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INDUSTRIAL PRODUCTION AND CAPACITY UTILIZATION (A REVISION)

The Federal Reserve index of industrial production (IP) and the related measures of capacity and utilization have been revised for the period 1991 to date. An important aspect of the revision is the updating of the weights used in constructing the indexes. Beginning with January 1992, the weights used for adding up the individual series are now derived from value added by industries in 1992, rather than in 1987. The new estimates of production also incorporate preliminary results of the 1992 Census of Manufactures, annual physical data on mining for 1992 and 1993, and updated monthly source data, seasonal factors, and productivity relationships.

The revisions to capacity and utilization reflect the new IP indexes, updated manufacturing capital stocks, and new information provided mainly by trade associations on physical capacity and utilization for selected industries.[1] The updated capital stocks incorporate new data on actual manufacturing investment in 1992 and revised estimates of investment in 1993 and 1994 based on surveys of capital spending plans by manufacturers.

For the third quarter of 1994, the revised production index is 118.8 percent of output in 1987, compared with 118.4 percent reported previously (table 1).[2] The revised capacity index is 140.9 percent of output in 1987, compared with 140.0 percent reported previously. As a result, the rate of capacity utilization—the ratio of production to capacity—has been revised down about a third of a percentage point to an estimated 84.3 percent in the third quarter of 1994 (chart). For October, industrial utilization is 84.6 percent, the highest rate since April 1989.

The IP index now shows stronger growth in 1991 and 1992 and slower growth in 1993 and 1994 (table 3). The upward revision to IP growth in 1992 reflects largely the incorporation of the new Census of Manufactures data. The slower growth now shown for the past two years is due chiefly to the introduction of 1992 value-added weights.

The new 1992 weights have substantially reduced the relative share of output of computers in the total indexes, a reduction that follows from the rapid decline in the relative price of computing power between 1987 and 1992. The smaller weight now given to the fast-growing computer industry explains, in large part, the slower growth in 1993 and 1994 shown by the revised indexes for business equipment and for total manufacturing (table 4). By contrast, indexes for these groups excluding computers are largely unaffected by the shift to 1992 valuation. The revisions to the special aggregates that exclude computers indicate that the picture of industrial activity during the past two years has been little changed, on balance, by the revision.

Annual industrial capacity growth has been revised up for 1991, 1992, and 1993; and capacity utilization by the fourth quarter of 1993 is unchanged from the earlier estimate (tables 5 and 6). The faster growth of capacity through 1993 reflects the upwardly revised gains in IP for these years, on balance, as well as a faster

1. Although the revisions of the individual capacity indexes and utilization rates begin in 1991, small revisions to some aggregates go back to 1987 for technical reasons. This aspect to the revision is discussed below.

2. The figures for August through October of this year are subject to further revision in the upcoming monthly statistical releases.

rate of capital formation by manufacturers. Capital stock estimates have been raised, in large part, because the 1992 Census of Manufactures shows investment spending by manufacturers to have been stronger than survey data had previously indicated.

The average upward revision to capacity growth for total manufacturing is relatively small. As with the production index, the use of 1992 value-added weights reduces the contribution made by the rapidly expanding computer industry to aggregate indexes. The upward revision to growth of capacity for manufacturing excluding the computer industry, however, is noticeable in each year since 1990.

Capacity utilization in manufacturing by the third quarter of this year is 83.6 percent, 0.4 percentage point lower than the rate previously reported. Although figures for some of the individual series changed noticeably, the revised estimates for the major aggregates on balance are not appreciably different from the earlier ones. Among primary-processing industries, operating rates are now estimated to have been slightly higher. The rubber and plastics products, stone, clay and glass, paper, and fabricated metals industries contributed to the increase; downward revisions to operating rates in the primary chemical, petroleum, and textiles industries largely offset those increases. Among advanced processors, overall utilization is lower because of downward revisions in a number of industries, especially printing and publishing and furniture and fixtures.

Capacity estimates for mining and utilities are little changed. Utilization rates in mining and in gas utilities for the third quarter of 1994 are higher than the estimates reported earlier, whereas the operating rate for electric utilities is essentially unchanged.

TECHNICAL ASPECTS OF THE REVISION

Value-Added Weights for 1992

The 1992 Censuses of Manufactures and Mineral Industries provided measures of value added by individual manufacturing and mining industries in 1992. Value-added estimates for electric and gas utilities were compiled from income and expense information published by the Department of Energy, the Edison Electric Institute, and the American Gas Association. Total industrial value added was $1.7 trillion in 1992, of which durable manufacturing contributed 45 percent; nondurable manufacturing, 40 percent; mining, 7 percent; and utilities, 8 percent (table 7).

The ratio of value added in an industry to total value added in manufacturing, mining, and utilities indicates the proportionate contribution of that industry to total industrial production. These 1992 proportions have been used in this revision to update the weights used to combine the production indexes beginning in 1992. Updating weights allows for using reasonably current price relationships to determine the relative importance of series in the index.

The index of industrial production is a linked Laspeyres quantity index. Value added for 1987 continues to provide the base weights to calculate annual growth from 1987 to 1992. Census measures of value added for 1992 determine the base weights for 1992 forward. Indexes based on the 1992 weight base have been linked to 1987-based indexes at the beginning of 1992 to form a continuous time series expressed as percentages of output in 1987.

As indicated above, the most notable effect of the introduction of 1992 weights is to reduce the effect of the rapidly rising output of the computer and office equipment industry (SIC 357) on total industrial production since 1992. Previously, the proportion of SIC 357 in total IP, which was based on 1987 price relationships, had grown from 2.3 percent in 1987 to 3.7 percent in 1992 and to 4.7 percent in 1993. The proportion for SIC 357 based on 1992 Census measures of value added, however, is only about half the proportion before the revision: 1.7 percent in 1992 and 2.2 percent in 1993. The reduced weight of SIC 357 in the total index reflects the decline in the cost of computing power between 1987 and 1992.

Changes in Series Structure

The series structure of the index of industrial production, which comprises 255 individual series, remains essentially unchanged. One series was added, and one was deleted beginning in 1992. First, the

"Business vehicles" series, which was formerly an individual IP series based on heavy and medium trucks and a share of light trucks, has been separated into two individual series, one for medium and heavy trucks and the other for business light trucks. Each of these series is based on monthly assemblies in units. The weight associated with medium and heavy truck production in the index reflects the higher prices of these vehicles relative to prices for light trucks.

Second, the separate series for metal barrels has been deleted because the Census Bureau eliminated its quarterly Current Industrial Report for metal barrels. A single monthly series based on shipments of metal cans now represents all of SIC 341—metal cans and shipping containers. The annual levels of this series are adjusted to reflect production of cans, barrels, and other metal shipping containers.

Weights, Linking, and Utilization

The value-added proportions for 1987 and 1992 that are applied to the individual capacity indexes when they are summed into aggregate indexes for the period since 1987 are the same weights that are used to combine series in the production index. The linking of each index to form a continuous time series expressed as a percentage of 1987 output involves finding a constant, called a link factor, that shifts the level of the 1992-based index to the level of the 1987-based index in the January 1992 link period. Output and capacity indexes for each series are independently linked, and the link factor for each is independently calculated. For the most part, the link factors for output and capacity are nearly the same. When they differ, such differences can affect the level of utilization. In particular, linking tends to raise or lower utilization rates when the relative prices (and the value-added weights) of series, such as computers, certain metals, or crude oil, change significantly.

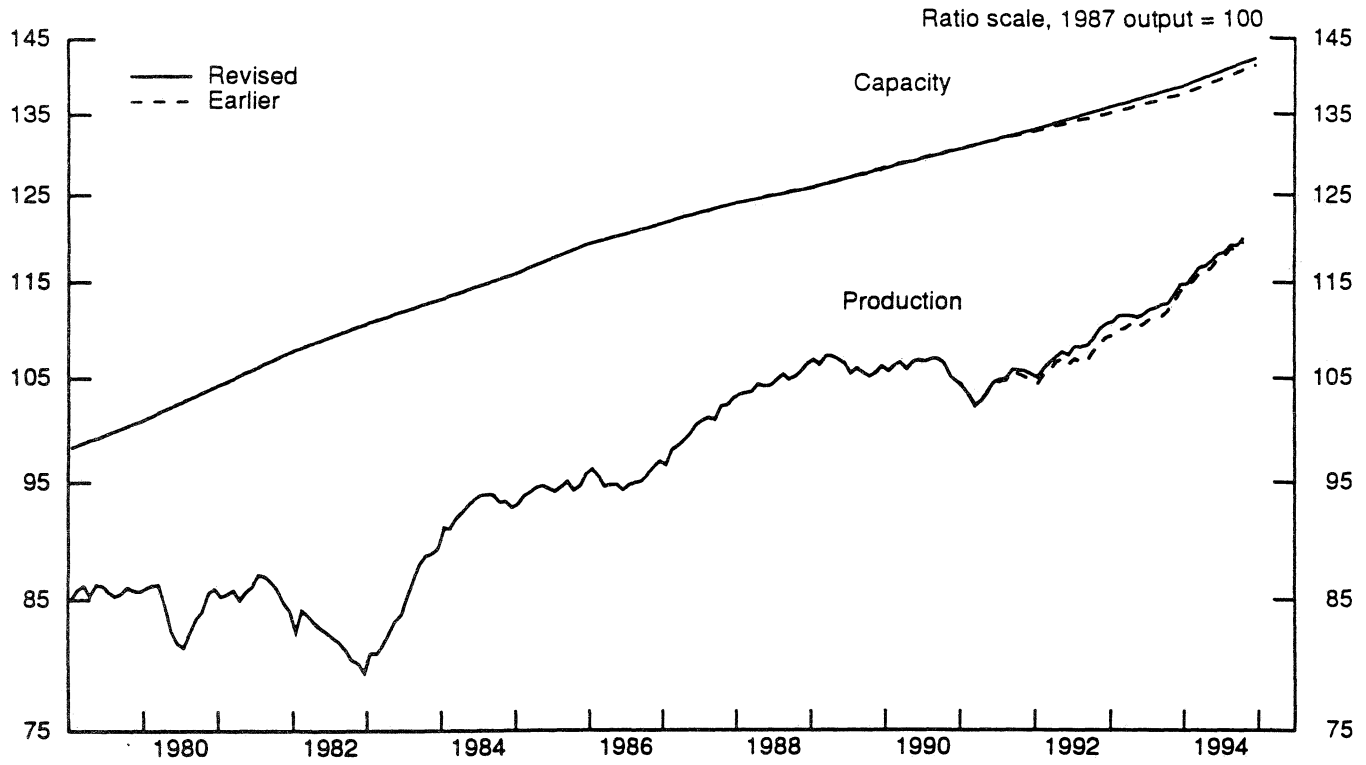
To avoid any distortion of utilization rates caused by linking in January 1992, the level of linked capacity in 1992 is raised or lowered relative to linked output so that the final utilization rate in 1992 is restored to the appropriate, unlinked rate. The adjustment to capacity is then distributed evenly between the appropriate 1987 and 1992 levels so that the "correct" utilization rates are shown for the base years and no discontinuities in capacity result.

Data Availability and Publication Changes

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

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

Industrial output, capacity, and utilization



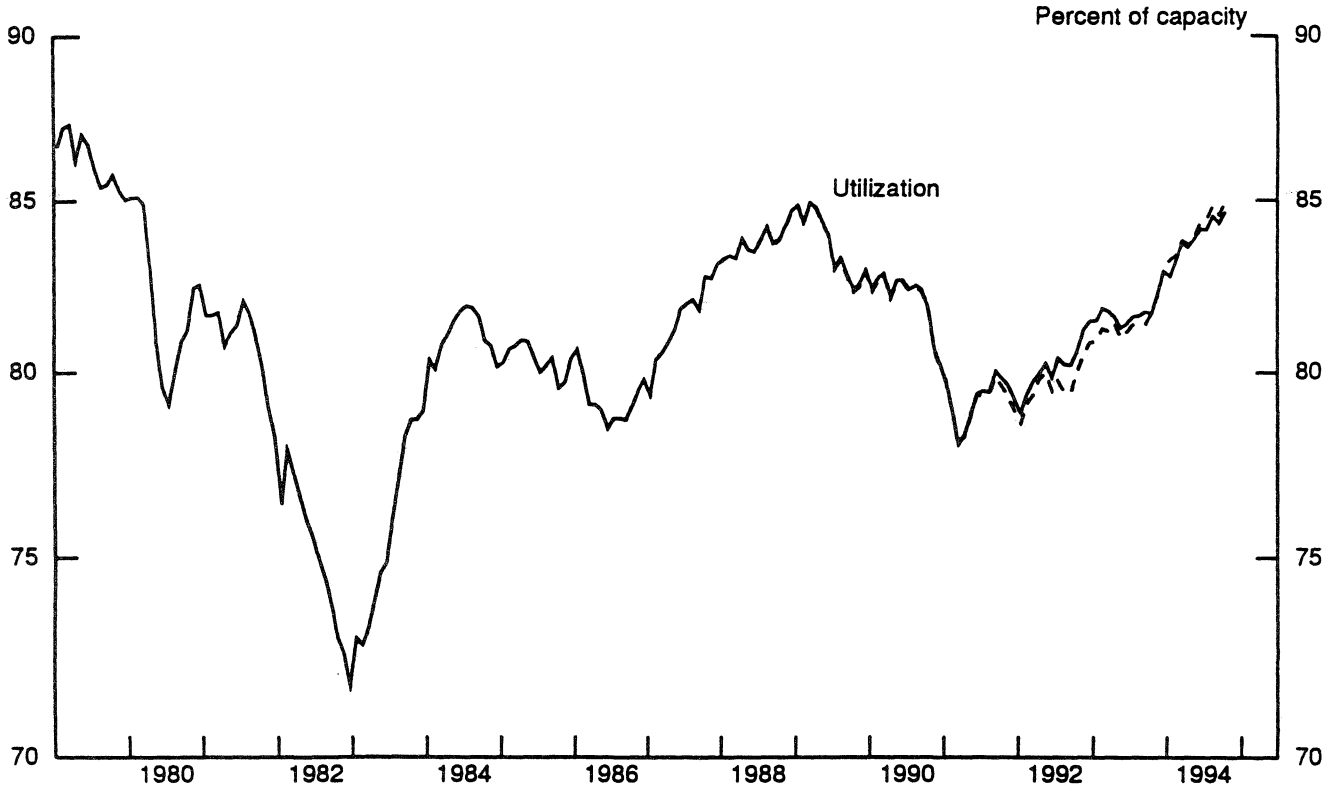


Table 1
INDUSTRIAL PRODUCTION, CAPACITY AND UTILIZATION: 1987–1994[1]

TOTAL INDUSTRY

Seasonally adjusted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Q1	Q2	Q3	Q4	Annual[2]
Industrial Production, Percent Change																	
1987	–.3	1.4	.4	.5	.6	.9	.4	.3	–.2	1.3	.1	.7	5.5	8.1	5.2	6.5	4.9
1988	.3	.2	.0	.8	–.3	.0	.6	.6	–.5	.3	.6	.6	3.8	3.0	2.9	3.0	4.4
1989	.3	–.5	.9	.0	–.3	–.3	–1.0	.5	–.4	–.4	.4	.7	3.9	.3	–4.4	–.2	1.5
1990	–.5	.5	.3	–.7	.7	.2	–.2	.3	.0	–.5	–1.3	–.4	2.1	1.1	1.6	–5.2	.0
1991	–.5	–.9	–1.0	.5	.8	.9	.3	.1	.9	–.1	.0	–.4	–8.1	1.7	6.3	1.5	–1.7
1992	–.3	.9	.6	.5	.5	–.3	.9	–.1	.2	.6	1.0	.5	.9	5.8	3.4	6.2	3.2
1993	.2	.6	.1	.0	–.2	.3	.4	.2	.3	.1	.9	.9	5.1	.7	3.3	5.3	4.1
1994	.0	.8	.9	.1	.5	.6	.2	.7	.0	.6			7.1	6.0	5.0		
Industrial Production																	
1987	96.5	97.9	98.2	98.8	99.4	100.3	100.6	100.9	100.7	102.1	102.2	102.8	97.5	99.5	100.8	102.3	100.0
1988	103.2	103.4	103.4	104.3	104.0	104.0	104.6	105.2	104.7	105.0	105.6	106.3	103.3	104.1	104.8	105.6	104.4
1989	106.6	106.2	107.1	107.1	106.7	106.4	105.3	105.8	105.4	105.0	105.4	106.1	106.6	106.7	105.5	105.5	106.0
1990	105.5	106.1	106.4	105.7	106.5	106.7	106.5	106.8	106.8	106.3	105.0	104.5	106.0	106.3	106.7	105.3	106.0
1991	104.0	103.1	102.1	102.6	103.5	104.4	104.7	104.8	105.7	105.6	105.6	105.2	103.1	103.5	105.1	105.5	104.3
1992	104.9	105.8	106.4	106.9	107.5	107.2	108.1	108.0	108.2	108.8	109.9	110.4	105.7	107.2	108.1	109.7	107.6
1993	110.6	111.3	111.4	111.4	111.1	111.5	112.0	112.2	112.5	112.7	113.7	114.7	111.1	111.3	112.2	113.7	112.0
1994	114.7	115.6	116.6	116.7	117.4	118.0	118.2	119.1	119.1	119.8			115.7	117.4	118.8		
Capacity																	
1987	121.6	121.8	122.0	122.2	122.4	122.6	122.8	123.0	123.2	123.4	123.6	123.8	121.8	122.4	123.0	123.6	122.7
1988	123.9	124.1	124.2	124.4	124.5	124.7	124.8	125.0	125.1	125.3	125.4	125.5	124.1	124.5	125.0	125.4	124.7
1989	125.7	125.9	126.1	126.3	126.5	126.7	126.9	127.1	127.3	127.5	127.7	127.9	125.9	126.5	127.1	127.7	126.8
1990	128.1	128.3	128.5	128.7	128.9	129.1	129.3	129.5	129.7	129.9	130.1	130.3	128.3	128.9	129.5	130.1	129.2
1991	130.5	130.7	130.9	131.1	131.3	131.5	131.7	132.0	132.2	132.4	132.6	132.8	130.7	131.3	132.0	132.6	131.6
1992	133.0	133.3	133.5	133.7	134.0	134.2	134.4	134.7	134.9	135.1	135.4	135.6	133.3	134.0	134.7	135.4	134.3
1993	135.8	136.1	136.3	136.5	136.8	137.0	137.2	137.5	137.7	137.9	138.2	138.4	136.1	136.8	137.5	138.2	137.1
1994	138.7	139.0	139.3	139.7	140.0	140.3	140.6	140.9	141.3	141.6			139.0	140.0	140.9		
Utilization																	
1987	79.3	80.3	80.5	80.8	81.2	81.8	81.9	82.0	81.8	82.7	82.7	83.1	80.1	81.3	81.9	82.8	81.5
1988	83.2	83.3	83.2	83.8	83.5	83.4	83.8	84.2	83.7	83.8	84.2	84.6	83.3	83.6	83.9	84.2	83.7
1989	84.8	84.3	84.9	84.8	84.3	83.9	83.0	83.3	82.8	82.3	82.5	82.9	84.7	84.3	83.0	82.6	83.7
1990	82.4	82.7	82.8	82.1	82.6	82.6	82.4	82.5	82.4	81.8	80.7	80.2	82.6	82.5	82.4	80.9	82.1
1991	79.7	78.9	78.0	78.3	78.8	79.4	79.5	79.4	80.0	79.8	79.6	79.2	78.9	78.8	79.6	79.6	79.2
1992	78.8	79.4	79.7	80.0	80.3	79.9	80.4	80.2	80.2	80.6	81.2	81.5	79.3	80.0	80.3	81.1	80.2
1993	81.5	81.8	81.7	81.6	81.2	81.4	81.6	81.6	81.7	81.7	82.3	82.9	81.7	81.4	81.6	82.3	81.7
1994	82.7	83.2	83.7	83.6	83.8	84.1	84.1	84.5	84.3	84.6			83.2	83.8	84.3		

1. Estimates from August 1994 through October 1994 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: 1987–1994[1]

MANUFACTURING

Seasonally adjusted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Q1	Q2	Q3	Q4	Annual[2]
Industrial Production, Percent Change																	
1987	–.6	1.7	.5	.4	.7	.9	.4	.0	.2	1.0	.4	.6	6.3	8.6	5.6	6.8	6.0
1988	.2	.1	.2	.7	–.1	.0	.5	.4	.0	.1	.9	.6	3.6	3.3	3.0	4.4	4.7
1989	.8	–.9	.6	.2	–.5	–.2	–1.2	.4	–.4	–.5	.3	.2	4.3	–.3	–5.3	–1.3	1.6
1990	–.1	.9	.4	–.9	.5	.0	–.3	.5	–.1	–.6	–1.2	–.5	3.7	.2	1.0	–5.5	–.3
1991	–.8	–.9	–1.1	.6	.7	1.0	.4	.2	1.1	–.1	–.1	–.2	–9.3	1.3	7.6	2.1	–2.0
1992	–.2	1.0	.7	.4	.5	–.2	.9	.0	.1	.5	1.1	.4	2.4	6.0	4.1	6.0	3.9
1993	.5	.5	.1	.1	–.2	.2	.5	.1	.4	.1	1.1	1.1	6.1	1.3	2.9	6.4	4.5
1994	–.3	.8	1.1	.3	.5	.3	.4	.9	.0	.7			7.2	7.3	5.4		
Industrial Production																	
1987	96.2	97.8	98.3	98.7	99.4	100.3	100.7	100.7	100.9	102.0	102.4	103.0	97.4	99.4	100.8	102.5	100.0
1988	103.2	103.4	103.6	104.3	104.2	104.2	104.7	105.1	105.2	105.3	106.2	106.8	103.4	104.2	105.0	106.1	104.7
1989	107.7	106.7	107.3	107.6	107.1	106.8	105.5	106.0	105.6	105.1	105.4	105.6	107.2	107.2	105.7	105.4	106.4
1990	105.5	106.5	107.0	106.0	106.6	106.6	106.3	106.9	106.8	106.2	104.9	104.4	106.3	106.4	106.6	105.1	106.1
1991	103.6	102.7	101.6	102.1	102.8	103.9	104.4	104.5	105.7	105.5	105.4	105.3	102.6	103.0	104.9	105.4	103.9
1992	105.1	106.1	106.9	107.3	107.8	107.7	108.6	108.6	108.7	109.3	110.5	110.9	106.0	107.6	108.7	110.3	108.0
1993	111.5	112.0	112.2	112.3	112.1	112.3	112.9	112.9	113.4	113.6	114.8	116.1	111.9	112.3	113.1	114.8	112.9
1994	115.8	116.7	118.0	118.4	119.0	119.3	119.8	120.8	120.9	121.8			116.8	118.9	120.5		
Capacity																	
1987	121.2	121.5	121.7	121.9	122.2	122.4	122.7	122.9	123.2	123.4	123.7	123.9	121.5	122.2	122.9	123.7	122.6
1988	124.1	124.3	124.5	124.7	124.9	125.1	125.3	125.5	125.7	125.9	126.0	126.2	124.3	124.9	125.5	126.0	125.2
1989	126.5	126.7	127.0	127.2	127.4	127.7	127.9	128.2	128.4	128.7	128.9	129.2	126.7	127.4	128.2	128.9	127.8
1990	129.4	129.6	129.8	130.1	130.3	130.5	130.7	130.9	131.2	131.4	131.6	131.8	129.6	130.3	130.9	131.6	130.6
1991	132.1	132.3	132.5	132.8	133.0	133.2	133.5	133.7	133.9	134.2	134.4	134.6	132.3	133.0	133.7	134.4	133.4
1992	134.9	135.2	135.5	135.7	136.0	136.3	136.6	136.8	137.1	137.4	137.7	137.9	135.2	136.0	136.8	137.7	136.4
1993	138.2	138.5	138.8	139.1	139.3	139.6	139.9	140.2	140.4	140.7	141.0	141.3	138.5	139.3	140.2	141.0	139.7
1994	141.6	142.0	142.3	142.7	143.1	143.4	143.8	144.2	144.5	144.9			142.0	143.1	144.2		
Utilization																	
1987	79.3	80.5	80.7	80.9	81.3	81.9	82.1	81.9	81.9	82.6	82.8	83.1	80.2	81.4	82.0	82.8	81.6
1988	83.2	83.1	83.2	83.6	83.4	83.3	83.6	83.8	83.7	83.7	84.3	84.6	83.2	83.5	83.7	84.2	83.6
1989	85.2	84.2	84.6	84.6	84.0	83.7	82.5	82.7	82.2	81.7	81.8	81.8	84.6	84.1	82.5	81.7	83.2
1990	81.6	82.2	82.4	81.5	81.8	81.7	81.3	81.6	81.4	80.8	79.7	79.2	82.0	81.7	81.4	79.9	81.3
1991	78.4	77.6	76.6	76.9	77.3	78.0	78.2	78.2	78.9	78.7	78.4	78.2	77.6	77.4	78.4	78.4	78.0
1992	77.9	78.5	78.9	79.0	79.3	79.0	79.5	79.4	79.3	79.6	80.3	80.4	78.4	79.1	79.4	80.1	79.2
1993	80.7	80.9	80.8	80.8	80.5	80.5	80.7	80.6	80.8	80.7	81.4	82.2	80.8	80.6	80.7	81.4	80.9
1994	81.8	82.2	82.9	83.0	83.2	83.2	83.3	83.8	83.6	84.0			82.3	83.1	83.6		

1. Estimates from August 1994 through October 1994 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, 1990–1994[1]

Item	Revised index (percent)					Difference between revised and earlier indexes (percentage points)				
	1990	1991	1992	1993	1994	1990	1991	1992	1993	1994
Total index	–.2	.2	4.0	3.6	6.0	.0	.5	.8	–.6	–.5
Products, total	–.4	–.1	4.3	2.9	5.1	.0	.5	.4	–1.0	–.8
Final products	–.1	.6	4.6	2.8	4.7	.0	.7	.5	–1.0	–1.3
Consumer goods	–1.8	2.5	3.4	2.1	3.5	.0	.2	.2	.3	–.7
Durable	–8.3	5.4	6.5	8.2	5.0	.0	.4	.1	–.9	1.2
Automotive products	–11.7	5.3	11.9	11.5	4.3	.0	.3	.2	–1.1	2.3
Other durable goods	–5.4	5.4	2.3	5.4	5.6	.0	.5	.2	–.5	.2
Nondurable	.1	1.8	2.6	.7	3.1	.0	.2	.2	.9	–1.2
Equipment, total	2.3	–2.0	6.3	3.9	6.5	.0	1.1	1.1	–2.5	–1.8
Business equipment	3.0	.8	9.0	6.9	10.0	.0	1.3	.3	–3.0	–1.4
Industrial	–1.4	–6.7	3.5	6.0	9.9	.0	–.8	–.1	1.8	–1.8
Information processing & related	6.2	4.5	16.5	10.6	13.6	.0	3.4	.1	–5.0	–2.5
Transit	7.0	7.9	1.1	–2.7	–1.5	.0	.2	2.2	–4.4	2.3
Other	–2.2	–5.3	6.7	11.8	13.6	.0	–.5	.4	1.2	2.1
Defense and space equipment	–.9	–8.1	–6.0	–9.8	–11.5	.0	.6	4.3	–.3	–3.1
Intermediate products	–1.6	–2.5	3.3	3.4	6.5	.0	.0	.2	–.7	.9
Construction supplies	–4.3	–3.6	4.3	6.2	7.9	.0	.9	.9	.3	2.1
Business supplies	.2	–1.9	2.8	1.9	5.6	.0	–.7	–.1	–1.1	.1
Materials	.2	.7	3.7	4.6	7.5	.0	.6	1.5	–.2	.0
Durable	–.1	.9	6.2	7.4	10.2	.0	1.2	2.8	–.8	–.3
Nondurable	.7	.7	2.1	4.0	5.3	.0	–.5	.0	.2	–.1
Energy	.2	.2	–.1	–.9	3.1	.0	.3	–.2	.1	.4
SPECIAL AGGREGATES										
Total excluding:										
Computer and office equipment	–.5	.[illegible]	3.4	3.1	5.7		.[illegible]	1.1		
Business equipment excluding:										
Computer and office equipment	1.5	–.4	5.3	3.8	8.8	.0	.6	1.5	.3	.5

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 1994, the growth rates are calculated from the fourth quarter of 1993 to the third quarter of 1994.

Table 4
RATES OF GROWTH IN INDUSTRIAL PRODUCTION, BY INDUSTRY GROUPS, 1990–1994[1]

Item	SIC	Revised index (percent) 1990	1991	1992	1993	1994	Difference between revised and earlier indexes (percentage points) 1990	1991	1992	1993	1994
Total index		–.2	.2	4.0	3.6	6.0	.0	.5	.8	–.6	–.5
Manufacturing		–.2	.2	4.6	4.2	6.6	.0	.5	1.0	–.8	–.6
Primary processing		–1.2	–.6	3.8	5.1	5.6	.0	.1	1.0	.1	.3
Advanced processing		.2	.6	5.0	3.7	7.1	.0	.7	1.0	–1.3	–1.0
Durable		–.7	.0	5.8	6.3	8.2	.0	.9	1.5	–1.4	–.3
Lumber and products	24	–8.5	–.2	7.3	5.7	3.0	.0	–.9	–1.1	.7	1.6
Furniture and fixtures	25	–4.2	–1.0	5.5	4.5	10.8	.0	.2	1.8	–1.3	.3
Stone, clay, and glass products	32	–3.3	–6.8	5.7	5.0	4.6	.0	–.1	.6	–.3	2.3
Primary metals	33	.9	–2.9	1.1	6.8	5.1	.0	.5	.3	–.7	2.4
Iron and steel	331,2	2.9	–5.2	1.6	8.2	1.2	.0	.0	.3	–1.2	.7
Raw steel		5.6	–8.2	1.7	5.9	–1.1	.0	.0	.0	.0	.0
Nonferrous	333–6,9	–2.0	.6	.3	5.1	10.5	.0	1.3	.1	.4	4.1
Fabricated metal products	34	–3.0	–1.4	4.5	4.9	8.6	.0	.9	3.5	–.7	.1
Industrial machinery and equipment	35	1.7	–1.2	11.3	14.1	13.4	.0	1.5	–2.0	–3.3	–2.4
Computer and office equip.	357	11.0	5.6	30.6	33.5	17.9	.0	3.6	–1.2	–.4	–2.7
Electrical machinery	36	–.2	4.0	11.4	13.1	17.2	.0	1.5	6.2	2.2	–.6
Transportation equipment	37	–1.2	1.2	2.3	.5	.1	.0	.6	2.5	–3.1	1.0
Motor vehicles and parts	371	–7.2	10.2	11.7	14.0	3.9	.0	.8	1.2	–2.6	.1
Autos and light trucks		–11.1	12.7	8.8	14.9	1.4	.0	.4	–2.4	–2.1	.7
Aerospace and misc.	372–6,9	4.1	–5.8	–6.3	–14.4	–5.3	.0	.4	3.7	–3.6	2.1
Instruments	38	2.0	.7	.5	–2.1	4.6	.0	1.2	.5	.7	.3
Miscellaneous	39	–1.1	.5	.6	3.8	7.5	.0	–.2	–.1	1.7	2.7
Nondurable		.4	.5	3.2	1.8	4.7	.0	.0	.4	.3	–.9
Foods	20	1.7	.8	1.9	2.1	2.9	.0	–.2	.0	1.5	–1.3
Tobacco products	21	.0	–12.1	10.0	–15.5	22.1	.0	–2.6	.3	.0	1.7
Textile mill products	22	–5.2	5.6	4.4	1.4	4.2	.0	–1.1	–.7	–.2	–1.5
Apparel products	23	–4.6	5.9	.0	–1.2	3.6	.0	1.5	–.1	.5	–1.0
Paper and products	26	2.6	1.8	–.4	7.2	2.7	.0	.6	–.5	1.6	–.9
Printing and publishing	27	–.7	–2.4	2.1	–.2	3.5	.0	–.3	–1.0	–1.4	–1.0
Chemicals and products	28	1.4	.5	4.4	3.0	5.2	.0	–.2	1.1	.7	–1.8
Petroleum products	29	–.1	–2.0	3.3	2.5	–1.4	.0	–1.1	–.2	–.1	.7
Rubber and plastics products	30	.6	3.2	8.4	6.0	9.8	.0	2.0	3.5	1.2	–.3
Leather and products	31	–7.5	–5.7	5.3	–4.8	–.3	.0	–1.4	5.2	–1.4	.6
Mining		2.6	–3.1	.3	–.8	2.5	.0	.3	.8	.0	1.0
Metal mining	10	4.4	.2	5.8	.7	–4.4	.0	–.3	.7	–5.8	3.8
Coal mining	12	1.4	–2.5	–.7	–3.3	9.2	.0	.0	.0	–.1	.3
Oil and gas extraction	13	3.0	–3.3	–.6	–.9	1.4	.0	.2	.5	.4	.7
Stone and earth minerals	14	.6	–5.1	4.8	2.7	5.7	.0	2.4	4.2	.7	2.3
Utilities		–2.0	2.6	1.9	1.1	2.8	.0	.2	.0	.2	–.2
Electric	491,3pt	–.6	1.5	1.9	.6	3.6	.0	.3	–.2	.2	–1.0
Gas	492,3pt	–6.8	6.8	1.9	3.2	–.2	.0	–.1	.6	.4	2.4
SPECIAL AGGREGATES											
Manufacturing excluding:											
Computer and office equipment		–.6	.0	3.8	3.5	6.3	.0	.4	1.2	–.1	–.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 1994, the growth rates are calculated from the fourth quarter of 1993 to the third quarter of 1994.

Table 5
RATES OF GROWTH IN CAPACITY, BY INDUSTRY GROUPS, 1990–1994[1]

Item	SIC	Revised index (percent)					Difference between revised and earlier indexes (percentage points)				
		1990	1991	1992	1993	1994	1990	1991	1992	1993	1994
Total index		1.9	1.9	2.1	2.1	2.5	.0	.2	.4	.2	.0
Manufacturing		2.1	2.1	2.4	2.4	2.9	.0	.2	.4	.2	.0
Primary processing		1.7	1.2	1.4	1.4	1.8	.0	.1	.4	.3	.7
Advanced processing		2.2	2.5	2.9	2.8	3.3	–.1	.3	.5	.1	–.3
Durable		2.1	2.5	2.6	2.6	3.3	.0	.7	.5	.0	–.3
Lumber and products	24	.6	–.3	.3	.7	1.3	.0	–.4	.1	.0	.6
Furniture and fixtures	25	2.2	.9	1.6	2.4	2.7	.0	.2	.8	1.1	1.4
Stone, clay, and glass products	32	.6	.2	.5	1.0	1.4	–.1	–.1	–.4	–.1	.4
Primary metals	33	.6	–.6	–1.0	–.6	.3	.0	.4	.4	.6	.8
Iron and steel	331,2	.9	–1.2	–2.3	–1.0	.5	.0	.0	.0	.9	1.3
Raw steel		.0	–1.6	–2.6	–3.7	–2.7	.0	.0	–.4	–1.7	–1.9
Nonferrous	333–6,9	.2	.4	.7	.0	–.1	.2	1.0	.8	.1	.1
Fabricated metal products	34	.3	.4	.9	.9	.9	.0	.5	1.1	1.1	1.1
Industrial machinery and equipment	35	4.7	5.5	4.8	4.4	5.3	.0	.2	–.5	–1.5	–3.9
Computer and office equip.	357	15.3	15.4	15.6	14.4	15.1	.0	1.0	2.2	.4	–5.9
Electrical machinery	36	3.6	5.7	6.6	7.5	8.9	.0	3.0	3.7	2.5	2.1
Transportation equipment	37	1.1	1.3	1.5	.5	1.4	.1	.5	–.5	–.8	.3
Motor vehicles and parts	371	1.5	3.0	3.2	2.5	3.9	.4	1.3	–.3	–1.1	–.5
Autos and light trucks		.8	1.0	2.4	.8	3.4	.0	.0	–2.4	–2.9	–1.5
Aerospace and misc.	372–6,9	.7	–.2	–.3	–1.6	–1.3	–.1	–.1	–.7	–.6	1.0
Instruments	38	1.3	1.2	1.2	1.3	1.4	.0	–.1	–.2	–.2	.1
Miscellaneous	39	1.6	1.5	3.5	3.2	3.4	.0	–.2	1.8	1.6	2.0
Nondurable		2.1	1.7	2.2	2.2	2.3	.0	–.3	.4	.5	.4
Foods	20	1.4	1.9	2.2	2.2	2.1	.0	–.2	–.3	–.3	–.7
Tobacco products	21	–.4	–.5	–.7	1.0	.7	.0	–.1	–.3	1.4	1.0
Textile mill products	22	1.6	.5	1.2	1.7	2.0	.0	–.5	.2	.0	.0
Apparel products	23	.1	–.4	.9	.0	.3	.0	.1	1.7	.8	1.0
Paper and products	26	3.0	2.3	1.9	1.6	1.7	.1	–.1	.1	.0	.2
Printing and publishing	27	2.9	1.3	1.7	1.7	1.3	.0	–.3	1.0	1.0	.2
Chemicals and products	28	2.6	2.6	3.5	3.3	3.6	.1	–.3	.9	.9	1.1
Petroleum products	29	.9	–.8	–1.3	–.5	–.4	.0	.0	.0	.0	.0
Rubber and plastics products	30	4.0	3.5	4.4	4.4	4.6	.0	.1	1.1	1.4	1.8
Leather and products	31	–3.5	–3.8	–2.4	–2.7	–2.4	.0	–.3	1.2	1.1	1.7
Mining		–1.2	–.3	–1.1	–1.4	–.5	.2	.3	–.1	–.3	.1
Metal mining	10	5.1	2.3	2.5	1.7	.8	–.2	.1	.9	.2	–1.7
Coal mining	12	2.1	2.1	1.0	1.1	1.1	.0	.0	.0	.0	.1
Oil and gas extraction	13	–2.6	–1.0	–2.1	–2.4	–1.1	.4	.5	–.2	–.4	.4
Stone and earth minerals	14	–.1	–.5	.5	.0	–.2	.0	.0	.7	.1	–.4
Utilities		2.4	1.3	1.2	1.1	1.2	.0	–.1	.0	.1	–.1
Electric	491,3pt	3.2	1.8	1.5	1.4	1.4	.0	.0	.0	.0	–.2
Gas	492,3pt	.0	.0	.0	.0	.2	.0	.0	.0	.0	.3
SPECIAL AGGREGATES											
Total excluding: Computer and office equipment		1.5	1.5	1.8	1.8	2.2					
Manufacturing excluding: Computer and office equipment		1.6	1.6	2.1	2.1	2.5	.0	.2	.7	.5	.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 1994, the growth rates are calculated from the fourth quarter of 1993 to the third quarter of 1994.

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

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

Percent of capacity, seasonally adjusted

Item	SIC	Revised index						Difference between revised and earlier indexes (percentage points)			
		1967-1993 Ave.	1988-1989 High	1990-1991 Low	1992 Q4	1993 Q4	1994 Q3	1990-1991 Low	1992 Q4	1993 Q4	1994 Q3
Total index		81.9	84.9	78.0	81.1	82.3	84.3	−.1	.6	.0	−.3
Manufacturing		81.2	85.2	76.6	80.1	81.4	83.6	.0	.7	−.1	−.4
Primary processing		82.3	89.0	77.9	82.8	85.8	88.1	−.2	.5	.4	.1
Advanced processing		80.7	83.5	76.2	79.0	79.7	81.8	.2	.9	−.2	−.6
Durable		79.1	84.0	73.7	78.0	80.8	83.4	−.1	1.1	.1	.0
Lumber and products	24	83.1	93.3	76.3	86.0	90.4	91.4	.2	−1.3	−.7	−.1
Furniture and fixtures	25	81.7	86.8	71.0	78.3	79.9	84.5	−.6	.7	−1.1	−1.8
Stone, clay, and glass products	32	77.9	83.8	71.5	76.4	79.4	81.3	−.1	.9	.8	1.9
Primary metals	33	80.0	92.8	74.0	81.9	88.0	91.0	−.4	−.3	−1.4	−.4
Iron and steel	331,2	79.7	95.7	72.1	82.3	90.0	90.1	.0	.3	−1.6	−2.0
Raw steel		79.3	92.7	71.4	82.1	90.3	91.1	.0	.3	1.9	3.2
Nonferrous	333–6,9	80.8	88.7	75.0	81.4	85.6	92.3	−.8	−.9	−.7	1.8
Fabricated metal products	34	77.3	82.0	71.8	76.6	79.7	84.1	−.2	2.1	.9	.3
Industrial machinery and equipment	35	80.9	84.0	72.5	77.6	84.9	89.5	1.1	.4	−.8	.2
Computer and office equip.	357	80.6	84.4	64.5	74.2	86.6	88.0	1.1	−.2	−.8	1.0
Electrical machinery	36	80.4	84.9	76.6	80.3	84.5	89.0	−.8	.7	.4	−1.2
Transportation equipment	37	75.0	84.4	70.2	75.6	75.6	74.7	−.3	2.5	.8	1.2
Motor vehicles and parts	371	75.7	85.1	57.6	75.9	84.4	84.1	.3	1.0	.0	.4
Autos and light trucks			89.1	53.3	75.8	86.4	84.6	−.3	−.1	.8	2.1
Aerospace and misc.	372–6,9	75.7	88.4	79.4	75.3	65.5	63.5	.9	4.1	1.3	1.9
Instruments	38	82.1	81.2	76.7	77.4	74.7	76.5	.6	1.5	2.1	2.3
Miscellaneous	39	75.5	80.1	73.5	73.4	73.8	75.9	.6	−1.5	−1.4	−1.0
Nondurable		83.5	86.7	80.4	82.8	82.4	83.9	.0	.0	−.2	−1.0
Foods	20	82.3	83.3	80.5	81.1	81.0	81.5	−.3	.2	1.5	1.2
Tobacco products	21	91.3	102.4	77.1	90.4	75.6	87.4	−2.2	−2.1	−2.9	−3.1
Textile mill products	22	86.1	92.1	78.9	88.8	88.5	89.9	.4	−1.2	−1.3	−2.3
Apparel products	23	81.1	84.2	75.1	80.1	79.1	81.0	.2	−.4	−.7	−1.9
Paper and products	26	89.7	94.8	86.5	87.7	92.5	93.2	.2	.0	1.3	.6
Printing and publishing	27	86.3	92.3	78.7	80.2	78.7	80.0	.2	−1.5	−3.5	−4.3
Chemicals and products	28	80.0	85.9	78.9	80.9	80.7	81.6	−.4	.1	−.1	−1.8
Petroleum products	29	85.5	88.5	83.7	89.1	91.8	91.1	−.8	−1.2	−1.4	−.9
Rubber and plastics products	30	83.9	90.5	78.4	86.1	87.5	90.6	.1	3.5	3.4	2.2
Leather and products	31	82.0	83.8	74.7	84.1	82.4	83.6	−1.7	2.2	.2	−.5
Mining		87.3	86.5	86.0	87.6	88.1	89.9	−.8	.1	.3	.9
Metal mining	10	78.2	87.9	80.6	85.9	85.1	81.9	.6	.0	−5.1	−1.3
Coal mining	12	86.9	91.4	82.9	83.1	79.5	84.2	.0	.0	−.1	−.1
Oil and gas extraction	13	88.0	86.1	86.8	89.1	90.5	91.9	−1.1	−.8	−.1	.1
Stone and earth minerals	14	84.2	90.0	79.4	84.3	86.6	90.5	1.6	4.8	5.4	7.3
Utilities		86.7	92.6	83.2	86.4	86.5	87.5	.1	.2	.4	.3
Electric	491,3pt	88.8	94.8	86.5	88.1	87.4	88.9	.2	.1	.3	−.2
Gas	492,3pt	82.5	85.5	68.3	80.4	82.9	82.6	.0	.3	.6	1.9
SPECIAL AGGREGATES											
Total excluding:											
Computer and office equipment		81.6	85.0	78.3	81.1	82.1	84.2	−.2			−.3
Manufacturing excluding:											
Computer and office equipment		80.9	85.3	77.0	80.3	81.4	83.5	−.1	.6	.2	−.3

1. Series begins in 1977.
Note—The "high" columns refer to periods in which utilization generally peaked; the "low" columns refer to recession years in which utilization generally bottomed out. The monthly highs and lows are specific to each series, and all did not occur in the same month.

Table 7
VALUE ADDED AND ANNUAL PROPORTIONS IN INDUSTRIAL PRODUCTION, BY INDUSTRY GROUPS

Item	SIC	Previous			Revised			
		1987 value-added proportion	1992 IP proportion	1993 IP proportion	1987 value-added proportion	1992 value-added proportion	1992 IP index	1993 IP proportion
Total index		100.0	100.0	100.0	100.0	100.0	107.6	100.0
Manufacturing		84.3	84.5	84.9	84.3	85.5	108.0	85.9
Primary processing		27.1	26.4	26.3	27.1	26.5	104.6	26.5
Advanced processing		57.1	58.1	58.6	57.1	59.0	109.7	59.3
Durable		46.5	46.7	47.9	46.5	45.1	109.3	46.0
Lumber and products	24	2.1	1.9	1.9	2.1	2.0	95.8	2.0
Furniture and fixtures	25	1.5	1.3	1.4	1.5	1.4	99.1	1.4
Stone, clay, and glass products	32	2.4	2.2	2.1	2.4	2.1	95.3	2.1
Primary metals	33	3.3	3.2	3.2	3.3	3.1	101.9	3.1
Iron and steel	331,2	1.9	1.9	1.9	1.9	1.7	105.1	1.8
Raw steel		.1	.1	.1	.1	.1	101.2	.1
Nonferrous	333–6,9	1.4	1.3	1.3	1.4	1.4	97.6	1.3
Fabricated metal products	34	5.4	4.9	4.9	5.4	5.0	98.8	5.1
Industrial machinery and equipment	35	8.5	9.9	11.1	8.5	7.9	124.6	8.6
Computer and office equip.	357	2.3	3.7	4.7	2.3	1.7	172.8	2.2
Electrical machinery	36	6.9	7.5	8.0	6.9	7.3	121.9	8.0
Transportation equipment	37	9.9	9.6	9.3	9.9	9.6	105.1	9.3
Motor vehicles and parts	371	4.8	4.8	5.2	4.8	4.8	107.4	5.2
Autos and light trucks		2.5	2.4	2.6	2.5	2.5	101.9	2.7
Aerospace and misc.	372–6,9	5.1	4.8	4.1	5.1	4.8	103.0	4.1
Instruments	38	5.1	5.1	4.8	5.1	5.4	106.3	5.2
Miscellaneous	39	1.3	1.3	1.2	1.3	1.3	106.3	1.3
Nondurable		37.8	37.8	37.0	37.8	40.5	106.5	39.9
Foods	20	8.8	8.9	8.6	8.8	9.4	107.0	9.3
Tobacco products	21	1.0	1.0	.8	1.0	1.6	96.5	1.4
Textile mill products	22	1.8	1.8	1.8	1.8	1.8	103.9	1.7
Apparel products	23	2.3	2.0	2.0	2.3	2.2	95.0	2.1
Paper and products	26	3.6	3.7	3.7	3.6	3.6	108.9	3.6
Printing and publishing	27	6.5	6.1	6.0	6.5	6.8	97.2	6.6
Chemicals and products	28	8.8	9.4	9.3	8.8	9.9	114.7	9.9
Petroleum products	29	1.3	1.3	1.3	1.3	1.4	102.1	1.4
Rubber and plastics products	30	3.2	3.3	3.4	3.2	3.5	115.6	3.6
Leather and products	31	.3	.3	.2	.3	.3	89.0	.3
Mining		8.0	7.4	7.0	8.0	6.8	98.9	6.5
Metal mining	10	.3	.5	.5	.3	.4	163.8	.4
Coal mining	12	1.2	1.3	1.2	1.2	1.0	108.2	.9
Oil and gas extraction	13	5.8	5.1	4.8	5.8	4.7	93.2	4.5
Stone and earth minerals	14	.7	.6	.6	.7	.6	99.0	.6
Utilities		7.7	8.1	8.1	7.7	7.7	111.9	7.7
Electric	491,3pt	6.1	6.4	6.3	6.1	6.1	111.7	6.1
Gas	492,3pt	1.6	1.7	1.7	1.6	1.6	112.7	1.6

Explanatory Note

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

Industrial Production

Coverage. The industrial production (IP) index measures output in the manufacturing, mining, and electric and gas utilities industries. For the period since 1987, the total IP index has been constructed from 255 individual series based on the 1987 Standard Industrial Classification (SIC). These individual series are classified and grouped in two ways: (1) market groups (shown in table 1), such as consumer goods, equipment, intermediate products, and materials; and (2) industry groups (shown in tables 2 and 6), such as two-digit SIC industries and major aggregates of these industries—for example, durable and nondurable manufacturing, mining, and utilities.

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

Timing. The first estimate of output for a month is published around the 15th of the following month. The estimate is preliminary (denoted by the superscript "p" in tables) and subject to revision in each of the subsequent three months as new source data become available. (Revised estimates are denoted by the superscript "r" in tables.) After the fourth month, indexes are not revised further until the time of an annual revision or a benchmark revision. The last three benchmark revisions were published in 1990, 1985, and 1976. In 1993, a revision that converted the indexes to the 1987 SIC from 1987 forward was published.

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

Weights. In the index, series that measure the output of an individual industry are weighted according to their proportion in the total value-added output of all industries. The industrial production index, which extends back to 1919, is built in chronological segments that are linked together to form a continuous index expressed as a percentage of output in a comparison base year (currently 1987). Each segment, which usually spans five years, is a Laspeyres quantity index showing changes in quantities with prices (Census value added per unit of output) held at base-year values for the segment. For the period from 1992 to the present, IP is aggregated on the basis of 1992 value-added weights. The aggregation of the index for the 1987–91 period is based on 1987 weights, whereas 1982 weights are used for the 1982–86 period. The other weight years in the postwar period are 1977, 1972, 1967, 1963, 1958, 1954, and 1947. The 1992 value-added weights used to aggregate the index, as well as the previous and revised annual proportions in IP for recent years, are shown in table 7 of this release.

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 1994; for other series, the factors were estimated with data through at least June 1994. In some cases, series were preadjusted for the effects of holidays or the business cycle before using X–11 ARIMA. The seasonally adjusted total index is calculated by aggregating the seasonally adjusted major market groups, and may not precisely equal an aggregation of the seasonally adjusted industry groups.

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

Rounding. In some cases, components may not add to totals because of independent rounding. In addition, the published percent changes are calculated from unrounded indexes, and may not be the same as percent changes calculated from the rounded indexes shown in the release.

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

Capacity Utilization

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

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

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

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

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

Electric Power

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

Release Schedule for late 1994 and 1995

At 9:15 a.m. on December 14, 1994, January 17, 1995, February 15, March 15, April 14, May 16, June 15, July 14, August 15, September 15, October 17, November 15, and December 14.

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