FEDERAL RESERVE statistical release

G.17 (419) 2023 Historical and Annual Revision

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Industrial Production and Capacity Utilization: The 2023 Annual Revision

The Federal Reserve has revised its index of industrial production (IP) and the related measures of capacity and capacity utilization.[1] On net, revisions to total IP pushed its growth rates slightly lower in recent years; the rates of change for total IP have revised no more than 0.6 percentage point in any year.[2] Similarly, the utilization rates for total industry are little changed from previous estimates.

This revision incorporated detailed data for manufacturing from the U.S. Census Bureau's 2021 Annual Survey of Manufactures (ASM). The aggregate effect of those data was slightly slower growth in overall IP in 2021. The overall picture of the last three years of performance in the industrial sector, however, is unchanged. After contracting sharply in the first half of 2020 because of the pandemic, the industrial sector rebounded later in the year and in 2021, and then exhibited more modest growth in 2022.

In the fourth quarter of 2022, capacity utilization for total industry stood at 79.9 percent, about 1 percentage point above its previous estimate and 0.2 percentage point above its long-run (1972–2022) average. Most of the upward revision to utilization reflects modest downward revisions to estimates of capacity. The utilization rates for 2019 to 2021 are close to previous estimates—within ½ percentage point—and revisions to earlier years are very small.

Annual capacity growth for the industrial sector is revised down by about ¾ percentage point per year, on average, in 2021 and 2022; earlier-year revisions are very small. Capacity for total industry at the end of 2022 is now estimated to be nearly 1 percent lower than at the end of 2018, as opposed to about 1 percent higher prior to the revision.

This revision incorporated newly available annual data on both output and prices. As noted earlier, the updated IP indexes incorporated new data for manufacturing from the U.S. Census Bureau's 2021 ASM. For publishing, the IP indexes folded in data for 2021 from the Census Bureau's Service Annual Survey. In addition, the indexes for metallic and nonmetallic minerals were updated with revised annual data for 2020 and with new data for 2021 from the U.S. Geological Survey (USGS). Data on prices from the Bureau of Labor Statistics (BLS) were also incorporated into most of the manufacturing indexes.

The monthly estimates of production have been updated to include late-arriving or revised quarterly or monthly indicator data, including information from the BLS's benchmark revisions to the Current Employment Statistics. The IP estimates also reflect updated seasonal factors.

The revised estimates of capacity and capacity utilization incorporated data from the Census Bureau's Quarterly Survey of Plant Capacity Utilization for the fourth quarters of 2021 and 2022 along with new data on

[1] The revision affected rates of change for IP from 1972 forward. When necessary to maintain consistency with any revisions to the data for 1972 and subsequent years, the levels of production for the years before 1972 were multiplied by a constant. However, the rates of change in IP for the years before 1972 were not revised. Utilization rates and capacity growth rates were revised minimally between 1968 and 1971 but were unchanged before then.

[2] Rates of change are calculated as the percentage change in the seasonally adjusted index from the fourth quarter of the previous year to the fourth quarter of the year specified.

capacity from the USGS, the Energy Information Administration, and other organizations. The revised capacity estimates also included new data on capital spending from the 2021 ASM.

RESULTS OF THE REVISION

Industrial Production

Manufacturing output is now estimated to have been about 3 percent lower in the fourth quarter of 2020 than it was a year earlier; it moved up about 3½ percent in 2021 and another ¾ percent in 2022. The rates of change for 2020 and 2021 are respectively about ½ percentage point and ¾ percentage point weaker than the estimates published previously, whereas the rate of change for 2022 is about ¼ percentage point stronger. Manufacturing output is now estimated to have dropped more than 19 percent between February 2020 and April 2020 because of the pandemic, about the same as was previously reported. Factory output has recovered since then, and the index for February 2023 is currently reported to be about ¾ percent above its pre-pandemic level, about ½ percentage point less of a gain than the pre-revision estimate.

The revised contour for mining output shows a sharp drop in the first half of 2020 and a substantial rebound later in 2020 and in 2021, followed by continued but more moderate growth in 2022. The rates of change are broadly similar to those published previously, although the gains in 2021 and 2022 are now each about ¾ percentage point weaker, and the drop between the fourth quarters of 2019 and 2020 is about ⅓ percentage point smaller. The index for mining currently stands about 3¼ percent below its pre-pandemic level; before the revision, the index was 2⅓ percent below its pre-pandemic level. The rates of change for utilities output are little changed from their previously reported values.

Production by Industry Group

The output of durables decreased sharply in the first half of 2020 before increasing later in the year and in 2021 and 2022. Relative to the previous estimates, the net decline over 2020 is modestly steeper, the gain in 2021 is more moderate, and the increase in 2022 is stronger. The cumulative downward revision to output growth for durables from 2020 through 2022 was about 1⅔ percentage points.

The index for nondurables was little changed after the revision. Among nondurable manufacturing industries, the revisions to the rates of change were mixed, with the indexes for textiles and product mills and paper revising downward for 2021 and the indexes for plastics and rubber products revising upward for the same period.

The output index for industries in scope for manufacturing IP that are not part of manufacturing under the North American Industry Classification System (NAICS)—that is, logging and publishing—has been recording declines for several years, and it continued to fall each year in the 2020–22 period. However, the declines in 2020 and 2021 are now reported to have been noticeably smaller than previously published, while the decrease in 2022 is somewhat larger.

Production by Market Group

The index for consumer goods now shows slightly less output in the 2020–22 period than previously reported. The rate of change for business equipment revised down in 2020 and 2021, but revised up strongly in 2022. Relative to earlier reports, the index for defense and space equipment now records noticeably slower growth over the 2020–22 period.

Revisions to the index for construction supplies were very small. The index for business supplies revised up incrementally for 2020, 2021, and 2022 relative to earlier reports. The output of materials was little changed

cumulatively from previously reported values.

Capacity Utilization

Capacity utilization for total industry decreased in 2019 and 2020 before moving up in 2021 and 2022; the reading in February 2023 was 79.1 percent, about ¾ percentage point below its 1972–2022 average. Previous estimates displayed a similar contour, with the main difference being that now utilization moves up modestly in 2022 rather than remaining essentially flat. The upward revision to utilization for total industry in 2022 is due primarily to higher operating rates at mines than in previous estimates.

Utilization at manufacturers moved down about 3¼ percentage points from 2018 to 2020 before increasing in 2021 back to its 2018 level. The factory operating rate in February 2023 was 78.3 percent, essentially matching its long-run average. Relative to the previous estimates, the current readings for manufacturing utilization are slightly higher over recent history. Revisions to utilization rates for 2022 were mixed among manufacturing industries and largely offsetting. The largest upward revisions in operating rates for 2022 occurred in wood products, in nonmetallic mineral products, in printing and related support activities, and in petroleum and coal products; the largest downward revisions in operating rates for 2022 occurred in electrical equipment, appliances, and components; plastics and rubber products; and aerospace and miscellaneous transportation equipment.

The capacity utilization rate for mining dropped 19 percentage points from 2018 to 2020 before rebounding in 2021 to 87.6 percent, about 1 percentage point above its long-run average. Relative to its previously published rate, utilization at mines for the fourth quarter of 2022 is about 2½ percentage points higher. The operating rate for utilities declined about 8 percentage points from 2018 to 2021 before rising modestly in 2022 to 73.9 percent, 10¾ percentage points below its long-run average.

Capacity

Total industrial capacity fell about ¾ percent and 2 percent in 2020 and 2021, respectively, with decreases in manufacturing and mining partly offset by increases for utilities. In contrast, overall capacity rose 1 percentage point in 2022 and is expected to rise 1½ percentage points in 2023. Compared with previous estimates, overall capacity growth is now modestly weaker; in particular, the decline in 2021 is somewhat larger, and the increase in 2022 is somewhat smaller.

Manufacturing capacity is now reported to have contracted about ¾ percentage point per year, on average, from 2018 to 2021, just a touch more negative than was reported earlier. The downward revisions to manufacturing capacity growth during this period were concentrated primarily in nondurable manufacturing industries. Manufacturing capacity expanded about ¾ percent in 2022 and is expected to grow by 1¼ percent in 2023.

Mining capacity rose in 2018 and 2019 before falling back by an equivalent amount in 2020 and 2021; the level of capacity in 2021 was roughly back to its 2017 value. Capacity grew about 2 percent in 2022 but is expected to contract about ⅓ percentage point in 2023; these estimates are, on average, weaker than the previous estimates. Capacity for electric and gas utilities rose at a pace of 2⅓ percent per year, on average, from 2019 to 2022 and is expected to grow somewhat faster in 2023. Revisions to the rates of utilities capacity growth were, on net, very small.

TECHNICAL ASPECTS OF THE REVISION

The IP indexes represent the level of real output relative to a base year. At the monthly frequency, movements of the indexes are based on indicators that are derived using industry-specific data from a variety of government and private sources. The monthly production indexes are anchored to annual benchmarks that are less timely but typically based on more comprehensive data. In most cases, the annual benchmark is nominal gross output reported by the Census Bureau deflated by a suitable price index.

Annual revisions to the IP and capacity measures generally involve (1) incorporating new and revised annual benchmark data on output, prices, and value-added proportions; (2) incorporating new monthly or quarterly data that were revised or that arrived too late to be included in the regular six-month reporting window for monthly IP; (3) updating seasonal adjustment factors; (4) updating the methods used to construct the indexes; and (5) introducing changes to the industry- or market-group structure of the indexes based on changes to underlying data sources.

Annual Benchmark Data on Output, Prices, and Value-Added Proportions

Output

The annual benchmark output indexes for IP are measures of real gross output at the six-digit NAICS (2017) level. The Census Bureau provides annual figures for value added and the cost of materials for manufacturing industries, which can be summed to obtain nominal gross output. The benchmark indexes for manufacturing for this revision incorporated information for 2021 from the ASM.

New annual data were also incorporated into many other indexes not in the scope of the ASM. The benchmark indexes for metallic and nonmetallic mineral mining were updated with any newly available data from 2020 through 2022 from the USGS, and the benchmark index for publishing was advanced through 2021 based on data from the U.S. Census Bureau.

Prices

Individual benchmarks of real gross output are obtained by deflating the measures of nominal gross output by annual price deflators. In general, the benchmark industry price deflators consist of price indexes from the Bureau of Economic Analysis (BEA) through 2011 that are extended through 2021 with the related producer price indexes (PPIs) from the BLS.[3] However, for a few selected industries, the annual price deflators are constructed by the Federal Reserve.[4]

Value-Added Proportions (Weights for Aggregation)

The IP system is organized as a hierarchical structure where individual production indexes are combined using a version of the Fisher-ideal index formula to construct aggregate indexes of production. Utilization rate aggregates are calculated on an annual basis through the most recent year as capacity-weighted aggregates of individual utilization rates.

The weights that are used to combine individual IP indexes into more aggregate indexes are based on the value added from the industry, calculated as gross output less cost of materials. For individual IP indexes that are

[3]The BEA price deflators were discontinued at the six-digit NAICS level after 2011. Overall, at the industry level, the BEA and PPI measures are quite similar, as the BEA used weighted product-level PPIs to derive its industry-level shipments deflator.

[4]For selected industries, the Federal Reserve constructs price indexes from alternative sources. These industries include communications equipment (NAICS 3342), computer storage devices (NAICS 334112), semiconductors (NAICS 334413), and pharmaceuticals (NAICS 325412).

defined at the six-digit (or more aggregate) NAICS level, the value-added weights are derived from either the Economic Census or the ASM. For IP indexes that cover only part of a six-digit NAICS industry, the aggregation weights were constructed by allocating value added (as defined by the Census Bureau) for a six-digit industry across the various components of IP that compose that industry.

The allocation of value added across each component was determined by that component's share of the industry's overall product shipments. As in the 2022 annual revision, this annual revision used data on product shipments based on the new 2017 North American Product Classification System (NAPCS). In earlier revisions, product shipments were classified based on NAICS and were included as part of the Census of Manufactures or the ASM. NAPCS is coded independently of NAICS, and a concordance was required to align the recent data with the historical data for the period before 2017. Missing values for specific NAPCS-based products were imputed where necessary.

The Federal Reserve derives estimates of value added for the electric and gas utility industries from annual revenue and expense data issued by other organizations. For electric utilities, the measures of value added incorporate data from the Energy Information Administration of the U.S. Department of Energy and from the Edison Electric Institute. For gas utilities, the value-added estimates incorporate data from the American Gas Association. The weights for aggregation for mining industries are derived from value-added data from the Economic Census. Figures for value added for mining industries in the years between the quinquennial Economic Censuses are estimated based on industry-specific nominal output measures (the product of real output indexes and price indexes).

The weights for aggregation, expressed as value added per unit output, were estimated with data on producer prices for the period after 2021.

Revised Quarterly and Monthly Data

This revision incorporated source data on production, shipments, and inventories that became available or were revised after the regular six-month reporting window for monthly IP was closed. These data were released with too great of a lag to be included with monthly IP estimates but were available for inclusion in the annual revision.

Revised Seasonal Factors

IP indexes are adjusted to remove from the underlying data the predictable movements related to timing, holiday, workday, and monthly or quarterly seasonal patterns. Individual indexes are adjusted using the Census X-13ARIMA-SEATS seasonal adjustment program. The seasonal factors are based on the full history of data back to 1972, where available.

Seasonal factors for indexes based on production-worker hours were updated with data through January 2023. The updated factors for the physical-product-based indexes used data through December 2022 where available. Extreme movements in indexes are often explicitly treated as additive outliers in the seasonal adjustment procedure and thus excluded from the calculation of seasonal factors. Hurricanes that produce extreme drops for industries based in the Gulf Coast region are often specified to be outlier events. In recent years, the pandemic-related swings in most of the indexes were deemed outliers; in addition, February 2021 was deemed an outlier for many industries because of the extreme cold weather that caused widespread outages.

Seasonal factors for unit motor vehicle assemblies have been updated, and projections through June 2024 are available on the Board's website at https://www.federalreserve.gov/releases/g17/mvsf.htm. These factors are based on production data through January 2023 and were revised back to January 2018. The seasonal factors

explicitly incorporate the holiday schedule for the vehicle assembly lines specified in the latest collective bargaining agreements with domestic manufacturers.

Methodological Changes to Individual Production and Capacity Indexes

Change in Source Data for Three Production Indexes

With this revision, the source data for three indexes for original equipment motor vehicle parts were modified. Previously, the indexes reflected data on production of major vehicle components (engines, brakes, axles, and transmissions) from Stark's News Service, as well as data for production-worker hours by industry and for light vehicle production. The data on the direct production of components, however, were discontinued so beginning in 2022 these three series are based just on production-worker hours for the industry and on light vehicle production.

Change to Price Indexes for Semiconductors

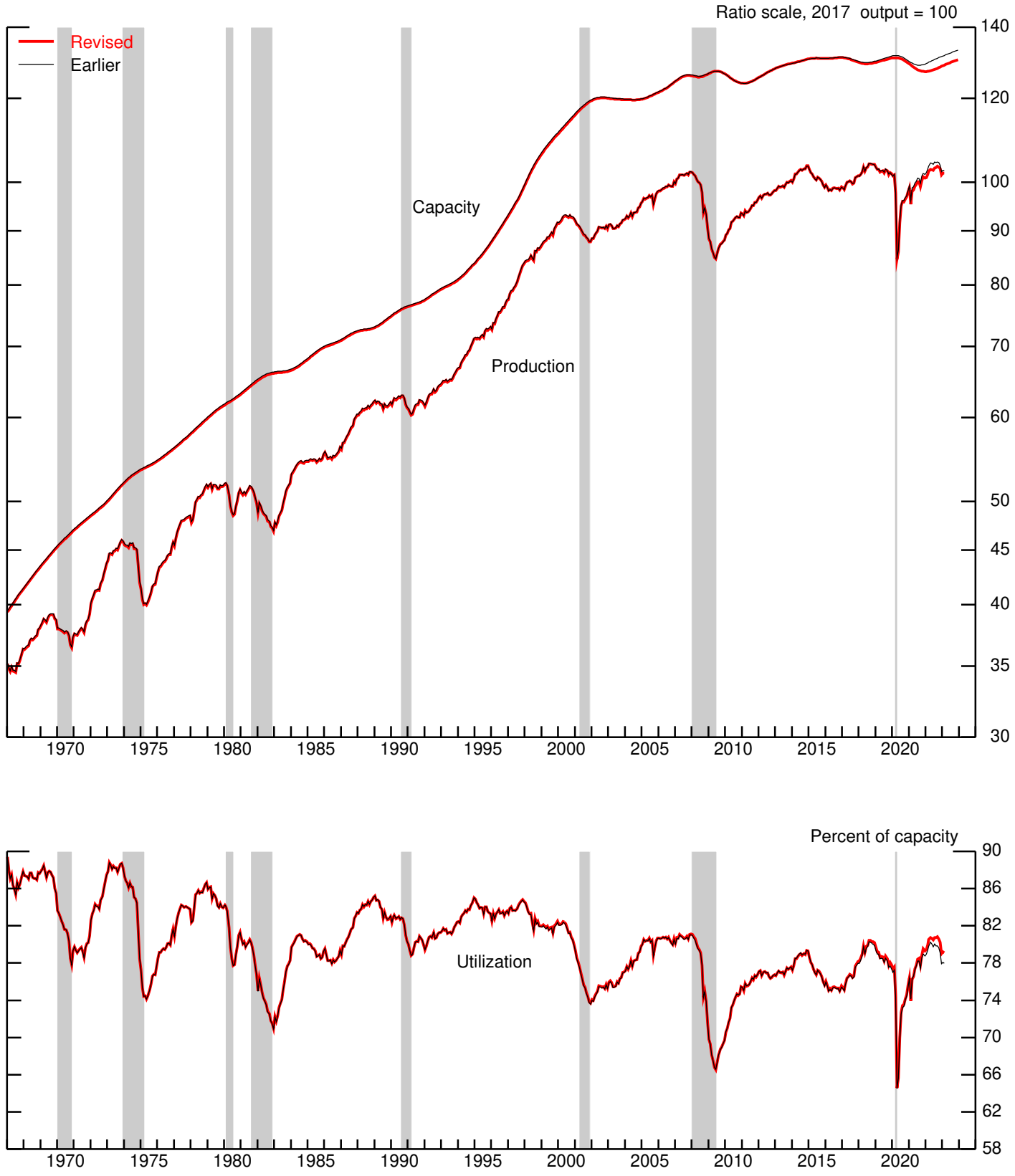
With this revision, the price indexes used to deflate the nominal output of two semiconductor (chip) categories have been modified. For microprocessor units (MPUs), a price index based on "hedonic" analysis of the relationship between model prices and characteristics is used through 2015. Previously, this index was extended using the producer price index published by the BLS adjusted by the average historical relationship between the BLS index and the hedonic index. In light of analysis indicating that MPU performance on benchmark tests designed to mimic representative MPU uses is highly correlated with the number of transistors found on MPUs, the hedonic index is now extended using an implicit price index calculated as the nominal global output of MPUs published by the Semiconductor Industry Association (SIA) divided by a staff estimate of the number of transistors used in MPUs based on data from Semiconductor Equipment and Materials International.

Similarly, staff analysis found that the performance of graphics processing units (GPUs) on benchmark tests is highly correlated with the number of transistors on GPU models. GPUs are an example of processors designed for narrow purposes—in contrast to MPUs, which are general-purpose processors—that make up the majority of the chips found in a sub-industry IP index for metal-oxide semiconductor (MOS) logic devices excluding MPUs and MOS memory chips. Previously, nominal output for this category of chips was deflated by a geometric mean of the price indexes for MPUs, MOS memory chips, and an index based on average prices for other MOS logic types provided by the SIA. With this revision, the SIA-based component of the index has been replaced beginning in 2008 with an implicit price index based on global nominal output of other MOS logic devices divided by a staff estimate of transistors.

Data Availability and Publication Changes

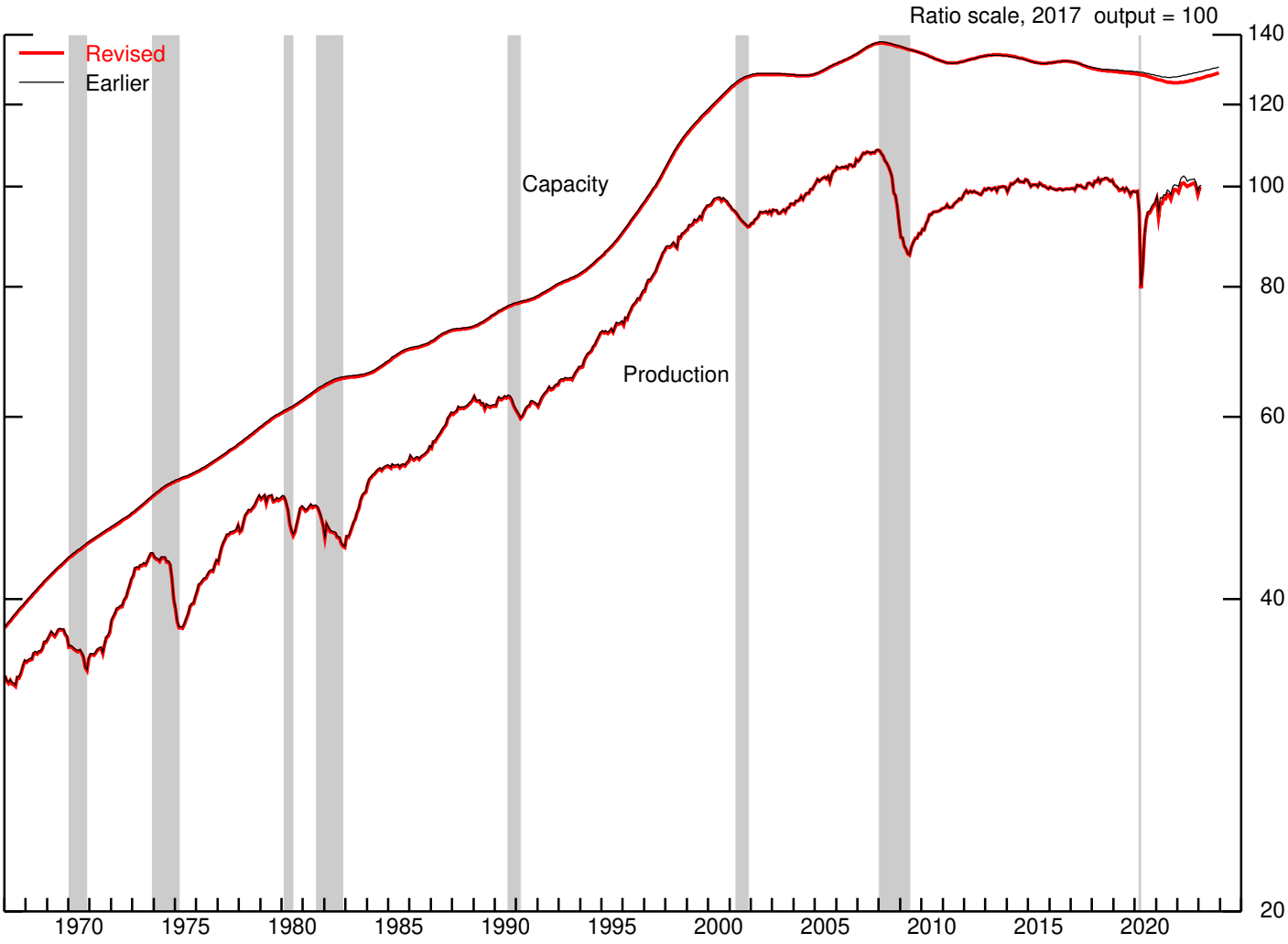
Files containing the revised data and the text and tables from this release are available on the Board's website at https://www.federalreserve.gov/releases/g17, as are updated data for the annual revision and for all of the regularly issued series on IP, capacity, and capacity utilization. Other changes are listed on the Board's website at https://www.federalreserve.gov/releases/g17/g17_revision_series.htm.

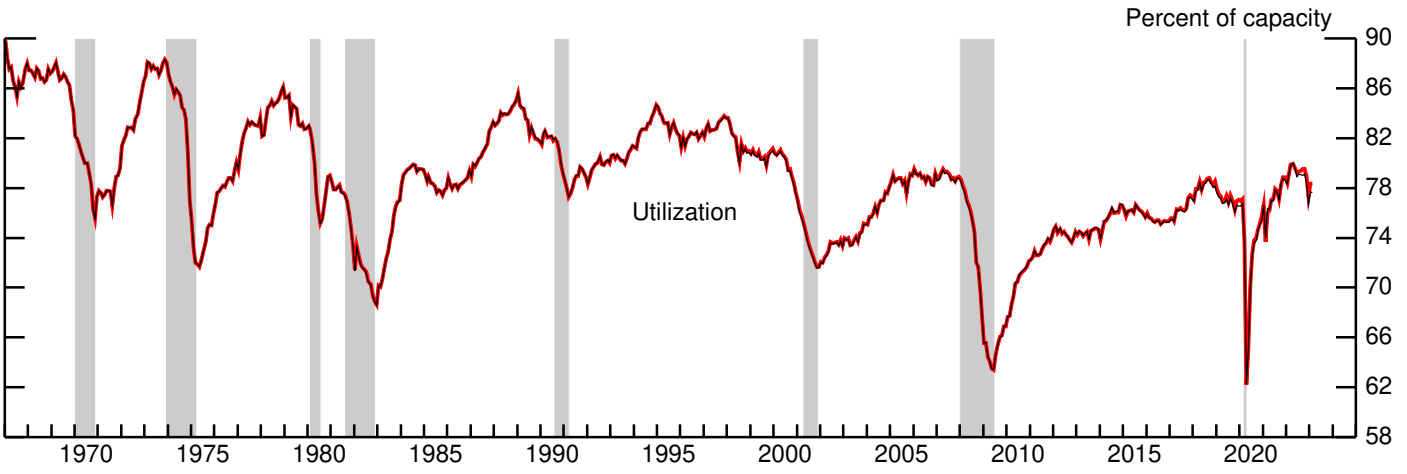
1. Total industrial production, capacity, and utilization



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

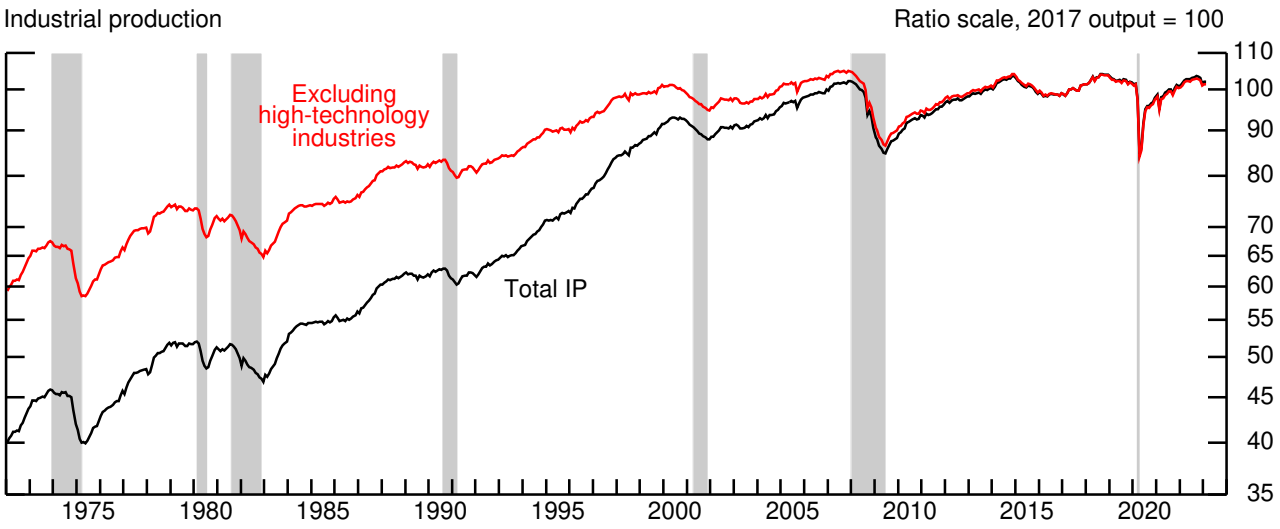
2. Manufacturing industrial production, capacity, and utilization

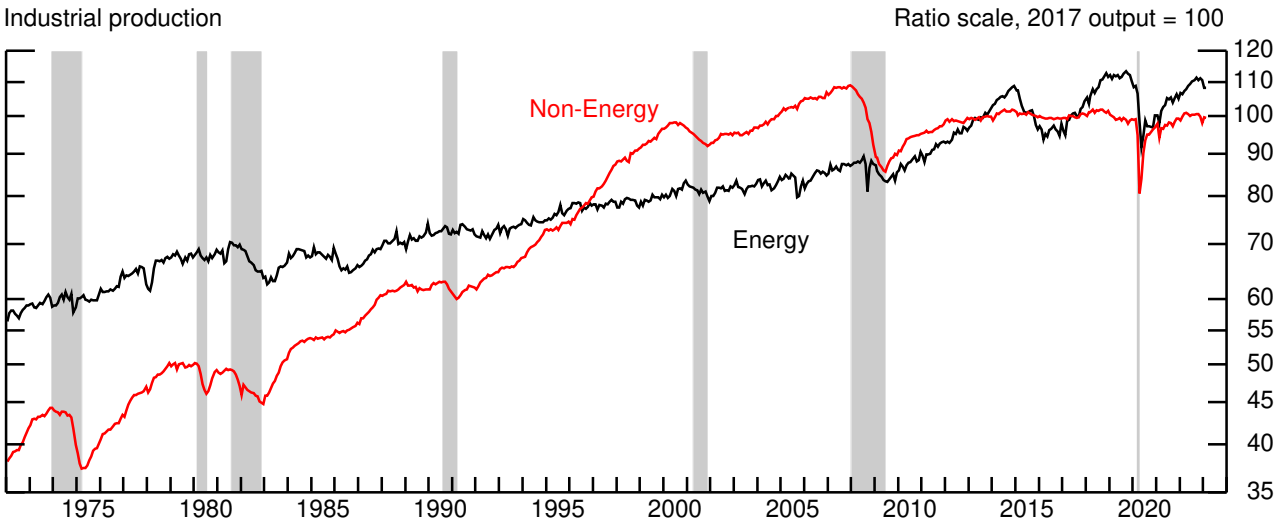


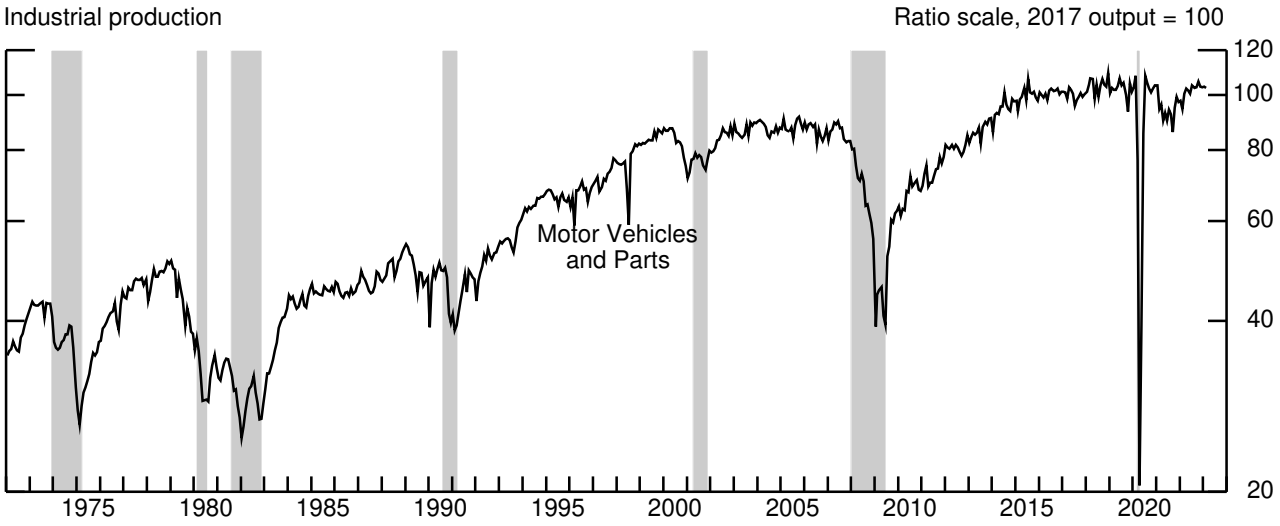


Notes: Manufacturing consists of those industries in the North American Industry Classification System, or NAICS, definition of manufacturing plus those industries--logging and newspaper, periodical, book, and directory publishing--that have traditionally been considered to be manufacturing and included in the industrial sector.
The shaded areas represent periods of business recession as defined by the NBER.

3. Industrial production of selected industries

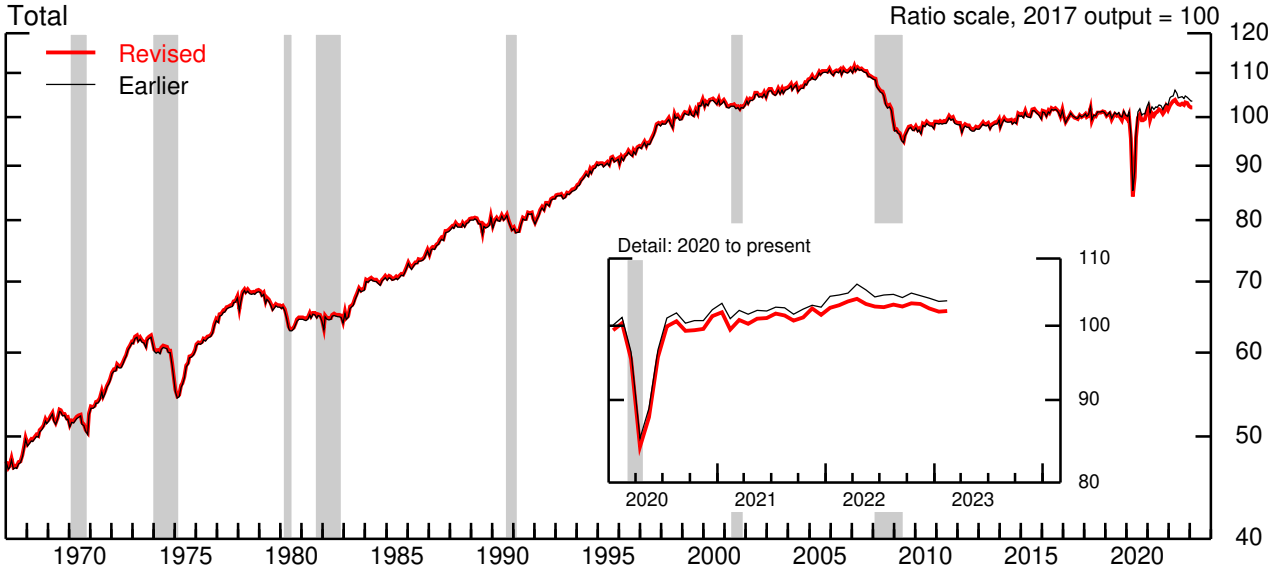


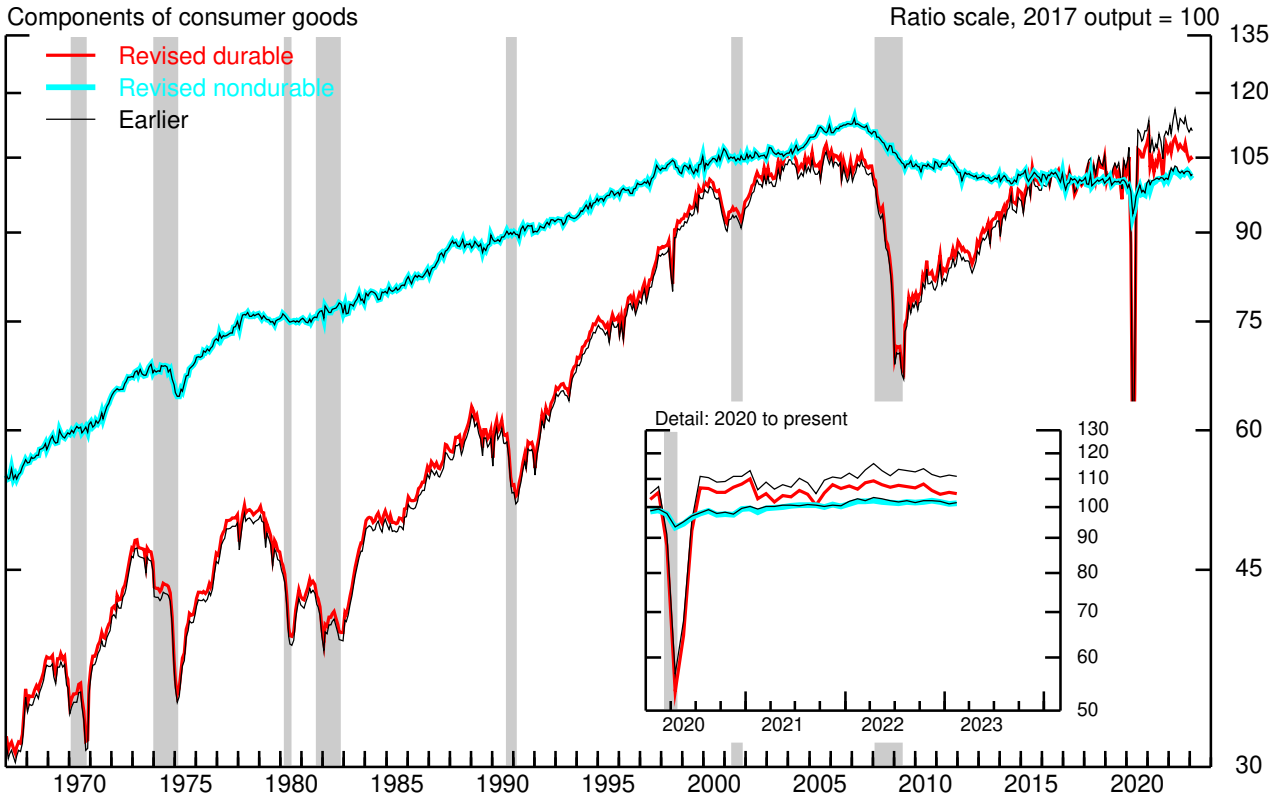




Notes: High-technology industries are defined as semiconductors and related electronic components (NAICS 3344), computers (NAICS 3341), and communications equipment (NAICS 3342).
The shaded areas represent periods of business recession as defined by the NBER.

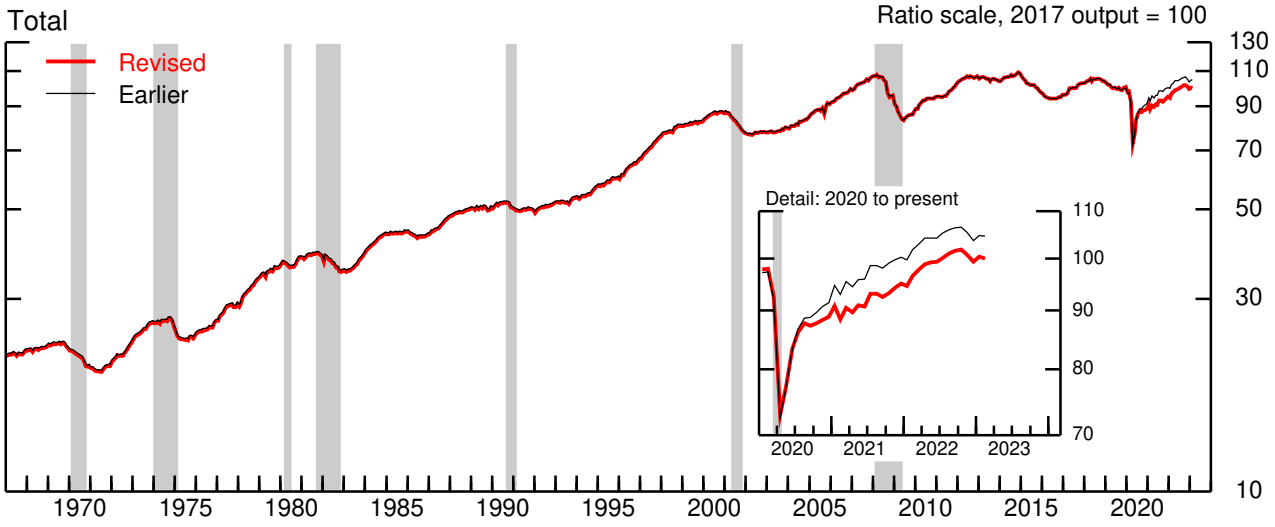
4. Consumer goods



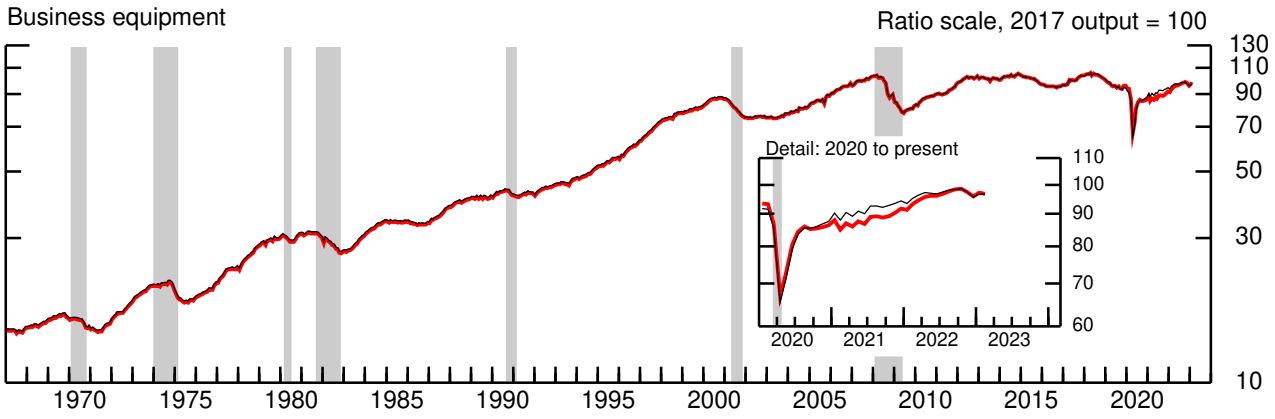


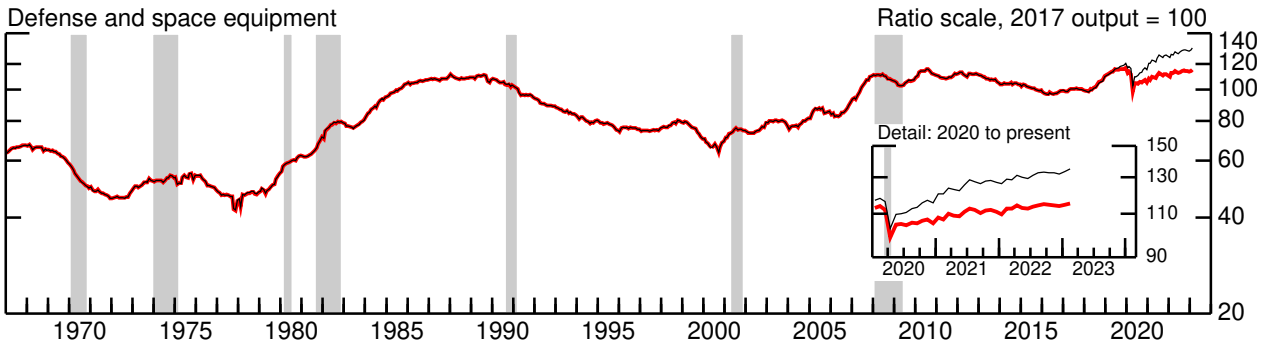
Note: The shaded areas represent periods of business recession as defined by the NBER.

5. Equipment



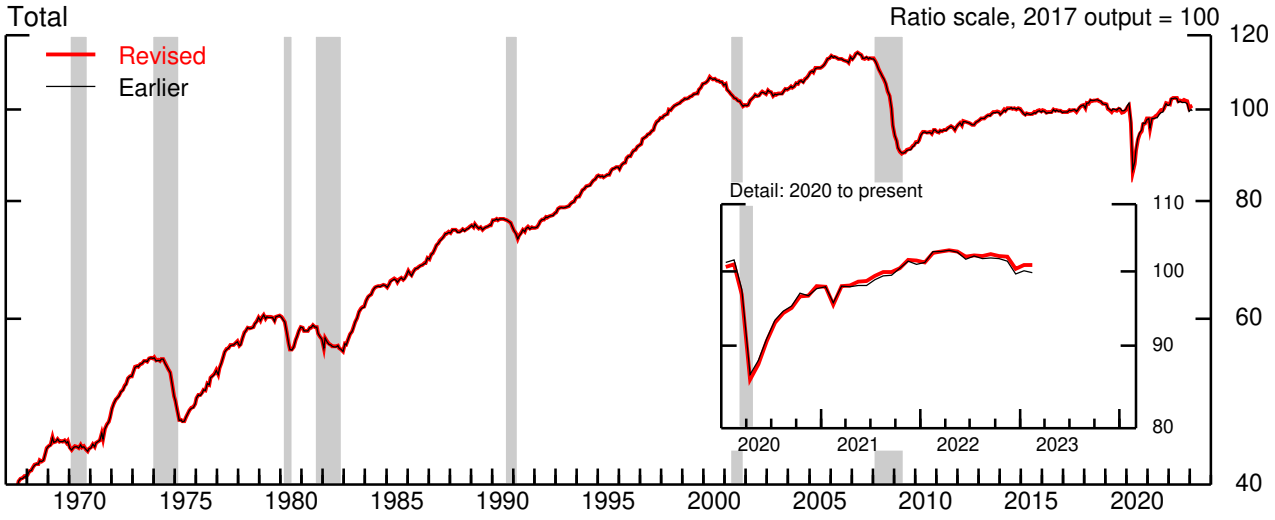
Note: Includes business equipment, defense and space equipment, oil and gas well drilling, and manufactured homes.

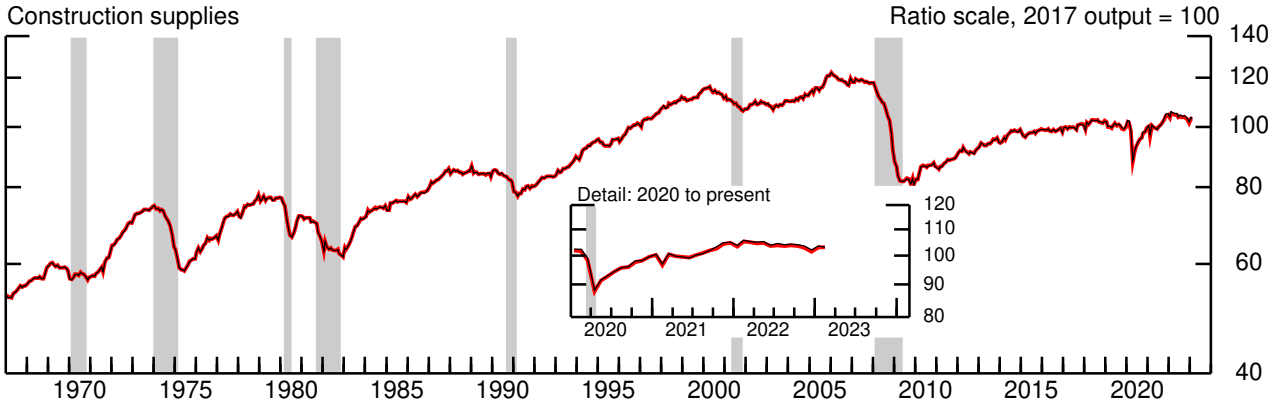


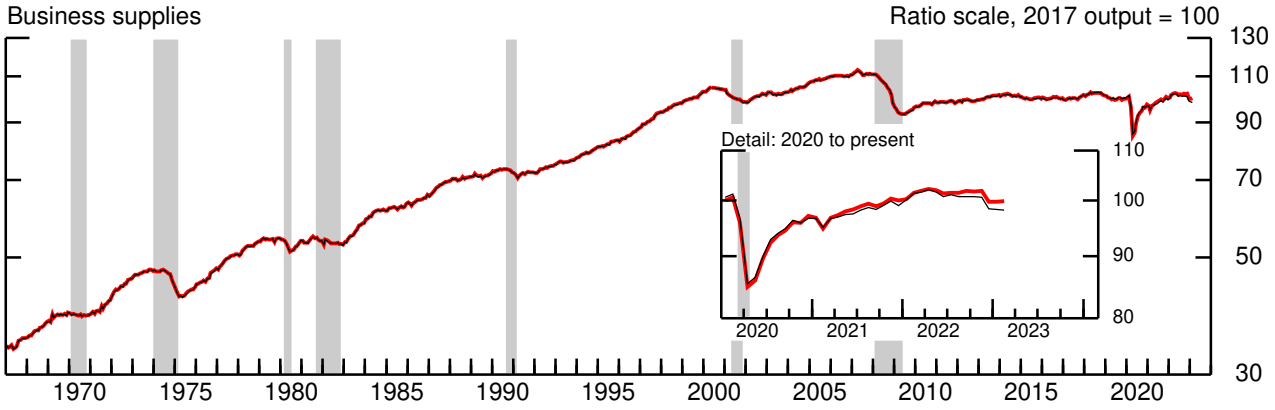


Note: The shaded areas represent periods of business recession as defined by the NBER.

6. Nonindustrial supplies

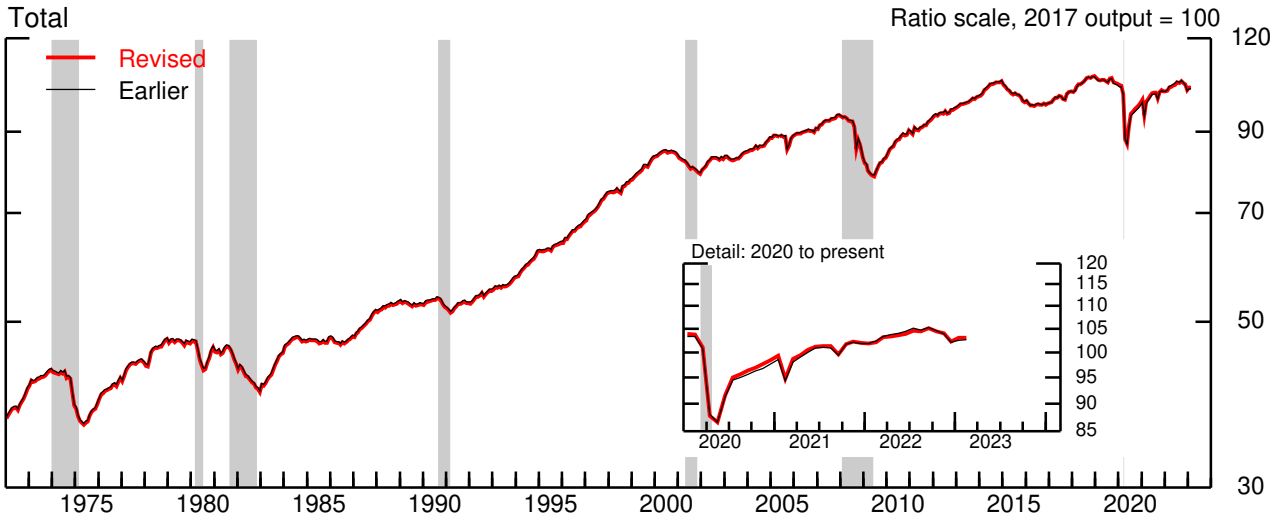


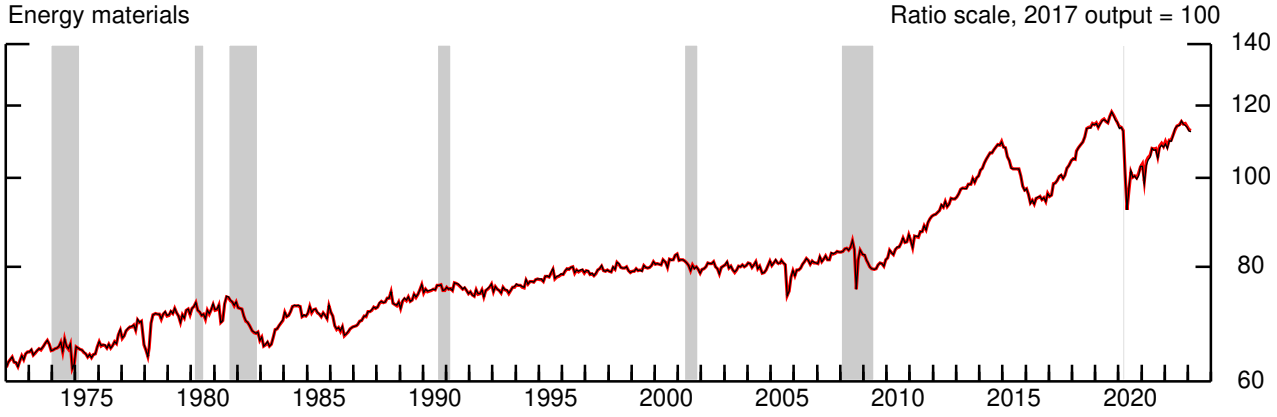


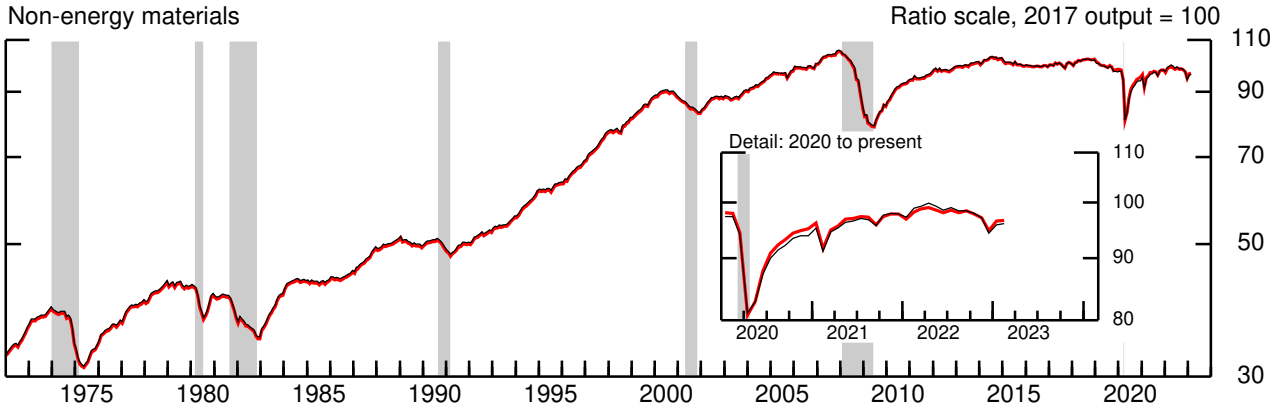


Note: The shaded areas represent periods of business recession as defined by the NBER.

7. Industrial materials

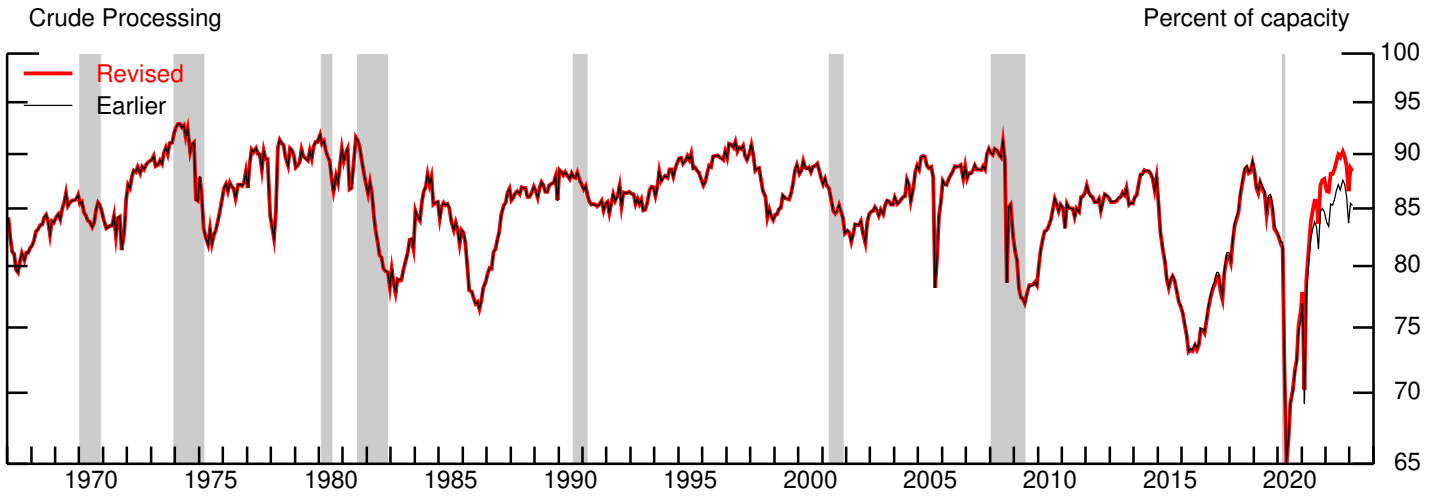


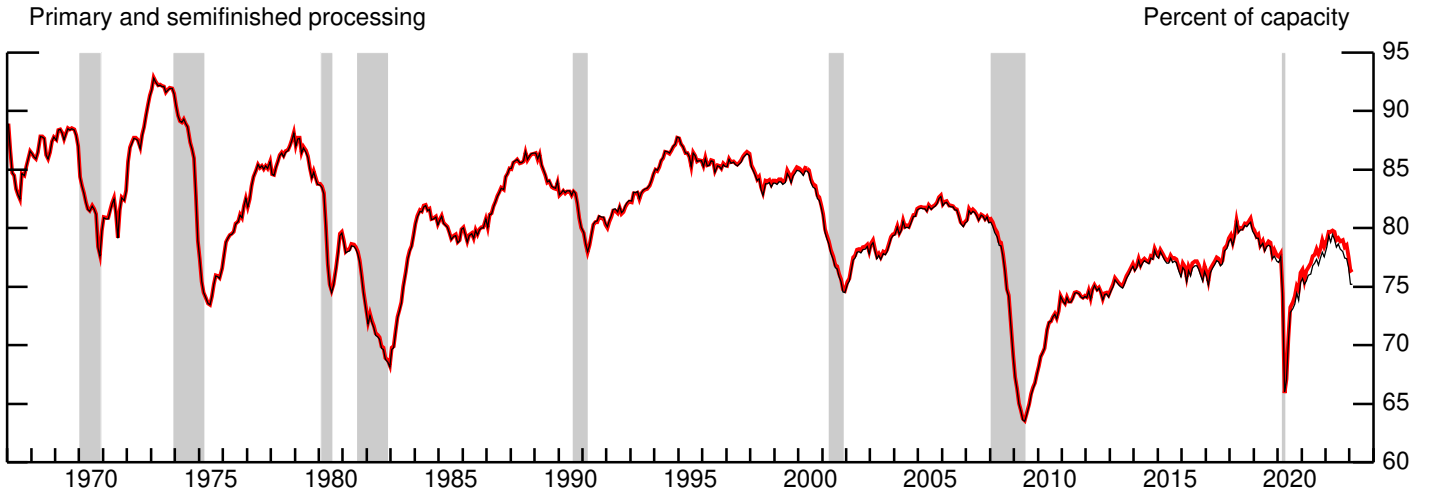


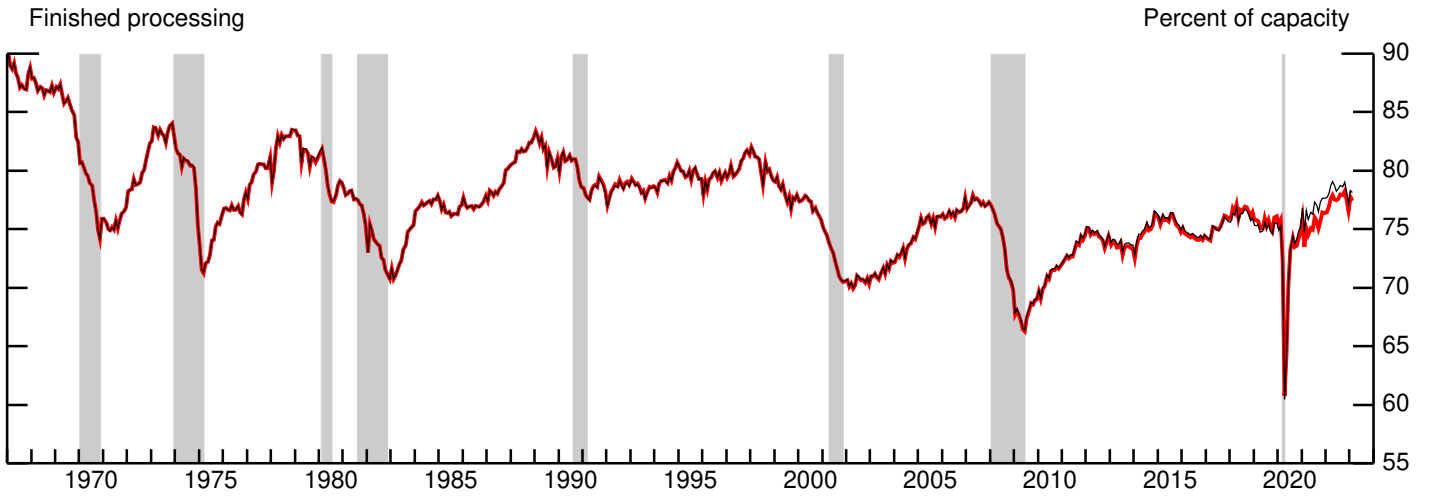


Note: The shaded areas represent periods of business recession as defined by the NBER.

8. Capacity utilization by stage of process







Note: The shaded areas represent periods of business recession as defined by the NBER.

Table 1A

INDUSTRIAL PRODUCTION: Total

Seasonally adjusted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Q1	Q2	Q3	Q4	Annual[1]
IP (*percent change*)																	
1993	.4	.5	-.1	.3	-.4	.2	.3	-.1	.5	.7	.5	.6	3.7	.8	1.5	6.4	3.3
1994	.3	.1	1.0	.6	.5	.7	.1	.7	.3	.8	.7	1.0	5.0	7.5	5.2	8.4	5.3
1995	.2	-.1	.1	-.2	.5	.3	-.4	1.3	.4	-.2	.2	.3	4.2	1.2	3.9	3.3	4.6
1996	-.5	1.4	-.2	1.0	.7	.8	.0	.5	.6	.0	.9	.6	2.8	8.9	5.3	5.6	4.5
1997	.2	1.2	.6	.1	.6	.5	.8	1.0	.9	.9	.8	.4	7.8	5.9	9.7	10.5	7.2
1998	.5	.2	.0	.3	.7	-.6	-.4	2.1	-.1	.7	-.1	.4	4.6	2.7	3.1	5.6	5.9
1999	.4	.6	.2	.2	.6	-.1	.6	.4	-.4	1.3	.5	.8	4.5	3.8	3.7	7.3	4.4
2000	-.1	.3	.4	.6	.3	.1	-.2	-.3	.4	-.3	.0	-.3	4.0	5.0	-.3	-1.1	3.9
2001	-.5	-.7	-.3	-.4	-.5	-.5	-.6	-.1	-.5	-.3	-.6	.0	-4.8	-5.0	-5.4	-4.3	-3.0
2002	.7	.0	.7	.5	.4	.8	.0	-.1	.1	-.3	.5	-.6	3.0	6.3	2.5	-.2	.3
2003	.8	.1	-.3	-.6	.0	.1	.5	-.2	.7	.1	.7	.0	2.5	-2.9	2.7	3.9	1.3
2004	.2	.6	-.4	.4	.7	-.8	.7	.1	.1	.9	.2	.8	2.9	2.3	2.3	5.8	2.7
2005	.4	.7	-.1	.2	.1	.4	-.3	.3	-1.9	1.2	1.1	.5	5.7	2.3	-1.7	3.7	3.4
2006	.2	.0	.2	.3	.0	.3	-.1	.4	-.2	-.1	.0	1.0	3.9	2.4	1.6	1.0	2.3
2007	-.4	1.0	.2	.7	.0	.0	-.2	.2	.2	-.3	.6	.1	4.2	4.7	.3	1.3	2.6
2008	-.1	-.4	-.3	-.7	-.6	-.3	-.4	-1.6	-4.4	1.0	-1.3	-2.8	-1.0	-5.9	-12.5	-16.0	-3.5
2009	-2.5	-.6	-1.6	-.8	-1.0	-.3	1.2	1.1	.9	.2	.4	.3	-20.7	-10.6	7.0	6.4	-11.4
2010	1.1	.3	.7	.4	1.4	.2	.4	.4	.3	-.3	.1	1.0	7.8	8.0	5.4	1.7	5.5
2011	-.2	-.4	1.1	-.4	.1	.3	.5	.6	-.1	.7	.0	.5	2.2	1.6	4.5	4.2	3.1
2012	.6	.3	-.5	.7	.2	.0	.2	-.4	-.1	.3	.4	.3	4.1	2.5	-.1	2.0	3.1
2013	.0	.5	.4	-.1	.1	.2	-.3	.6	.5	-.1	.2	.2	3.1	1.8	1.6	2.7	2.0
2014	-.4	.8	1.0	.1	.4	.3	.2	-.2	.3	.0	.6	.0	2.8	5.6	2.3	2.4	3.0
2015	-.8	-.7	-.3	-.6	-.5	-.3	.6	-.2	-.3	-.5	-.7	-.5	-4.4	-5.5	.3	-5.4	-1.4
2016	.5	-.5	-.7	.3	-.2	.5	.1	-.1	-.1	.1	-.4	.7	-2.7	-1.5	1.1	-.2	-2.2
2017	-.2	-.4	.6	1.0	.1	.2	-.2	-.4	.1	1.2	.3	.2	.3	5.7	-1.2	5.7	1.3
2018	-.1	.4	.5	1.1	-.9	.8	.1	.7	.0	-.2	.1	.0	2.2	4.7	3.4	.5	3.2
2019	-.6	-.5	.0	-.6	.2	.1	-.5	.7	-.2	-.9	.5	-.3	-3.7	-2.4	.2	-2.2	-.7
2020	-.5	.3	-3.9	-13.4	1.6	6.5	3.8	.9	.0	.6	.4	1.2	-6.3	-42.2	43.2	6.4	-7.2
2021	.8	-3.5	2.9	.2	.9	.4	.6	.0	-1.1	1.3	.9	-.3	1.4	6.5	3.2	4.2	4.4
2022	.1	.6	.8	.3	.0	-.1	.4	.1	.3	-.2	-.3	-1.4	3.7	4.1	2.1	-2.4	3.4
2023	.4	.0															
IP (*2017=100*)																	
1993	64.6	64.9	64.9	65.1	64.8	65.0	65.1	65.0	65.4	65.9	66.2	66.6	64.8	64.9	65.2	66.2	65.3
1994	66.8	66.8	67.5	67.9	68.2	68.7	68.7	69.2	69.4	70.0	70.4	71.1	67.0	68.2	69.1	70.5	68.7
1995	71.3	71.2	71.3	71.2	71.5	71.7	71.4	72.4	72.7	72.5	72.7	73.0	71.3	71.5	72.2	72.7	71.9
1996	72.6	73.6	73.5	74.3	74.8	75.4	75.4	75.8	76.2	76.2	76.9	77.4	73.2	74.8	75.8	76.8	75.2
1997	77.5	78.4	78.9	79.0	79.4	79.8	80.5	81.3	82.0	82.8	83.4	83.8	78.3	79.4	81.3	83.3	80.6
1998	84.2	84.3	84.3	84.6	85.2	84.7	84.3	86.1	86.0	86.6	86.5	86.9	84.3	84.8	85.5	86.7	85.3
1999	87.2	87.7	87.9	88.1	88.7	88.6	89.1	89.5	89.1	90.3	90.8	91.5	87.6	88.5	89.3	90.8	89.0
2000	91.4	91.7	92.1	92.7	92.9	93.0	92.8	92.6	93.0	92.6	92.7	92.3	91.8	92.9	92.8	92.5	92.5
2001	91.9	91.3	91.1	90.7	90.3	89.8	89.2	89.1	88.7	88.4	87.9	87.8	91.4	90.3	89.0	88.0	89.7
2002	88.5	88.5	89.1	89.6	89.9	90.7	90.6	90.5	90.6	90.4	90.9	90.4	88.7	90.1	90.6	90.6	90.0
2003	91.1	91.3	91.0	90.4	90.4	90.5	91.0	90.8	91.4	91.5	92.1	92.2	91.1	90.5	91.1	91.9	91.1
2004	92.3	92.9	92.5	92.9	93.6	92.9	93.6	93.6	93.7	94.6	94.8	95.5	92.6	93.1	93.6	95.0	93.6
2005	95.9	96.6	96.4	96.6	96.7	97.1	96.8	97.2	95.3	96.4	97.5	98.0	96.3	96.8	96.4	97.3	96.7
2006	98.1	98.2	98.4	98.7	98.7	99.0	99.0	99.4	99.2	99.1	99.1	100.1	98.2	98.8	99.2	99.4	98.9
2007	99.8	100.7	100.9	101.6	101.6	101.6	101.5	101.7	101.9	101.6	102.2	102.3	100.5	101.6	101.7	102.0	101.5
2008	102.1	101.8	101.4	100.7	100.1	99.9	99.4	97.8	93.6	94.5	93.3	90.6	101.8	100.2	96.9	92.8	97.9
2009	88.4	87.8	86.5	85.8	85.0	84.7	85.7	86.7	87.4	87.6	88.0	88.2	87.6	85.1	86.6	87.9	86.8
2010	89.2	89.5	90.1	90.5	91.7	91.9	92.3	92.6	92.9	92.6	92.7	93.6	89.6	91.4	92.6	93.0	91.6
2011	93.4	93.0	94.0	93.7	93.8	94.0	94.5	95.1	95.0	95.7	95.7	96.2	93.5	93.8	94.9	95.9	94.5
2012	96.8	97.1	96.6	97.3	97.5	97.5	97.7	97.3	97.2	97.5	97.9	98.2	96.8	97.4	97.4	97.9	97.4
2013	98.2	98.7	99.1	99.0	99.1	99.2	98.9	99.5	100.0	99.9	100.2	100.4	98.7	99.1	99.5	100.2	99.3
2014	100.0	100.8	101.8	101.8	102.3	102.6	102.8	102.7	103.0	103.0	103.6	103.6	100.8	102.2	102.8	103.4	102.3
2015	102.8	102.2	101.8	101.2	100.8	100.5	101.1	100.9	100.7	100.2	99.4	98.9	102.3	100.8	100.9	99.5	100.9
2016	99.5	98.9	98.2	98.5	98.3	98.7	98.8	98.8	98.7	98.7	98.3	99.0	98.9	98.5	98.8	98.7	98.7
2017	98.8	98.4	99.1	100.0	100.1	100.3	100.1	99.7	99.8	101.0	101.3	101.5	98.8	100.2	99.8	101.2	100.0
2018	101.4	101.8	102.2	103.3	102.4	103.2	103.3	104.1	104.1	103.9	104.0	104.0	101.8	103.0	103.8	104.0	103.2
2019	103.4	102.8	102.8	102.2	102.4	102.5	102.0	102.8	102.5	101.6	102.1	101.9	103.0	102.4	102.4	101.9	102.4
2020	101.4	101.6	97.7	84.6	86.0	91.6	95.0	95.9	95.8	96.4	96.9	98.0	100.2	87.4	95.6	97.1	95.1
2021	98.8	95.4	98.1	98.3	99.2	99.5	100.1	100.1	99.1	100.3	101.2	100.9	97.4	99.0	99.8	100.8	99.2
2022	101.0	101.7	102.5	102.8	102.8	102.7	103.1	103.2	103.5	103.4	103.0	101.6	101.7	102.8	103.3	102.7	102.6
2023	102.0	102.0															

NOTE: Estimates from October 2022 through February 2023 are subject to further revision in the upcoming monthly releases.

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

Table 1B

CAPACITY AND UTILIZATION: Total

Seasonally adjusted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Q1	Q2	Q3	Q4	Annual
Capacity (*percent of 2017 output*)																	
1993	79.3	79.5	79.6	79.7	79.8	79.9	80.1	80.2	80.3	80.5	80.6	80.8	79.5	79.8	80.2	80.6	80.0
1994	81.0	81.2	81.4	81.6	81.8	82.1	82.3	82.6	82.9	83.1	83.4	83.7	81.2	81.8	82.6	83.4	82.2
1995	84.0	84.3	84.6	84.8	85.2	85.5	85.8	86.1	86.5	86.8	87.2	87.6	84.3	85.2	86.1	87.2	85.7
1996	88.0	88.4	88.8	89.2	89.6	90.0	90.4	90.8	91.3	91.7	92.1	92.6	88.4	89.6	90.8	92.1	90.2
1997	93.0	93.5	93.9	94.4	94.9	95.4	96.0	96.5	97.1	97.7	98.3	99.0	93.5	94.9	96.5	98.3	95.8
1998	99.6	100.3	100.9	101.6	102.2	102.8	103.4	103.9	104.5	105.0	105.5	105.9	100.3	102.2	103.9	105.5	103.0
1999	106.4	106.9	107.3	107.7	108.1	108.5	108.9	109.3	109.7	110.1	110.5	110.9	106.9	108.1	109.3	110.5	108.7
2000	111.3	111.6	112.0	112.4	112.8	113.2	113.5	113.9	114.3	114.7	115.0	115.4	111.6	112.8	113.9	115.0	113.3
2001	115.8	116.2	116.6	116.9	117.3	117.6	117.9	118.2	118.5	118.8	119.0	119.2	116.2	117.3	118.2	119.0	117.7
2002	119.4	119.6	119.8	119.9	120.0	120.0	120.1	120.1	120.1	120.1	120.1	120.0	119.6	120.0	120.1	120.1	119.9
2003	120.0	119.9	119.9	119.8	119.8	119.8	119.7	119.7	119.7	119.7	119.7	119.7	119.9	119.8	119.7	119.7	119.8
2004	119.7	119.6	119.6	119.6	119.6	119.6	119.6	119.6	119.6	119.6	119.7	119.7	119.6	119.6	119.6	119.7	119.6
2005	119.8	119.9	120.0	120.1	120.3	120.4	120.6	120.8	120.9	121.1	121.3	121.4	119.9	120.3	120.8	121.3	120.5
2006	121.6	121.8	122.0	122.2	122.4	122.6	122.8	123.1	123.3	123.6	123.9	124.2	121.8	122.4	123.1	123.9	122.8
2007	124.5	124.8	125.0	125.3	125.5	125.7	125.9	126.0	126.1	126.1	126.1	126.0	124.8	125.5	126.0	126.1	125.6
2008	126.0	125.9	125.8	125.7	125.7	125.7	125.7	125.8	125.9	126.1	126.2	126.4	125.9	125.7	125.8	126.2	125.9
2009	126.6	126.8	127.0	127.1	127.2	127.3	127.3	127.2	127.1	127.0	126.8	126.6	126.8	127.2	127.2	126.8	127.0
2010	126.3	126.1	125.8	125.6	125.3	125.0	124.8	124.6	124.4	124.2	124.1	124.0	126.1	125.3	124.6	124.1	125.0
2011	124.0	123.9	124.0	124.0	124.1	124.2	124.3	124.5	124.7	124.9	125.1	125.3	124.0	124.1	124.5	125.1	124.4
2012	125.6	125.8	126.0	126.3	126.5	126.7	126.9	127.2	127.4	127.6	127.8	127.9	125.8	126.5	127.2	127.8	126.8
2013	128.1	128.3	128.4	128.6	128.7	128.8	129.0	129.1	129.1	129.2	129.3	129.4	128.3	128.7	129.1	129.3	128.8
2014	129.5	129.6	129.7	129.8	129.9	130.0	130.1	130.2	130.4	130.5	130.6	130.7	129.6	129.9	130.2	130.6	130.1
2015	130.8	130.8	130.9	130.9	130.9	130.9	130.9	130.9	130.9	130.8	130.8	130.8	130.8	130.9	130.9	130.8	130.9
2016	130.8	130.8	130.8	130.8	130.9	130.9	131.0	131.0	131.0	131.1	131.1	131.1	130.8	130.9	131.0	131.1	130.9
2017	131.1	131.0	131.0	130.9	130.8	130.7	130.5	130.4	130.2	130.1	129.9	129.8	131.0	130.8	130.4	129.9	130.5
2018	129.6	129.5	129.5	129.4	129.4	129.3	129.3	129.4	129.4	129.5	129.6	129.6	129.6	129.4	129.4	129.6	129.5
2019	129.7	129.8	129.9	130.0	130.2	130.3	130.4	130.5	130.6	130.7	130.8	130.9	129.8	130.2	130.5	130.8	130.3
2020	131.0	131.0	131.0	131.0	131.0	130.9	130.7	130.6	130.3	130.1	129.8	129.6	131.0	130.9	130.5	129.8	130.6
2021	129.3	129.0	128.7	128.4	128.2	127.9	127.7	127.5	127.4	127.3	127.2	127.2	129.0	128.2	127.5	127.2	128.0
2022	127.2	127.2	127.3	127.4	127.5	127.6	127.7	127.9	128.1	128.2	128.4	128.6	127.2	127.5	127.9	128.4	127.8
2023	128.8	128.9															
Utilization (*percent*)																	
1993	81.4	81.7	81.5	81.6	81.2	81.3	81.3	81.1	81.4	81.9	82.1	82.4	81.5	81.4	81.3	82.1	81.6
1994	82.5	82.3	82.9	83.2	83.3	83.7	83.5	83.8	83.8	84.2	84.4	85.0	82.6	83.4	83.7	84.5	83.5
1995	84.9	84.5	84.3	83.9	84.0	83.9	83.3	84.0	84.0	83.6	83.4	83.3	84.6	83.9	83.8	83.4	83.9
1996	82.5	83.3	82.8	83.3	83.5	83.7	83.4	83.4	83.5	83.1	83.5	83.6	82.9	83.5	83.4	83.4	83.3
1997	83.3	83.9	84.0	83.7	83.7	83.6	83.9	84.2	84.5	84.7	84.8	84.6	83.8	83.7	84.2	84.7	84.1
1998	84.5	84.1	83.6	83.3	83.3	82.4	81.6	82.8	82.3	82.5	82.0	82.0	84.0	83.0	82.2	82.2	82.9
1999	82.0	82.1	81.9	81.8	82.0	81.6	81.8	81.9	81.2	82.0	82.1	82.5	82.0	81.8	81.6	82.2	81.9
2000	82.2	82.2	82.2	82.5	82.4	82.2	81.8	81.3	81.3	80.8	80.5	80.0	82.2	82.4	81.5	80.4	81.6
2001	79.3	78.6	78.1	77.6	77.0	76.3	75.7	75.4	74.8	74.4	73.8	73.7	78.7	77.0	75.3	74.0	76.2
2002	74.1	74.0	74.4	74.7	75.0	75.5	75.5	75.4	75.5	75.3	75.7	75.3	74.1	75.1	75.4	75.4	75.0
2003	76.0	76.1	75.9	75.5	75.5	75.6	76.0	75.8	76.3	76.4	77.0	77.0	76.0	75.5	76.1	76.8	76.1
2004	77.2	77.6	77.4	77.7	78.3	77.7	78.2	78.3	78.4	79.1	79.2	79.8	77.4	77.9	78.3	79.4	78.2
2005	80.0	80.5	80.4	80.4	80.4	80.7	80.3	80.5	78.8	79.6	80.4	80.7	80.3	80.5	79.9	80.2	80.2
2006	80.7	80.6	80.7	80.8	80.7	80.8	80.6	80.8	80.5	80.2	80.0	80.6	80.7	80.7	80.6	80.3	80.6
2007	80.1	80.7	80.7	81.1	81.0	80.8	80.6	80.7	80.9	80.6	81.1	81.1	80.5	81.0	80.7	80.9	80.8
2008	81.1	80.8	80.6	80.1	79.7	79.5	79.1	77.8	74.3	75.0	73.9	71.7	80.8	79.8	77.1	73.5	77.8
2009	69.8	69.3	68.1	67.5	66.8	66.6	67.3	68.1	68.8	69.0	69.4	69.7	69.1	66.9	68.1	69.4	68.4
2010	70.6	71.0	71.6	72.0	73.2	73.5	73.9	74.3	74.7	74.5	74.7	75.5	71.1	72.9	74.3	74.9	73.3
2011	75.3	75.0	75.8	75.5	75.6	75.7	76.0	76.4	76.2	76.6	76.5	76.8	75.4	75.6	76.2	76.6	76.0
2012	77.1	77.2	76.6	77.1	77.1	76.9	77.0	76.5	76.4	76.5	76.7	76.8	77.0	77.0	76.6	76.6	76.8
2013	76.7	76.9	77.1	77.0	77.0	77.0	76.7	77.1	77.5	77.3	77.5	77.6	76.9	77.0	77.1	77.4	77.1
2014	77.2	77.8	78.5	78.5	78.7	78.9	79.0	78.8	79.0	78.9	79.4	79.3	77.8	78.7	78.9	79.2	78.7
2015	78.6	78.1	77.8	77.3	77.0	76.7	77.2	77.1	76.9	76.6	76.0	75.6	78.2	77.0	77.1	76.1	77.1
2016	76.0	75.6	75.1	75.3	75.1	75.4	75.5	75.4	75.3	75.3	75.0	75.5	75.6	75.2	75.4	75.3	75.4
2017	75.4	75.1	75.6	76.4	76.6	76.8	76.7	76.4	76.6	77.7	77.9	78.2	75.4	76.6	76.6	77.9	76.6
2018	78.2	78.6	79.0	79.9	79.2	79.8	79.9	80.4	80.4	80.3	80.3	80.2	78.6	79.6	80.3	80.3	79.7
2019	79.7	79.2	79.1	78.6	78.7	78.7	78.2	78.7	78.5	77.7	78.1	77.8	79.3	78.7	78.5	77.9	78.6
2020	77.4	77.6	74.5	64.6	65.6	70.0	72.7	73.4	73.5	74.1	74.6	75.6	76.5	66.7	73.2	74.8	72.8
2021	76.4	73.9	76.2	76.5	77.4	77.8	78.4	78.5	77.8	78.8	79.5	79.3	75.5	77.2	78.2	79.2	77.6
2022	79.4	79.9	80.5	80.7	80.6	80.5	80.7	80.7	80.8	80.6	80.2	79.0	80.0	80.6	80.8	79.9	80.3
2023	79.2	79.1															

NOTE: Estimates from October 2022 through February 2023 are subject to further revision in the upcoming monthly releases.

Table 2
Rates Of Change in Industrial Production, Market and Industry Group Summary: 2018–22[1]

Item		Revised change (percent)					Difference between revised and earlier changes (percentage points)				
		2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Total IP		2.7	-2.0	-4.7	3.8	1.9	.0	.0	-.3	-.6	.1
Market Groups											
Final products and nonindustrial supplies		1.0	-2.1	-3.3	3.4	2.1	-.1	-.2	-.8	-.6	.1
Consumer goods		.9	-1.0	.0	1.6	1.2	.0	-.5	-.7	.2	-.4
Durable		3.9	-3.4	6.7	-.3	-.3	-.3	-1.3	-1.6	-.2	-2.1
Automotive products		4.1	-3.3	10.0	-5.5	1.9	-.3	-2.0	-2.6	-.1	-4.3
Home electronics		20.0	.0	13.9	10.8	3.2	1.0	-2.2	-.2	-1.5	-6.4
Appliances, furniture, carpeting		-2.3	-3.9	4.1	1.8	-7.9	-1.5	.6	1.4	-2.7	.2
Miscellaneous goods		5.6	-3.5	.2	9.3	-.6	.2	-.5	-1.1	.5	1.2
Nondurable		.0	-.3	-2.0	2.4	1.6	.1	-.2	-.3	.3	.0
Non-energy		-1.4	1.3	-.4	1.4	1.0	.0	-.2	-.5	-.5	.2
Foods and tobacco		-2.1	2.4	.7	.0	.2	-.1	-.1	.2	.1	.4
Clothing		-1.0	-1.1	-8.3	6.1	2.9	.1	-.5	1.4	.1	-2.2
Chemical products		-.5	1.7	-1.6	3.9	3.3	.2	-.5	-2.3	-2.4	.1
Paper products		-2.6	-7.2	-3.0	-.8	-4.9	.3	-.1	2.2	3.6	-.2
Energy		4.2	-5.1	-7.8	6.4	3.1	.2	-.2	.3	3.3	-1.4
Business equipment		-1.5	-6.4	-9.7	5.3	7.7	-.4	1.4	-2.1	-2.4	3.7
Transit		-13.7	-13.2	-18.6	-5.9	21.4	-1.3	5.5	-6.6	-8.1	13.9
Information processing		5.8	-.6	-6.2	9.5	-.5	.3	-.9	-2.3	-.6	.8
Industrial and other		3.1	-5.4	-7.1	7.2	6.8	-.1	.3	.1	-1.7	2.1
Defense and space equipment		7.8	7.8	-8.6	4.9	2.4	.4	-3.6	-5.7	-5.1	-1.4
Construction supplies		.8	-2.4	-.9	5.5	-1.2	-.1	-.3	.3	-.4	-.1
Business supplies		.7	-2.0	-3.2	3.7	1.2	.0	-.3	.4	.5	.6
Materials		4.9	-1.9	-6.5	4.4	1.6	.1	.2	.4	-.8	.0
Non-energy		1.4	-4.0	-3.1	3.1	-1.1	.1	.3	.6	-1.2	.2
Durable		2.5	-5.1	-4.5	2.8	1.1	.2	.5	.9	-1.7	.4
Consumer parts		3.5	-9.6	-1.4	-5.2	4.2	.4	3.2	1.7	-6.5	.1
Equipment parts		2.7	-2.9	-6.9	6.9	.6	.2	.3	.4	-1.7	.7
Other		2.0	-4.7	-4.3	3.5	.4	.0	-.2	.9	.1	.3
Nondurable		-.3	-2.3	-.8	3.5	-4.4	.0	.0	.0	-.5	-.1
Textile		-.4	-4.2	-6.3	1.3	-5.9	-.3	.5	-2.5	-3.4	3.6
Paper		1.4	-.2	-8.4	.0	-4.6	-.3	.2	-.2	-2.0	.8
Chemical		-1.6	-5.1	1.4	6.5	-6.5	.1	-.1	1.1	.3	-1.0
Energy		10.5	1.5	-12.6	7.2	5.3	.0	.0	.1	.2	-.1
Industry Groups											
Manufacturing[2]		.6	-2.7	-3.0	3.5	.7	.0	.0	-.4	-.7	.3
Manufacturing (NAICS)	31–33	.8	-2.6	-3.0	3.7	.8	.0	.0	-.5	-.8	.4
Durable manufacturing		2.0	-4.1	-3.9	3.5	2.5	.0	.2	-.8	-1.6	.8
Wood products	321	-3.8	.2	2.1	.0	-3.5	-.1	.4	-.9	-1.6	1.7
Nonmetallic mineral products	327	.4	-.5	.4	2.8	7.7	.1	-.2	1.4	2.9	1.2
Primary metals	331	2.9	-7.2	-4.4	6.0	-5.1	-.2	.4	.2	-1.7	.7
Fabricated metal products	332	4.0	-4.8	-7.3	6.0	1.4	.0	-.1	.5	.1	-.9
Machinery	333	3.4	-7.1	-6.8	8.2	4.5	.0	.3	-.1	-2.1	2.6
Computer and electronic products	334	3.8	1.1	-2.1	6.7	-1.1	.5	-.1	-1.1	-2.3	1.7
Electrical equip., appliances, and components	335	2.7	-3.0	-.3	3.2	1.0	-.9	.2	.2	-2.5	.3
Motor vehicles and parts	3361–3	5.6	-5.5	2.7	-5.2	7.1	.1	.5	-1.2	-1.2	-.6
Aerospace and miscellaneous transportation equipment	3364–9	-6.9	-3.0	-13.7	-.3	9.3	-.5	1.1	-5.9	-7.3	1.8
Furniture and related products	337	-.4	-5.4	-6.8	2.4	-2.9	-.5	1.3	1.5	-2.5	.2
Miscellaneous	339	4.2	-5.9	-1.3	8.1	4.4	.1	-.7	-1.1	.6	1.2
Nondurable manufacturing		-.5	-1.0	-2.1	3.9	-1.0	.0	-.3	-.1	.1	.0
Food, beverage, and tobacco products	311,2	-1.4	2.5	.7	.1	.5	-.1	-.1	.0	.1	.5
Textile and product mills	313,4	.7	-3.8	-4.5	3.3	-8.1	-.1	.1	-.9	-1.5	1.5
Apparel and leather	315,6	-1.1	-1.7	-8.3	6.7	3.6	.1	-.4	1.2	-.1	-1.5
Paper	322	2.3	-.4	-4.1	-1.1	-6.0	-.2	.7	.5	-1.5	.5
Printing and support	323	-2.4	-4.4	-8.1	3.1	.8	-1.2	-2.4	-.1	-.3	.8
Petroleum and coal products	324	.8	-5.1	-18.9	18.2	-2.6	.2	-.6	-2.5	-.5	-2.9
Chemicals	325	-1.6	-1.7	-.1	5.9	-1.2	.2	-.2	.0	-.1	-.2
Plastics and rubber products	326	2.7	-3.9	-.7	3.6	-.1	.3	-.6	.6	1.3	.1
Other manufacturing (non-NAICS)	**1133,5111**	-4.8	-3.9	-1.9	-2.8	-4.6	.4	-.4	.9	2.8	-.9
Mining	**21**	14.5	1.8	-17.6	10.0	5.5	.0	.0	.4	-.9	-.8
Utilities	**2211,2**	3.1	-1.6	-2.4	.0	4.3	.0	.1	.1	.3	-.1
Electric	2211	1.5	-1.2	-1.5	.4	2.6	.0	.0	.1	.0	.0
Natural gas	2212	13.1	-4.1	-8.2	-2.4	14.9	.3	.5	.3	2.2	-.4

1. Rates of change 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.
2. 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 a part of manufacturing and are included in the industrial sector.

Table 3
Rates Of Change in Industrial Production, Special Aggregates and Selected Detail: 2018–22[1]

Item		Revised change (percent)					Difference between revised and earlier changes (percentage points)				
		2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Total industry		2.7	-2.0	-4.7	3.8	1.9	.0	.0	-.3	-.6	.1
Energy		8.8	-.3	-12.2	7.6	5.0	.1	.0	.1	.4	-.9
Consumer products		4.2	-5.1	-7.8	6.4	3.1	.2	-.2	.3	3.3	-1.4
Commercial products		2.6	.9	-8.2	6.1	5.5	.1	.2	-.5	-.9	.8
Oil and gas well drilling	213111	31.9	-12.9	-48.0	53.1	11.8	1.2	-1.4	2.2	-20.0	-28.9
Converted fuel		5.0	-2.6	-3.8	4.2	2.7	.1	-.1	.1	1.2	-.6
Primary energy		12.7	3.3	-16.4	8.6	6.1	.0	.1	.1	-.2	.1
Non-energy		.6	-2.6	-2.4	2.8	.5	.0	.0	-.4	-.9	.4
Selected high-technology industries		7.2	4.7	2.7	7.0	1.8	1.0	-.6	-3.6	-4.0	3.7
Computers and peripheral equipment	3341	28.3	-.9	-8.8	18.4	12.5	1.1	-9.8	-22.5	-2.4	-.6
Communications equipment	3342	15.8	.4	2.3	18.5	11.0	1.4	-1.7	-3.8	4.4	1.9
Semiconductors and related electronic components	3344	1.4	7.3	4.7	2.1	-2.8	.9	1.4	-.4	-6.6	4.8
Excluding selected high-technology industries		.4	-2.8	-2.5	2.7	.5	-.1	.0	-.3	-.8	.3
Motor vehicles and parts	3361–3	5.6	-5.5	2.7	-5.2	7.1	.1	.5	-1.2	-1.2	-.6
Motor vehicles	3361	10.0	-3.6	7.1	-10.4	13.1	.0	.5	-2.1	-1.6	-1.3
Motor vehicle parts	3363	3.3	-8.3	-1.2	-3.8	8.0	.1	.8	1.1	-2.9	-1.0
Excluding motor vehicles and parts		-.1	-2.6	-3.0	3.5	.0	-.1	.0	-.2	-.8	.3
Consumer goods		-.8	.4	.0	2.1	.3	.0	-.2	-.4	-.5	.3
Business equipment		-4.1	-6.7	-9.1	4.6	6.8	-.5	1.8	-1.3	-3.1	2.8
Construction supplies		.7	-2.4	-.9	5.4	-1.3	-.1	-.3	.3	-.4	-.1
Business supplies		.0	-3.4	-1.8	2.9	-.1	-.1	-.5	.9	1.4	.3
Materials		1.2	-4.1	-3.7	3.9	-2.0	.0	.0	.3	-.7	-.1
Measures excluding selected high-technology industries											
Total industry		2.6	-2.2	-4.9	3.8	1.8	.0	.0	-.2	-.5	.0
Manufacturing[2]		.4	-2.9	-3.2	3.4	.6	.0	.0	-.3	-.6	.2
Durable		1.6	-4.5	-4.3	3.2	2.6	-.1	.3	-.7	-1.5	.6
Measures excluding motor vehicles and parts											
Total industry		2.5	-1.8	-5.2	4.5	1.6	.0	.0	-.2	-.6	.1
Manufacturing[2]		.2	-2.4	-3.5	4.3	.2	.0	-.1	-.4	-.7	.4
Durable		1.3	-3.7	-5.1	5.1	1.8	-.1	.2	-.8	-1.7	1.0
Measures excluding selected high-technology industries and motor vehicles and parts											
Total industry		2.4	-1.9	-5.4	4.4	1.5	.0	.0	-.1	-.5	.0
Manufacturing[2]		.0	-2.6	-3.7	4.2	.1	.0	-.1	-.3	-.5	.3
Stage-of-process components of non-energy materials, measures of the input to											
Finished processors		2.6	-4.5	-5.5	1.8	.5	.2	1.1	.7	-3.5	.6
Primary and semifinished processors		.7	-3.7	-1.7	3.8	-1.9	.1	-.1	.5	.0	.0
STAGE-OF-PROCESS GROUPS											
Crude		9.7	.4	-11.1	6.5	2.1	.0	.1	.9	.7	-.6
Primary and semifinished		1.6	-3.8	-4.0	3.6	.6	.0	-.1	.3	-.2	.2
Finished		.9	-.8	-2.9	3.0	3.3	.0	.0	-1.5	-1.8	.3

1. See footnote 1 to table 2.
2. See footnote 2 to table 2.

Table 4

Annual Rates of Change for Industrial Production: 2018–22[1]

Item	Revised change (percent)					Difference between revised and earlier changes (percentage points)				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Total IP	3.2	-.7	-7.2	4.4	3.4	.0	.0	-.2	-.6	-.4
Market Groups										
Consumer goods	.6	-.4	-3.3	4.4	1.8	-.2	-.1	-.8	-.1	-.5
Durable	2.6	-1.7	-5.4	9.9	2.3	-.7	-.6	-2.0	-.3	-1.4
Nondurable	.1	-.1	-2.7	2.8	1.7	.0	.0	-.4	.1	-.2
Business equipment	3.6	-7.5	-12.5	5.2	8.8	-.2	.3	.5	-4.6	2.9
Defense and space equipment	2.9	11.3	-6.8	3.3	2.7	.6	-1.7	-4.7	-7.1	-1.9
Construction supplies	1.7	-1.5	-3.9	4.8	2.9	.0	-.2	-.1	.1	-.4
Business supplies	1.9	-2.0	-5.9	4.6	3.3	-.1	-.2	-.1	.9	.1
Materials	4.8	.5	-8.6	4.1	3.4	.1	.1	.3	-.1	-.6
Non-energy	1.5	-2.3	-7.3	4.8	1.6	.1	.1	.5	-.4	-.7
Energy	10.3	4.9	-10.9	2.9	6.0	.0	.0	.0	.4	-.3
Industry Groups										
Manufacturing[2]	1.3	-2.0	-6.6	5.0	2.7	.0	.0	-.2	-.7	-.2
Manufacturing (NAICS)	1.4	-1.9	-6.5	5.0	2.9	-.1	.0	-.3	-.8	-.2
Durable manufacturing	3.1	-2.8	-8.9	6.1	4.3	-.1	.0	-.3	-1.7	.0
Nondurable manufacturing	-.4	-.9	-3.9	3.9	1.5	.0	-.1	-.2	.1	-.3
Other manufacturing (non-NAICS)	-3.3	-4.4	-7.8	2.4	-4.2	.0	-.1	.2	2.7	-.3
Mining	13.3	6.6	-14.8	3.2	6.8	.1	-.1	.2	.0	-1.4
Utilities	4.9	-.8	-2.9	2.0	3.1	.0	.0	.0	.1	-.3

1. The rates of change are calculated as the percent change in the annual averages of not seasonally adjusted industrial production indexes rather than as the percent change between the fourth quarter of one year and the fourth quarter of the next.
2. See footnote 2 to table 2.

Table 5

Rates of Change in Capacity, by Industry Groups: 2019–23[1]

Item	Revised change (percent)					Difference between revised and earlier changes (percentage points)				
	2019	2020	2021	2022	2023	2019	2020	2021	2022	2023
Total industry	1.0	-.8	-2.0	.9	1.5	-.2	-.1	-.9	-.7	.1
Manufacturing[2]	-.5	-1.0	-1.0	.7	1.3	-.1	-.2	-.6	-.2	.1
Manufacturing (NAICS)	-.4	-.9	-.9	.9	1.4	-.1	-.2	-.6	-.3	.1
Durable manufacturing	.0	.3	-.6	1.5	1.7	-.1	.4	-.6	.0	.4
Nondurable manufacturing	-.8	-2.2	-1.0	.3	1.2	-.1	-.9	-.4	-.3	-.2
Other manufacturing (non-NAICS)	-5.9	-5.1	-5.2	-5.6	-5.0	-.2	-.2	1.2	.8	.2
Mining	8.7	-2.8	-9.9	1.9	-.4	-.1	.5	-2.6	-1.6	-.9
Utilities	1.5	2.4	2.3	3.1	3.5	.0	-.1	-.1	.5	.5
Selected high-technology industries	6.3	5.2	3.7	6.5	10.5	-1.8	2.9	-4.0	-5.0	4.0
Manufacturing[2] ex. selected high-technology industries	-.7	-1.2	-1.2	.6	1.1	-.1	-.3	-.4	-.1	.0
Stage-of-process groups										
Crude	5.9	-2.5	-8.1	1.2	-.4	.2	.4	-2.1	-1.4	-.7
Primary and semifinished	-.5	-.3	-.8	1.1	1.4	-.2	-.2	-.4	.1	.1
Finished	.2	-.7	.1	1.3	2.2	-.1	-.2	-.4	-.3	.4

1. Rates of change 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.
2. See footnote 2 to table 2.

Table 6

Revised and Earlier Capacity Utilization Rates, by Industry Groups

Percent of capacity, seasonally adjusted

Item		Revised Rate					Difference between revised and earlier rates (percentage points)			
		1972-2021 Ave.	2019 Q4	2020 Q4	2021 Q4	2022 Q4	2019 Q4	2020 Q4	2021 Q4	2022 Q4
Total industry		79.7	77.9	74.8	79.2	79.9	.3	.2	.5	1.0
Manufacturing[1]		78.2	76.7	75.2	78.6	78.6	.3	.2	.1	.5
Manufacturing (NAICS)	31–33	78.2	76.9	75.2	78.7	78.6	.3	.1	.0	.5
Durable manufacturing		76.8	75.8	72.6	75.6	76.4	.8	-.2	-.9	-.3
Wood products	321	76.8	78.7	82.7	84.5	80.6	-.9	1.0	3.2	4.3
Nonmetallic mineral products	327	73.4	72.8	73.9	77.5	84.1	-1.2	-1.3	.5	3.0
Primary metals	331	77.8	70.4	66.0	74.6	69.3	-.9	-.4	-.5	-.8
Fabricated metal products	332	78.0	78.8	72.9	77.6	78.9	.6	.3	-.1	-1.0
Machinery	333	77.9	78.6	74.8	81.4	84.2	.9	.9	-1.0	.8
Computer and electronic products	334	77.1	74.0	70.4	73.3	69.9	.3	-2.8	-2.1	1.5
Electrical equip., appliances, and components	335	81.8	77.5	78.4	78.9	77.9	3.7	3.1	-1.9	-2.9
Motor vehicles and parts	3361–3	74.9	72.6	72.4	69.7	73.3	.2	-.6	-.6	-2.1
Aerospace and miscellaneous transportation equipment	3364–9	73.9	73.1	62.4	62.9	68.5	3.3	-1.1	-5.4	-4.9
Furniture and related products	337	77.5	84.4	78.8	79.0	75.5	1.9	2.7	-.9	-.4
Miscellaneous	339	77.0	80.3	82.1	86.1	84.1	.5	.2	-.1	-.7
Nondurable manufacturing		80.0	78.1	78.1	82.0	80.9	-.2	.4	.9	1.1
Food, beverage, and tobacco products	311,2	80.4	78.2	80.9	80.8	80.5	.6	.9	1.5	2.0
Textile and product mills	313,4	78.3	72.5	70.4	74.4	69.2	1.0	.7	.8	2.3
Apparel and leather	315,6	75.8	72.8	68.7	75.6	76.4	-.4	-.8	1.2	-2.0
Paper	322	86.6	87.8	87.0	88.4	83.6	.0	1.5	2.3	2.6
Printing and support	323	79.5	74.1	73.6	80.3	84.2	-2.4	.9	2.7	5.2
Petroleum and coal products	324	85.3	84.9	71.8	90.7	87.5	.2	1.2	4.7	3.6
Chemicals	325	76.5	74.0	74.6	79.5	78.6	-1.1	-.5	-1.1	-.9
Plastics and rubber products	326	82.1	83.5	84.0	84.5	81.1	.3	1.0	-1.0	-3.3
Other manufacturing (non-NAICS)	**1133,5111**	79.6	73.0	75.4	77.3	78.1	.9	1.8	3.1	1.8
Mining	21	86.4	84.7	71.8	87.6	90.7	.2	.1	1.8	2.6
Utilities	2211,2	84.7	78.6	74.8	73.1	73.9	.5	.6	.8	.4
Selected high-technology industries		77.4	77.1	75.3	77.7	74.3	.9	-3.9	-4.0	2.4
Computers and peripheral equipment	3341	76.7	60.7	57.0	69.3	75.2	-9.5	-20.4	-24.0	-24.2
Communications equipment	3342	75.5	68.2	63.0	70.8	72.9	.7	-1.3	5.6	11.2
Semiconductors and related electronic components	3344	79.1	84.6	84.2	81.9	74.5	3.8	-1.6	-4.7	2.4
Measures excluding selected high-technology industries										
Total industry		79.8	77.9	74.8	79.3	80.1	.3	.3	.6	1.0
Manufacturing[1]		78.3	76.7	75.2	78.7	78.7	.3	.3	.2	.5
STAGE-OF-PROCESS GROUPS										
Crude		85.6	83.7	74.6	87.4	88.4	-.3	.4	2.6	2.8
Primary and semifinished		80.2	77.8	75.3	78.6	78.2	.4	.8	.9	1.0
Finished		76.7	75.7	74.2	76.2	77.4	.4	-.6	-1.4	-.7

1. See footnote 2 to table 2.

Table 7A
INDUSTRIAL PRODUCTION: Manufacturing[1]
Seasonally adjusted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Q1	Q2	Q3	Q4	Annual[2]
IP (*percent change*)																	
1993	.9	.3	-.2	.5	-.1	-.1	.2	-.2	.7	.8	.5	.6	4.7	1.3	.7	7.2	3.5
1994	.1	.1	1.3	.9	.6	.3	.4	.9	.4	.9	.8	1.1	4.9	9.5	6.1	10.1	5.9
1995	.2	-.2	.3	-.3	.4	.5	-.7	1.2	.9	-.1	.1	.3	4.4	.6	3.3	4.1	5.1
1996	-.6	1.5	-.2	1.2	.8	.9	.4	.4	.8	-.1	.9	.9	2.0	10.0	7.7	5.9	4.9
1997	.1	1.4	1.0	-.1	.7	.6	.8	1.2	.9	.9	1.0	.5	9.3	7.1	10.7	11.6	8.4
1998	.8	.2	-.2	.5	.5	-.7	-.4	2.4	-.1	.9	.1	.6	6.1	2.1	3.4	7.7	6.7
1999	.3	.9	.0	.3	.8	-.2	.4	.6	-.4	1.5	.7	.7	5.2	4.4	3.3	8.7	5.1
2000	.0	.2	.7	.6	.0	.2	.1	-.7	.5	-.4	-.3	-.6	4.4	4.9	-.3	-2.6	4.1
2001	-.4	-.7	-.2	-.4	-.5	-.6	-.5	-.4	-.4	-.4	-.4	.2	-5.6	-5.3	-5.8	-4.0	-3.6
2002	.7	.0	.7	.3	.5	1.0	-.1	.1	.1	-.3	.5	-.6	3.6	5.8	3.2	-.4	.5
2003	.8	-.1	.1	-.8	.1	.4	.3	-.5	.8	.1	.9	-.1	2.1	-2.2	2.5	4.4	1.3
2004	-.1	.8	.0	.4	.7	-.7	.9	.5	.0	.9	.0	.8	2.6	3.4	4.0	5.5	3.1
2005	.6	.8	-.5	.4	.3	.2	-.4	.5	-1.1	1.4	.9	.1	6.4	2.6	-.6	6.1	4.1
2006	.8	-.3	.0	.3	-.2	.3	-.3	.7	.1	-.4	.1	1.5	3.9	.7	1.1	1.6	2.6
2007	-.3	.3	.8	.6	-.1	.3	-.1	-.3	.3	-.2	.5	.2	4.7	5.5	.1	1.3	2.8
2008	-.2	-.7	-.4	-1.0	-.6	-.7	-1.1	-1.3	-3.4	-.6	-2.5	-3.4	-2.0	-8.4	-14.0	-22.0	-4.8
2009	-3.2	-.1	-1.8	-.7	-1.0	-.2	1.6	1.1	1.0	.1	1.0	-.2	-24.7	-10.3	9.1	7.1	-13.8
2010	1.0	-.1	1.3	.8	1.3	.0	.5	.1	.1	.1	.1	.5	6.6	10.4	4.3	1.6	5.9
2011	.1	.1	.6	-.6	.0	.1	.6	.4	.3	.5	-.2	.7	3.0	-.2	4.2	3.9	2.9
2012	.9	.4	-.5	.5	-.4	.3	-.2	-.1	-.2	-.2	.6	.7	5.5	.5	-1.2	1.0	2.6
2013	-.2	.4	-.1	-.3	.3	.2	-.8	.9	.1	.1	.0	-.2	2.8	.1	.2	1.6	.9
2014	-1.1	.9	.9	.0	.3	.3	.4	-.6	.0	-.1	.7	-.2	-1.1	4.8	1.4	.3	1.1
2015	-.6	-.8	.4	.0	.0	-.4	.7	-.3	-.3	-.1	-.3	-.3	-3.4	-.6	.8	-2.7	-.5
2016	.4	-.4	-.1	-.2	-.1	.2	.0	-.3	.2	.1	-.1	.0	-.6	-1.2	.0	.5	-.8
2017	.2	-.1	-.4	1.1	-.1	.0	-.4	-.2	.0	1.1	.1	-.2	-.1	3.0	-2.0	4.0	.6
2018	-.4	1.0	-.1	.7	-.9	.6	.0	.3	.0	-.5	-.3	.3	.4	2.3	1.6	-1.7	1.3
2019	-.9	-.5	-.3	-.6	.0	.4	-.7	.7	-.6	-.9	.9	.1	-4.6	-3.2	-.6	-2.1	-2.0
2020	-.2	.2	-4.6	-15.5	4.4	7.7	3.6	1.5	.0	.8	.6	.6	-5.0	-44.0	53.9	8.0	-6.6
2021	1.0	-3.9	3.0	.1	1.1	-.1	1.0	-.3	-.9	1.3	.9	-.1	-.1	5.9	3.4	4.9	5.0
2022	-.6	1.2	.8	.1	-.4	-.4	.2	.2	.2	.1	-.7	-1.9	3.0	2.7	.1	-3.0	2.7
2023	1.4	.1															
IP (*2017=100*)																	
1993	64.9	65.1	65.0	65.3	65.2	65.1	65.3	65.1	65.6	66.1	66.5	66.9	65.0	65.2	65.3	66.5	65.5
1994	66.9	67.0	67.9	68.5	68.9	69.1	69.4	70.0	70.2	70.9	71.5	72.3	67.3	68.8	69.9	71.5	69.4
1995	72.4	72.2	72.4	72.2	72.4	72.8	72.3	73.1	73.8	73.7	73.7	74.0	72.3	72.4	73.0	73.8	72.9
1996	73.5	74.6	74.4	75.3	75.9	76.6	76.9	77.3	77.9	77.8	78.5	79.2	74.2	75.9	77.4	78.5	76.5
1997	79.3	80.4	81.1	81.1	81.7	82.2	82.8	83.8	84.6	85.4	86.2	86.6	80.3	81.6	83.7	86.1	82.9
1998	87.3	87.4	87.3	87.7	88.2	87.5	87.2	89.3	89.2	89.9	90.1	90.6	87.4	87.8	88.5	90.2	88.5
1999	90.8	91.6	91.6	91.9	92.7	92.4	92.8	93.4	93.0	94.4	95.0	95.7	91.3	92.3	93.1	95.0	93.0
2000	95.7	96.0	96.6	97.2	97.2	97.4	97.4	96.8	97.3	96.9	96.6	96.0	96.1	97.2	97.2	96.5	96.8
2001	95.6	95.0	94.8	94.4	93.9	93.3	92.9	92.5	92.1	91.7	91.4	91.5	95.1	93.9	92.5	91.5	93.3
2002	92.2	92.2	92.8	93.1	93.5	94.4	94.3	94.4	94.5	94.2	94.7	94.1	92.4	93.7	94.4	94.3	93.7
2003	94.8	94.7	94.8	94.1	94.2	94.6	94.9	94.4	95.2	95.4	96.2	96.1	94.8	94.3	94.9	95.9	95.0
2004	96.0	96.8	96.7	97.1	97.8	97.1	98.0	98.4	98.4	99.3	99.3	100.1	96.5	97.3	98.3	99.6	97.9
2005	100.7	101.6	101.1	101.5	101.8	102.0	101.7	102.2	101.1	102.5	103.4	103.6	101.1	101.8	101.7	103.2	101.9
2006	104.4	104.1	104.1	104.4	104.2	104.5	104.1	104.9	104.9	104.5	104.6	106.1	104.2	104.4	104.6	105.1	104.6
2007	105.8	106.1	107.0	107.7	107.6	107.9	107.9	107.5	107.9	107.7	108.2	108.4	106.3	107.7	107.8	108.1	107.5
2008	108.2	107.5	107.0	105.9	105.3	104.5	103.4	102.0	98.5	97.9	95.5	92.3	107.5	105.2	101.3	95.2	102.3
2009	89.3	89.2	87.6	87.0	86.1	85.9	87.3	88.3	89.2	89.2	90.1	90.0	88.7	86.3	88.2	89.8	88.3
2010	90.9	90.8	92.0	92.7	93.9	93.9	94.4	94.5	94.6	94.6	94.7	95.2	91.2	93.5	94.5	94.8	93.5
2011	95.3	95.4	96.0	95.5	95.5	95.6	96.1	96.5	96.8	97.3	97.1	97.8	95.5	95.5	96.5	97.4	96.2
2012	98.6	99.0	98.5	99.0	98.6	98.9	98.7	98.6	98.4	98.1	98.8	99.5	98.7	98.8	98.5	98.8	98.7
2013	99.2	99.6	99.5	99.2	99.5	99.7	99.0	99.8	99.9	100.0	100.0	99.8	99.5	99.5	99.6	100.0	99.6
2014	98.8	99.7	100.6	100.6	100.8	101.2	101.6	101.0	101.0	100.9	101.6	101.4	99.7	100.9	101.2	101.3	100.8
2015	100.8	100.0	100.4	100.4	100.4	100.0	100.8	100.5	100.2	100.0	99.8	99.5	100.4	100.3	100.5	99.8	100.2
2016	99.9	99.5	99.5	99.3	99.2	99.5	99.5	99.2	99.4	99.5	99.4	99.5	99.6	99.3	99.3	99.5	99.4
2017	99.6	99.5	99.2	100.3	100.1	100.2	99.8	99.6	99.6	100.7	100.8	100.5	99.5	100.2	99.7	100.7	100.0
2018	100.1	101.1	101.0	101.7	100.8	101.5	101.5	101.8	101.9	101.4	101.1	101.4	100.8	101.3	101.7	101.3	101.3
2019	100.5	100.0	99.7	99.1	99.2	99.6	98.9	99.6	98.9	98.0	98.9	99.0	100.1	99.3	99.1	98.6	99.3
2020	98.8	98.9	94.4	79.8	83.3	89.7	92.9	94.3	94.3	95.1	95.6	96.2	97.4	84.2	93.8	95.6	92.8
2021	97.2	93.4	96.2	96.3	97.4	97.3	98.3	98.0	97.1	98.4	99.3	99.2	95.6	97.0	97.8	99.0	97.4
2022	98.7	99.8	100.6	100.8	100.4	100.0	100.2	100.4	100.6	100.7	100.0	98.2	99.7	100.4	100.4	99.6	100.0
2023	99.5	99.6															

NOTE: Estimates from October 2022 through February 2023 are subject to further revision in the upcoming monthly releases.

1. See footnote 2 to table 2.

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

Table 7B
CAPACITY AND UTILIZATION: Manufacturing[1]
Seasonally adjusted

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Q1	Q2	Q3	Q4	Annual
Capacity (*percent of 2017 output*)																	
1993	80.6	80.7	80.9	81.0	81.1	81.2	81.4	81.5	81.7	81.8	82.0	82.2	80.7	81.1	81.5	82.0	81.3
1994	82.4	82.6	82.8	83.0	83.3	83.6	83.9	84.1	84.4	84.7	85.1	85.4	82.6	83.3	84.1	85.1	83.8
1995	85.7	86.0	86.4	86.7	87.1	87.4	87.8	88.2	88.6	89.1	89.5	90.0	86.0	87.1	88.2	89.5	87.7
1996	90.4	90.9	91.4	91.9	92.4	92.9	93.4	94.0	94.5	95.0	95.5	96.0	90.9	92.4	94.0	95.5	93.2
1997	96.5	97.1	97.6	98.2	98.8	99.4	100.0	100.7	101.4	102.1	102.9	103.6	97.1	98.8	100.7	102.9	99.9
1998	104.4	105.2	105.9	106.7	107.4	108.2	108.8	109.5	110.1	110.7	111.3	111.9	105.2	107.4	109.5	111.3	108.4
1999	112.5	113.0	113.5	114.0	114.5	115.0	115.5	116.0	116.5	117.0	117.5	118.0	113.0	114.5	116.0	117.5	115.3
2000	118.5	118.9	119.4	119.9	120.4	120.9	121.4	121.8	122.3	122.8	123.3	123.8	118.9	120.4	121.8	123.3	121.1
2001	124.2	124.7	125.1	125.5	125.9	126.2	126.6	126.8	127.1	127.3	127.5	127.7	124.7	125.9	126.8	127.5	126.2
2002	127.8	128.0	128.1	128.1	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	127.9	128.2	128.2	128.2	128.1
2003	128.2	128.2	128.2	128.2	128.2	128.1	128.1	128.1	128.1	128.0	128.0	128.0	128.2	128.2	128.1	128.0	128.1
2004	127.9	127.9	127.8	127.8	127.8	127.8	127.8	127.8	127.8	127.9	128.0	128.2	127.9	127.8	127.8	128.0	127.9
2005	128.3	128.5	128.7	129.0	129.2	129.5	129.7	130.0	130.3	130.5	130.8	131.0	128.5	129.2	130.0	130.8	129.6
2006	131.3	131.5	131.7	131.9	132.1	132.4	132.6	132.9	133.1	133.4	133.7	134.0	131.5	132.2	132.9	133.7	132.6
2007	134.4	134.7	135.0	135.4	135.7	136.1	136.4	136.7	136.9	137.1	137.3	137.4	134.7	135.7	136.6	137.3	136.1
2008	137.5	137.5	137.5	137.4	137.3	137.2	137.1	136.9	136.8	136.7	136.5	136.4	137.5	137.3	136.9	136.5	137.0
2009	136.2	136.1	135.9	135.7	135.6	135.4	135.3	135.1	135.0	134.8	134.7	134.5	136.1	135.6	135.1	134.7	135.4
2010	134.3	134.1	133.9	133.7	133.5	133.3	133.0	132.8	132.6	132.4	132.2	132.0	134.1	133.5	132.8	132.2	133.2
2011	131.9	131.7	131.6	131.5	131.5	131.5	131.5	131.5	131.6	131.7	131.8	131.9	131.7	131.5	131.5	131.8	131.6
2012	132.1	132.2	132.4	132.5	132.7	132.8	133.0	133.1	133.2	133.4	133.5	133.6	132.2	132.7	133.1	133.5	132.9
2013	133.7	133.7	133.8	133.9	133.9	133.9	133.9	133.9	133.9	133.8	133.8	133.8	133.7	133.9	133.9	133.8	133.8
2014	133.7	133.6	133.6	133.5	133.4	133.3	133.1	133.0	132.9	132.7	132.5	132.4	133.6	133.4	133.0	132.5	133.1
2015	132.2	132.1	131.9	131.8	131.7	131.6	131.5	131.4	131.4	131.4	131.4	131.5	132.1	131.7	131.4	131.4	131.7
2016	131.5	131.6	131.7	131.7	131.8	131.9	132.0	132.0	132.0	132.0	132.0	132.0	131.6	131.8	132.0	132.0	131.9
2017	131.9	131.8	131.6	131.5	131.3	131.1	130.9	130.7	130.6	130.4	130.2	130.0	131.8	131.3	130.7	130.2	131.0
2018	129.9	129.8	129.7	129.6	129.5	129.4	129.3	129.3	129.2	129.2	129.2	129.1	129.8	129.5	129.3	129.2	129.4
2019	129.1	129.0	129.0	128.9	128.8	128.8	128.7	128.7	128.6	128.6	128.5	128.4	129.0	128.8	128.7	128.5	128.8
2020	128.4	128.3	128.2	128.1	128.0	127.9	127.8	127.7	127.5	127.4	127.2	127.1	128.3	128.0	127.7	127.2	127.8
2021	126.9	126.8	126.6	126.5	126.3	126.2	126.1	126.0	126.0	125.9	125.9	125.9	126.8	126.3	126.0	125.9	126.3
2022	125.9	125.9	126.0	126.1	126.1	126.2	126.3	126.4	126.6	126.7	126.8	126.9	125.9	126.1	126.4	126.8	126.3
2023	127.1	127.2															
Utilization (*percent*)																	
1993	80.6	80.6	80.4	80.6	80.4	80.2	80.2	79.9	80.3	80.8	81.1	81.4	80.5	80.4	80.1	81.1	80.5
1994	81.3	81.2	82.0	82.5	82.7	82.7	82.7	83.1	83.2	83.7	84.0	84.6	81.5	82.6	83.0	84.1	82.8
1995	84.5	83.9	83.8	83.2	83.2	83.2	82.3	82.9	83.2	82.7	82.4	82.2	84.1	83.2	82.8	82.4	83.1
1996	81.3	82.0	81.4	81.9	82.1	82.4	82.3	82.3	82.5	81.9	82.2	82.4	81.5	82.2	82.4	82.2	82.1
1997	82.1	82.8	83.1	82.6	82.7	82.7	82.8	83.2	83.4	83.6	83.8	83.6	82.7	82.6	83.1	83.7	83.0
1998	83.6	83.2	82.4	82.2	82.1	80.9	80.1	81.5	81.0	81.2	80.9	81.0	83.1	81.7	80.9	81.0	81.7
1999	80.8	81.1	80.7	80.6	80.9	80.4	80.4	80.5	79.8	80.7	80.9	81.1	80.8	80.6	80.2	80.9	80.6
2000	80.8	80.7	80.9	81.1	80.7	80.5	80.3	79.4	79.5	78.9	78.4	77.6	80.8	80.8	79.7	78.3	79.9
2001	77.0	76.2	75.8	75.2	74.6	73.9	73.4	72.9	72.5	72.0	71.7	71.7	76.3	74.6	72.9	71.8	73.9
2002	72.1	72.0	72.5	72.6	73.0	73.7	73.6	73.6	73.7	73.5	73.8	73.4	72.2	73.1	73.6	73.5	73.1
2003	74.0	73.9	74.0	73.4	73.5	73.8	74.1	73.7	74.4	74.5	75.1	75.1	73.9	73.6	74.1	74.9	74.1
2004	75.1	75.7	75.7	76.0	76.5	76.0	76.7	77.0	77.0	77.7	77.6	78.1	75.5	76.2	76.9	77.8	76.6
2005	78.5	79.0	78.5	78.7	78.8	78.8	78.4	78.6	77.6	78.6	79.1	79.0	78.7	78.8	78.2	78.9	78.6
2006	79.5	79.2	79.0	79.1	78.8	78.9	78.5	78.9	78.8	78.3	78.2	79.2	79.2	79.0	78.8	78.6	78.9
2007	78.7	78.8	79.2	79.5	79.3	79.3	79.1	78.7	78.8	78.5	78.8	78.9	78.9	79.4	78.9	78.8	79.0
2008	78.7	78.2	77.8	77.1	76.7	76.2	75.4	74.5	72.0	71.6	69.9	67.7	78.2	76.6	74.0	69.8	74.7
2009	65.6	65.6	64.4	64.1	63.5	63.4	64.5	65.3	66.1	66.2	66.9	66.9	65.2	63.7	65.3	66.7	65.2
2010	67.7	67.7	68.7	69.3	70.3	70.4	70.9	71.1	71.3	71.5	71.7	72.1	68.0	70.0	71.1	71.8	70.2
2011	72.2	72.4	72.9	72.6	72.6	72.7	73.1	73.4	73.5	73.9	73.7	74.1	72.5	72.6	73.3	73.9	73.1
2012	74.7	74.9	74.4	74.7	74.3	74.5	74.2	74.1	73.8	73.6	74.0	74.5	74.7	74.5	74.0	74.0	74.3
2013	74.2	74.5	74.4	74.1	74.3	74.5	73.9	74.5	74.6	74.7	74.7	74.6	74.4	74.3	74.4	74.7	74.4
2014	73.9	74.6	75.3	75.3	75.6	75.9	76.3	76.0	76.1	76.0	76.7	76.6	74.6	75.6	76.1	76.4	75.7
2015	76.2	75.7	76.1	76.2	76.2	76.0	76.6	76.4	76.2	76.1	75.9	75.7	76.0	76.1	76.4	75.9	76.1
2016	76.0	75.6	75.5	75.4	75.3	75.4	75.4	75.1	75.3	75.4	75.3	75.4	75.7	75.4	75.3	75.4	75.4
2017	75.5	75.5	75.3	76.3	76.3	76.4	76.2	76.2	76.3	77.2	77.4	77.3	75.5	76.3	76.2	77.3	76.3
2018	77.1	77.9	77.9	78.5	77.9	78.4	78.5	78.8	78.8	78.5	78.3	78.5	77.6	78.3	78.7	78.4	78.3
2019	77.9	77.5	77.3	76.9	77.0	77.3	76.8	77.4	76.9	76.2	76.9	77.1	77.6	77.1	77.1	76.7	77.1
2020	76.9	77.1	73.6	62.2	65.0	70.1	72.7	73.8	73.9	74.6	75.2	75.7	75.9	65.8	73.5	75.2	72.6
2021	76.6	73.7	76.0	76.2	77.1	77.1	78.0	77.8	77.1	78.2	78.9	78.8	75.4	76.8	77.6	78.6	77.1
2022	78.4	79.3	79.9	79.9	79.6	79.2	79.3	79.4	79.5	79.5	78.9	77.3	79.2	79.6	79.4	78.6	79.2
2023	78.3	78.3															

NOTE: Estimates from October 2022 through February 2023 are subject to further revision in the upcoming monthly releases.
1. See footnote 2 to table 2.

Table 8
Annual Proportions in Industrial Production, Market and Industry Group Summary

Item		2015	2016	2017	2018	2019	2020	2021	2022
Total IP		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Market Groups									
Final products and nonindustrial supplies		55.9	56.9	56.0	55.3	55.8	55.5	53.4	53.7
Consumer goods		27.3	28.4	27.6	27.1	27.7	28.5	27.5	27.4
Durable		6.2	6.5	6.1	6.0	6.2	6.2	6.0	5.9
Automotive products		3.4	3.6	3.4	3.3	3.4	3.4	3.3	3.2
Home electronics		.2	.2	.1	.1	.1	.2	.1	.1
Appliances, furniture, carpeting		.9	.9	.9	.9	.9	1.0	1.0	.9
Miscellaneous goods		1.7	1.8	1.6	1.6	1.7	1.7	1.7	1.7
Nondurable		21.2	22.0	21.5	21.1	21.5	22.3	21.5	21.4
Non-energy		16.5	17.1	16.2	15.7	16.8	17.5	15.7	15.3
Foods and tobacco		9.4	9.8	9.5	9.2	9.7	10.4	9.5	9.4
Clothing		.2	.2	.2	.2	.2	.2	.2	.2
Chemical products		5.4	5.5	5.2	5.0	5.4	5.5	4.8	4.6
Paper products		1.0	1.0	.9	.9	.9	.9	.8	.8
Energy		4.6	4.9	5.3	5.3	4.8	4.8	5.8	6.1
Business equipment		10.2	10.0	10.2	10.1	9.6	8.7	8.0	8.4
Transit		2.8	2.8	3.0	2.9	2.2	1.6	1.5	1.6
Information processing		2.2	2.1	2.1	2.0	2.1	2.1	1.8	1.7
Industrial and other		5.3	5.1	5.1	5.1	5.3	5.0	4.8	5.1
Defense and space equipment		2.2	2.2	2.2	2.1	2.3	2.0	1.8	1.6
Construction supplies		4.4	4.6	4.6	4.6	4.8	5.1	5.1	5.2
Business supplies		10.9	11.1	10.8	10.7	10.8	10.7	10.4	10.6
Materials		44.1	43.1	44.0	44.7	44.2	44.5	46.6	46.3
Non-energy		28.0	28.3	27.7	27.4	27.9	28.4	27.9	27.3
Durable		17.2	17.3	16.9	16.8	17.3	17.2	16.7	16.4
Consumer parts		3.2	3.3	3.2	3.1	3.1	2.8	2.8	2.7
Equipment parts		5.3	5.1	5.0	4.9	5.1	4.8	4.5	4.4
Other		8.7	8.9	8.8	8.8	9.1	9.5	9.5	9.3
Nondurable		10.8	11.1	10.8	10.6	10.6	11.2	11.1	10.9
Textile		.4	.4	.4	.4	.4	.4	.3	.3
Paper		1.9	1.9	1.8	1.7	1.8	1.7	1.6	1.6
Chemical		5.2	5.4	5.4	5.2	5.1	5.5	5.8	5.5
Energy		16.0	14.8	16.2	17.3	16.3	16.1	18.7	19.0
Industry Groups									
Manufacturing		77.1	78.4	77.0	75.8	76.5	76.7	74.7	74.3
Manufacturing (NAICS)	31–33	74.7	76.0	74.7	73.7	74.4	74.7	73.0	72.8
Durable manufacturing		39.6	39.7	39.1	38.7	39.0	37.9	36.4	36.2
Wood products	321	1.3	1.4	1.4	1.4	1.5	1.9	2.0	1.8
Nonmetallic mineral products	327	2.1	2.2	2.1	2.1	2.2	2.3	2.1	2.2
Primary metals	331	2.5	2.6	2.6	2.6	2.5	2.8	3.2	2.9
Fabricated metal products	332	5.8	5.8	5.7	5.8	6.0	5.9	5.7	5.9
Machinery	333	5.7	5.4	5.4	5.5	5.6	5.3	5.1	5.4
Computer and electronic products	334	5.2	5.2	5.1	5.0	5.2	5.2	4.6	4.3
Electrical equip., appliances, and components	335	1.9	1.9	1.8	1.8	1.9	2.0	1.9	2.0
Motor vehicles and parts	3361–3	5.9	6.1	5.8	5.7	5.8	5.3	5.0	5.1
Aerospace and miscellaneous transportation equipment	3364–9	5.0	4.8	5.1	4.8	4.1	3.4	3.0	2.9
Furniture and related products	337	1.2	1.3	1.2	1.2	1.2	1.2	1.1	1.1
Miscellaneous	339	3.0	3.1	2.8	2.8	2.8	2.7	2.5	2.5
Nondurable manufacturing		35.1	36.3	35.6	35.0	35.5	36.8	36.6	36.6
Food, beverage, and tobacco products	311,2	11.7	12.1	11.7	11.4	12.1	13.0	12.0	11.9
Textile and product mills	313,4	.7	.7	.7	.6	.7	.6	.6	.6
Apparel and leather	315,6	.2	.2	.2	.2	.2	.2	.2	.2
Paper	322	2.6	2.6	2.5	2.5	2.5	2.6	2.4	2.4
Printing and support	323	1.5	1.5	1.5	1.4	1.4	1.3	1.2	1.3
Petroleum and coal products	324	2.8	2.9	3.7	3.8	3.0	2.7	4.3	4.6
Chemicals	325	12.1	12.4	11.9	11.6	11.9	12.6	12.2	11.9
Plastics and rubber products	326	3.5	3.7	3.5	3.6	3.6	3.7	3.7	3.7
Other manufacturing (non-NAICS)	**1133,5111**	2.4	2.4	2.2	2.1	2.1	2.0	1.7	1.5
Mining	**21**	12.1	10.4	12.2	13.4	12.5	12.1	15.0	15.2
Utilities	**2211,2**	10.7	11.2	10.8	10.8	11.0	11.2	10.3	10.5
Electric	2211	9.5	9.7	9.3	9.3	9.6	9.7	8.8	8.9
Natural gas	2212	1.3	1.5	1.5	1.4	1.4	1.5	1.5	1.6

NOTE: The IP proportion data are estimates of the industries' relative contributions to the overall change in IP between the reference year and the following year. For example, a 1 percent increase in durable goods manufacturing between 2022 and 2023 would account for a 0.362 percent increase in total IP.

Table 9

INDUSTRIAL PRODUCTION AND CAPACITY UTILIZATION: SUMMARY

Seasonally adjusted

Industrial production	2017=100						Percent change						
	2022				2023		2022				2023		Feb. '22 to
	Sept.[r]	Oct.[r]	Nov.[r]	Dec.[r]	Jan.[r]	Feb.[r]	Sept.[r]	Oct.[r]	Nov.[r]	Dec.[r]	Jan.[r]	Feb.[r]	Feb. '23
Total index	103.5	103.4	103.0	101.6	102.0	102.0	.3	-.2	-.3	-1.4	.4	.0	.3
Previous estimates	104.5	104.4	103.8	102.4	102.6	102.6	.2	-.1	-.6	-1.4	.3	.0	-.2
Major market groups													
Final Products	102.2	102.6	102.2	101.4	101.4	101.3	-.1	.4	-.4	-.9	.0	-.1	.4
Consumer goods	102.7	103.2	103.1	102.4	102.0	102.1	-.3	.5	-.1	-.7	-.4	.1	-.8
Business equipment	98.2	98.6	97.5	95.9	97.2	96.9	.6	.4	-1.1	-1.6	1.4	-.4	3.9
Nonindustrial supplies	102.5	102.2	102.1	100.3	100.8	100.9	.3	-.2	-.1	-1.8	.5	.1	-1.7
Construction	103.8	103.4	102.8	101.4	103.1	103.0	.3	-.4	-.6	-1.3	1.6	.0	-2.0
Materials	105.0	104.4	104.0	102.3	103.0	103.0	.5	-.6	-.4	-1.7	.7	.0	.9
Major industry groups													
Manufacturing (see note below)	100.6	100.7	100.0	98.2	99.5	99.6	.2	.1	-.7	-1.9	1.4	.1	-.2
Previous estimates	101.5	101.7	100.9	98.8	100.1	100.2	.0	.2	-.8	-2.1	1.3	.1	-1.0
Mining	117.2	117.3	116.2	113.9	116.3	115.3	1.2	.1	-.9	-2.0	2.1	-.8	6.9
Utilities	104.9	102.4	105.8	109.3	99.5	100.0	-1.0	-2.4	3.4	3.2	-8.9	.5	-6.4

Capacity utilization	Percent of capacity												Capacity growth
	Average 1972-2022	1988-89 high	1990-91 low	1994-95 high	2008-09 low	2022 Feb.	2022 Sept.[r]	Oct.[r]	Nov.[r]	Dec.[r]	2023 Jan.[r]	Feb.[r]	Feb. '22 to Feb. '23
Total industry	79.7	85.2	78.8	85.0	66.6	79.9	80.8	80.6	80.2	79.0	79.2	79.1	1.4
Previous estimates	79.6	85.2	78.8	85.0	66.6	79.4	79.9	79.7	79.1	77.9	78.0	78.0	1.6
Manufacturing (see note below)	78.2	85.6	77.3	84.6	63.4	79.3	79.5	79.5	78.9	77.3	78.3	78.3	1.0
Previous estimates	78.2	85.6	77.3	84.7	63.4	79.2	79.0	79.1	78.4	76.7	77.7	77.6	1.0
Mining	86.4	86.3	84.3	88.6	78.9	86.2	92.1	92.0	91.0	89.1	90.9	90.2	2.2
Utilities	84.7	93.2	84.7	93.2	78.1	76.5	73.7	71.8	74.0	76.1	69.1	69.3	3.3
Stage-of-process groups													
Crude	85.6	87.9	84.8	90.0	76.9	86.5	90.2	89.8	88.9	86.6	88.6	88.4	1.5
Primary and semifinished	80.2	86.5	78.0	87.8	63.6	79.7	79.0	78.4	78.6	77.6	76.4	76.5	1.4
Finished	76.7	83.4	77.5	80.7	66.3	76.9	77.9	78.3	77.5	76.6	77.7	77.4	1.5

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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 of its industrial output data from the SIC system to NAICS.

Explanatory Note

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 2017. 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 2012, the total IP index has been constructed from 296 individual series based on the 2017 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 5 percent. If output in this industry increased 10 percent in a month, then this gain would boost growth in total IP by $5/10$ percentage point (0.05 x 10% = 0.5%). 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 76 percent of the source data (in value-added terms) are available; the fraction of available source data increases to 86 percent for estimates in the second month that the estimate is published, 94 percent in the third month, 98 percent in the fourth month, 98 percent in the fifth month, and 98 percent in the sixth month. Data availability by data type in 2022 is summarized in the table below:

Availability of Monthly IP Data in Publication Window
(Percent of value added in 2022; the numbers may not sum because of rounding.)

	Month of estimate					
Type of data	1st	2nd	3rd	4th	5th	6th
Physical product	35	44	53	56	57	57
Production-worker hours	42	42	42	42	42	42
IP data received	76	86	94	98	98	98
IP data estimated	24	14	6	2	2	2

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 more than one-half of the series (in terms of value added) that ultimately are based on physical product data (35 percent out of a total of 57 percent). Of the 35 percent, about two-thirds (24 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-13 ARIMA. For series based on production-worker hours, the current seasonal factors were estimated with data through February 2023; for other series, the factors were estimated with data through at least December 2022. 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-13 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 0.30 percent during the 1987–2022 period. The average revision to the *percent change* in total IP, without regard to sign, from the first to the fourth estimates was 0.24 percentage point during the 1987–2022

period. In most cases (about 86 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 26 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 64 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 1972–2022 period, the average total industry utilization rate was 79.7 percent; for manufacturing, the average factory operating rate was 78.2 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 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 March 28, 2023, 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 release on Industrial Production and Capacity Utilization is published at 9:15 a.m. on:

2023: January 18, February 15, March 17, April 14, May 16, June 15, July 18, August 16, September 15, October 17, November 16, December 15

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