

FEDERAL RESERVE statistical release



G.17 (419)

For release at 9:15 a.m. (EST)
January 18, 2017

INDUSTRIAL PRODUCTION AND CAPACITY UTILIZATION

Industrial production rose 0.8 percent in December after falling 0.7 percent in November. For the fourth quarter as a whole, the index slipped 0.6 percent at an annual rate. In December, manufacturing output moved up 0.2 percent and mining output was unchanged. The index for utilities jumped 6.6 percent, largely because of a

(over)

Industrial Production and Capacity Utilization: Summary

Seasonally adjusted

Industrial production	2012=100						Percent change						Dec. '15 to Dec. '16
	2016 July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p	2016 July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p	
Total index	104.5	104.4	104.2	104.4	103.7	104.6	.3	-.1	-.2	.2	-.7	.8	.5
<i>Previous estimates</i>	104.5	104.5	104.2	104.3	103.9		.3	-.1	-.2	.1	-.4		
Major market groups													
Final Products	101.0	101.1	100.9	100.8	100.1	101.0	.0	.1	-.2	-.1	-.7	.9	1.1
Consumer goods	103.9	104.1	104.0	103.8	102.8	103.9	.0	.2	-.2	-.2	-1.0	1.1	1.5
Business equipment	102.7	102.2	101.9	102.0	101.4	102.1	.0	-.5	-.3	.1	-.7	.7	.8
Nonindustrial supplies	105.6	104.8	105.4	105.5	105.5	105.6	.5	-.7	.5	.1	.0	.1	-.2
Construction	109.2	107.8	108.5	109.5	110.6	110.3	.8	-1.3	.6	.9	1.0	-.3	.2
Materials	107.0	107.0	106.4	106.9	106.0	107.0	.5	.0	-.6	.5	-.9	1.0	.2
Major industry groups													
Manufacturing (see note below)	103.3	102.8	102.9	103.2	103.0	103.2	.2	-.5	.1	.3	-.1	.2	.2
<i>Previous estimates</i>	103.3	102.8	102.9	103.2	103.2		.3	-.5	.2	.3	-.1		
Mining	104.5	104.4	104.1	107.8	107.0	107.1	.8	-.1	-.2	3.5	-.7	.0	-2.8
Utilities	105.1	108.1	105.1	102.3	97.6	104.0	.3	2.8	-2.7	-2.7	-4.6	6.6	6.2
Capacity utilization													
	Percent of capacity												Capacity growth
	Average 1972-2015	1988-89 high	1990-91 low	1994-95 high	2009 low	2015 Dec.	2016 July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p	Dec. '15 to Dec. '16
Total industry	80.0	85.3	78.8	85.0	66.7	75.4	75.6	75.5	75.3	75.4	74.9	75.5	.4
<i>Previous estimates</i>							75.7	75.6	75.4	75.4	75.0		
Manufacturing (see note below)	78.5	85.6	77.3	84.6	63.8	75.2	75.1	74.7	74.7	74.9	74.7	74.8	.8
<i>Previous estimates</i>							75.1	74.7	74.8	74.9	74.8		
Mining	87.3	86.2	83.8	88.6	79.0	77.5	75.1	75.3	75.4	78.2	77.9	78.1	-3.5
Utilities	85.8	93.2	84.7	93.2	78.2	75.1	80.2	82.5	80.1	77.9	74.3	79.1	.8
Stage-of-process groups													
Crude	86.3	87.6	84.5	90.1	77.0	77.4	76.1	76.0	76.0	77.9	77.6	77.8	-2.5
Primary and semifinished	80.6	86.5	78.1	87.8	63.8	75.3	75.8	75.9	75.5	75.2	74.4	75.4	1.0
Finished	77.0	83.4	77.3	80.6	66.6	74.8	75.2	75.0	75.0	75.0	74.6	74.9	.6

r Revised. p Preliminary.

Note. The statistics in this release cover output, capacity, and capacity utilization in the U.S. industrial sector, which is defined by the Federal Reserve to comprise manufacturing, mining, and electric and gas utilities. Mining is defined as all industries in sector 21 of the North American Industry Classification System (NAICS); electric and gas utilities are those in NAICS sectors 2211 and 2212. Manufacturing comprises NAICS manufacturing industries (sector 31-33) plus the logging industry and the newspaper, periodical, book, and directory publishing industries. Logging and publishing are classified elsewhere in NAICS (under agriculture and information, respectively), but historically they were considered to be manufacturing and were included in the industrial sector under the Standard Industrial Classification (SIC) system. In December 2002 the Federal Reserve reclassified all its industrial output data from the SIC system to NAICS.

return to more normal temperatures following unseasonably warm weather in November; the gain last month was the largest since December 1989. At 104.6 percent of its 2012 average, total industrial production in December was 0.5 percent above its year-earlier level. Capacity utilization for the industrial sector increased 0.6 percentage point in December to 75.5 percent, a rate that is 4.5 percentage points below its long-run (1972–2015) average.

Market Groups

In December, the jump in the output of utilities contributed substantially to gains in the indexes for consumer goods, business supplies, and materials through their energy components. Among the non-energy market groups, consumer durables posted an increase of 1.1 percent, with a gain in automotive products outweighing a decline in home electronics. The output of consumer non-energy nondurables was unchanged, as cutbacks in chemical products and paper products offset a gain in the index for foods and tobacco. An increase of 0.7 percent for business equipment was attributable to improvements both in information processing equipment and in industrial and other equipment; the index for transit equipment was unchanged. The output of defense and space equipment decreased 0.3 percent after advancing 1.5 percent in November. The indexes for construction supplies and non-energy business supplies moved down 0.3 percent and 0.4 percent, respectively, in December. The production of non-energy materials was unchanged, with a gain for durable materials offset by a loss for nondurable materials.

Industry Groups

Manufacturing output moved up 0.2 percent in December, as an increase in durable manufacturing outweighed declines in nondurable manufacturing and other manufacturing (publishing and logging). The index for manufacturing rose at an annual rate of 0.7 percent in the fourth quarter but was unchanged from its level in the fourth quarter of 2015. In December, the production of durables gained 0.5 percent. Primary metals recorded a sizable increase for a second consecutive month, and motor vehicles and parts registered a jump of 1.8 percent to nearly reverse its drop in November. Most nondurables industries posted declines in December; the biggest decreases were recorded by textile and product mills and by chemicals, at 3.0 percent and 1.0 percent, respectively.

The output of mining was unchanged in December. Gains posted in crude oil extraction and in oil and gas well drilling and servicing were offset by declines reported in other mining categories. After having fallen for six consecutive quarters, the index for mining advanced 3.4 percent at an annual rate in the third quarter and jumped nearly 12 percent in the fourth quarter.

Capacity utilization for manufacturing moved up 0.1 percentage point in December to 74.8 percent, a rate that is 3.7 percentage points below its long-run average. The operating rate for durables, at 76.2 percent, was 0.7 percentage point below its long-run average; the rates for nondurables and for other manufacturing (publishing and logging), at 74.2 percent and 60.6 percent, respectively, were substantially below their long-run averages. Utilization for mining increased 0.2 percentage point to 78.1 percent, and the rate for utilities jumped 4.8 percentage points to 79.1 percent.

Tables

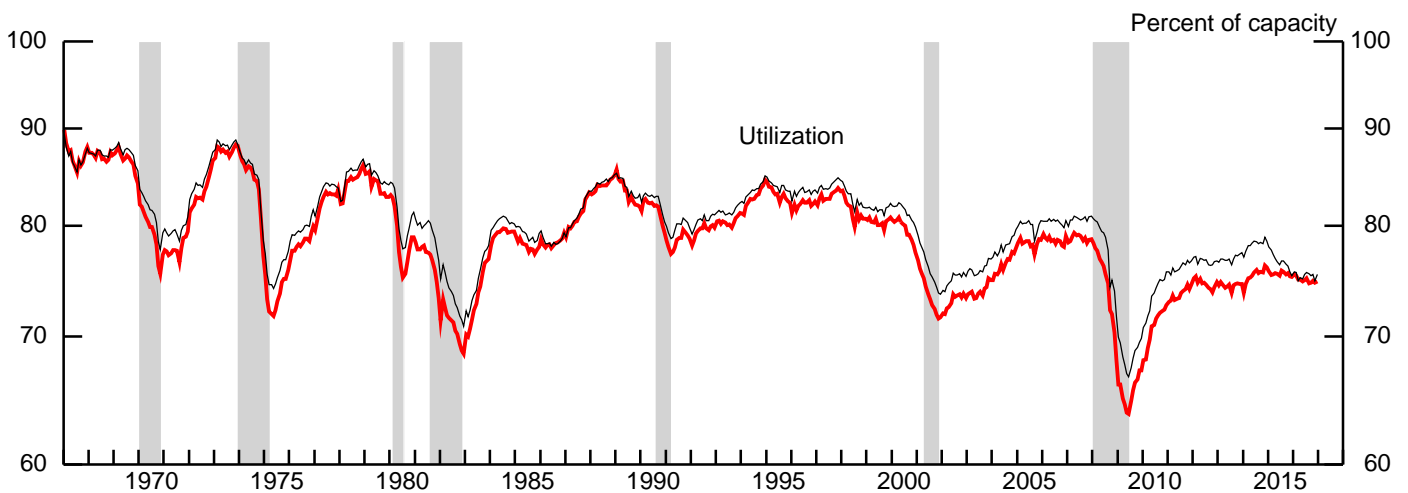
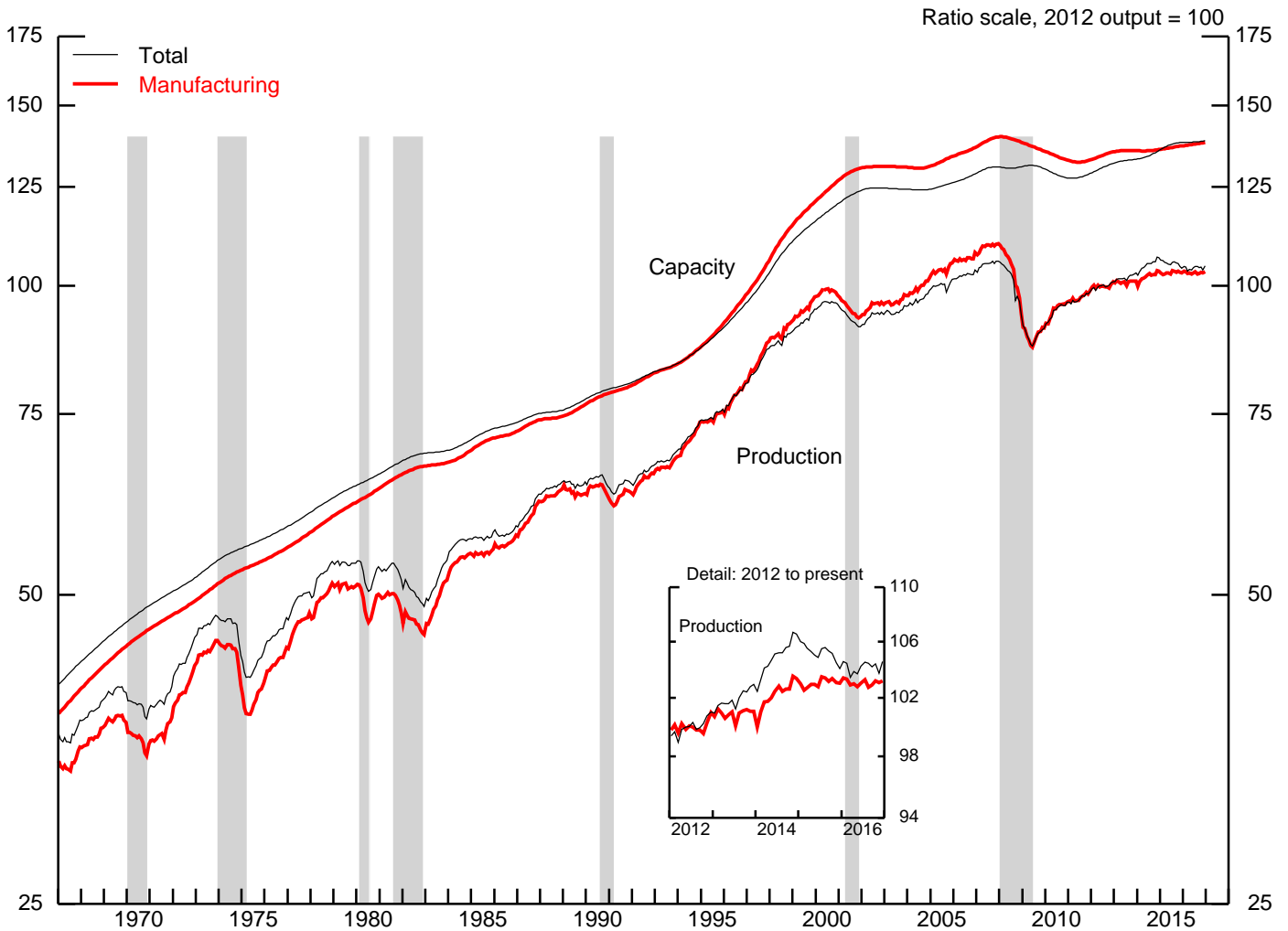
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 14. Historical Statistics: Manufacturing Excluding Selected High-Technology Industries
- Further detail is available on the Board's website (www.federalreserve.gov/releases/G17/).

Revision of Industrial Production and Capacity Utilization

The Federal Reserve Board plans to issue its annual revision to the index of industrial production (IP) and the related measures of capacity utilization on March 31, 2017. New annual benchmark data for 2015 for manufacturing will be incorporated, as will other annual data, including information on the mining of metallic and nonmetallic minerals (except fuels). The updated IP indexes will include revisions to the monthly indicator (either product data or input data) and to seasonal factors for each industry. In addition, the estimation methods for some series may be changed. Any modifications to the methods for estimating the output of an industry will affect the index from 1972 to the present.

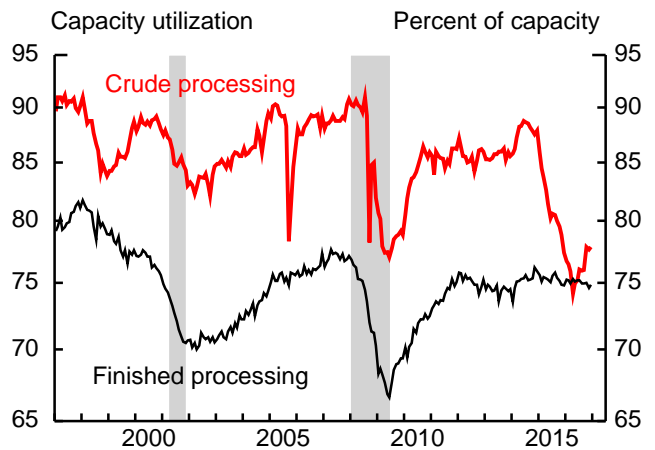
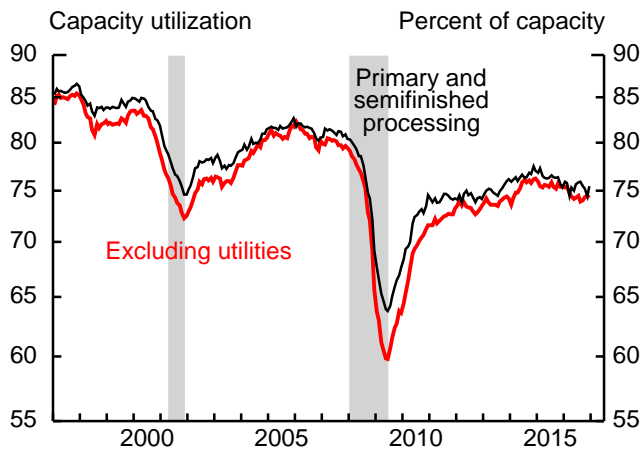
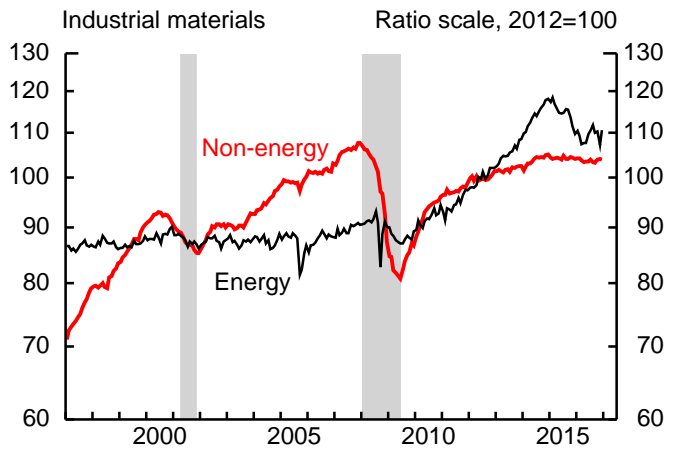
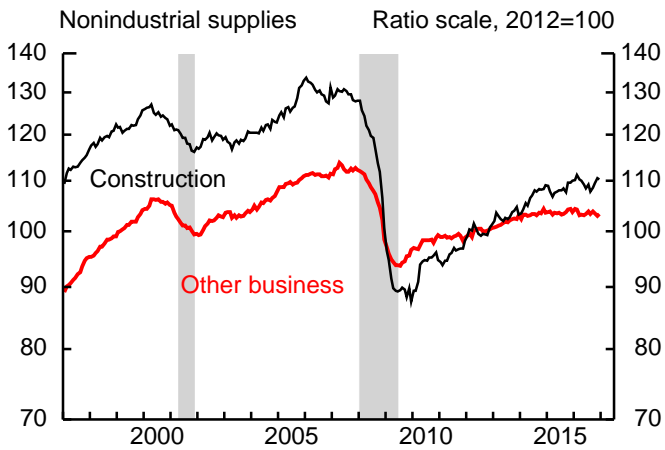
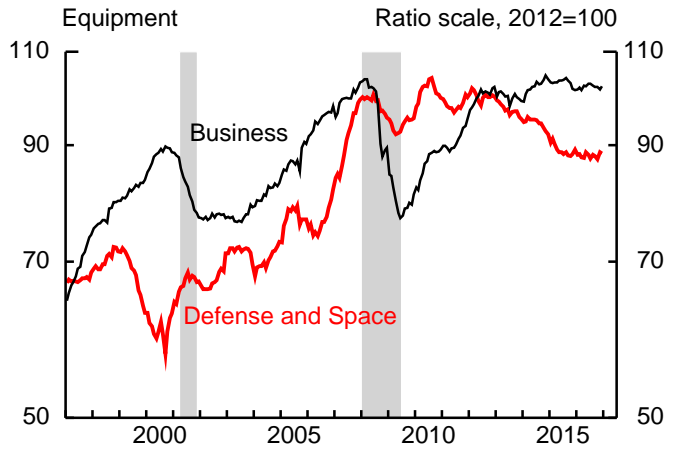
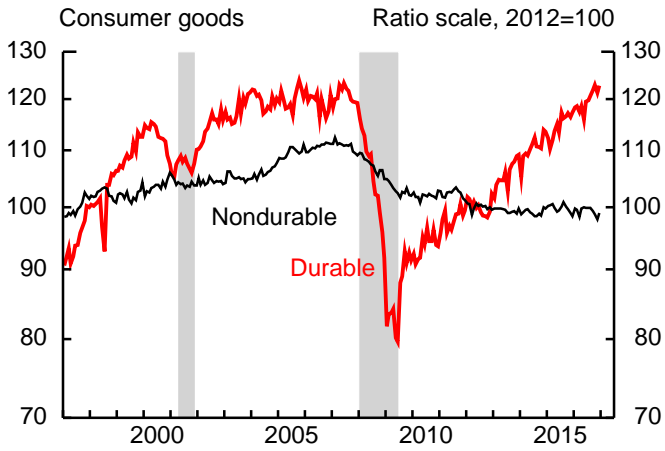
Capacity and capacity utilization will be revised to incorporate data through the fourth quarter of 2016 from the U.S. Census Bureau's Quarterly Survey of Plant Capacity along with new data on capacity from the U.S. Geological Survey, the U.S. Department of Energy, and other organizations.

1. Industrial production, capacity, and utilization



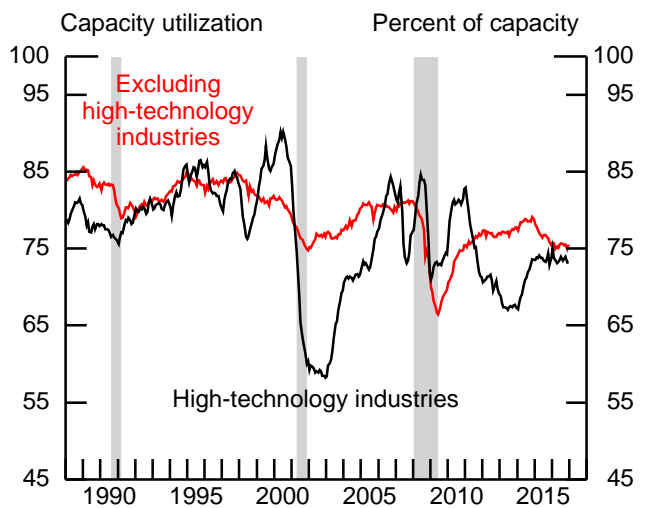
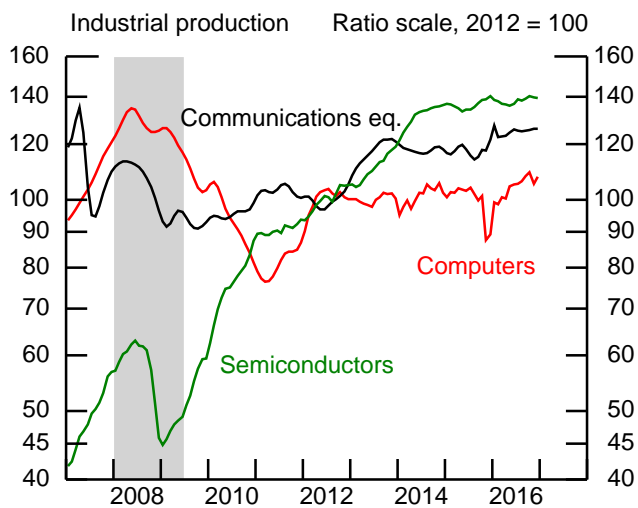
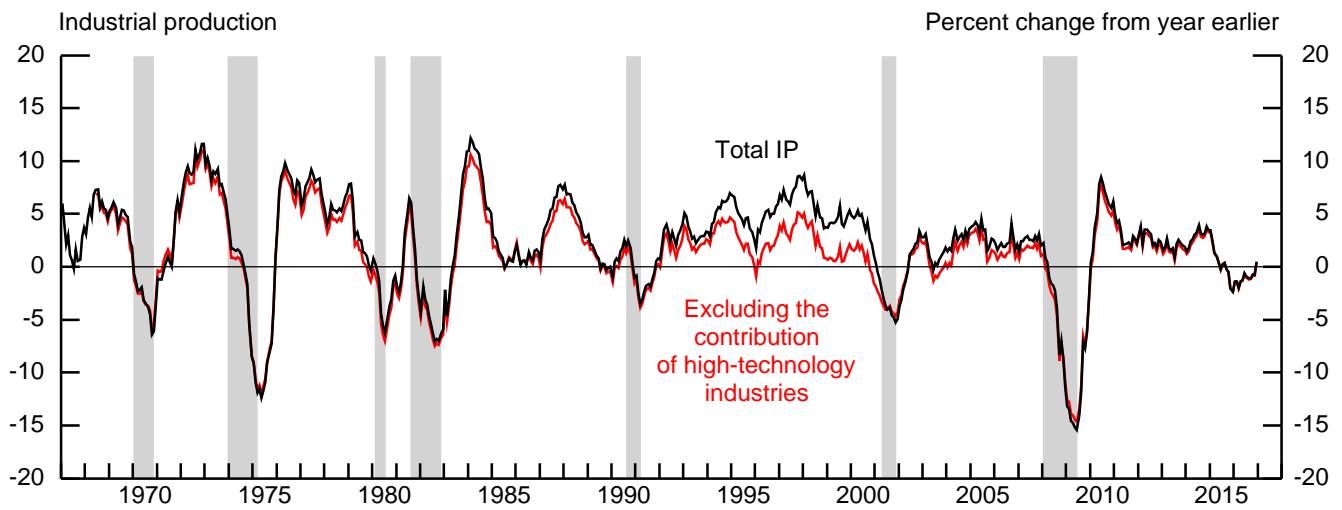
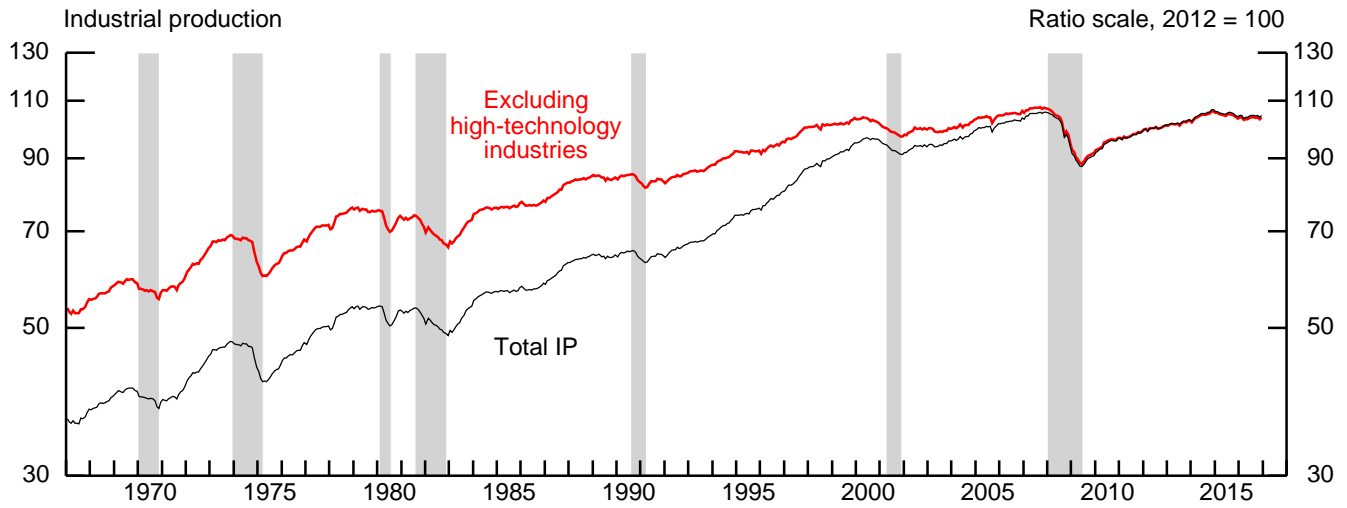
Note: The shaded areas are periods of business recession as defined by the National Bureau of Economic Research (NBER).

2. Industrial production and capacity utilization



Note: The shaded areas are periods of business recession as defined by the National Bureau of Economic Research (NBER).

3. Industrial production and capacity utilization, high-technology industries



Notes: High-technology industries are defined as semiconductors and related electronic components (NAICS 3344), computers (NAICS 3341), and communications equipment (NAICS 3342). The shaded areas are periods of business recession as defined by the NBER.

Table 1
INDUSTRIAL PRODUCTION: MARKET AND INDUSTRY GROUP SUMMARY

Percent change, seasonally adjusted

Item	2015 proportion ¹	Fourth quarter to fourth quarter			Annual rate			Monthly rate						Dec. '15 to Dec. '16
		2014	2015	2016	2016 Q2	Q3 ^r	Q4 ^p	2016 July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p	
Total IP	100.00	3.5	-1.6	-3	-8	1.8	-6	.3	-1	-2	.2	-7	.8	.5
MARKET GROUPS														
Final products and nonindustrial supplies	55.52	1.8	-1.0	.1	.3	.9	-.7	.1	-.1	.0	-.1	-.5	.7	.8
Consumer goods	27.08	.9	.6	.8	2.0	1.7	-2.1	.0	.2	-.2	-.2	-1.0	1.1	1.5
Durable	6.36	3.6	3.8	4.6	-.3	9.6	5.2	.2	.8	.9	.9	-1.3	1.1	4.6
Automotive products	3.18	5.3	6.6	7.8	-1.8	17.8	6.7	.1	2.2	1.1	1.1	-2.4	2.1	8.5
Home electronics	.17	.2	-.5	1.5	-10.2	-1.1	13.0	2.8	-3.1	-2.2	6.3	-.2	-1.1	2.1
Appliances, furniture, carpeting	.90	2.6	3.1	.8	-.3	-.6	3.4	-.5	-1.6	.5	1.1	-.1	.2	.3
Miscellaneous goods	2.11	2.0	.5	1.6	3.2	3.1	3.0	.5	-.1	1.1	.2	-.3	.3	.7
Nondurable	20.72	.1	-.4	-.4	2.7	-.7	-4.4	.0	.0	-.5	-.6	-.8	1.0	.6
Non-energy	17.34	1.0	-.1	-1.1	-.8	-3.5	-1.6	-.1	-.5	.0	-.1	-.2	.0	-1.1
Foods and tobacco	9.60	-.4	.4	.3	-1.5	.9	-1.5	.7	.0	-.2	-.2	-.3	.7	.4
Clothing	.26	-1.3	-4.6	-4.1	-13.0	5.3	7.0	.6	-.3	2.1	.0	.4	.3	-3.8
Chemical products	5.71	5.0	.4	-2.4	1.0	-10.1	-1.4	-1.2	-1.1	-.1	.4	.1	-1.0	-2.5
Paper products	1.26	-2.8	-4.5	-6.6	-2.6	-9.7	-1.9	-2.3	-.1	.5	-.3	-.2	-.8	-6.4
Energy	3.38	-2.8	-2.6	3.2	24.8	16.0	-18.4	.4	3.0	-3.1	-3.3	-4.5	7.4	10.1
Business equipment	11.32	4.6	-1.9	-.1	3.2	-.1	-1.8	.0	-.5	-.3	.1	-.7	.7	.8
Transit	3.09	10.4	-.4	-2.3	-3.6	-3.1	-.1	-1.7	.9	-.2	.2	-.5	.0	-1.7
Information processing	2.45	1.9	1.1	4.6	2.8	1.7	7.3	-.5	1.5	-.2	1.0	.0	1.4	4.7
Industrial and other	5.78	3.0	-3.9	-.9	7.2	.7	-6.4	1.2	-2.0	-.4	-.3	-1.0	.8	.5
Defense and space equipment	2.37	-3.2	-4.7	-.3	.3	-1.2	1.5	-.7	.7	-.3	-.6	1.5	-.3	-.8
Construction supplies	5.12	4.4	1.2	.3	-4.6	-2.6	6.0	.8	-1.3	.6	.9	1.0	-.3	.2
Business supplies	9.19	1.1	.3	-.8	-2.6	1.8	-1.7	.4	-.5	.5	-.4	-.5	.4	-.4
Materials	44.48	5.2	-2.3	-.9	-2.3	3.1	-.4	.5	.0	-.6	.5	-.9	1.0	.2
Non-energy	28.59	2.2	-.5	-.3	-2.2	.2	1.8	.4	-.6	-.1	.7	.1	.0	-.1
Durable	17.81	3.6	-1.3	-.5	-.6	.7	.7	.5	-.6	-.5	.7	-.1	.2	-.1
Consumer parts	3.32	4.6	3.4	4.9	5.1	17.2	-4.0	2.6	-1.3	-.7	.2	-.8	.7	5.8
Equipment parts	5.91	5.7	-1.4	-2.4	-1.8	.5	-.8	.7	-.4	-1.4	1.1	-.4	-.1	-2.5
Other	8.58	2.0	-3.0	-1.3	-2.0	-5.3	3.8	-.6	-.4	.2	.6	.5	.2	-.7
Nondurable	10.78	.1	.9	.0	-4.7	-.6	3.8	.3	-.6	.7	.6	.3	-.4	-.2
Textile	.44	-1.2	-.4	1.6	-6.7	4.5	9.7	1.1	-1.3	1.3	2.3	1.1	-3.2	-.9
Paper	2.08	-.5	-2.6	-.4	-6.0	-1.8	8.1	-.4	-.9	1.2	.8	.8	.4	.7
Chemical	5.09	.0	2.8	-1.6	-7.9	-3.9	2.7	.2	-.6	.6	.7	.2	-1.0	-2.4
Energy	15.89	9.2	-5.1	-2.0	-2.4	9.3	-5.0	.7	1.1	-1.5	.2	-2.7	3.1	.8
INDUSTRY GROUPS														
Manufacturing	78.47	2.0	.0	.0	-1.1	.2	.7	.2	-.5	.1	.3	-.1	.2	.2
Manufacturing (NAICS) 31-33	76.02	2.3	.1	.2	-1.0	.6	.8	.3	-.5	.2	.3	-.1	.2	.4
Durable manufacturing	41.77	3.3	-.7	.8	.6	2.2	.7	.3	-.4	-.1	.4	-.3	.5	1.1
Wood products	321	1.28	3.0	-.1	.9	-4.4	-3.6	11.0	-1.0	.0	-.5	1.7	2.1	-.3
Nonmetallic mineral products	327	2.20	4.9	4.4	.0	-5.2	-5.5	7.7	-.6	-1.2	1.1	.4	1.3	-.2
Primary metals	331	2.41	-1.8	-7.0	-2.0	3.8	-11.7	1.4	-2.5	-.2	-1.5	-.7	2.6	1.2
Fabricated metal products	332	6.10	1.1	-3.2	-.2	-3.6	1.1	3.4	.5	-.4	.8	.9	-.9	-.5
Machinery	333	6.32	3.9	-5.0	-.7	10.2	6.5	-6.2	1.9	-1.6	-1.4	-.4	-1.2	.9
Computer and electronic products	334	5.88	5.6	1.4	3.2	.1	2.6	6.9	.2	.7	-.1	1.3	-.1	.9
Electrical equip., appliances, and components	335	1.96	.8	2.4	-2.1	-5.8	.8	-3.4	-.1	-.9	-.3	-.2	.3	-1.1
Motor vehicles and parts	3361-3	5.86	6.4	5.1	5.4	-2.0	14.8	2.8	.7	.9	.3	.9	-1.9	1.8
Aerospace and miscellaneous transportation equipment	3364-9	5.35	4.6	-1.5	-1.4	.8	-2.1	-2.2	-.4	.2	-.9	-.4	.9	-.8
Furniture and related products	337	1.24	3.9	3.1	-2.3	-5.4	-5.0	4.5	-.5	-.5	-.2	1.1	.7	-.4
Miscellaneous	339	3.18	.3	-1.5	2.3	6.5	2.3	-7.6	1.6	-2.2	2.3	-1.5	-1.6	-.3
Nondurable manufacturing	34.25	1.1	1.1	-.5	-2.9	-1.5	.8	.2	-.6	.4	.2	.1	-.3	-.6
Food, beverage, and tobacco products	311,2	11.40	-.1	.7	.6	-1.1	1.2	-.9	.6	-.1	-.1	-.2	-.4	.7
Textile and product mills	313,4	.74	.1	-.5	.3	-5.0	1.8	.9	.9	-1.4	1.2	.7	.3	-3.0
Apparel and leather	315,6	.27	-1.4	-4.3	-4.0	-13.1	5.5	6.5	.7	-.3	2.1	-.1	.5	.2
Paper	322	2.67	.7	-3.2	1.2	-2.9	-.8	9.9	-.7	-.4	1.1	1.0	1.2	-.2
Printing and support	323	1.59	-.6	2.7	-2.7	-10.2	-2.1	4.5	-.5	-.8	1.2	.2	.9	-.8
Petroleum and coal products	324	1.85	-.2	6.5	.0	-3.8	-2.3	7.8	-.7	-.7	.2	-.2	3.6	-.5
Chemicals	325	12.23	2.3	1.4	-1.5	-3.2	-5.1	-.2	-.2	-.8	.4	.2	.1	-1.0
Plastics and rubber products	326	3.50	5.7	1.2	-1.3	-2.5	1.8	-1.4	1.6	-1.5	1.0	.4	-1.3	-.2
Other manufacturing (non-NAICS) 1133,5111	2.46	-.5	-.4	-7.2	-4.9	-11.0	-2.6	-1.4	-.9	-.3	-.4	.6	-.3	-6.5
Mining 21	10.76	12.4	-8.3	-4.4	-14.8	3.4	11.9	.8	-.1	-.2	3.5	-.7	.0	-2.8
Utilities 2211,2	10.76	-.7	-4.1	1.4	15.1	12.9	-17.0	.3	2.8	-2.7	-2.7	-4.6	6.6	6.2
Electric	2211	9.75	-.3	-3.2	1.0	10.7	15.1	-16.7	.4	3.0	-2.7	-2.3	-4.9	6.1
Natural gas	2212	1.01	-3.4	-11.5	5.0	68.4	-5.9	-20.1	-.8	.7	-2.8	-6.6	-1.4	12.0

r Revised, p Preliminary.

NOTE. Under the industry groups, the figures to the right of the series descriptions are 2012 North American Industry Classification System (NAICS) codes. The abbreviation pt denotes part of a NAICS code. Additional industry detail is available on the Board's website (www.federalreserve.gov/releases/G17). Under market groups, in the products category, miscellaneous consumer nondurables, oil and gas drilling, and manufactured homes are not shown separately; in the nondurable materials category, containers and miscellaneous nondurable materials are not shown separately.

1. The proportion data are the relative weights for the rates of change for each series in the computation of the change in total industrial production in the following year.

Table 2
INDUSTRIAL PRODUCTION: SPECIAL AGGREGATES AND SELECTED DETAIL

Percent change, seasonally adjusted

Item	2015 proportion	Fourth quarter to fourth quarter			Annual rate			Monthly rate						Dec. '15 to Dec. '16	
		2014	2015	2016	2016 Q2	Q3 ^r	Q4 ^p	2016 July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p		
Total industry	100.00	3.5	-1.6	-3	-8	1.8	-6	.3	-1	-2	.2	-7	.8	.5	
Energy	21.52	6.7	-6.1	-1.2	1.4	10.8	-7.2	.6	1.7	-1.8	-.5	-2.9	3.9	2.3	
Consumer products	3.38	-2.8	-2.6	3.2	24.8	16.0	-18.4	.4	3.0	-3.1	-3.3	-4.5	7.4	10.1	
Commercial products	1.86	.7	-.1	.6	4.6	12.2	-11.8	.0	3.2	-1.7	-2.4	-2.6	3.5	3.1	
Oil and gas well drilling	213111	.39	7.1	-59.5	-22.6	-62.6	27.4	118.6	4.9	3.2	5.1	9.0	5.3	9.3	-10.5
Converted fuel		5.13	.5	-2.0	1.8	17.9	25.4	-19.8	.9	1.8	-3.2	-3.3	-3.2	4.9	6.2
Primary energy		10.76	12.0	-6.1	-4.0	-12.3	.5	5.4	.6	.7	-.5	2.4	-2.5	2.0	-2.1
Non-energy	78.48	2.3	-.2	-.1	-1.3	-.2	1.1	.2	-.5	.1	.4	-.1	.1	.1	
Selected high-technology industries	2.66	8.8	.1	3.7	-.2	6.4	3.0	.9	-.3	.6	.8	-.7	.3	3.0	
Computers and peripheral equipment	3341	.36	2.2	-10.6	16.0	16.2	12.9	3.9	.2	1.0	1.6	1.3	-3.7	2.4	20.9
Communications equipment	3342	.64	-2.6	.4	6.0	.4	2.3	2.4	-.4	-.1	.1	.2	.5	.0	3.8
Semiconductors and related electronic components	3344	1.66	15.5	2.5	.4	-3.7	6.7	3.0	1.5	-.6	.6	.8	-.4	-.1	-6
Excluding selected high-technology industries	75.82	2.0	-.2	-.2	-1.3	-.5	1.0	.2	-.5	.1	.4	-.1	.1	.0	
Motor vehicles and parts	3361-3	5.86	6.4	5.1	5.4	-2.0	14.8	2.8	.7	.9	.3	.9	-1.9	1.8	6.6
Motor vehicles	3361	2.74	3.4	3.2	3.7	-6.8	12.4	1.5	-1.6	2.4	.7	1.0	-4.0	2.5	5.0
Motor vehicle parts	3363	2.64	8.9	6.6	7.2	4.8	19.7	-1.6	3.6	-1.2	-.8	.6	-.7	1.1	7.9
Excluding motor vehicles and parts	69.96	1.7	-.6	-.7	-1.3	-1.7	.8	.1	-.6	.1	.3	.1	.0	-.6	
Consumer goods	20.87	1.2	.2	-.7	-.7	-2.6	-.7	.0	-.6	.1	.1	-.2	.0	-.8	
Business equipment	9.65	4.9	-1.9	.0	5.4	.8	-2.9	.4	-.6	-.5	-.1	-.4	.6	.8	
Construction supplies	5.10	4.5	1.2	.3	-4.6	-2.6	6.1	.8	-1.3	.6	.9	1.0	-.3	.2	
Business supplies	6.89	.1	.3	-1.5	-4.5	-1.6	.7	.4	-1.4	1.1	.1	.0	-.4	-1.6	
Materials	25.09	1.3	-1.1	-.9	-2.7	-1.8	2.4	.0	-.5	.0	.7	.2	-.2	-.8	
Measures excluding selected high-technology industries															
Total industry	97.34	3.3	-1.7	-.4	-.8	1.7	-.7	.3	-.1	-.3	.2	-.7	.8	.4	
Manufacturing ¹	75.81	1.8	.0	-.1	-1.2	.0	.6	.2	-.5	.1	.3	-.1	.2	.1	
Durable	39.29	2.9	-.8	.6	.6	1.8	.7	.3	-.4	-.1	.4	-.3	.5	1.0	
Measures excluding motor vehicles and parts															
Total industry	94.14	3.3	-2.0	-.7	-.7	1.0	-.8	.3	-.1	-.3	.1	-.6	.8	.1	
Manufacturing ¹	72.61	1.7	-.4	-.5	-1.1	-1.0	.5	.2	-.6	.1	.2	.0	.0	-.4	
Durable	36.09	2.8	-1.6	.1	1.0	.1	.5	.3	-.6	-.1	.3	.0	.3	.3	
Measures excluding selected high-technology industries and motor vehicles and parts															
Total industry	91.47	3.2	-2.1	-.8	-.7	.8	-.9	.2	-.1	-.3	.1	-.6	.8	.0	
Manufacturing ¹	69.95	1.4	-.4	-.6	-1.1	-1.2	.4	.2	-.6	.1	.2	.1	.0	-.5	
Stage-of-process components of non-energy materials, measures of the input to															
Finished processors	11.75	4.0	-.2	.2	-.8	4.9	.1	1.1	-.8	-.6	.8	-.2	.1	.5	
Primary and semifinished processors	16.84	1.1	-.6	-.6	-3.2	-3.0	3.1	-.1	-.4	.3	.6	.3	-.2	-.5	

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1. Refer to note on cover page.

Table 3
MOTOR VEHICLE ASSEMBLIES

Millions of units, seasonally adjusted annual rate

Item	2016 average	2016 Q1	Q2	Q3	Q4	2016 July	Aug.	Sept.	Oct.	Nov.	Dec.
Total	12.20	12.11	12.00	12.13	12.16	11.95	12.24	12.21	12.34	11.97	12.19
Autos	3.94	3.96	3.94	3.91	3.78	3.86	3.95	3.91	3.75	3.85	3.73
Trucks	8.27	8.15	8.07	8.22	8.39	8.09	8.29	8.29	8.58	8.11	8.46
Light	8.00	7.83	7.79	8.00	8.14	7.86	8.07	8.06	8.34	7.87	8.22
Medium and heavy	.27	.32	.28	.23	.24	.23	.22	.23	.24	.24	.24
Memo											
Autos and light trucks	11.94	11.79	11.72	11.91	11.92	11.72	12.02	11.97	12.10	11.73	11.94

NOTE. Seasonal factors and underlying data for auto, light truck, and medium and heavy truck production are available on the Board's website, www.federalreserve.gov/releases/G17/mvsv.htm

Table 5
INDUSTRIAL PRODUCTION INDEXES: SPECIAL AGGREGATES
2012 = 100, seasonally adjusted

Item	2015 proportion	2016									
		Apr.	May	June	July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p	
Total industry	100.00	103.8	103.7	104.2	104.5	104.4	104.2	104.4	103.7	104.6	
Energy	21.52	104.3	104.5	106.7	107.4	109.2	107.2	106.7	103.6	107.6	
Consumer products	3.38	105.1	106.0	109.4	109.8	113.1	109.6	106.0	101.3	108.8	
Commercial products	1.86	104.9	105.5	107.3	107.4	110.7	108.9	106.3	103.5	107.1	
Oil and gas well drilling	213111	.39	25.5	23.5	23.6	24.7	25.5	26.8	29.3	30.8	33.7
Converted fuel	5.13	98.8	99.8	106.5	107.5	109.5	106.0	102.5	99.2	104.0	
Primary energy	10.76	109.7	109.2	108.2	108.8	109.6	109.0	111.7	108.9	111.1	
Non-energy	78.48	103.0	102.8	102.9	103.1	102.6	102.8	103.2	103.0	103.1	
Selected high-technology industries	2.66	127.0	127.8	128.7	129.8	129.5	130.3	131.3	130.4	130.8	
Computers and peripheral equipment	3341	.36	100.4	104.5	105.0	105.2	106.3	107.9	109.3	105.3	107.8
Communications equipment	3342	.64	123.2	124.6	125.9	125.3	125.2	125.3	125.6	126.2	126.2
Semiconductors and related electronic components	3344	1.66	136.5	136.2	137.0	139.1	138.2	139.1	140.3	139.7	139.5
Excluding selected high-technology industries	75.82	102.1	101.9	102.0	102.2	101.7	101.8	102.1	102.0	102.2	
Motor vehicles and parts	3361-3	5.86	127.7	122.0	128.8	129.8	130.9	131.3	132.5	129.9	132.3
Motor vehicles	3361	2.74	125.7	116.9	126.3	124.3	127.3	128.2	129.5	124.3	127.4
Motor vehicle parts	3363	2.64	128.6	125.6	130.9	135.6	134.1	133.1	133.8	132.9	134.4
Excluding motor vehicles and parts	69.96	100.3	100.5	100.1	100.3	99.6	99.7	100.0	100.1	100.1	
Consumer goods	20.87	99.4	99.4	98.9	99.0	98.4	98.5	98.6	98.4	98.4	
Business equipment	9.65	101.2	101.5	101.9	102.3	101.7	101.2	101.1	100.6	101.2	
Construction supplies	5.10	110.0	109.2	108.3	109.2	107.8	108.5	109.4	110.5	110.2	
Business supplies	6.89	99.9	99.7	99.5	99.9	98.5	99.5	99.6	99.6	99.2	
Materials	25.09	100.3	100.6	100.2	100.2	99.8	99.8	100.5	100.7	100.5	
Measures excluding selected high-technology industries											
Total industry	97.34	103.2	103.1	103.6	103.9	103.8	103.5	103.7	103.0	103.9	
Manufacturing ¹	75.81	102.1	101.9	102.1	102.3	101.8	101.9	102.2	102.1	102.2	
Durable	39.29	104.4	103.9	104.8	105.2	104.8	104.7	105.0	104.7	105.3	
Measures excluding motor vehicles and parts											
Total industry	94.14	102.6	102.8	103.0	103.3	103.1	102.8	103.0	102.4	103.2	
Manufacturing ¹	72.61	101.3	101.5	101.3	101.5	100.9	101.0	101.2	101.3	101.3	
Durable	36.09	103.0	103.2	103.4	103.6	103.0	102.9	103.2	103.2	103.5	
Measures excluding selected high-technology industries and motor vehicles and parts											
Total industry	91.47	102.0	102.1	102.3	102.5	102.4	102.1	102.2	101.6	102.4	
Manufacturing ¹	69.95	100.4	100.5	100.3	100.4	99.8	99.9	100.1	100.2	100.2	
Stage-of-process components of non-energy materials, measures of the input to											
Finished processors	11.75	105.9	105.4	106.9	108.1	107.3	106.6	107.5	107.2	107.4	
Primary and semifinished processors	16.84	101.7	102.2	101.3	101.1	100.7	101.1	101.6	101.9	101.7	

^r Revised. ^p Preliminary.

1. Refer to note on cover page.

Table 6
DIFUSION INDEXES OF INDUSTRIAL PRODUCTION
Percent

Item	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
One month earlier												
2014	42.5	65.9	66.9	51.5	59.5	56.5	58.2	46.8	62.9	51.5	61.9	49.8
2015	42.8	44.1	54.5	49.5	50.8	47.5	57.9	50.5	41.1	56.2	48.8	51.5
2016	52.5	51.0	45.0	47.0	53.7	52.2	52.2	46.3	57.4	61.7	53.3	
Three months earlier												
2014	45.8	57.2	61.9	67.9	62.2	58.2	61.5	59.2	57.9	55.9	65.9	59.5
2015	54.8	41.1	43.1	49.2	53.2	47.8	54.2	56.5	51.5	54.2	48.5	50.2
2016	50.8	52.3	46.2	41.6	43.6	51.5	56.2	48.8	54.2	56.0	57.4	
Six months earlier												
2014	51.2	53.5	61.5	60.5	59.9	61.5	67.6	64.5	57.5	61.9	66.2	60.9
2015	56.2	51.5	53.8	52.8	45.2	45.5	51.5	55.9	55.9	54.8	50.8	54.8
2016	48.2	48.2	46.2	41.8	49.3	49.2	53.5	47.2	56.2	59.2	58.2	

NOTE. The diffusion indexes are calculated as the percentage of series that increased over the indicated span (one, three, or six months) plus one-half the percentage that were unchanged.

Table 7
CAPACITY UTILIZATION
Percent of capacity, seasonally adjusted

Item	2015 proportion	1972- 2015 ave.	1994- 95 high	2009 low	2016 Q2	Q3 ^r	Q4 ^p	2016 July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p
Total industry	100.00	80.0	85.0	66.7	75.2	75.5	75.3	75.6	75.5	75.3	75.4	74.9	75.5
Manufacturing¹	78.58	78.5	84.6	63.8	74.9	74.8	74.8	75.1	74.7	74.7	74.9	74.7	74.8
Manufacturing (NAICS) 31-33	75.80	78.4	84.7	63.5	75.4	75.3	75.3	75.6	75.2	75.2	75.4	75.2	75.3
Durable manufacturing	41.24	76.9	83.7	58.2	75.8	76.1	76.0	76.3	76.0	75.9	76.1	75.8	76.2
Wood products 321	1.41	76.4	86.6	48.6	66.0	64.7	65.7	65.0	64.8	64.2	65.0	66.2	65.8
Nonmetallic mineral products 327	2.52	74.0	82.5	45.0	65.7	64.6	65.6	65.0	64.1	64.7	65.0	65.8	66.2
Primary metals 331	2.64	78.8	94.1	49.1	71.0	69.0	69.5	69.4	69.3	68.3	67.9	69.8	70.8
Fabricated metal products 332	5.71	77.6	84.9	62.1	78.6	78.9	79.7	78.9	78.6	79.2	79.9	79.2	79.8
Machinery 333	6.42	77.7	87.1	58.5	71.5	72.6	71.4	73.7	72.5	71.5	71.8	70.9	71.5
Computer and electronic products 334	6.10	77.6	84.5	69.8	72.3	71.9	72.3	71.9	72.1	71.8	72.4	72.1	72.4
Electrical equip., appliances, and components 335	1.77	82.6	92.7	67.0	83.5	83.6	82.7	84.2	83.4	83.1	82.9	83.1	82.1
Motor vehicles and parts 3361-3	5.53	74.9	87.8	33.8	81.5	84.2	84.7	83.7	84.4	84.6	85.3	83.6	85.1
Aerospace and miscellaneous transportation equipment 3364-9	4.85	74.0	70.1	72.4	82.0	81.7	81.3	81.7	82.0	81.3	81.0	81.8	81.2
Furniture and related products 337	1.21	76.5	82.6	56.1	76.5	75.7	76.7	75.9	75.6	75.5	76.3	77.0	76.7
Miscellaneous 339	3.09	76.4	80.9	68.8	79.8	80.2	78.6	80.8	79.0	80.8	79.5	78.2	78.0
Nondurable manufacturing	34.55	80.3	86.0	69.3	74.8	74.4	74.4	74.6	74.1	74.4	74.5	74.5	74.2
Food, beverage, and tobacco products 311,2	11.25	80.8	85.3	75.1	75.7	75.5	74.9	75.7	75.5	75.3	75.1	74.7	75.0
Textile and product mills 313,4	.78	79.3	91.9	53.6	71.5	71.9	72.1	72.2	71.3	72.2	72.7	72.9	70.8
Apparel and leather 315,6	.31	76.8	87.1	56.9	60.5	62.2	64.1	61.6	61.7	63.3	63.6	64.2	64.6
Paper 322	2.42	86.6	92.7	72.9	81.8	81.9	84.1	81.7	81.5	82.5	83.4	84.5	84.5
Printing and support 323	1.84	79.7	84.9	58.9	63.8	63.6	64.5	63.6	63.2	64.0	64.2	64.9	64.4
Petroleum and coal products 324	2.02	85.4	91.0	76.0	78.5	78.0	79.3	78.3	77.7	77.9	77.6	80.4	79.9
Chemicals 325	12.65	77.1	82.1	66.1	73.4	72.6	72.7	72.9	72.3	72.7	72.9	73.0	72.3
Plastics and rubber products 326	3.29	82.0	93.3	58.4	77.5	77.1	76.1	77.9	76.5	77.0	77.1	75.9	75.5
Other manufacturing (non-NAICS) 1133,5111	2.79	81.0	83.2	67.3	63.3	61.3	60.7	61.8	61.2	60.9	60.6	60.9	60.6
Mining 21	11.19	87.3	88.6	79.0	73.9	75.3	78.1	75.1	75.3	75.4	78.2	77.9	78.1
Utilities 2211,2	10.22	85.8	93.2	78.2	78.7	80.9	77.1	80.2	82.5	80.1	77.9	74.3	79.1
Selected high-technology industries	2.82	77.5	86.5	71.0	73.3	73.7	73.4	73.9	73.4	73.6	73.9	73.2	73.2
Computers and peripheral equipment 3341	.40	77.6	88.0	83.0	78.2	82.7	85.6	81.0	82.5	84.5	86.3	83.8	86.5
Communications equipment 3342	.72	76.6	84.3	77.5	69.9	70.2	70.6	70.2	70.1	70.2	70.4	70.7	70.7
Semiconductors and related electronic components 3344	1.70	78.9	91.8	62.4	73.9	73.4	72.4	74.1	73.1	73.1	73.2	72.3	71.8
Measures excluding selected high-technology industries													
Total industry	97.18	80.1	84.9	66.4	75.3	75.6	75.3	75.7	75.6	75.4	75.5	74.9	75.5
Manufacturing ¹	75.76	78.5	84.5	63.3	75.0	74.9	74.9	75.2	74.8	74.8	75.0	74.8	74.9
STAGE-OF-PROCESS GROUPS													
Crude	15.30	86.3	90.1	77.0	74.8	76.0	77.8	76.1	76.0	76.0	77.9	77.6	77.8
Primary and semifinished	44.60	80.6	87.8	63.8	75.3	75.7	75.0	75.8	75.9	75.5	75.2	74.4	75.4
Finished	40.10	77.0	80.6	66.6	75.2	75.0	74.8	75.2	75.0	75.0	75.0	74.6	74.9

^r Revised. ^p Preliminary.

1. Refer to note on cover page.

Table 8
INDUSTRIAL CAPACITY
Percent change

Item	Average annual rate				Fourth quarter to fourth quarter				Annual rate				Monthly rate
	1972-79	1980-88	1989-94	1995-2016	2013	2014	2015	2016	2016 Q1	Q2	Q3	Q4	2016 Dec.
Total industry	3.0	1.9	2.3	2.2	1.0	1.8	2.0	.4	.3	.1	.3	.7	.1
Manufacturing ¹	3.2	2.2	2.6	2.1	.4	.2	.8	.7	.7	.7	.8	.8	.1
Mining	.7	.1	-.6	1.2	6.7	8.3	5.6	-3.4	-2.2	-3.9	-4.2	-3.3	-.2
Utilities	4.4	2.2	1.8	1.7	.0	.9	.7	.8	.6	.7	.8	.8	.1
Selected high-technology industries													
Manufacturing ¹ ex. selected high-technology industries	18.6	16.8	15.7	18.4	15.4	.2	-.4	4.0	3.4	4.1	4.4	4.3	.3
	2.6	1.3	1.6	.8	-.1	.2	.9	.6	.6	.5	.6	.7	.1
STAGE-OF-PROCESS GROUPS													
Crude	1.5	.4	-.5	1.2	4.9	6.5	4.8	-2.5	-1.8	-3.0	-3.0	-2.1	-.1
Primary and semifinished	3.0	1.3	2.5	2.3	.7	.1	.6	1.0	.8	.9	1.1	1.1	.1
Finished	3.9	3.3	2.8	1.9	-.2	.5	1.2	.7	.8	.6	.6	.6	.1

1. Refer to note on cover page.

Table 9
GROSS VALUE OF FINAL PRODUCTS AND NONINDUSTRIAL SUPPLIES
Billions of 2009 dollars at annual rate, seasonally adjusted

Item	2009	2016	2016 Q2	Q3 ^r	Q4 ^p	2016 July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p
Final products and nonindustrial supplies	3,234.7	3,645.9	3,636.4	3,662.5	3,651.7	3,657.9	3,665.4	3,664.3	3,656.3	3,632.1	3,666.7
Final products	2,407.9	2,710.0	2,703.4	2,726.1	2,715.0	2,719.8	2,731.2	2,727.3	2,720.0	2,696.8	2,728.4
Consumer goods	1,790.5	1,967.6	1,960.3	1,986.0	1,974.4	1,978.1	1,992.1	1,988.0	1,978.9	1,958.9	1,985.4
Durable	351.6	526.8	517.1	532.3	538.1	526.0	532.9	537.8	541.8	532.6	540.0
Automotive products	197.7	358.4	349.2	363.9	368.3	357.1	365.6	369.2	371.9	362.9	370.2
Other durable goods	153.9	169.3	168.6	169.4	170.9	169.8	168.5	169.8	171.1	170.7	170.9
Nondurable	1,438.9	1,457.1	1,459.4	1,470.0	1,452.3	1,468.3	1,475.5	1,466.3	1,453.1	1,442.3	1,461.5
Equipment, total	617.4	750.1	750.4	748.1	748.3	749.4	747.3	747.4	748.8	745.3	750.8
Business and defense	600.0	743.4	744.9	742.3	740.6	744.3	741.6	741.0	741.8	737.6	742.5
Business	483.3	635.2	636.6	634.4	632.5	636.8	633.4	633.1	634.6	628.8	634.1
Defense and space	116.8	108.9	108.9	108.6	108.8	108.2	108.9	108.6	107.9	109.5	109.1
Nonindustrial supplies	826.8	937.0	934.0	937.3	937.7	939.2	934.8	937.9	937.3	936.6	939.3
Construction supplies	232.1	282.5	281.9	280.2	284.2	282.6	278.4	279.6	282.3	285.0	285.2
Business supplies	594.7	654.5	652.0	657.4	653.3	656.6	656.9	658.7	655.1	651.1	653.6
Commercial energy products	218.5	234.1	233.3	239.7	232.6	236.6	243.3	239.3	234.0	229.4	234.6

^r Revised. ^p Preliminary.

Table 10
GROSS-VALUE-WEIGHTED INDUSTRIAL PRODUCTION: STAGE-OF-PROCESS GROUPS
Percent change, seasonally adjusted

Item	2015 gross value ¹	Fourth quarter to fourth quarter			Annual rate			Monthly rate						Dec. '15 to Dec. '16
		2014	2015	2016	2016 Q2	Q3 ^r	Q4 ^p	2016 July ^r	Aug. ^r	Sept. ^r	Oct. ^r	Nov. ^r	Dec. ^p	
Finished	2,122.1	2.2	-.9	1.2	-.3	1.9	1.1	-.1	-.1	.3	.3	-.6	.7	1.7
Semifinished	1,919.0	3.8	.1	.6	.7	6.8	-3.0	1.1	.1	-.5	.0	-1.2	1.1	1.4
Primary	1,487.9	-1.8	-.4	-.1	4.0	1.2	-5.0	-.5	.6	-1.0	-1.4	.0	1.6	1.9
Crude	768.1	5.7	-3.4	-2.9	-8.6	1.5	5.6	.5	-.7	.4	1.2	.2	.0	-1.7

^r Revised. ^p Preliminary.

1. Billions of 2009 dollars.

The **Industrial Production and Capacity Utilization** statistical release, which is published around the middle of the month, reports measures of output, capacity, and capacity utilization in manufacturing, mining, and the electric and gas utilities industries. More detailed descriptions of industrial production and capacity utilization are available on the Board's website at www.federalreserve.gov/releases/G17. In addition, files containing data shown in the release, more detailed series that were published in the G.17 prior to December 2000, and historical data are available from the Data Download Program on the Board's website. Instructions for searching for and downloading specific series are provided as well.

INDUSTRIAL PRODUCTION

Coverage. The industrial production (IP) index measures the real output of the manufacturing, mining, and electric and gas utilities industries; the reference period for the index is 2012. Manufacturing consists of those industries included in the North American Industry Classification System, or NAICS, definition of manufacturing *plus* those industries—logging and newspaper, periodical, book, and directory publishing—that have traditionally been considered to be manufacturing and included in the industrial sector. For the period since 1997, the total IP index has been constructed from 299 individual series based on the 2012 NAICS codes. These individual series are classified in two ways: (1) market groups, and (2) industry groups. Market groups consist of products and materials. Total products are the aggregate of final products, such as consumer goods and equipment, and nonindustrial supplies (which are inputs to nonindustrial sectors). Materials are inputs in the manufacture of products. Major industry groups include three-digit NAICS industries and aggregates of these industries—for example, durable and nondurable manufacturing, mining, and utilities. A complete description of the market and industry structures, including details regarding series classification, relative importance weights, and data sources, is available on the Board's website at www.federalreserve.gov/releases/G17/About.htm.

Source Data. 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 typically obtained from private trade associations and from government agencies; data of this type are used to estimate monthly IP wherever possible and appropriate. Production indexes for a few industries are derived by dividing estimated nominal output (calculated using unit production and unit values or sales) by a corresponding Fisher price index; the most notable of these fall within the high-technology grouping and include semiconductors. When suitable data on physical product are not available, estimates of output are based on production-worker hours by industry. Data on hours worked by production workers are collected in the monthly establishment survey conducted by the Bureau of Labor Statistics. The factors used to convert inputs into estimates of production are based on historical relationships between the inputs and the comprehensive annual data used to benchmark the IP indexes; these factors also may be influenced by technological or cyclical developments. The annual data used in benchmarking 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 U.S. Geological Survey of the Department of the Interior; and publications of the Department of Energy.

Aggregation Methodology and Weights. The aggregation method for the IP index is a version of the Fisher-ideal index formula. (For a detailed discussion of the aggregation method, see the *Federal Reserve Bulletin* February 1997 and March 2001.) In the IP index, series that measure the output of an individual industry are combined using weights derived from their proportion in the total value-added output of all industries. The IP index, which extends back to 1919, is built as a chain-type index since 1972. The current formula for the growth in monthly IP (or any of the sub-aggregates) since 1972 is the geometric mean of the change in output (I), and, as can be seen below, is computed using the unit value added estimate for the current

month (p_m) and the estimate for previous month:

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

The IP proportions (typically shown in the first column of the relevant tables in the monthly G.17 release) are estimates of the industries' relative contributions to overall growth in the following year. For example, the relative importance weight of the motor vehicles and parts industry is about 6 percent. If output in this industry increased 10 percent in a month, then this gain would boost growth in total IP by 6/10 percentage point (0.06 x 10% = 0.6%). To assist users with calculations, the Federal Reserve's website 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 (www.federalreserve.gov/releases/G17/ipdisk/ipweightssa.txt).

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 five months as new source data become available. (Revised estimates are denoted by the superscript "r" in tables.) For the first estimate of output for a given month, about 73 percent of the source data (in value-added terms) are available; the fraction of available source data increases to 87 percent for estimates in the second month that the estimate is published, 94 percent in the third month, 97 percent in the fourth month, 99 percent in the fifth month, and 99 percent in the sixth month. Data availability by data type in early 2016 is summarized in the table below:

Availability of Monthly IP Data in Publication Window
(Percent of value added in 2015; the numbers may not sum because of rounding.)

Type of data	Month of estimate					
	1st	2nd	3rd	4th	5th	6th
Physical product	31	45	52	55	55	56
Production-worker hours	42	42	42	42	42	42
IP data received	73	87	94	97	99	99
IP data estimated	27	13	6	3	1	1

The physical product group includes series based on either monthly or quarterly data. As can be seen in the first row of the table, in the first month, a physical product indicator is available for about one-half of the series (in terms of value added) that ultimately are based on physical product data (31 percent out of a total of 56 percent). Of the 31 percent, about three-fourths (23 percent of total IP) include series that are derived from weekly physical product data and for which actual monthly data may lag up to several months. On average, quarterly product data are received for the fourth estimate of industrial production. Specifically, quarterly data are available for the third estimate of the last month of a quarter, the fourth estimate of the second month of a quarter, and the fifth estimate of the first month of a quarter.

Seasonal Adjustment. Individual series are seasonally adjusted using Census X-12 ARIMA. For series based on production-worker hours, the current seasonal factors were estimated with data through January 2016; for other series, the factors were estimated with data through at least December 2015. Series are pre-adjusted for the effects of holidays or the business cycle when appropriate. For the data since 1972, all seasonally adjusted aggregate indexes are calculated by aggregating the seasonally adjusted indexes of the individual series. Additional documentation and X-12 specifications can be found on the Board's website at www.federalreserve.gov/releases/G17/About.htm.

Reliability. The average revision to the *level* of the total IP index, without regard to sign, between the first and the fourth estimates was

0.27 percent during the 1987–2015 period. The average revision to the *percent change* in total IP, without regard to sign, from the first to the fourth estimates was 0.21 percentage point during the 1987–2015 period. In most cases (about 85 percent), the direction of the change in output indicated by the first estimate for a given month is the same as that shown by the fourth estimate.

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

CAPACITY UTILIZATION

Overview. The Federal Reserve Board constructs estimates of capacity and capacity utilization for industries in manufacturing, mining, and electric and gas utilities. For a given industry, the capacity utilization rate is equal to an output index (seasonally adjusted) divided by a capacity index. The Federal Reserve Board's capacity indexes attempt to capture the concept of *sustainable maximum output*—the greatest level of output a plant can maintain within the framework of a realistic work schedule, after factoring in normal downtime and assuming sufficient availability of inputs to operate the capital in place.

Coverage. Capacity indexes are constructed for 89 detailed industries (71 in manufacturing, 16 in mining, and 2 in utilities), which mostly correspond to industries at the three- and four-digit North American Industry Classification System, or NAICS, level. Estimates of capacity and utilization are available for a variety of groups, including durable and nondurable manufacturing, total manufacturing, mining, utilities, and total industry. Manufacturing consists of those industries included in the NAICS definition of manufacturing *plus* those industries—logging and newspaper, periodical, book, and directory publishing—that have traditionally been considered to be manufacturing and included in the industrial sector. Also, special aggregates are available, such as high-technology industries and manufacturing excluding high-technology industries.

Source Data. The monthly rates of capacity utilization are designed to be consistent with both the monthly data on production and the periodically available data on capacity and utilization. Because there is no direct monthly information on overall industrial capacity or utilization rates, the Federal Reserve first estimates annual capacity indexes from the source data. Capacity data reported in physical units from government sources (primarily from the U.S. Geological Survey and the Department of Energy's Energy Information Administration) and trade sources are available for portions of several industries in manufacturing (for example, paper, industrial chemicals, petroleum refining, motor vehicles), as well as for electric utilities and mining; these industries represent about 25 percent of total industrial capacity. When physical product data are unavailable for manufacturing industries, capacity indexes are based on responses to the Bureau of the Census's *Quarterly Survey of Plant Capacity* (QSPC); these industries account for about 65 percent of total industry capacity. In the absence of utilization data for a few mining and petroleum series, capacity is based on trends through peaks in production (roughly 10 percent of total industry capacity). A detailed description of the methodology used to construct the capacity indexes is available on the Board's website (www.federalreserve.gov/releases/G17/Meth/MethCap.htm).

Aggregation Methodology. Monthly capacity aggregates are calculated in three steps: (1) utilization aggregates are calculated on an annual basis through the most recent full year as capacity-weighted aggregates of individual utilization rates; (2) the annual aggregate capacity is derived from the corresponding production and utilization aggregates; (3) the monthly capacity aggregate is obtained by interpolating with a Fisher index of its constituent monthly capacity series. Utilization rates for the individual series and aggregates are calculated by dividing the pertinent monthly production index by the related capacity index.

Consistency. A major aim is that the Federal Reserve utilization rates be consistent over time so that, for example, a rate of 85 percent means about the same degree of tightness that it meant in the past. A major task for the Federal Reserve in developing reasonable and consistent time series of capacity and utilization is dealing with

inconsistencies between the movements of the industrial production index and the survey-based utilization rates. The McGraw-Hill/DRI Survey, now discontinued, was the primary source of manufacturing utilization rates for many years. This survey of large companies reported, on average, higher utilization rates than those reported by establishments covered by the annual *Survey of Plant Capacity* (the primary source of factory operating rates through 2006, after which it was discontinued) for the fourteen years they overlapped. Adjustments have been made to keep the industry utilization rates currently reported by the Federal Reserve (now based on the QSPC) roughly in line with rates formerly reported by McGraw-Hill. As a consequence, the rates reported by the Federal Reserve tend to be higher than the rates reported in the Census utilization surveys.

Perspective. Over the 1972–2015 period, the average total industry utilization rate was 80.0 percent; for manufacturing, the average factory operating rate was 78.5 percent. Industrial plants usually operate at capacity utilization rates that are well below 100 percent: none of the broad aggregates has ever reached 100 percent. For total industry and total manufacturing, utilization rates have exceeded 90 percent only in wartime. The highs and lows in capacity utilization are specific to each series and do not all occur in the same month.

REFERENCES AND RELEASE DATES

References. The release for the annual revision that was published on April 1, 2016, is available on the Board's website (www.federalreserve.gov/releases/g17/revisions/Current/DefaultRev.htm). A summary of the annual revision that incorporated back to 1972 production and capacity indexes reclassified according to the North American Industry Classification System is available in an article in the *Federal Reserve Bulletin*, vol. 89 (April 2003), pp. 151–176. A description of the aggregation methods for industrial production and capacity utilization is included in an article in the *Federal Reserve Bulletin*, vol. 83 (February 1997), pp. 67–92. The Federal Reserve methodology for constructing industry-level measures of capital is detailed in "Capital Stock Estimates for Manufacturing Industries: Methods and Data" by Mike Mohr and Charles Gilbert (1996), which can be obtained at www.federalreserve.gov/releases/g17/CapitalStockDocLatest.pdf.

Industrial Production—1986 Edition contains a more detailed description of the other methods used to compile the industrial production index, plus a history of its development, a glossary of terms, and a bibliography. The major revisions to the IP indexes and capacity utilization since 1990 have been described in the *Federal Reserve Bulletin* (April 1990, June 1990, June 1993, March 1994, January 1995, January 1996, February 1997, February 1998, January 1999, March 2000, March 2001, March 2002, April 2003, Winter 2004, Winter 2005, March 2006, May 2007, August 2008, August 2009) or in online staff studies (www.federalreserve.gov/releases/g17/articles/rev2010/industrial10.pdf, www.federalreserve.gov/releases/g17/articles/rev2012/industrial12.pdf, www.federalreserve.gov/releases/g17/articles/rev2013/industrial13.pdf).

Release Schedule

The G.17 will be published at 9:15 a.m. on

2017: January 18, February 15, March 17, April 18, May 16, June 15, July 14, August 17, September 15, October 17, November 16, and December 15.

This release schedule is available on the Board's website at <http://www.federalreserve.gov/releases/g17>.