industries .....	81.1	81.2	81.8	83.3	80.7	80.9	79.3	.2	.1	.3	.2	.3	.2
Selected high-tech industries .....	8.9	81.7	83.2	80.5	79.2	80.8	85.0	-.2	.6	-1.4	-.3	.3	-1.0
Mining and utilities .....	10.0	88.7	89.5	90.1	86.8	87.1	89.9	.4	.7	.1	.3	1.2	.0

NOTE. The 1996–2000 average growth rates are calculated as the average annual percentage change in the seasonally adjusted index from the fourth quarter of 1995 to the fourth quarter of 2000. Growth rates for years are calculated from the fourth quarter of the previous year to the fourth quarter of the year specified. The capacity utilization rates for years are for the last quarter of the year.

The difference between revised and previous growth rates for 1996–2000 and for the year 2000 are calculated from annualized growth rates through the third quarter of 2000. The difference between revised and previous utilization rates for 2000 use the third quarter of the year.

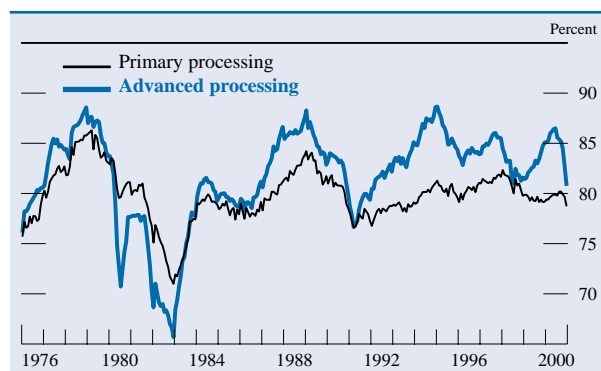
For the definition of high-tech industries, see text note 1.

the year. After that, the rate fell, on balance, and was at 80.2 percent during the fourth quarter of 2000. Within manufacturing, utilization in the advanced-processing industries (which the revision modified to exclude semiconductors, related electronic components, and motor vehicle parts) declined, for the most part, over that period. By contrast, the operating rate for primary processors, after having fallen in 1998, increased noticeably throughout 1999 and into 2000; the rate rose above 86 percent in the second quarter of 2000 for the first time since 1995 (chart 2). Since mid-2000, however, the primary-processing utiliza-

tion rate has declined more than 5 percentage points; the drop reflects cutbacks in the output of the metals, textile, paper, and lumber industries, as well as an easing in the pace of production of semiconductors and related components.

After having fallen sharply between the fourth quarters of 1997 and 1998, utilization rates in mining and utilities reached 89.9 percent in the fourth quarter of 2000, a rise of more than 3 percentage points. Operating rates for energy producers were at elevated levels at the end of last year: Capacity at utilities expanded at a faster pace in 1999 and 2000 than it did earlier in the 1990s, but on balance, production advanced more rapidly than capacity during the 1990s and surged with an increase in demand beginning in the middle of 2000.

## 2. Primary-processing and advanced-processing utilization rates, 1976–2000



## SUMMARY OF THE REVISION

The statistical revisions to the IP index are principally derived from the inclusion of information contained in annual reports issued by the U.S. Census Bureau: the 1997 Census of Manufactures, the 1998 Annual Survey of Manufactures, and selected 1999 Current Industrial Reports. Revised annual data from the U.S. Geological Survey (USGS) on minerals

(except fuels) for 1998 and new data for 1999 were also introduced.

The capacity indexes and capacity utilization rates now incorporate the preliminary results from the Census Bureau's 1999 Survey of Plant Capacity, which covers manufacturing; the survey provided data for the fourth quarter of the year. The revised measures also include newly available 1999 data on industrial capacity, expressed in physical units, from the USGS, the Department of Energy (DOE), and other organizations.

New production measures were introduced for individual series in four industries: communications equipment, computer and office equipment, drugs and medicines, and bearings. Production for the new series was measured using detailed information on the major products of these industries. The revision also incorporated improved source data for three existing production series: electricity generation, electrical housewares, and truck trailers.

Beginning with this revision, the weights used to calculate the production and capacity aggregates change every month rather than once a year. The introduction of the refined aggregation method, which began with data for 1992, had a small effect on the intra-yearly changes in monthly IP.

Tables A.3 and A.4 show the revised rates of growth of industrial production by market group and by industry group for 1996 through 2000; tables A.5 and A.6 show the revised figures for capacity and capacity utilization. For production and capacity, the tables also show the difference between the revised and earlier growth rates; for capacity utilization, the difference between revised and previous rates for the final quarter of the year are shown.

For most manufacturing industries, the annual reports from the Census Bureau implied faster increases in output in 1997 and 1998 than had previously been reported. Output also rose more rapidly in 1999 because of upwardly revised monthly source data. The textile mill products industry and the industrial machinery and equipment industry, which includes computers, are the only major industry groups whose production in the third quarter of 2000 was lower than shown previously. Within the industrial machinery and equipment group, the output of the computer industry was lowered noticeably in 1998 because the new Census data were included.

The introduction of a new series that measures the production of pharmaceuticals boosted the production estimates for the chemical industry during 1999. The output of the electrical machinery group, which includes the communications equipment industry,

was revised upward for most years, in part because of the introduction of a new series that explicitly measures the equipment used for local-area computer networks.

According to indicators from the Survey of Plant Capacity, the factory operating rate was higher in the fourth quarter of 1999 than previously estimated. Using the revised production indexes and new information on manufacturing capital spending, we estimate that manufacturing capacity increased 5.1 percent in 1999 and 5 percent in 2000. The previous estimates had reported that it had slowed in 2000, to a rate  $\frac{1}{2}$  percentage point less than its rate in 1999.

The revision modified the definitions of advanced-processing and primary-processing industries to reflect more accurately the distinction between industries that produce final products and those that produce goods for further processing. Specifically, the measures for production, capacity, and capacity utilization in primary processing now include the series for semiconductors and related electronic components (Standard Industrial Classification [SIC] 3672-9) and for motor vehicle parts (SIC 3714); previously, these industries were included in the measures for advanced-processing industries.<sup>2</sup> The new utilization rate for primary-processing industries averaged 82.2 percent between 1967 and 2000, and the rate for advanced-processing industries averaged 80.6 percent. These long-term averages are about the same as those for the previously published measures.

In more recent years, however, capacity utilization rates for the modified aggregates differ noticeably from the previously reported measures: The operating rate for advanced-processing industries in the third quarter of 2000 was 80.1 percent, a level below the long-term average and lower than the previously published rate based on the old definition. For the same period, the operating rate for primary-processing industries was 85.4 percent, a level above the long-term average and higher than previously reported.

#### *TECHNICAL ASPECTS OF THE REVISION*

As discussed earlier, the annual revision incorporated more-up-to-date results from the 1997 Census of Manufactures, the 1998 Annual Survey of Manufactures, the 1999 Survey of Plant Capacity, and

2. The modified utilization rates for primary-processing and advanced-processing industries were recomputed from January 1967 on; the results were spliced to the earlier aggregates from January 1948 to December 1966. The modified production and capacity indexes for these groups begin with data for January 1967.

### Data Availability and Publication Changes

Files containing the revised data and the text and tables from the G.17 statistical release "Industrial Production and Capacity Utilization" are available on the Board's web site ([www.federalreserve.gov/releases/g17](http://www.federalreserve.gov/releases/g17)) and on diskettes from Publications Services (telephone 202-452-3245). 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.

Beginning with data for January 2001, the tables in the monthly statistical release on industrial production and capacity utilization have been redesigned. The data as previously shown are still available on the Board's web site. For further information, or comments, contact the Board's Industrial Output Section (telephone 202-452-3197) or e-mail Charles Gilbert ([cgilbert@frb.gov](mailto:cgilbert@frb.gov)).

other annual industry reports on production in 1999 and on capacity in 1999 and 2000. The value-added weights used in aggregating the production and capacity indexes to total industry or other groups were also updated, along with the seasonal factors and source data used to compile the monthly production indexes (see box "Data Availability and Publication Changes").

The Census Bureau reported its 1998 data on industry output according to the new North American Industrial Classification System, or NAICS. The Census reported data for 1997 both on the new NAICS and on the old, 1987 SIC system. Before being included in the IP index, the manufacturing data for 1998 were recategorized by the Federal Reserve according to the SIC system. The Census Bureau provided the Federal Reserve with industry utilization rates on the SIC system from the Survey of Plant Capacity.<sup>3</sup>

### MEASUREMENT OF PRODUCTION

Individual IP series are derived from (1) annual indexes of industry output that are calculated using

3. The current and historical industrial production and capacity utilization statistics will be categorized according to the NAICS for the 2001 revision.

comprehensive information sources and (2) production indicators that are available for inclusion in the monthly index within the regular four-month reporting window. The annual index determines the trend for a series from one year to the next, and the production indicator determines the monthly changes for a series within each year. Each series is seasonally adjusted, and the contribution of the change in an IP series for an industry to the monthly change in the overall IP index is based on the value added by that industry.

The annual indexes for individual IP series are derived from detailed industry data. For each four-digit SIC industry in manufacturing, an annual chain-type measure of the real gross output of an industry is compiled. The value of the production is represented by Census data on the industry's value added plus its cost of materials; the real output measure is obtained by deflating the value of production by an annually weighted chain-type price index compiled from detailed information on the composition of the industry's products. Most of these price indexes are obtained from the Bureau of Economic Analysis (BEA). Because an individual IP series may represent a combination of several four-digit SIC industries, the annual indexes for many manufacturing IP series are constructed from a number of industry gross output measures; for these indexes, the contribution of each component industry to the annual index is based on the value added by that industry.

For many IP series, the production indicators are compiled from monthly (or quarterly) product data. The indicator may measure the output of a product in physical terms (for example, tons of portland cement or barrels of distillate fuel oil); or the indicator may be data on the output of several types of a product (for example, unit counts of assemblies of crawlers, wheel loaders, skid steer loaders, and the like), combined with fixed weights. Alternatively, for selected series, the indicator is a chain-type quantity index that is compiled each month (or quarter) using very detailed data on the prices and quantities of specific products produced by an industry. This method is used for the monthly IP indexes for semiconductors, computers, autos, light trucks, and with this revision, pharmaceuticals and a component of communications equipment.<sup>4</sup>

4. The method was introduced for the monthly measurement of semiconductors in the 1998 annual revision and for computers and motor vehicles in the 1999 annual revision. For semiconductors and computers, the method consists of (1) estimating the value of U.S. production for the industry from monthly and quarterly data that contain highly detailed unit counts and values of individual products produced by industry and (2) deflating the value of production by a

For non-energy mining, most annual and monthly indexes are developed from product data issued by the USGS; the IP series on fuels and electric and gas utilities are developed from comprehensive monthly and annual data from the DOE. For most IP series in these groups, the monthly data are measures of a product in physical terms, such as barrels of motor gasoline; for other series, the indicator is more complex. For example, coal production is measured using the tonnage output of four geographic regions, weighted by the Btu content of the variety mined in each region.<sup>5</sup>

When high-frequency data on the physical quantity of production are not available, the Federal Reserve uses monthly data on the inputs to production, either the Bureau of Labor Statistics (BLS) monthly data on production-worker hours or the Federal Reserve's monthly data on electric power use, as the production indicator. The production indicator is combined with a productivity trend calculated from the annual output index to obtain the monthly IP index.

With the changes introduced in this revision, the proportion of the IP index that is measured using product data that are available for inclusion in the monthly index within the regular four-month reporting window has increased by 3 percentage points, to 46 percent in value-added terms in 1999.<sup>6</sup> Complete information on the sources used to compile the production indicator for each individual IP index can be found on the Board's web site.<sup>7</sup>

### CHANGES TO INDIVIDUAL PRODUCTION SERIES

The revision introduced improved production indicators for several industries. The production measure for telephone and telegraph apparatus (SIC 3661) was revised as an aggregate of two components: a series for routers, switches, and hubs—equipment

used for local-area computer networks (LANs)—and a series for all other telephone and telegraph apparatus. Production of LAN equipment is measured as a chain-type index calculated from detailed quarterly data; see box “Technical Note on the Measurement of LAN Equipment” for an explanation of how the series was derived. The monthly production indicator for the other component of telephone and telegraph apparatus is production-worker hours.

The revised index for the production of computer and office equipment (SIC 357) is an aggregate of three components: computers, computer printers, and other computer and office equipment. The index for the output of computers is based on the data that were previously used to measure the production of computer and office equipment as a whole; these data are highly detailed quarterly estimates from Dataquest on the revenue and unit count of sales of PCs, notebook computers, and workstations/servers.

The revision introduced a new index for computer printers based on similar data—that is, highly detailed quarterly figures on the revenue and unit count of sales of computer printers, also from Dataquest. The index for the output of other computer and office equipment is represented by a combination of the data on computers and computer printers.

This revision included a new method for estimating the production of pharmaceutical preparations. Accordingly, the previous production measure for drugs and medicines (SIC 283) was revised and is now an aggregate of two components: pharmaceutical preparations (SIC 2834) and other drugs and medicines (SIC 2833,5,6,9). The series for other drugs and medicines uses production-worker hours as the production indicator.

The new production index for pharmaceutical preparations is a monthly real output measure developed from detailed data on the prices and quantities of shipments to dispensers of prescription drugs in the United States from IMS-Health. These data include monthly dollar shipments and chain-type price indexes for about 500 product classes that IMS-Health constructed using its proprietary, highly detailed, comprehensive database on pharmaceutical products. The Federal Reserve used the measures developed by IMS-Health, information from the Census Bureau's Current Industrial Reports, and other sources to create a chain-type quantity index for the production of the pharmaceutical preparations industry as a whole.

The production estimates for two other industries were improved by obtaining and incorporating new source data. The production of ball and roller bearings (SIC 3562) is measured as a weighted combina-

chain-type matched-model price index constructed, for the most part, from the same data.

For motor vehicles, detailed monthly data on the production of each vehicle model are aggregated using annual prices as weights. For a few other series in the IP index, the production indicator is obtained by deflating detailed data on the value of production or shipments from a trade source by a corresponding BLS producer price index.

5. This method was introduced in the 1998 annual revision.

6. For a review and documentation of the timing of the receipt of the source data for monthly IP over the course of the regular four-month reporting period, see Charles Gilbert, Norman Morin, and Richard Raddock, “Industrial Production and Capacity Utilization: A Revision and Recent Developments,” *Federal Reserve Bulletin*, vol. 86 (March 2000), p. 193.

7. See table 1, “Industry structure of industrial production: classification, value-added weights, and description of series,” on the “About” page of the Board's web site for the G.17 release: [www.federalreserve.gov/releases/g17/About.htm](http://www.federalreserve.gov/releases/g17/About.htm).



tion of the unit count of four classes of bearings (ball, mounted, tapered, and other roller bearings); the measure was developed from data provided by the American Bearing Manufacturers Association. The production of electrical housewares (SIC 3634) is measured using data provided by the Association of Home Appliance Manufacturers. Previously, these series were derived from monthly input data.

The production index for electric power generation (SIC 491) has been expanded to include electricity generation by plants owned by nonregulated businesses that supply electric power to the public. Previously, the monthly IP series for electricity generation was measured using monthly DOE data on electric power generation by utilities, which the DOE defines as the output of regulated entities. These data are still used, but the revised series combines them with estimates of the power generated by nonindustrial nonregulated businesses. The principal source data for these estimates are new monthly measures of electric power generation issued by the DOE beginning in January 2000.<sup>8</sup> Estimates for earlier years were developed principally from annual data, also from the DOE.

Last, the source data for three other physical product series have changed. For two series—fabric finishing (SIC 226) and metal cans (SIC 341)—the sources switched to reporting data quarterly rather than monthly. The source for the production of truck trailers (SIC 3715) from 1998 on is America's Commercial Transportation Research.

### AGGREGATION AND WEIGHTS

This revision introduced a refinement to the method used for aggregating the individual IP indexes. Previously, the monthly industrial production aggregates from 1977 on were annually weighted chain-type indexes, and the weights were updated in the middle of the year. With this revision, the weights change monthly rather than at midyear for the period since

8. Beginning with data for January 2000, the DOE has provided monthly measures of electric power generation by "non-utility" producers; these producers are composed of industrial plants generating power for their own use (co-generation) and nonindustrial nonregulated plants generating power for distribution to the public. The Federal Reserve uses the new DOE series after deducting an estimate of industrial co-generation.

Because the power generation by nonregulated firms is distributed by utilities that are regulated entities, the source data for the IP series on electric utility sales, also from the DOE, accurately represents the provision of electric services to households and businesses. The IP series that measures the generation and distribution of electric power to the public is still called "the output of utilities."

July 1992. This change affects industry weights only within each year, as well as the monthly capacity and capacity utilization rate aggregates; the procedure used to derive capacity and utilization aggregates, given an industrial production aggregate, is unchanged.<sup>9</sup>

The weights for the aggregation of IP and capacity utilization are expressed as unit value added (a "price"), and are derived from annual estimates of industry value added. New information on industry value added was used to update and extrapolate the annual estimates of unit value added. Reports from the 1997 Census of Manufactures and the 1998 Annual Survey of Manufactures, as well as revenue and expense data reported by the DOE and the American Gas Association, provided industry value-added data for manufacturing and utilities through 1998. The latest value-added data for mining came from the Census of Mineral Industries reports for 1997. Generally, the unit value-added measures track broad changes in related producer price indexes. The weights required for aggregating IP in the most recent period are estimated from available data on producer prices through October 2000. Table A.7 reports the annual value-added proportions incorporated in the IP index from 1992 on.

With this revision, the annual unit value-added measures are linearly interpolated to the monthly frequency, and the IP index becomes a chain-type index with monthly weights.<sup>10</sup> As with the earlier formulation, the percentage change in IP can be considered as the value-added weighted sum of the percentage changes in its components; consequently, in the monthly statistical release, the value-added proportion for each series for the most recent full year of data is shown along with the series. To assist users with calculations, the Federal Reserve's web site provides supplemental monthly statistics that represent the exact proportionate contribution of a monthly change in a component index to the monthly change in the total index.<sup>11</sup>

9. See 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.

10. Specifically, the change in IP for a month is the geometric mean of the change in the aggregate industrial output computed using current month weights and the change computed using weights for the previous month; the formula for a monthly IP aggregate is given by

$$\frac{IP_m}{IP_{m-1}} = \sqrt{\frac{\sum I_m p_{m-1}}{\sum I_{m-1} p_{m-1}} \times \frac{\sum I_m p_m}{\sum I_{m-1} p_m}}$$

where  $p_m$  denotes the monthly unit value added for month  $m$ .

11. For the relative weights, see the Board's web site for the G.17 release: [www.federalreserve.gov/releases/g17/ipdisk/ipweights.sa/](http://www.federalreserve.gov/releases/g17/ipdisk/ipweights.sa/).

### Technical Note on the Measurement of LAN Equipment

Equipment for local-area computer networks (LANs) consists of routers, switches, and hubs. These devices direct traffic among computers and make possible e-mail transmission, Internet browsing, and file sharing. Like many high-technology products, LAN devices have become faster and more sophisticated in recent years. For instance, in 1995, Ethernet switches operating at 10 megabits per second dominated the market; last year, the two most popular switches operated at rates of 100 megabits and 1,000 megabits per second.

Statistical information on LAN equipment is available from the Census Bureau's Current Industrial Reports and from reports issued by Dataquest, a private company. The new IP index for LAN equipment production is compiled from these sources and from research conducted at the Federal Reserve by Mark Doms and Christopher Forman, who developed annual quality-adjusted price indexes for routers and switches using hedonic techniques.<sup>1</sup>

#### *Price Indexes for Routers, Switches, and Total LAN Equipment*

Hedonic methods are a tool used to develop price indexes for goods whose characteristics change rapidly.<sup>2</sup> Traditional methods (the calculation of matched-model price indexes) may be used to measure price change for a high-technology good, but highly detailed information on distinct varieties of the good are needed to capture quality change.<sup>3</sup> For routers and switches, such data are not available; therefore, price indexes have been produced using hedonic techniques.

Because Cisco is the dominant firm in the router market, the data used in the hedonic regressions for routers came from Cisco product catalogs from 1995 to 1999. More than 400 observations were used, and the regressions controlled for about twenty characteristics. Separate models for four classes of routers were estimated; the four price indexes were aggregated using annual revenue data to obtain an annually weighted chain-type price index for all routers. Router prices are estimated to have fallen at an average annual rate of almost 14 percent since 1995 (table A). However, the price changes for each router class exhibited

#### A. Average annual price change, by router type, 1995–99

Router type	Price change
All routers .....	-13.6
Personal (inexpensive) .....	-24.7
Branch .....	-19.4
Midrange .....	3.2
High-end (expensive) .....	-16.1

SOURCE. See note 1.

substantial variation that reflected, in part, the degree of actual or potential competition in the four markets.<sup>4</sup>

A similar exercise was conducted for switches. The data for the hedonic regressions came from Datapro, a private source that produces regular reports evaluating the performance of different varieties of these devices. More than 370 observations from 1996 to 2000 were used. The results show that prices for switches have fallen at an average annual rate of nearly 21 percent during this period. The Doms-Forman price indexes for routers and switches were combined with price measures for hubs developed from Dataquest data to obtain an annually weighted chain-type price index for total LAN equipment. The index shows that, between 1995 and 1999, prices for LAN equipment have fallen an average of 18 percent per year.

#### *Production of LAN Equipment*

Estimates of the annual value of U.S.-produced routers, switches, and hubs were developed from 1992 on. The estimates for the total value of LAN equipment were obtained principally from the Census data, which are annual and cover activity in the United States. The Dataquest data, which are available annually from 1993 and cover activity in world markets, contain statistics on the three types of LAN equipment. These data were used in conjunction with the aggregate Census data to develop separate annual figures from 1992 on for routers, switches, and hubs.

The value of the production of LAN equipment increased rapidly in the 1990s, although the pace has moderated in recent years (chart A). The value of U.S.-produced LAN equipment rose at an annual rate of 37 percent between 1992 and 1999, with especially striking increases for routers and switches (chart B). Though switches did not enter the market until 1993, by 1999 they made up the largest proportion of total domestic production of LAN equipment. When the LAN equipment price index is combined with these estimates of the value of LAN equipment production, the results show that real output increased at an average annual rate of more than 50 percent for 1995–99.

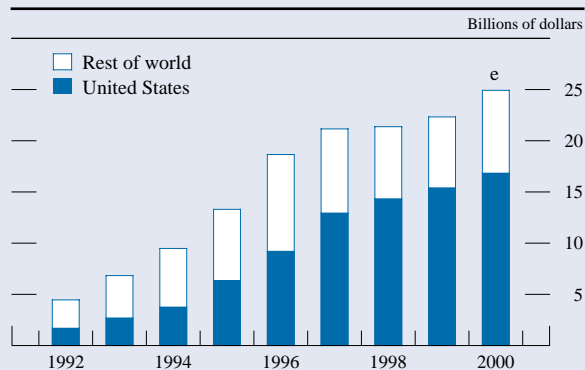
NOTE. Mark Doms constructed the new series and developed the material reported in this note.

1. Mark Doms and Christopher Forman, "Prices for Local Area Network Equipment" (paper presented at the Brookings Workshop on Communications Output and Productivity, Washington, D.C., February 23, 2001).

2. See J. Steven Landefeld and Bruce T. Grimm, "A Note on the Impact of Hedonics and Computers on Real GDP," *Survey of Current Business*, vol. 80 (December 2000), pp. 17–22, and the references contained therein.

3. Ana Aizcorbe, Carol Corrado, and Mark Doms, "Constructing Price and Quantity Indexes for High-Technology Goods" (paper presented at the CRIW-NBER Summer Institute 2000 Workshop on Price, Output, and Productivity Measurement, Cambridge, Mass., July 31, 2000).

4. See Doms and Forman, "Prices for Local Area Network Equipment."

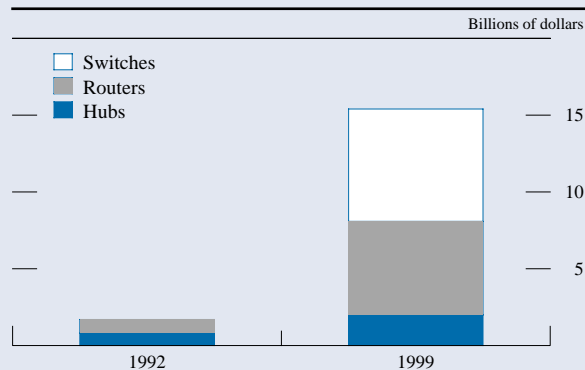
**Technical Note on the Measurement of LAN Equipment—Continued**
**A. Production of LAN equipment, 1992–2000**


e. Estimated.

Table B shows the annual index of LAN equipment production, as well as the annual LAN price index and the annual value of LAN output. The annual price measures for 1992–94 were obtained by an extension of the Doms–Forman price indexes back to 1992 based on their relationship to price measures reported in the Dataquest data and on estimated trends.

The new IP index for LAN equipment is derived from the annual production index and quarterly data from the Dataquest reports. The Dataquest reports provide figures for the world revenue and unit sales count of twenty-five classes of routers, switches, and hubs beginning in the first quarter of 1996 on. The Dataquest data are converted to quarterly estimates of U.S. real output in three steps. First, the annual estimates of nominal U.S. production are interpolated and extrapolated using the Dataquest quarterly revenue data. Second, the Doms–Forman annual price indexes are interpolated and extrapolated using the quarterly price information reported by Dataquest. For each class of router, an average selling price is used; for switches, the average price per port is used; and for hubs, a price measure is developed from the five types of these devices reported in the Dataquest data. Third, each estimated nominal value of U.S. production of routers, switches, and hubs is deflated by its price indexes, and the three real output measures are aggregated to obtain a quarterly chain-type real output index for LAN equipment.

The new quarterly IP index for LAN equipment is shown in table B. The new series is not published in the monthly statistical release, but the index is updated on an ongoing basis and included in the broader aggregate, the IP index for communications equipment (SIC 366). LAN equipment accounted for 18 percent of the value of the output of the communications equipment industry in 1999. Had the previous methods for measuring LAN equipment been used,

**B. U.S. production of LAN equipment, 1992 and 1999**


the IP index for communications equipment would have increased at an average annual rate of about 13 percent for 1995–99, rather than at the nearly 19 percent now reported.

**B. U.S. LAN equipment, 1992–2000**

Period	Production index	Price index	Value of production <sup>1</sup>
<i>Annual estimates<sup>2</sup></i>			
1992	100.000	100.000	1,684.8
1993	190.706	83.547	2,684.4
1994	298.751	74.236	3,736.5
1995	603.748	62.189	6,325.8
1996	951.649	57.190	9,169.4
1997	1,605.151	47.628	12,880.1
1998	2,478.863	34.352	14,346.5
1999	3,192.484	28.131	15,130.7
<i>Quarterly estimates<sup>3</sup></i>			
96:1	100.000	100.000	7,911.2
96:2	114.483	98.989	8,966.1
96:3	129.172	93.771	9,583.2
96:4	149.434	86.422	10,217.1
97:1	162.075	84.049	10,776.9
97:2	184.893	79.754	11,665.6
97:3	225.762	77.645	13,867.6
97:4	259.174	74.184	15,210.3
98:1	291.332	62.847	14,485.4
98:2	328.857	59.134	15,384.2
98:3	332.261	53.620	14,093.5
98:4	324.278	52.323	13,422.9
99:1	419.177	48.654	16,137.0
99:2	423.775	47.116	15,797.3
99:3	400.055	47.017	14,882.2
99:4	394.040	43.964	13,706.2
00:1	451.754	43.502	15,547.4
00:2	500.061	41.755	16,517.5
00:3	608.214	39.679	19,094.6

1. Billions of dollars.

2. Indexes are 1992 = 100.

3. Indexes are 1996:Q1 = 100.



### REVISED MONTHLY DATA

The 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. The input measures were also updated to incorporate revised data on monthly production-worker hours, based on the BLS benchmark of employment to March 1999 comprehensive measures, and revised data on monthly electric power use since 1996. Late reports of electric power data for 1999 resulted in a large upward revision for that year; revisions to data for earlier years were small (table A.8).

Seasonal factors for all series were re-estimated using data that extended into 2000. Factors for production-worker hours, which adjust for timing, holiday, and monthly seasonal patterns, were updated with data through October 2000. Factors for the electric power series, which are developed using multivariate methods, were re-estimated with data through May 2000. The updated factors for the monthly (and quarterly) physical product series, which include adjustments for holiday and workday patterns, used data through at least June 2000.<sup>12</sup>

### MEASUREMENT OF CAPACITY

The individual capacity indexes for a year are derived from (1) preliminary, implied end-of-year indexes of capacity obtained by dividing a production index for an industry by a corresponding utilization rate obtained from a survey and (2) additional measures that, for most industries, are economic determinants of an industry's annual capacity growth. The capacity indexes, like the IP indexes, are expressed as percentages of production in 1992.

Once the preliminary, implied capacity indexes are calculated, they are related to the additional measures in a regression model. The final capacity indexes for a year are derived from the fitted values of these regressions. The preliminary, implied capacity indexes thus give the general level and trend of

12. Seasonal factors for motor vehicle assemblies are updated twice each year and reported on the Board's web site: [www.federalreserve.gov/releases/g17/mvsf.htm](http://www.federalreserve.gov/releases/g17/mvsf.htm)

the individual capacity estimates over a period of years, and the additional measures determine the annual changes from one year to the next. For most manufacturing industries, estimates of industry capital input and a variable related to the average age of the industry's capital stock are used as the additional measures.<sup>13</sup> For mining, utilities, and selected manufacturing industries, measures of physical capacity are available and are used to determine the final capacity indexes.<sup>14</sup>

The capital input figures are estimates of the flow of services derived from an industry's net stocks of physical assets; the net stocks are developed principally from investment data reported in the Annual Surveys of Manufactures and Censuses of Manufactures. Also used are estimates of business investment and price deflators by asset type, as well as the composition of an industry's capital spending by asset type, all from the BEA.

The information on capital spending by manufacturing industries in the 1997 and 1998 Census reports indicated a higher level of investment than previously estimated by the Federal Reserve. The higher level of spending, in conjunction with indicators of the rate of change in manufacturing capital spending in 1999 and 2000, suggested that capital input rose at a moderately stronger rate after 1996 than previously estimated. These results were generally consistent with the trends in capacity implied by the upwardly revised estimates of production and the new survey data on utilization rates.

Measures of capacity in physical terms for mining, utilities, and selected manufacturing industries were updated with revised data for 1999 and with data for 2000 newly available since the midyear capacity update issued in June 2000. On balance, the capacity indexes and capacity utilization rates for these industries were changed little by the revision. □

13. A fuller description of the models that are used to develop the Federal Reserve's capacity estimates was reported in "Industrial Production and Capacity Utilization: A Revision and Recent Developments," pp. 194-97.

14. The industry structure and documentation of the sources used to compile each individual capacity index can be found in table 3, "Industry structure of capacity and capacity utilization: classification, value-added weights, and description of series," on the "About" page of the Board's web site for the G.17 release: [www.federalreserve.gov/releases/g17/About.htm](http://www.federalreserve.gov/releases/g17/About.htm).

## APPENDIX A: SUMMARY TABLES BASED ON THE G.17 RELEASE, JANUARY 17, 2001

## A.1. Revised data for industrial production, capacity, and utilization for total industry, 1987–2000

Seasonally adjusted data except as noted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Quarter				Annual avg. <sup>1</sup>
													1	2	3	4	
Industrial production (percentage change)																	
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	-.1	.5	.9	.7	.3	-.2	.7	-.3	.4	-.7	.5	.0	1.0	6.5	2.4	5.0	3.1
1993	.4	.5	.2	.3	-.5	.3	.2	-.2	1.1	.3	.4	.8	3.8	1.5	1.9	6.2	3.5
1994	.2	.3	.8	.5	.8	.4	.6	.3	.1	.5	.7	1.0	5.5	7.7	5.8	6.3	5.4
1995	.6	-.1	.2	-.2	.4	.4	-.4	1.3	.6	-.4	.3	.1	6.0	1.1	4.4	2.9	4.8
1996	-.2	1.1	-.1	1.1	.8	.8	.0	.6	.5	.0	1.0	.4	2.8	9.2	5.4	5.3	4.6
1997	.5	1.0	.2	.6	.3	.6	.7	.9	.6	.6	.6	.3	7.6	6.1	7.9	7.3	6.8
1998	.4	.0	.3	.5	.4	-.7	-.1	2.1	-.3	.5	-.4	.1	3.6	3.0	3.4	2.9	4.9
1999	.6	.3	.7	.1	.7	.2	.8	.4	.1	.8	.3	.7	3.9	4.9	5.8	5.7	4.2
2000	.5	.5	.7	.7	.7	.5	-.2	.7	.2	-.3	-.3	-.6	6.7	7.9	3.5	-1.1	5.7
Industrial production (index)																	
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	99.0	99.7	100.0	99.7	100.4	100.2	100.5	101.3	101.8	101.8	98.2	99.8	100.4	101.6	100.0
1993	102.2	102.7	102.9	103.2	102.7	102.9	103.2	103.0	104.1	104.4	104.9	105.7	102.6	102.9	103.4	105.0	103.5
1994	105.9	106.2	107.1	107.6	108.5	109.0	109.6	110.0	110.2	110.7	111.5	112.6	106.4	108.4	109.9	111.6	109.1
1995	113.3	113.2	113.4	113.1	113.6	114.0	113.6	115.1	115.7	115.3	115.7	115.9	113.3	113.6	114.8	115.6	114.3
1996	115.6	116.9	116.8	118.1	119.0	120.0	119.9	120.6	121.2	121.2	122.4	122.9	116.4	119.0	120.6	122.2	119.6
1997	123.5	124.8	125.0	125.8	126.2	126.9	127.7	128.8	129.5	130.3	131.1	131.5	124.4	126.3	128.7	131.0	127.7
1998	132.0	132.0	132.4	133.1	133.6	132.7	132.5	135.3	134.9	135.5	135.0	135.1	132.1	133.1	134.2	135.2	134.0
1999	135.9	136.3	137.3	137.4	138.4	138.6	139.7	140.3	140.4	141.5	141.9	142.8	136.5	138.1	140.1	142.1	139.6
2000	143.6	144.3	145.2	146.3	147.2	147.9	147.6	148.6	149.0	148.5	148.1	147.3	144.4	147.1	148.4	148.0	147.5
Capacity (index)																	
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	123.8	124.1	124.3	124.5	124.7	124.9	125.2	125.4	125.6	125.8	123.6	124.3	124.9	125.6	124.6
1993	126.0	126.3	126.5	126.7	126.9	127.2	127.4	127.7	127.9	128.2	128.5	128.8	126.3	126.9	127.7	128.5	127.3
1994	129.1	129.4	129.7	130.1	130.5	130.9	131.3	131.8	132.2	132.7	133.2	133.7	129.4	130.5	131.8	133.2	131.2
1995	134.2	134.7	135.3	135.8	136.4	137.0	137.6	138.2	138.8	139.4	140.0	140.6	134.7	136.4	138.2	140.0	137.3
1996	141.2	141.9	142.5	143.1	143.8	144.4	145.0	145.6	146.2	146.9	147.5	148.1	141.9	143.8	145.6	147.5	144.7
1997	148.8	149.4	150.1	150.8	151.5	152.3	153.0	153.8	154.6	155.4	156.2	157.1	149.4	151.5	153.8	156.2	152.7
1998	158.0	158.9	159.8	160.7	161.6	162.5	163.4	164.2	165.0	165.7	166.5	167.2	158.9	161.6	164.2	166.5	162.8
1999	167.9	168.6	169.2	169.9	170.5	171.1	171.7	172.3	172.9	173.5	174.1	174.8	168.6	170.5	172.3	174.1	171.4
2000	175.4	176.1	176.7	177.4	178.1	178.7	179.4	180.1	180.7	181.4	182.1	182.8	176.1	178.1	180.1	182.1	179.1
Utilization (level, percent)																	
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	79.9	80.4	80.4	80.1	80.5	80.2	80.3	80.8	81.0	80.9	79.5	80.3	80.3	80.9	80.2
1993	81.0	81.3	81.3	81.4	80.9	80.9	81.0	80.7	81.4	81.5	81.6	82.1	81.2	81.1	81.0	81.7	81.3
1994	82.1	82.1	82.5	82.7	83.2	83.3	83.5	83.5	83.3	83.5	83.7	84.3	82.2	83.1	83.4	83.8	83.1
1995	84.4	84.0	83.8	83.3	83.3	83.2	82.5	83.3	83.4	82.8	82.7	82.4	84.1	83.3	83.1	82.6	83.3
1996	81.9	82.4	82.0	82.5	82.8	83.1	82.7	82.8	82.9	82.5	83.0	83.0	82.1	82.8	82.8	82.8	82.6
1997	83.0	83.5	83.3	83.4	83.3	83.3	83.5	83.8	83.8	83.9	83.9	83.7	83.3	83.3	83.7	83.8	83.5
1998	83.5	83.1	82.9	82.8	82.7	81.6	81.1	82.4	81.8	81.8	81.1	80.8	83.2	82.4	81.8	81.2	82.1
1999	81.0	80.9	81.1	80.9	81.2	81.0	81.3	81.4	81.2	81.5	81.5	81.7	81.0	81.0	81.3	81.6	81.2
2000	81.9	82.0	82.2	82.5	82.7	82.7	82.3	82.6	82.4	81.9	81.4	80.6	82.0	82.6	82.4	81.3	82.1

NOTE. Monthly percentage change figures show change from the previous month; quarterly figures show the change from the previous quarter at a compound annual rate of growth. Production and capacity indexes are expressed as percentages of output in 1992.

Estimates from October 2000 through December 2000 are subject to further revision in the upcoming monthly releases.

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

## A.2. Revised data for industrial production, capacity, and utilization for manufacturing industries, 1987–2000

Seasonally adjusted data except as noted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Quarter				Annual avg. <sup>1</sup>
													1	2	3	4	
Industrial production (percentage change)																	
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	.3	.6	1.0	.6	.4	-.1	.7	-.2	.3	.7	.5	-.1	2.4	7.3	3.0	4.5	4.0
1993	.7	.3	.2	.5	-.4	.0	.2	-.2	1.3	.2	.5	.9	4.4	2.0	1.5	6.6	3.7
1994	.0	.4	1.0	.8	.9	.2	.8	.5	.2	.6	.9	1.0	5.6	9.4	6.6	7.6	6.0
1995	.6	-.2	.3	-.3	.2	.5	-.6	1.3	.9	-.3	.2	.1	6.5	.7	3.9	3.6	5.3
1996	-.2	1.0	-.2	1.3	.9	.9	.2	.6	.6	.0	1.0	.6	2.3	10.1	7.1	5.7	4.9
1997	.5	1.2	.4	.5	.3	.8	.6	1.1	.5	.6	.7	.4	8.5	6.7	9.0	7.7	7.8
1998	.6	.0	.2	.6	.3	-.8	-.1	2.3	-.2	.7	-.2	.2	4.8	2.8	3.9	4.7	5.6
1999	.5	.5	.5	.2	.8	.2	.6	.6	.1	.9	.5	.6	4.1	5.4	6.0	6.8	4.8
2000	.6	.4	.9	.6	.6	.4	-.1	.6	.3	-.2	-.6	-1.1	7.1	8.0	3.7	-2.1	6.1
Industrial production (index)																	
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	97.3	97.9	98.9	99.5	99.9	99.9	100.6	100.4	100.6	101.3	101.9	101.7	98.1	99.8	100.5	101.6	100.0
1993	102.5	102.8	103.0	103.5	103.1	103.1	103.4	103.1	104.4	104.6	105.1	106.1	102.7	103.2	103.6	105.3	103.7
1994	106.1	106.5	107.6	108.4	109.4	109.6	110.5	111.0	111.3	111.9	112.9	114.1	106.7	109.2	110.9	113.0	109.9
1995	114.8	114.6	114.9	114.6	114.9	115.4	114.8	116.2	117.3	116.9	117.1	117.3	114.8	115.0	116.1	117.1	115.7
1996	117.1	118.3	118.0	119.5	120.6	121.7	122.0	122.7	123.4	123.4	124.6	125.3	117.8	120.6	122.7	124.4	121.4
1997	125.9	127.3	127.8	128.4	128.9	129.9	130.7	132.1	132.8	133.6	134.5	135.0	127.0	129.1	131.9	134.4	130.8
1998	135.8	135.9	136.1	136.9	137.4	136.3	136.2	139.4	139.0	139.9	139.6	139.8	135.9	136.9	138.2	139.8	138.2
1999	140.5	141.2	141.9	142.2	143.4	143.6	144.5	145.3	145.6	146.8	147.5	148.4	141.2	143.1	145.1	147.6	144.8
2000	149.2	149.9	151.3	152.2	153.1	153.8	153.7	154.6	155.1	154.8	153.9	152.2	150.1	153.0	154.4	153.6	153.6
Capacity (index)																	
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	125.0	125.3	125.5	125.8	126.0	126.3	126.5	126.7	127.0	127.2	124.8	125.5	126.3	127.0	125.9
1993	127.5	127.7	128.0	128.2	128.5	128.8	129.0	129.3	129.6	129.9	130.2	130.5	127.7	128.5	129.3	130.2	128.9
1994	130.9	131.3	131.6	132.1	132.5	132.9	133.4	133.9	134.4	134.9	135.5	136.1	131.3	132.5	133.9	135.5	133.3
1995	136.6	137.3	137.9	138.5	139.2	139.8	140.5	141.2	141.9	142.6	143.3	144.0	137.3	139.2	141.2	143.3	140.2
1996	144.7	145.4	146.2	146.9	147.7	148.4	149.1	149.8	150.5	151.2	151.9	152.7	145.4	147.7	149.8	151.9	148.7
1997	153.4	154.2	154.9	155.7	156.5	157.4	158.2	159.1	160.0	160.9	161.9	162.9	154.2	156.5	159.1	161.9	157.9
1998	163.9	164.9	165.9	167.0	168.0	169.0	170.0	171.0	171.9	172.8	173.6	174.5	164.9	168.0	171.0	173.6	169.4
1999	175.3	176.0	176.8	177.5	178.3	179.0	179.7	180.3	181.0	181.7	182.4	183.1	176.0	178.3	180.3	182.4	179.3
2000	183.8	184.6	185.3	186.1	186.9	187.6	188.4	189.1	189.9	190.7	191.5	192.3	184.6	186.9	189.2	191.5	188.0
Utilization (level, percent)																	
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	78.1	78.5	79.1	79.5	79.6	79.4	79.8	79.5	79.6	79.9	80.2	79.9	78.6	79.5	79.6	80.0	79.4
1993	80.4	80.4	80.4	80.7	80.2	80.1	80.1	79.7	80.6	80.6	80.7	81.3	80.4	80.3	80.1	80.9	80.4
1994	81.1	81.1	81.7	82.1	82.6	82.5	82.8	82.9	82.8	83.0	83.3	83.8	81.3	82.4	82.8	83.4	82.5
1995	84.0	83.5	83.3	82.7	82.5	82.6	81.7	82.3	82.7	82.0	81.7	81.4	83.6	82.6	82.2	81.7	82.5
1996	80.9	81.3	80.7	81.4	81.7	82.0	81.8	81.9	82.0	81.6	82.0	82.1	81.0	81.7	81.9	81.9	81.6
1997	82.1	82.6	82.5	82.5	82.3	82.5	82.6	83.1	83.0	83.0	83.1	82.9	82.4	82.5	82.9	83.0	82.7
1998	82.9	82.4	82.0	82.0	81.8	80.6	80.1	81.5	80.9	81.0	80.4	80.2	82.4	81.5	80.8	80.5	81.3
1999	80.2	80.2	80.3	80.1	80.4	80.2	80.4	80.6	80.4	80.8	80.9	81.0	80.2	80.3	80.5	80.9	80.5
2000	81.2	81.2	81.6	81.8	81.9	82.0	81.6	81.7	81.7	81.2	80.4	79.1	81.3	81.9	81.7	80.2	81.3

NOTE. See general note to table A.1.

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

## A.3. Rates of growth in industrial production, by major market group, 1996–2000

Market group	Revised growth rate (percent)					Difference between growth rates: revised less earlier (percentage points)				
	1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
<b>Total index</b> .....	<b>5.6</b>	<b>7.2</b>	<b>3.2</b>	<b>5.1</b>	<b>4.2</b>	<b>.3</b>	<b>.5</b>	<b>.3</b>	<b>.9</b>	<b>-.1</b>
Products, total .....	4.7	6.0	3.2	3.4	3.0	.4	.8	.7	.9	.3
Final products .....	4.9	6.5	2.9	3.4	3.7	.5	.8	.6	.8	.2
Consumer goods .....	2.2	4.0	.2	3.1	.7	.2	1.2	1.1	1.1	.2
Durable .....	2.7	8.4	4.3	8.2	-4.3	.9	2.9	-8	1.4	-1
Automotive products .....	3.0	10.6	5.4	3.3	-6.8	.6	.3	.7	.6	1.1
Autos and trucks .....	4.1	15.0	5.5	2.5	-9.9	1.6	2.0	1.2	.6	2.5
Autos .....	-4.7	5.1	4.1	-5.5	-11.3	1.5	1.5	1.4	.6	.1
Trucks .....	10.8	21.1	6.3	6.7	-9.3	1.6	2.0	1.3	.6	3.3
Auto parts and allied goods .....	1.0	2.5	6.1	4.4	-1.3	-1.1	-3.4	.1	.7	-5
Other durable goods .....	2.5	6.6	3.4	12.4	-2.1	1.2	4.8	-1.7	1.8	-1.2
Appliances and electronics .....	5.8	12.1	10.2	32.5	-.5	1.7	10.7	-13.6	3.0	-3.4
Appliances and air conditioning ..	.9	4.2	8.2	11.5	-5.2	1.8	6.3	-1.6	3.5	5.4
Home electronics .....	10.9	19.8	11.7	53.3	5.1	1.5	14.2	-27.7	-7.0	-14.0
Carpeting and furniture .....	3.0	4.2	6.2	2.8	.4	-1	1.2	3.7	-5	1.5
Miscellaneous .....	.4	4.5	-2.5	4.6	-4.4	1.6	2.7	.8	.2	-4
Nondurable .....	2.1	2.7	-1.0	1.6	2.1	.1	.7	1.5	.9	.4
Non-energy .....	2.0	2.9	-.5	1.5	1.2	.1	.8	1.8	.9	.7
Foods and tobacco .....	.6	2.2	.6	.2	.8	-6	.0	1.9	.9	.6
Clothing .....	-.4	-3.1	-8.1	-4.9	-4.6	.0	-7	-1	-2.7	3.5
Chemical products .....	5.2	5.5	3.3	5.8	2.5	.4	3.1	3.4	1.8	-.1
Paper products .....	3.5	5.2	-5.4	2.6	3.3	2.1	.7	.0	1.4	.3
Energy products .....	2.6	1.8	-4.1	2.5	7.1	.1	-1	-2	1.2	-2.2
Fuels .....	3.6	1.8	-4	1.9	.0	.0	.0	.2	.0	.8
Utilities .....	2.1	1.6	-5.5	2.5	11.8	.2	.0	-4	1.7	-3.5
Equipment, total .....	9.3	10.4	7.3	3.9	8.9	.7	.1	.1	.4	.7
Business equipment .....	11.6	13.2	9.1	5.7	11.0	.8	.4	-9	1.0	1.4
Information processing and related .....	20.7	16.5	16.8	21.0	23.8	2.2	.5	-3.2	-5	2.4
Computer and office .....	57.6	24.1	56.0	55.3	46.5	4.1	-8.1	-21.6	4.7	5.0
Industrial .....	1.7	5.5	-1.0	-.9	6.8	.5	.7	-1.7	2.0	1.8
Transit .....	15.4	23.5	12.9	-8.9	-9.2	-4	1.7	2.2	3.0	1.2
Autos and trucks .....	-2.0	13.2	9.0	1.6	-15.7	1.7	1.5	2.6	2.6	-.8
Other .....	4.3	7.9	2.9	-3.5	11.8	-1.7	-2.8	4.5	4.6	4.5
Defense and space equipment .....	-1.8	-5.0	8.2	-3.1	-3.6	.7	-1.0	7.6	.6	-.2
Oil and gas well drilling .....	7.9	8.6	-26.3	5.6	18.6	.0	-1.0	-1.1	-5	-1.2
Manufactured homes .....	3.5	9.5	9.2	-17.4	-35.4	-3	.6	2.5	.5	.5
Intermediate products .....	4.1	4.5	4.1	3.2	1.0	.3	.9	1.0	1.2	.7
Construction supplies .....	6.1	4.0	7.6	4.5	-.6	.2	1.2	2.0	1.3	.2
Business supplies .....	2.8	4.8	1.8	2.3	2.1	.4	.7	.4	1.2	1.0
Materials .....	7.0	9.4	3.7	8.0	6.0	.1	.2	.2	.9	-.6
Durable .....	10.6	14.1	7.2	10.9	11.3	.1	-.3	-.1	1.2	-.3
Consumer parts .....	1.5	10.3	.1	7.1	-2.8	-.3	.7	2.9	1.7	1.9
Equipment parts .....	23.8	26.1	20.5	22.0	35.8	.4	-.4	-1.6	1.0	.2
Semiconductors, printed circuit boards, and other electrical components .....	53.4	55.1	53.7	54.6	81.4	1.2	.9	-2.9	2.7	-1.1
Other .....	3.9	5.4	-.6	3.4	-1.8	-1	-.6	.1	1.3	-.1
Basic metals .....	4.1	5.5	-3.0	6.5	-5.4	-.6	.0	2.6	1.5	-.2
Nondurable .....	3.5	5.3	-2.8	5.6	-4.5	.1	1.0	.1	-.4	.4
Textile .....	1.4	3.4	-8.5	-1.2	-10.3	-.9	.3	1.1	-1.7	2.2
Paper .....	4.4	4.5	-2.9	4.2	-3.8	.1	.0	-.3	.2	-.5
Chemical .....	4.7	6.3	-4.0	9.4	-4.5	.1	1.9	-.4	-1.3	-.5
Other .....	1.3	4.8	2.8	2.0	-2.7	.7	.5	1.2	.5	2.2
Energy .....	.7	.1	-.7	.5	1.7	.0	.0	.3	1.3	-.1
Primary .....	-1.0	-.1	-1.0	-.7	.0	-.2	.0	-.6	.1	-.8
Converted fuel .....	4.0	.4	-.2	2.8	5.8	.2	.0	2.0	3.8	1.6
<i>Special aggregates</i>										
Total excluding:										
Autos and trucks .....	5.8	7.0	3.1	5.2	4.7	.3	.4	.3	.9	-.1
Motor vehicles and parts .....	6.0	6.8	3.2	5.0	5.0	.3	.4	.2	.8	-.1
Computers .....	4.8	7.0	2.3	4.0	3.3	.2	.6	.8	1.0	.2
Computers and semiconductors <sup>1</sup> .....	3.2	5.4	.9	2.4	.6	.2	.7	1.0	.9	.3
Computers, communications equipment, and semiconductors .....	3.0	5.0	.7	2.2	.0	.2	.6	1.1	1.0	.5
Consumer goods excluding:										
Autos and trucks .....	2.1	3.2	-.1	3.1	1.4	.2	1.1	1.1	1.1	.1
Energy .....	2.2	4.3	.6	3.2	-.2	.3	1.3	1.2	1.1	.4
Business equipment excluding:										
Autos and trucks .....	13.1	13.3	9.1	6.1	13.9	.7	.3	-1.2	.8	1.8
Computers and office equipment .....	7.6	12.2	4.8	.5	6.7	.5	1.2	.8	1.3	2.1
Materials excluding:										
Energy .....	8.7	11.7	4.5	9.5	6.9	.2	.3	.0	.7	-.7

NOTE. Growth rates are calculated as the percentage change in the seasonally adjusted index from the fourth quarter of the previous year to the fourth quarter of the year specified. For 2000, the differences between growth rates are

calculated from annualized growth rates between the fourth quarter of 1999 and the third quarter of 2000.

1. Semiconductors include related electronic components.

## A.4. Rates of growth in industrial production, by industry group, 1996–2000

Series	SIC code <sup>1</sup>	Revised growth rate (percent)					Difference between growth rates: revised less earlier (percentage points)				
		1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
<b>Total index</b> .....	...	<b>5.6</b>	<b>7.2</b>	<b>3.2</b>	<b>5.1</b>	<b>4.2</b>	<b>.3</b>	<b>.4</b>	<b>.3</b>	<b>.9</b>	<b>–1</b>
Manufacturing .....	...	6.3	8.0	4.0	5.6	4.1	.4	.6	.3	.8	.0
Primary processing .....	...	8.3	10.4	4.3	8.8	5.0	.1	.4	.2	.4	–.2
Advanced processing .....	...	5.0	6.4	3.9	3.7	3.5	.5	.6	.5	1.0	.0
Durable manufacturing .....	...	9.2	11.5	8.0	8.2	7.9	.3	.1	–.3	1.2	.0
Lumber and products .....	24	1.8	3.7	5.4	.5	–7.6	.0	–.8	1.2	.6	.5
Furniture and fixtures .....	25	5.2	7.8	6.2	3.1	5.3	.6	4.1	2.9	.5	3.8
Stone, clay, and glass products .....	32	5.6	3.4	5.6	2.3	.5	–.2	.1	.6	1.1	.8
Primary metals .....	33	5.0	6.1	–3.4	8.0	–7.1	–.6	.1	3.0	.5	.2
Iron and steel .....	331,2	4.4	5.8	–8.4	12.6	–10.6	–.8	–.3	3.2	.3	.6
Raw steel .....	331pt	–1.1	7.5	–9.4	16.6	–15.7	–1.0	.3	3.4	–1.1	1.4
Nonferrous metals .....	333–6,9	5.8	6.4	2.6	3.0	–3.2	–.4	.4	2.6	.8	–.2
Fabricated metal products .....	34	4.2	6.2	1.5	1.6	.5	.0	.3	1.5	1.4	1.1
Industrial machinery and equipment .....	35	10.9	7.3	11.6	13.6	14.3	.4	–3.8	–4.5	2.3	–.5
Computer and office equipment .....	357	51.5	21.5	54.0	54.3	43.6	5.0	–6.3	–24.9	3.2	2.4
Electrical machinery .....	36	24.3	28.4	20.4	25.2	38.9	.9	2.2	–1.1	2.5	.6
Semiconductors and related electronic components .....	3672–9	47.7	49.0	45.7	47.8	72.8	.8	–.9	–2.8	3.5	–.8
Transportation equipment .....	37	4.7	14.7	5.9	–1.4	–5.5	–.1	1.5	3.7	1.6	1.2
Motor vehicles and parts .....	371	–.5	16.0	3.3	5.9	–8.4	.9	2.2	2.3	1.9	1.8
Autos and light trucks .....	...	3.2	13.5	5.4	1.5	–10.0	1.6	2.2	1.4	.9	1.6
Aerospace and miscellaneous transportation equipment .....	372–6,9	13.3	12.9	10.4	–11.6	–.7	–1.7	.6	6.3	.5	.5
Instruments .....	38	3.8	2.9	3.9	4.5	2.2	1.4	–.4	2.0	–.4	2.6
Miscellaneous manufactures .....	39	2.7	3.1	.7	6.6	.0	.1	.0	1.3	2.3	2.1
Nondurable manufacturing .....	...	2.9	4.2	–.4	2.5	–.5	.4	1.3	.7	.6	.4
Foods .....	20	.3	2.2	3.7	.9	1.5	–.5	.3	1.9	1.0	.9
Tobacco products .....	21	–.3	5.5	–15.9	–1.9	–2.7	–.9	.2	2.5	.9	–.2
Textile mill products .....	22	.7	1.5	–6.5	–.2	–8.8	–1.2	–2.3	–.1	–4.6	4.1
Apparel products .....	23	–.3	–.2	–6.3	–4.0	–5.5	.9	2.3	1.0	1.0	.3
Paper and products .....	26	3.6	4.9	–.1	3.0	–3.2	.6	.8	1.1	.0	–.1
Printing and publishing .....	27	3.0	5.1	–1.8	1.8	2.3	1.2	1.2	–.2	1.3	1.1
Chemicals and products .....	28	5.4	5.3	.2	6.7	–.4	.7	2.7	.9	.9	–.5
Petroleum products .....	29	4.0	3.1	2.1	.2	–.3	–.1	.4	.0	.2	–.3
Rubber and plastic products .....	30	5.1	7.0	1.6	3.6	–1.8	1.1	2.4	–1.5	–.2	–.1
Leather and products .....	31	4.3	–5.4	–10.1	–6.0	–3.8	2.3	1.7	–1.9	3.8	4.4
Mining .....	...	1.6	1.5	–5.3	–.5	1.5	–.3	–.4	–.3	.4	–1.7
Metal mining .....	10	3.2	3.2	–2.3	–8.8	–2.1	–.8	.3	–.2	3.1	–3.3
Coal mining .....	12	2.4	1.7	2.4	–1.3	.6	–.2	–.2	–.4	–.1	.7
Oil and gas extraction .....	13	1.0	1.3	–8.7	.3	2.2	–.1	–.4	–.3	.1	–2.9
Stone and earth minerals .....	14	5.1	2.4	4.3	.6	–3.2	.3	–.7	.5	1.1	–.4
Utilities .....	...	1.4	2.2	–1.4	2.3	7.7	.2	.1	.0	2.1	.2
Electric .....	491,3pt	1.1	3.2	1.6	1.7	5.5	.1	.3	.8	1.7	.2
Gas .....	492,3pt	2.5	–1.5	–11.9	4.6	15.1	.3	.3	.3	3.5	–2.8
<i>Special aggregates</i>											
Computers, communications equipment, and semiconductors <sup>2</sup> .....	...	41.0	35.7	37.2	40.6	55.6	1.9	–.9	–6.7	3.2	5.2
Manufacturing excluding:											
Motor vehicles and parts .....	...	6.7	7.5	4.1	5.5	5.0	.3	.4	.2	.7	–.1
Computers and office equipment .....	...	5.3	7.7	3.0	4.4	3.1	.2	.7	.8	1.0	.3
Computers and semiconductors <sup>2</sup> .....	...	3.5	5.9	1.4	2.6	.1	.2	.8	1.1	.9	.5
Computers, communications equipment, and semiconductors <sup>2</sup> .....	...	3.2	5.4	1.2	2.3	–.7	.2	.7	1.2	1.0	.7

NOTE. Growth rates are calculated as the percentage change in the seasonally adjusted index from the fourth quarter of the previous year to the fourth quarter of the year specified. For 2000, the differences between growth rates are calculated from annualized growth rates between the fourth quarter of 1999 and the third quarter of 2000.

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.

1. Standard Industrial Classification; see Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual, 1987* (U.S. Government Printing Office, 1987).

2. Semiconductors include related electronic components.

pt. Part of classification.



## A.5. Rates of growth in capacity, by industry group, 1996–2000

Industry group	SIC code <sup>1</sup>	Revised growth rate (percent)					Difference between growth rates: revised less earlier (percentage points)				
		1996	1997	1998	1999	2000	1996	1997	1998	1999	2000 <sup>2</sup>
<b>Total index</b> .....	...	<b>5.4</b>	<b>5.9</b>	<b>6.5</b>	<b>4.6</b>	<b>4.6</b>	<b>-1</b>	<b>.5</b>	<b>.3</b>	<b>.4</b>	<b>.8</b>
Manufacturing .....	...	6.1	6.5	7.2	5.1	5.0	-1	.5	.2	.4	.8
Primary processing .....	...	9.2	8.5	9.4	4.9	8.0	-7	.1	-5	-8	1.5
Advanced processing .....	...	4.0	4.9	5.7	5.2	3.0	.3	.2	.5	1.3	-4
Durable manufacturing .....	...	9.3	9.3	10.2	8.4	8.8	.0	.5	-5	1.1	1.3
Lumber and products .....	24	3.4	3.3	3.7	1.6	1.2	-3	.0	.6	-1.3	1.0
Furniture and fixtures .....	25	4.3	5.4	10.0	2.9	3.9	.0	1.6	6.8	.9	3.3
Stone, clay, and glass products .....	32	3.0	3.5	3.9	2.1	2.4	-4	.4	1.1	-1.4	.2
Primary metals .....	33	5.3	3.4	5.1	3.3	.6	-4	.0	1.6	.8	-1.2
Iron and steel .....	331.2	4.8	3.9	5.8	3.1	.9	-3	.0	.6	-8	-1.5
Raw steel .....	331pt	2.4	6.1	6.5	2.8	1.7	-4	.1	.4	1.2	-5
Nonferrous metals .....	333-6,9	6.0	2.9	4.4	3.4	.4	-4	-2	2.9	2.6	-1.0
Primary copper .....	3331	.6	1.0	-1.1	-3.1	-2.9	5.7	.3	-6	-9	3.0
Primary aluminum .....	3334	.3	.1	.7	1.5	1.3	-1	.0	.7	1.5	.9
Fabricated metal products .....	34	4.4	6.3	6.0	1.8	2.5	-8	.2	.2	1.5	2.5
Industrial machinery and equipment .....	35	12.0	11.4	11.8	18.1	10.6	-3	-2.9	-4.0	2.8	-1.7
Computer and office equipment .....	357	39.3	44.3	37.0	72.7	39.0	-3.2	-6.6	-21.8	10.8	-3.2
Electrical machinery .....	36	30.4	26.5	28.2	18.4	33.2	-5	3.7	-2.3	1.2	7.8
Semiconductors and related electronic components .....	3672-9	57.6	46.3	55.2	31.8	69.8	-1.5	3.3	-5.8	.2	16.2
Transportation equipment .....	37	1.4	3.6	4.1	2.2	1.1	1.0	1.2	1.4	2.3	1.0
Motor vehicles and parts .....	371	2.8	6.2	4.7	2.7	2.1	1.3	2.5	2.0	2.5	.2
Autos and light trucks .....	...	-2.1	5.2	4.4	.5	.9	2.4	1.0	1.8	2.1	-3
Aerospace and miscellaneous transportation equipment .....	372-6,9	-2	.6	3.1	1.6	-4	.9	.0	.3	2.3	1.6
Instruments .....	38	1.2	1.1	3.4	5.8	1.8	.9	.3	1.2	1.8	-1
Miscellaneous manufactures .....	39	2.4	1.7	2.9	2.4	1.3	.0	1.2	1.4	1.2	1.0
Nondurable manufacturing .....	...	2.2	3.4	4.1	1.3	.9	.0	.8	1.6	.1	.6
Foods .....	20	2.4	2.3	2.8	2.2	.4	.2	.0	.6	.3	-1
Textile mill products .....	22	.7	-2	-2	-5	-1.7	-1.2	-2.4	-5	-8	-1.8
Apparel products .....	23	.0	.8	.8	-9	-2.2	-3	.2	.1	.0	.2
Paper and products .....	26	2.3	3.3	4.3	.9	.8	1.0	.0	1.2	-1.4	.7
Pulp and paper .....	261-3	2.6	1.6	.3	.9	.7	1.4	-7	-1.1	-3	.5
Printing and publishing .....	27	1.0	3.0	3.5	.9	-1	.3	1.2	1.9	1.1	-8
Chemicals and products .....	28	3.4	5.5	7.0	1.4	2.5	.0	2.7	4.2	.4	1.6
Plastics materials .....	2821	3.3	6.8	9.6	1.3	.5	.1	5.1	6.0	-2.4	-2.7
Synthetic fibers .....	2823,4	-3.3	2.0	2.8	-1.5	1.4	-1.3	1.0	2.3	-3.2	3.7
Petroleum products .....	29	1.1	2.4	2.4	1.9	.0	-3	.1	-5	.3	-6
Rubber and plastics products .....	30	3.9	5.2	5.7	3.8	3.5	-3	-2	.6	-1.6	.1
Leather and products .....	31	-1.8	-6	-2.0	-3.5	-4.4	-3	1.2	.8	1.4	.7
Mining .....	...	.6	1.9	-1	-1.5	-8	.2	.3	-1.0	-1.3	.7
Metal mining .....	10	3.2	3.0	.8	-1	-1.8	1.7	-2	-3	1.4	.7
Coal mining .....	12	1.1	.9	.3	.8	.6	-7	.7	-1	.4	.4
Oil and gas extraction .....	13	.1	1.5	-8	-2.4	-1.1	.4	.3	-1.3	-1.8	1.0
Oil and gas well drilling .....	138	-5	3.5	1.4	-1.9	-4	.7	2.5	-5	1.2	-1.2
Stone and earth minerals .....	14	3.3	4.8	2.0	.4	.0	-3	.5	-9	-1.2	-4
Utilities .....	...	.9	1.0	1.1	2.4	3.3	-1.0	.8	.4	1.0	2.1
Electric .....	491,3pt	1.1	.2	1.1	3.2	4.4	-8	.4	.4	1.8	2.7
Gas .....	492,3pt	1.1	1.1	.5	.1	-1	-7	-4	-7	-9	-1.1
<i>Special aggregates</i>											
Computers, communications equipment, and semiconductors <sup>3</sup> .....	...	44.2	40.3	39.5	37.8	48.0	-1.4	2.4	-8.7	2.1	9.0
Manufacturing excluding computers, communications equipment, and semiconductors <sup>3</sup> .....	...	2.7	3.6	4.4	2.1	1.3	.1	.5	1.4	.8	.8

NOTE. See general note to table A.4.

1. Standard Industrial Classification; see table A.4, note 1.

2. Through the fourth quarter of 2000.

3. Semiconductors include related electronic components.

pt. Part of classification.

## A.6. Capacity utilization rates, by industry group, 1967–2000

Item	SIC code <sup>1</sup>	Revised rate (percent of capacity, seasonally adjusted)						Difference between rates: revised less earlier (percentage points)		
		1967–99 avg.	1988–89 high	1990–91 low	1998:Q4	1999:Q4	2000:Q4	1998:Q4	1999:Q4	2000:Q3
<b>Total index</b> .....	...	<b>82.1</b>	<b>85.4</b>	<b>78.1</b>	<b>81.2</b>	<b>81.6</b>	<b>81.3</b>	<b>.2</b>	<b>.6</b>	<b>.1</b>
Manufacturing .....	...	81.1	85.7	76.6	80.5	80.9	80.2	.3	.6	.2
Primary processing .....	...	82.1	88.3	76.7	81.6	84.6	82.3	.9	1.9	1.1
Advanced processing .....	...	80.6	84.2	76.6	80.4	79.2	79.7	.5	.2	.4
Durable manufacturing .....	...	79.6	84.6	73.1	81.0	81.0	80.3	.6	.7	.0
Lumber and products .....	24	82.6	93.6	75.5	84.2	83.3	76.1	.5	2.1	1.9
Furniture and fixtures .....	25	81.3	86.6	72.5	78.6	78.8	79.8	.0	-.3	.2
Stone, clay, and glass products .....	32	78.7	83.5	69.7	85.1	85.2	83.7	-.4	1.7	2.2
Primary metals .....	33	81.5	92.7	73.7	84.8	88.6	81.8	1.6	1.3	2.2
Iron and steel .....	331,2	81.3	95.2	71.8	79.9	87.2	77.3	1.6	2.6	3.8
Raw steel .....	331pt	80.9	92.7	71.5	76.3	86.6	71.8	2.1	.5	1.6
Nonferrous metals .....	333–6,9	81.9	89.3	74.2	90.8	90.4	87.1	1.5	-.1	.2
Primary copper .....	3331	76.2	86.3	73.5	106.4	77.5	78.3	19.6	2.1	11.1
Primary aluminum .....	3334	88.4	100.4	97.3	88.4	89.7	80.6	-.2	-1.5	-2.0
Fabricated metal products .....	34	78.0	82.0	71.9	77.0	76.9	75.4	1.5	1.5	.7
Industrial machinery and equipment .....	35	81.4	85.4	72.3	83.0	79.8	82.5	-1.1	-1.3	-.9
Computer and office equipment .....	357	81.3	86.9	66.9	85.6	76.5	79.1	-.1	-3.5	-1.6
Electrical machinery .....	36	81.2	84.0	75.0	79.0	83.4	87.0	1.1	2.0	-1.1
Semiconductors and related electronic components .....	3672–9	79.6	81.1	75.6	76.8	86.1	87.7	-1.7	.1	-7.2
Transportation equipment .....	37	76.0	85.8	68.5	81.7	78.8	73.7	1.0	.5	.6
Motor vehicles and parts .....	371	76.9	89.1	55.9	80.4	82.9	74.3	-.2	-.7	.2
Autos and light trucks <sup>2</sup> .....	...	...	92.3	53.3	86.6	87.5	78.1	-.4	-1.5	-.2
Aerospace and miscellaneous transportation equipment .....	372–6,9	75.3	87.3	79.2	83.7	72.8	72.6	2.9	1.3	.6
Instruments .....	38	81.7	81.4	77.2	81.4	80.4	80.7	1.0	-.7	.9
Miscellaneous manufactures .....	39	75.8	79.0	71.7	78.3	81.6	80.5	-.8	-.1	.6
Nondurable manufacturing .....	...	83.3	87.3	80.7	80.1	81.0	79.9	-.3	.2	.1
Foods .....	20	82.8	85.4	82.7	81.2	80.2	81.0	1.1	1.6	2.2
Textile mill products .....	22	85.6	90.4	77.7	82.2	82.4	76.4	.9	-2.1	1.7
Apparel products .....	23	80.8	85.1	75.5	74.0	71.7	69.3	3.0	3.6	3.6
Paper and products .....	26	88.9	93.5	85.0	85.0	86.7	83.2	-1.1	.0	-.2
Pulp and paper .....	261–3	92.4	98.0	89.9	90.9	94.0	89.2	.1	.5	-.6
Printing and publishing .....	27	85.5	91.7	79.6	80.1	80.8	82.7	-1.1	-.9	.1
Chemicals and products .....	28	79.3	86.2	79.3	74.5	78.4	76.2	-2.5	-2.3	-3.5
Plastics materials .....	2821	86.8	97.0	74.8	89.4	94.0	89.5	-2.4	-.7	5.0
Synthetic fibers .....	2823,4	85.1	90.7	77.6	79.9	87.6	81.7	2.9	5.3	2.1
Petroleum products .....	29	87.1	88.5	85.1	94.7	93.2	92.9	.6	.5	.7
Rubber and plastics products .....	30	84.7	89.6	77.4	85.5	85.3	80.9	.4	1.5	1.5
Leather and products .....	31	80.9	83.3	76.1	71.2	69.3	69.8	.4	2.3	4.2
Mining .....	...	87.4	88.0	87.0	83.8	84.7	86.6	.5	1.9	.3
Metal mining .....	10	79.4	89.4	79.9	87.1	79.6	79.4	-.6	1.2	-1.3
Coal mining .....	12	86.7	91.5	83.4	87.3	85.4	85.4	-.5	-.9	-.7
Oil and gas extraction .....	13	88.4	88.2	88.7	82.4	84.7	87.6	.9	2.5	.1
Oil and gas well drilling .....	138	73.9	69.3	60.0	62.0	66.8	79.5	-1.3	-2.6	-3.1
Stone and earth minerals .....	14	84.8	89.0	79.4	86.4	86.6	83.8	.6	2.6	2.5
Utilities .....	...	87.5	92.6	83.4	89.3	89.2	93.0	-.1	.9	-.4
Electric .....	491,3pt	89.6	95.0	87.1	95.0	93.6	94.6	1.2	1.2	-.5
Gas .....	492,3pt	82.0	85.0	67.1	72.2	75.4	86.9	1.3	4.5	4.0
<i>Special aggregates</i>										
Computers, communications equipment, and semiconductors <sup>3</sup> .....	...	80.2	81.9	72.4	79.2	80.8	85.0	-.3	.3	-1.0
Manufacturing excluding computers, communications equipment, and semiconductors <sup>3</sup> .....	...	81.2	86.1	76.8	80.7	80.9	79.3	.2	.3	.2

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.

1. Standard Industrial Classification; see table A.4, note 1.

2. Series begins in 1977.

3. Semiconductors include related electronic components.

pt. Part of classification.

## A.7. Annual proportions in industrial production, by industry group, 1992–99

Item	SIC code <sup>1</sup>	1992	1993	1994	1995	1996	1997	1998	1999
<b>Total index</b> .....	...	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Manufacturing .....	...	85.4	85.9	86.7	86.9	87.0	88.2	88.9	88.4
Primary processing .....	...	31.0	31.8	33.4	33.7	33.5	34.0	33.7	34.1
Advanced processing .....	...	54.5	54.1	53.3	53.2	53.5	54.1	55.2	54.3
Durable manufacturing .....	...	44.8	45.6	46.3	46.8	47.6	48.3	48.9	48.4
Lumber and products .....	24	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1
Furniture and fixtures .....	25	1.4	1.4	1.4	1.4	1.4	1.5	1.6	1.6
Stone, clay, and glass products .....	32	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.4
Primary metals .....	33	3.1	3.3	3.6	3.5	3.5	3.6	3.4	3.4
Iron and steel .....	331,2	1.8	1.9	2.0	1.9	1.9	2.0	1.8	1.8
Raw steel .....	331pt	.1	.1	.1	.1	.1	.1	.1	.1
Nonferrous metals .....	333–6,9	1.4	1.4	1.6	1.6	1.6	1.6	1.6	1.6
Fabricated metal products .....	34	5.0	5.1	5.2	5.3	5.5	5.7	5.7	5.6
Industrial machinery and equipment .....	35	7.8	8.1	8.4	8.9	9.1	9.0	9.1	9.0
Computer and office equipment .....	357	1.6	1.6	1.6	1.7	1.8	1.9	2.0	2.3
Electrical machinery .....	36	7.1	7.4	7.8	8.3	8.6	8.8	8.6	8.5
Semiconductors and related electronic components .....	3672–9	2.5	2.6	2.9	3.4	3.6	3.7	3.5	3.6
Transportation equipment .....	37	9.4	9.5	9.3	8.9	8.9	9.3	9.9	9.7
Motor vehicles and parts .....	371	4.7	5.1	5.5	5.4	5.5	5.7	5.6	5.9
Autos and light trucks <sup>2</sup> .....	...	2.5	2.5	2.8	2.8	2.9	3.0	2.7	2.9
Aerospace and miscellaneous transportation equipment .....	372–6,9	4.7	4.4	3.8	3.5	3.4	3.6	4.3	3.9
Instruments .....	38	5.4	5.3	4.9	4.8	4.9	4.7	4.8	4.7
Miscellaneous manufactures .....	39	1.3	1.3	1.3	1.3	1.4	1.3	1.3	1.3
Nondurable manufacturing .....	...	40.6	40.3	40.4	40.2	39.4	39.9	40.1	40.0
Foods .....	20	9.6	9.6	9.3	9.2	9.1	9.0	9.2	9.0
Tobacco products .....	21	1.6	1.1	1.2	1.3	1.3	1.4	1.7	1.7
Textile mill products .....	22	1.8	1.8	1.8	1.7	1.6	1.6	1.5	1.4
Apparel products .....	23	2.2	2.1	2.1	2.0	1.9	1.8	1.7	1.5
Paper and products .....	26	3.5	3.5	3.8	3.9	3.5	3.4	3.4	3.4
Printing and publishing .....	27	6.8	6.8	6.6	6.6	6.6	6.9	6.8	6.6
Chemicals and products .....	28	10.0	10.0	10.0	9.9	9.8	10.1	10.2	10.4
Petroleum products .....	29	1.4	1.5	1.6	1.5	1.7	1.6	1.5	2.0
Rubber and plastics products .....	30	3.5	3.6	3.8	3.7	3.7	3.8	3.8	3.8
Leather and products .....	31	.3	.3	.2	.2	.2	.2	.2	.2
Mining .....	...	6.8	6.3	5.9	6.0	6.3	5.6	5.0	5.6
Metal mining .....	10	.4	.4	.4	.4	.4	.3	.3	.2
Coal mining .....	12	1.0	.9	.9	.8	.8	.7	.7	.6
Oil and gas extraction .....	13	4.8	4.4	4.0	4.1	4.5	3.9	3.5	4.2
Stone and earth minerals .....	14	.6	.6	.6	.6	.6	.6	.6	.6
Utilities .....	...	7.8	7.7	7.4	7.1	6.7	6.3	6.1	5.9
Electric .....	491,3pt	6.2	6.1	5.8	5.6	5.3	4.9	4.8	4.6
Gas .....	492,3pt	1.6	1.6	1.6	1.5	1.4	1.4	1.3	1.3
<i>Special aggregates</i>									
Computers, communications equipment, and semiconductors <sup>3</sup> .....	...	5.7	5.8	6.2	6.9	7.3	7.6	7.5	7.8
Manufacturing excluding:									
Motor vehicles and parts .....	...	80.7	80.9	81.2	81.5	81.5	82.4	83.3	82.5
Computers and office equipment .....	...	83.8	84.3	85.1	85.2	85.2	86.3	86.9	86.1
Computers and semiconductors <sup>3</sup> .....	...	81.3	81.7	82.2	81.8	81.6	82.6	83.4	82.5
Computers, communications equipment, and semiconductors <sup>3</sup> .....	...	79.8	80.1	80.5	80.1	79.7	80.5	81.4	80.6

NOTE. The IP proportion data are estimates of the industries' relative contribution to overall IP growth in the following year. For example, a 1 percent increase in durable goods manufacturing in 2000 would account for a 0.484 percent increase in total IP.

1. Standard Industrial Classification; see table A.4, note 1.

2. Series began in 1977.

3. Semiconductors include related electronic components.

pt. Part of classification.

## A.8. Rates of growth in electric power use, 1996–2000

Item	SIC code <sup>1</sup>	Revised growth rate (percent)					Difference between growth rates: revised less earlier (percentage points)				
		1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
<b>Total</b> .....	...	<b>1.6</b>	<b>1.0</b>	<b>-1.2</b>	<b>1.0</b>	<b>.6</b>	<b>.1</b>	<b>-1</b>	<b>-3</b>	<b>1.3</b>	<b>.2</b>
Manufacturing .....	...	1.6	1.2	-1.2	1.1	.7	.2	-1	-3	1.4	.3
Durable manufacturing .....	...	.3	3.8	-1.8	1.3	2.7	.6	-9	-5	1.9	.6
Lumber and products .....	24	4.7	1.0	2.1	-1	3.1	.5	-2.5	.4	.9	1.1
Furniture and fixtures .....	25	4.8	2.7	1.0	1.9	5.1	.7	1.1	.4	.8	2.3
Stone, clay, and glass products .....	32	4.1	1.1	2.2	-4	4.0	.6	-5	-3	1.8	.1
Primary metals .....	33	-3.0	5.5	-4.8	1.9	2.3	.8	-1.2	-1.0	2.4	-1
Fabricated metal products .....	34	3.9	4.1	-7	.9	3.4	.2	-5	.5	2.0	.7
Industrial machinery and equipment .....	35	1.3	4.1	.5	.1	3.3	.1	-1	-5	2.1	1.2
Electrical machinery .....	36	2.9	2.6	-2.6	-4	4.8	.4	-3	-6	1.8	-9
Transportation equipment .....	37	-1	4.2	-1.0	3.6	-1.0	.6	-1.4	-1	1.6	1.8
Instruments .....	38	-2.6	.3	1.5	-1.9	4.9	.3	-7	-2.3	-3.0	5.6
Miscellaneous manufactures .....	39	8.5	.4	6.4	11.6	7.4	1.3	-1.7	-1.8	7.7	2.3
Nondurable manufacturing .....	...	2.7	-9	-8	1.0	-9	-1	.5	-1	.9	.0
Foods .....	20	3.4	3.7	3.0	2.2	2.3	1.7	.4	.7	2.6	-4
Tobacco products .....	21	1.3	.1	-1.7	-6.7	-8	1.3	-6	.1	.8	-6
Textile mill products .....	22	.7	-2	-2.3	-2.4	1.1	-2.0	-3.4	-9	-5	.1
Apparel products .....	23	-7	.1	-2.4	2.7	-1.6	1.1	1.8	1.0	9.0	.4
Paper and products .....	26	.6	1.6	-2.5	1.6	-1.3	-5	-9	-1.7	4.5	1.1
Printing and publishing .....	27	-1	1.5	1.5	.8	1.5	-9	-1.4	-8	3.0	.9
Chemicals and products .....	28	5.6	-3.8	-1.6	.8	-4.5	-4	1.8	.7	.3	.0
Petroleum products .....	29	-2.6	-1.5	-2.1	1.1	3.6	.6	1.9	-9	-4.3	-2.1
Rubber and plastics products .....	30	3.8	1.3	3.3	1.7	2.4	.5	-6	-3	1.2	1.0
Leather and products .....	31	-2.2	-1.4	-4.4	-2.4	6.6	-7	.0	-6	5.6	15.2
Mining .....	...	1.7	-8	-3	-6	-1.2	-1.4	-6	.3	.5	-3
Metal mining .....	10	-1.2	.0	.6	-1.1	-2	-3.8	-4	.8	.5	-4.3
Coal mining .....	12	.0	-6	.6	-4.4	3.6	.1	-6	-4	.4	.2
Oil and gas extraction .....	13	3.6	.5	-5.8	1.7	-2.0	-8	-1.0	.9	-2	2.1
Stone and earth minerals .....	14	4.2	-4.6	8.4	-1	-6.0	-2	.2	-1.0	1.4	.3
<i>Supplementary groups</i>											
Total, excluding nuclear nondefense .....	...	1.2	2.3	-1.5	1.1	1.2	.2	-1	-2	1.1	.2
Utilities sales to industry .....	...	2.1	1.0	-1.3	1.1	1.1	.1	-2	-5	1.4	.1
Industrial generation .....	...	-5.5	.8	.5	-1.1	.6	.2	.1	2.4	-2.6	4.3

NOTE. Growth rates are calculated as the percentage change in the seasonally adjusted index from the fourth quarter of the previous year to the fourth quarter of the year specified. For 2000, the growth rates are calculated from the fourth quarter of 1999 to the third quarter of 2000 and annualized.

1. Standard Industrial Classification; see table A.4, note 1.