

# FEDERAL RESERVE statistical release



G.17 (419) 2015 Historical and Annual Revision

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## Industrial Production and Capacity Utilization: The 2015 Annual Revision

The Federal Reserve has revised its index of industrial production (IP) and the related measures of capacity and capacity utilization.<sup>1</sup> Total IP is now reported to have increased slightly less than 2½ percent per year, on average, from 2011 through 2013 before advancing about 4½ percent in 2014 and falling back somewhat in the first half of 2015.<sup>2</sup> Relative to earlier reports, the current rates of change are lower—especially for 2012 and 2013. For the most recent recession, total IP still shows a peak-to-trough decline of about 17 percent, and the dates for the peak and trough are unaltered. However, the lower rates of change for recent years indicate that the recovery in the industrial sector since the trough has been slower than reported earlier. Total IP is now estimated to have returned to its pre-recession peak in May 2014, seven months later than previously estimated.

This revision advanced the base year for the IP index and incorporated newly available annual data on output and prices. The base year for IP was advanced from 2007 to 2012, which raised the level of the index in all periods. The updated IP indexes incorporated new detailed data for manufacturing from the U.S. Census Bureau's 2012 Economic Census and 2013 Annual Survey of Manufactures (ASM) as well as revised data from the 2011 ASM. For publishing, the IP indexes folded in data for 2013 from the Census Bureau's Service Annual Survey. In addition, the indexes were updated with annual data for 2014 from the Department of the Interior's U.S. Geological Survey (USGS) for metallic and nonmetallic minerals. Data on prices from the Bureau of Labor Statistics (BLS) were also incorporated.

The monthly estimates of production were updated to include late-arriving or revised monthly or quarterly indicator data (either outputs from or inputs to production), and they also now reflect recalculations of seasonal factors. In addition, new high-frequency indicators were incorporated for a few production indexes.

Capacity utilization rates were revised down for recent years. In the second quarter of 2015, capacity utilization stood at 77.8 percent, a rate more than 2 percentage points below its long-run (1972–2014) average. Relative to earlier estimates, utilization for total industry is about ¾ percentage point lower in the fourth quarters of 2012 and 2014 and about 1½ percentage point lower in the fourth quarter of 2013. The lower estimates for utilization reflected revisions to both industrial production and capacity. Utilization was revised downward as a result of the weaker industrial production estimates. Lower estimates for capacity, however, tempered the downward revision to utilization.

The revised estimates of capacity and capacity utilization incorporated data for the manufacturing sector from the Census Bureau's Quarterly Survey of Plant Capacity Utilization for the fourth quarter of 2014, along with new data on capacity primarily for the energy and mining sectors from the USGS, the U.S. Department of Energy, and other organizations. The revised estimates also include new data on capital spending from the 2012 Economic Census. Capital expenditures data from the 2013 ASM are not yet available.

<sup>1</sup>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 the production and capacity indexes for the years before 1972 were multiplied by a constant. However, utilization rates and the rates of change in IP for the years before 1972 were not revised.

<sup>2</sup>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. For 2015, the rates are calculated from the fourth quarter of 2014 to the second quarter of 2015 and are annualized.

## RESULTS OF THE REVISION

The tables show the summary statistics for the annual revision. Tables 1A and 1B present the monthly, quarterly, and annual average index levels for total IP and for total capacity and capacity utilization for January 1985 through June 2015, along with the percent changes in total IP. Tables 2 and 3 show the revised rates of change in IP from 2011 through the first half of 2015 for market groups, industry groups, special aggregates, and selected detail. Table 4 shows the annual rates of change for total IP and for major market and industry groups for 2010 through 2014. Table 5 presents the revised rates of change in capacity by industry groups for 2011 through the first half of 2015. Tables 2 through 5 also show the differences between the revised and previous estimates of the rates of change. Table 6 contains the revised capacity utilization rates for the fourth quarters of 2011 through 2014; it also shows the differences between the revised and previous estimates. Table 7 reports revised semiannual rates of change for IP for the second half of 2010 through the first half of 2015. Table 8 contains revised capacity utilization rates for the second and fourth quarters from the fourth quarter of 2012 through the second quarter of 2015. Tables 9A, 9B, 10A, 10B, 11A, and 11B report the revised production, capacity, and utilization measures for manufacturing, total industry excluding selected high-technology industries, and manufacturing excluding selected high-technology industries. Table 12 displays the annual proportions in IP by market and industry groups for 2007 through 2014. Table 13 reports revised IP indexes for the major market and industry groups for the previous six months; and it also reports revised capacity utilization rates for the same period. Table 14 shows price indexes for data networking equipment for 2001 through 2013.

### *Industrial Production*

Revisions to the changes in total IP show lower rates of change in recent years than were previously estimated (figure 1 and tables 2 and 7).<sup>3</sup> After having declined sharply during the recession, total IP is still reported to have rebounded strongly in 2010 and then to have increased moderately in each year from 2011 to 2013; industrial production advanced solidly in 2014 and fell back somewhat in the first half of 2015. However, the gains in 2012 and 2013 are each 1 percentage point weaker than previously stated, putting the trajectory of the recovery on a lower path. As currently reported, total IP did not return to its pre-recession peak until May 2014; previously, it was estimated to have reached that level in October 2013.

On net, the revision resulted in lower estimates for manufacturing IP and higher estimates for mining IP than previously reported; the estimates for utilities are little revised. In particular, manufacturing output is currently reported to have increased only about 1½ percent, on average, in 2012 and 2013, whereas it was previously stated to have averaged gains of more than 3 percent over those two years.<sup>4</sup> As currently reported, manufacturing IP had not yet recovered to its pre-recession peak by June 2015; indeed, it was more than 4 percent below that level. Prior to the revision, manufacturing IP was reported to have returned to its pre-recession level by November 2014. In contrast, increases in the extraction of crude oil and natural gas have boosted the index for mining in recent years, and the revised estimates show even stronger rates of change for 2012 through 2014 than reported earlier.

### *Production by Industry Group*

The rates of increase in manufacturing from 2011 through the first half of 2015 are now lower than reported earlier, particularly for 2012 and 2013, the years for which the majority of benchmark data became available. Since 2011, the output indexes for both durables and nondurables are now stated to have moved up more modestly than previously reported, and lower rates of change were widespread across industries.

<sup>3</sup>In this section, all of the rates of change for a full year are calculated from the fourth quarter of the previous year to the fourth quarter of the reference year. Rates of change on a half-year basis are shown in table 7.

<sup>4</sup>Manufacturing consists of those industries in the North American Industry Classification System definition of manufacturing, plus those industries—logging and newspaper, periodical, book, and directory publishing—that were in the manufacturing sector under the Standard Industrial Classification system.

The production of durables is currently estimated to have risen about 3½ percent in 2012 and just over 2 percent in 2013; previously, it was stated to have advanced about 6 percent and 5 percent, respectively. For 2014, the index for durable manufacturing is now reported to have moved up about 5 percent, a solid rate by historical standards but still a lower gain than previously recorded. The output of durables has edged down so far in 2015.

Within durables, most industry groups posted gains in output for most years since 2011. Nevertheless, by mid-2015, the indexes for many major categories of durables were still below their pre-recession levels. Relative to earlier estimates, with the exception of furniture, the gains in each industry group over this period are now reported to be, on net, lower than those stated earlier. In particular, the contours for fabricated metal products; machinery; computer and electronic products, electrical equipment, appliances, and components; and miscellaneous manufacturing show much slower gains than previously reported.

The output of selected high-technology industries moved up 8.0 percent in 2011 and 9.8 percent in 2012 before recording only modest gains the next two years and falling back so far in 2015 (table 3). Relative to previous estimates, the increase in high-tech output is now smaller in recent years, especially in 2012 but also in 2013 and 2014. The downward revisions largely arose, on net, from weaker production of semiconductors, which more than outweighed a substantial upward revision to computers and peripheral equipment.

The output of nondurable manufacturing industries declined sharply during the recession and has increased only modestly, on net, since then. The index moved up less than ½ percent per year, on average, in 2011, 2012, and 2013 before increasing about 2½ percent in 2014 and about 1½ percent in the first half of 2015. With this revision, the rates of increase for recent years are now lower than reported earlier. Other than the indexes for food, for petroleum and coal products, and for plastics and rubber products, the indexes for major nondurables industries remain well below their pre-recession peaks. Relative to the previously published estimates, the contour for output in recent years is lower for food, for apparel and leather, and for chemicals, and it is higher for paper and for petroleum and coal products.

The output index for industries not in the scope of manufacturing under the North American Industry Classification System (NAICS)—that is, logging and publishing—fell in every year from 2010 to 2014 and in the first half of 2015. The decrease in 2013 is now somewhat less than previously reported as a result of new benchmark data from the Service Annual Survey.

The production index for mining registered considerable gains in the period from 2011 through 2014 owing to strong increases in oil and natural gas extraction over this period. Although the index fell back in the first half of 2015, it remained at a high level by historical standards. Rates of change in the output of utilities are very similar to previous reports.

### *Production by Market Group*

The production index for final products and nonindustrial supplies fell substantially during the most recent recession, and then it rose between about 1¼ percent and 1¾ percent in each of 2011, 2012, and 2013 before advancing more strongly in 2014; the output of this market group has fallen back somewhat in the first half of 2015 (table 2). The post-recession recovery for final products and nonindustrial supplies is now reported to be weaker than earlier estimates suggested. Relative to previous reports, the gains in the index for recent years—especially for 2012 and 2013—are now stated to have been smaller, and the decline in 2015 so far is less steep. In June 2015, the index was about 5 percent below its pre-recession peak.

The index for consumer goods now shows a weaker post-recession recovery than was previously estimated. As currently stated, the output of consumer goods declined in 2012 and moved up in each year since.

Previously, output was reported to have advanced in 2012, and the rates of increase for overall consumer goods in 2011, 2013, and 2014 are now reported to be lower than estimated earlier. These lower rates of change were widespread across categories of durables and nondurables. The level of the index for consumer goods in June 2015 is now reported to be more than 7 percent below its pre-recession peak, whereas previously it was estimated to be only about 2 percent below its pre-recession peak.

Following a sharp decline during the recession, the index for business equipment rose substantially through 2012, receded a bit in 2013, and then recorded a sizable gain in 2014 before declining again in the early part of this year. Relative to earlier reports, output in 2013 was considerably weaker as a result of lower production across all major components of business equipment: transit, information processing, and industrial and other equipment. Still, the gains in other recent years were strong enough that, by mid-2015, each of the major components had either fully or nearly retraced its recession-era decline.

The production of defense and space equipment is now estimated to have been much lower in recent years than reported earlier. The index was little changed, on net, over the 2011–12 period, but it declined sharply in 2013 and has recovered only a small amount of that decline since then. Previously, the output of defense and space equipment was estimated to have moved up in 2011, 2012, and 2013.

The index for construction supplies has advanced solidly in recent years but stepped back a bit at the beginning of 2015. Production expanded between about 2 and 5 percent in each year from 2011 to 2014. Notwithstanding these gains, the index in June 2015 had recovered only about half of its recession-period decline of 33 percent. Compared with the index for construction supplies, the index for business supplies declined less steeply during the recession and rebounded less sharply during the recovery, and its most recent reading was about 5 percent below its pre-recession peak.

The output of materials has recovered strongly since the recession; however, as currently estimated, the recovery is not quite as strong as previously estimated. Still, by mid-2015, it stood about 10 percent above its pre-recession peak. The production of materials advanced, on average, just under 3½ percent over the 2010–12 period; output moved up more rapidly in 2014 and has fallen back somewhat in the first half of 2015.

Within materials, the recovery from the recession has been uneven. In every year from 2011 through 2014, all categories of durable goods materials and for energy materials have increased. By contrast, the output of nondurable materials declined in 2011, was little changed in 2012, 2013, and so far in 2015; it moved up about 1 percent in 2014. Relative to earlier estimates, on net, the indexes for both durable and nondurable materials have been lower in recent years, while the output of energy materials has been higher.

### *Capacity*

Total industrial capacity contracted in 2010 before increasing in 2011, 2012, 2013, and 2014 (table 5).<sup>5</sup> Capacity is expected to increase further in 2015. Relative to previous estimates, the gains in total industrial capacity are somewhat smaller in recent years, especially in 2014.

After having decreased each year from 2008 to 2010, manufacturing capacity rose modestly in each year from 2011 through 2014 and is expected to move up again in 2015. The strongest gain in recent years was in 2012 when manufacturing capacity advanced 1.9 percent. Relative to earlier estimates, the gains in recent years, particularly in 2014, are now weaker. Capacity in durable manufacturing industries advanced modestly in each year from 2011 to 2014, and it is expected to continue along that path in 2015. The rate of change in durable manufacturing capacity is now reported to have increased at a somewhat slower rate in recent years; much of that weakness is attributable to lower estimates for the capacity index for selected high-technology industries. For

<sup>5</sup>In this section, all of the rates of change for a full year are calculated from the fourth quarter of the previous year to the fourth quarter of the reference year.

nondurable manufacturing, capacity contracted in each year from 2008 to 2011 before increasing in 2012 and flattening out in 2013 and 2014; the gain in 2015 is expected to be modest. Relative to the previous estimates, the rate of change for nondurables manufacturing capacity is now estimated to have increased somewhat more in 2012 and to have shown less of a gain in 2014. The capacity index for non-NAICS manufacturing has registered declines or been unchanged in each year since 2007.

Capacity at mines increased sharply in each year from 2011 through 2014; further gains are expected in 2015. Relative to previous estimates, the rate of change in 2011 is now smaller, but the rates in other recent years are larger. Capacity at utilities increased in each year from 2011 to 2014, with another increase expected in 2015; the revised gains are little changed from the earlier estimates.

By stage of processing, capacity recorded gains of 4 percent or more in each year from 2011 through 2014; capacity is expected to increase further in 2015. Relative to previous estimates, the increases in capacity at the crude stage are now reported to be considerably higher in 2012 and 2013 and a little lower in 2011 and 2014. Capacity at the primary and semifinished stages then increased in 2011 through 2014, with further expansion expected for 2015. The largest difference between the previous and current increases in capacity at the primary and semifinished stages is that the gain in 2014 is now estimated to have been smaller. For finished goods industries, the contour of capacity shows noticeably weaker gains in recent years. Capacity for these producers declined in 2011 and then recorded moderate gains in 2012, 2013, and 2014, with similar-sized gains expected for 2015. The rates of change for capacity in the finished goods stage are smaller than previously reported for recent years.

### *Capacity Utilization*

After having dropped steeply during the recession, capacity utilization rose briskly in 2010, more moderately in 2011, and then was little changed, on net, through 2013. Capacity utilization moved up in 2014, but it has fallen back somewhat in the first half of this year.<sup>6</sup> In the second quarter of 2015, capacity utilization for total industry was 77.8 percent, a rate 2.3 percentage points below its long-run average of 80.1 percent (table 6 and table 8). Compared with earlier estimates, capacity utilization for total industry is now reported to have been about  $\frac{3}{4}$  percentage point lower in 2012 and 2014 and about  $1\frac{1}{2}$  percentage point lower in 2013.

The capacity utilization rate for manufacturing increased only modestly, on net, in the post-recession period from 2011 to 2013; it moved up more strongly in 2014 before falling back a bit thus far in 2015. Relative to previous reports, the capacity utilization rates for manufacturing are now lower in recent years because the downward revisions to the estimates of production were larger than the downward revisions to the estimates of capacity. At 75.8 percent, the rate for June 2015 was 1.4 percentage points below its previously published level and 2.7 percentage points below its long-run average.

The utilization rate for durable manufacturing posted gains in each year from 2011 to 2014, when it reached its long-run average of 76.9 percent, although it has fallen back so far in 2015. Among durable goods manufacturers in the second quarter of 2015, 6 of the 11 major industry groups in table 6 were operating at utilization rates above their long-run averages: fabricated metal products; electrical equipment, appliances, and components; motor vehicles and parts; aerospace and miscellaneous transportation equipment; furniture and related products; and miscellaneous goods manufacturing. Only the nonmetallic mineral products industry was operating at a rate far below its long-run average.

The utilization rate for nondurable manufacturing increased less than 1 percentage point, on net, between 2011 and the second quarter of 2015, when it was 77.3 percent, more than 3 percent below its long-run average. The rates for nondurables in 2012, 2013, and 2014 are at least  $2\frac{1}{2}$  percent lower in each year than was

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<sup>6</sup>Unless otherwise noted, rates of capacity utilization are reported for the fourth quarter of the reference year.

previously estimated.

As of the second quarter of 2015, among nondurable manufacturing industry groups, that of petroleum and coal products was operating at a rate just above its long-run average; the operating rates for all other categories were still below their industry-specific long-run averages (tables 6 and 8), with the rates for apparel and leather and for printing and support being well below their long-run averages.

For 2011, 2012, and 2013, capacity utilization rates for mining were close to 88.5 percent, a rate that is 1 percentage point above its long-run average. The utilization rate at mines moved up to 90.7 percent in 2014, but with the recent decline in drilling IP, it fell to 84.7 percent in the second quarter of 2015. Relative to earlier estimates, capacity utilization in mining is now reported to be a little higher in recent years. The operating rates for utilities have been below their long-run average of 85.9 percent for the past several years. The current estimates of utilization at utilities are very similar to the previously reported rates.

## **TECHNICAL ASPECTS OF THE REVISION**

The industrial production statistics are monthly production indexes that 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, however, are anchored to annual benchmarks that are less timely but typically based on more-comprehensive data. Annual revisions to the industrial production and capacity measures involve (1) incorporating into the indexes new monthly or quarterly data that were revised or arrived too late to be included in the regular six-month reporting window for monthly IP; (2) updating seasonal adjustment factors; (3) incorporating new annual benchmark data on output, prices, and value-added proportions; and (4) updating the methods used to construct the indexes.

This revision includes comprehensive annual data for both 2012 and 2013 for manufacturing production. The results of the Economic Census for 2012 and the Annual Survey of Manufactures for 2013 became available since the previous annual revision was published in March 2014. In addition, updated results from the ASM for 2011 were incorporated. For most industries, this revision integrated producer price indexes (PPIs) from the BLS. For a few selected industries, updated price indexes constructed by the Federal Reserve were incorporated.<sup>7</sup> In addition, the benchmark indexes for logging, metallic and nonmetallic mining, and publishing were advanced through 2013 or 2014 based on data from the U.S. Forest Service, the U.S. Geological Survey, and the U.S. Census Bureau.

The revised IP indexes include information from the Quarterly Survey of Plant Capacity Utilization for 2014 and from other industry reports. The indexes also incorporate revised monthly and quarterly source data on production, shipments, and inventories.

### ***Conversion to the 2012 North American Industry Classification System***

Industrial production and capacity utilization are structured to follow a single-industry classification system. With this revision, the industrial production and capacity indexes were classified according to the 2012 NAICS; previously, they were classified according to the 2007 NAICS. To maintain consistent time series, the transformation of the indexes to the 2012 NAICS covers the period from 1972 forward.

For the industrial sector, the primary difference between the 2007 NAICS and the 2012 NAICS involves several instances where multiple closely-related six-digit 2007 NAICS categories were consolidated into a single

<sup>7</sup>Price indexes for pharmaceuticals (NAICS 325412), for semiconductors (NAICS 334413), for most components of communications equipment (NAICS 3342), and for computer storage devices (NAICS 334112) are constructed by the Federal Reserve from alternative sources. A table that lists annual and quarterly price indexes for the networking equipment component of communications equipment follows the text.

six-digit 2012 NAICS category. For example, under the 2007 system, NAICS 331311 (Alumina Refining) and NAICS 331312 (Primary Aluminum Production) were separate industries, but under the 2012 system, they have been merged into NAICS 331313 (Alumina Refining and Primary Aluminum Production). Overall, more than 70 six-digit 2012 NAICS categories have different coverage than they did in the 2007 NAICS.

The implementation of the 2012 NAICS contributed to a reduction in the number of industrial production and capacity indexes. Prior to this annual revision, 312 individual industrial production indexes and 89 individual capacity indexes covered the industrial sector from 2012 forward. With this revision, 299 individual production indexes and 88 individual capacity indexes are estimated for the same period.

### ***Annual Benchmark Real Output Indexes***

The annual benchmark output indexes for IP are measures of real gross output at the six-digit NAICS 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 this revision incorporated revised information for 2011 and updated and new information for 2012 and 2013 from the Economic Census and the ASM.

To obtain individual benchmarks of real gross output, the measures of nominal gross output were deflated by annual price deflators. For most industries, this revision incorporated the BLS PPIs as the deflators for the IP benchmarks for recent years. Prior to the current revision, the benchmark IP indexes primarily reflected annual shipments deflators for six-digit NAICS industries from the Bureau of Economic Analysis (BEA); however, these deflators are no longer available at that level of detail. In general, the benchmark industry price deflators consist of information from the BEA through 2011 and are extended through 2013 with the related PPIs.<sup>8</sup>

### ***Changes to annual benchmark index for computer storage device manufacturing***

This revision updates the price index that is used to deflate nominal gross output in the annual benchmark index for computer storage device manufacturing (NAICS 334112).<sup>9</sup> The new industry-level price index is a chain-weighted Fisher price index that combines information from IDC on prices for large-scale storage devices (devices with three or more drives) with product price indexes from the BLS for related parts and accessories, for secondary products, and for miscellaneous receipts. The weights used in the chain aggregation are derived from each product's share of overall industry shipments as published in the Economic Census and ASM. Prior to the current annual revision, the annual benchmark index used the BEA's industry shipments deflator, which was based on BLS PPIs for the full range of products in the industry.

The segment of the new price deflator that was based on large-scale storage devices was constructed using quarterly frequency data from IDC on factory revenue and the number of units shipped for the 2002–14 period. These data cover more than 700 models and, using further detailed information on installation type, transmission protocol, and redundancy, yielded over 1,500 distinct items. Item prices were constructed by dividing revenue by terabytes of capacity shipped. The overall price index was constructed using a “matched model” method that aggregates the item-level relative price changes with weights based on revenue using a Fisher-ideal index formula.

The new price deflator for computer storage device manufacturing falls considerably faster than the previously used deflator. From 2002 through 2014, the new price deflator fell, on average, almost 23 percent per year, whereas the previous deflator fell about 7 percent per year. The more rapid declines in the new price

<sup>8</sup>Overall, at the industry level, the BEA measures and PPI measures are quite similar, as the BEA used weighted product-level PPIs to derive their industry-level shipments deflator.

<sup>9</sup>A detailed explanation of the new price index for computer storage device manufacturing can be found at [www.federalreserve.gov/econresdata/notes/feds-notes/2015/prices-for-data-storage-equipment-and-the-state-of-it-innovation-20150701.html](http://www.federalreserve.gov/econresdata/notes/feds-notes/2015/prices-for-data-storage-equipment-and-the-state-of-it-innovation-20150701.html).

deflator imply much faster real output growth for the industry than was reported earlier.

### *Changes to annual benchmark index for communications equipment*

With this revision, the benchmark price deflators for various components of communications equipment were updated. For the period from 2007 through 2013, the price index for enterprise and home voice equipment is constructed from data on units and the value of shipments for a variety of types of enterprise telephones. Previously, the price index for this period used similar information from the Telecom Industry Association (TIA); however, data are available at a quarterly frequency (rather than annual) from Dell’Oro, and they include more-detailed product-level information than the TIA data. For the period from 2001 through 2006, the price index continues to use product-level data on units and shipments from the Consumer Electronics Association (CEA) that are even more detailed than the Dell’Oro data. An adjustment is imposed for the 2007–13 period to account for the difference in the average rate of change between the price index based on the Dell’Oro data and the price index based on the CEA data for the overlap period from 2002 to 2006. Previously, an analogous adjustment accounted for differences between the price indexes constructed from the TIA data and from the CEA data.

The benchmark price deflators were also updated for the period from 2002 forward for different types of transmission, local loop, and legacy central office equipment. For wave division multiplexing (WDM) products—equipment used in fiber-optic communications—the price index is now derived from detailed prices based on measures of a transmission capacity (price per wavelength port); previously, the price index for WDM products relied on detailed prices of different categories of WDM equipment (for example, long-haul, metro). The new price index more carefully accounts for the increase in capacity per unit for each equipment category over time.

An updated benchmark price index was also constructed for other (non-fiber optic) long-haul transmission equipment. For the period beginning in 2009, this revision folded in quarterly frequency data from Dell’Oro on price per port for three kinds of microwave transmission equipment: time-division multiplexing microwave, packet microwave, and hybrid microwave. Prior to this revision, the price index for other (non-fiber optic) long-haul transmission equipment was constructed as a weighted average of the relevant PPI (two-thirds weight) and the fiber-optic transmission index (one-third weight) for the period beginning in 2009. The updated index prior to 2009 continues to use this weighted average.

The benchmark price index for wireless networking equipment was updated with this revision. For each of the five categories of cellular base stations, the price indexes are now based on average price per transceiver rather than price per unit. The new price measures better account for the increase in wireless signal transmission capacity per base station over time. The underlying data continue to be from Dell’Oro and cover 2003 to 2014.

### *Methodological Changes to Individual Production Indexes*

A few production indicators were affected by methodological changes in this revision.

#### *Gypsum*

With this annual revision, the IP index for gypsum (NAICS 32742) has been updated to incorporate quarterly data on short tons of calcined gypsum from the Gypsum Association as a preliminary indicator until the primary indicator becomes available. The primary indicator for the gypsum industry output continues to be quarterly data from the USGS. Typically, the Gypsum Association data are issued one month earlier than the USGS data.



## *Nuclear materials*

With this revision, the IP index for nuclear materials (NAICS 32518, part) incorporates data on uranium enrichment capacity from URENCO, the nation's sole supplier of enriched uranium to nuclear power utilities. The enrichment technology used by URENCO dictates that processes are always operating at full utilization, so a measure of capacity is also a measure of output. Previously, the production indicator for nuclear materials used sales of electric power to other uranium enrichment facilities, but all of these other facilities have closed.

## *Reweighting of within-industry products*

For many indexes that are constructed from information on a variety of products, the high-frequency indicator for industry output is derived from a weighted sum of these products. With this annual revision, the weights applied to the various products for these indexes were reviewed. In general, the product weights reflect the long-term relative prices of those products. For industries where the relative prices of the various products have remained stable over time, it was not necessary to change the formulas. However, weights in the formulas were updated for the following three industries where the relative prices of various products had evolved markedly: other nonmetallic mineral mining and quarrying (NAICS 21239), farm machinery (NAICS 333111), and travel trailer and camper (NAICS 336214).

## *Changes to Individual Capacity Indexes*

### *Fertilizer*

With this revision, the capacity index for fertilizer (NAICS 32531) beginning in 1997 is based on data for capacity in short tons from The Fertilizer Institute for anhydrous ammonia, ammonium nitrate, ammonium sulfate, urea and ammonium nitrate solutions, phosphoric acid, and urea. For the period prior to 1997, the capacity index is still based on utilization rates from the Census Bureau's Survey of Plant Capacity.

## *Adjustments to Market Groups*

The industrial production indexes are organized in two main ways: industry groups and market groups. Industry groups reflect a supply-oriented classification where the output is grouped based on the NAICS industries of the producers. Market groups reflect a demand-oriented classification where output is grouped according to the purchaser and by how the output is used. An industry's output is often allocated across a variety of market groups. Whenever possible, an industry's market group allocation is determined through detailed product-level data. For example, the IP index for steel mill products (NAICS 3311 and NAICS 3312) uses data from the American Iron and Steel Institute that includes information on the end-market (for example, automotive, construction, or oil patch) classifications for different types of steel. These classifications are used to allocate the production of steel mill products to different market groups. For industries where market-level detail is not available, an industry's market group allocation is determined based on information provided in the BEA's Input-Output (I-O) tables, which are issued every five years.

This revision incorporates information from the BEA's 2007 I-O tables (which were published in late 2013) to update the weights that are used to allocate industry output across various market groups. For years after 2007, the allocation weights were assumed to be identical to those for 2007. Between 2002 (the year covered by the previous I-O table) and 2007, the shares are linear combinations of the 2002 and 2007 weights. If the I-O tables indicate that only a very small share of an industry's output is consumed by a particular market group, the allocation weight for that market group will be zero.

With the incorporation of the 2007 I-O tables, the market group allocation for only one industry,

chocolate and confectionery manufacturing (NAICS 31135), needed to be updated. Previously, the market group allocation followed the 2002 I-O tables, which indicated that the overwhelming majority of output of chocolate was supplied to consumers. Consequently, the output of this industry had been assigned entirely to the foods and tobacco component of nondurable consumer goods. Following the 2007 I-O tables, the revised market group structure assigns 70 percent of the output of the chocolate industry to the foods and tobacco group and the remainder to miscellaneous nondurable materials.

### ***Weights for Aggregation***

The IP system is organized as a hierarchical structure where the finest-level production indexes are aggregated using a version of the Fisher-ideal index formula to construct higher-level measures of production. The weights that are used to combine individual IP measures into more aggregate measures are based on the value added from the industry, calculated as gross output less cost of materials. For IP indexes that are defined at the six-digit (or more aggregate) NAICS level, the value-added weights are derived from the Economic Census or ASM. For IP indexes that cover only part of a six-digit NAICS industry, the aggregation weights were constructed by allocating value-added for a six-digit industry across the various components of IP that compose that industry. Data from the Economic Census and ASM on shipments of different types of products within a six-digit NAICS industry were used to determine the share of an industry's value-added that was assigned to each component IP index.

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. The weights for aggregation for mining industries are derived from value-added data from the Economic Census. For some industries, however, data are still not available for 2012, so the 2007 weights were extended based, in part, on commodities prices.

The weights for aggregation expressed as value-added per unit were estimated with data on producer prices for the period after 2013. Table 12 shows the annual value-added proportions in the IP index from 2007 through 2014.

### ***Revised Quarterly and Monthly Data***

This revision incorporated product data 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***

Seasonal factors for production-worker hours—which adjust for timing, holiday, and monthly seasonal patterns—were updated with data through May 2015. The updated factors for the physical product series, which include adjustments for holiday and workday patterns, used data through March 2015 where available.

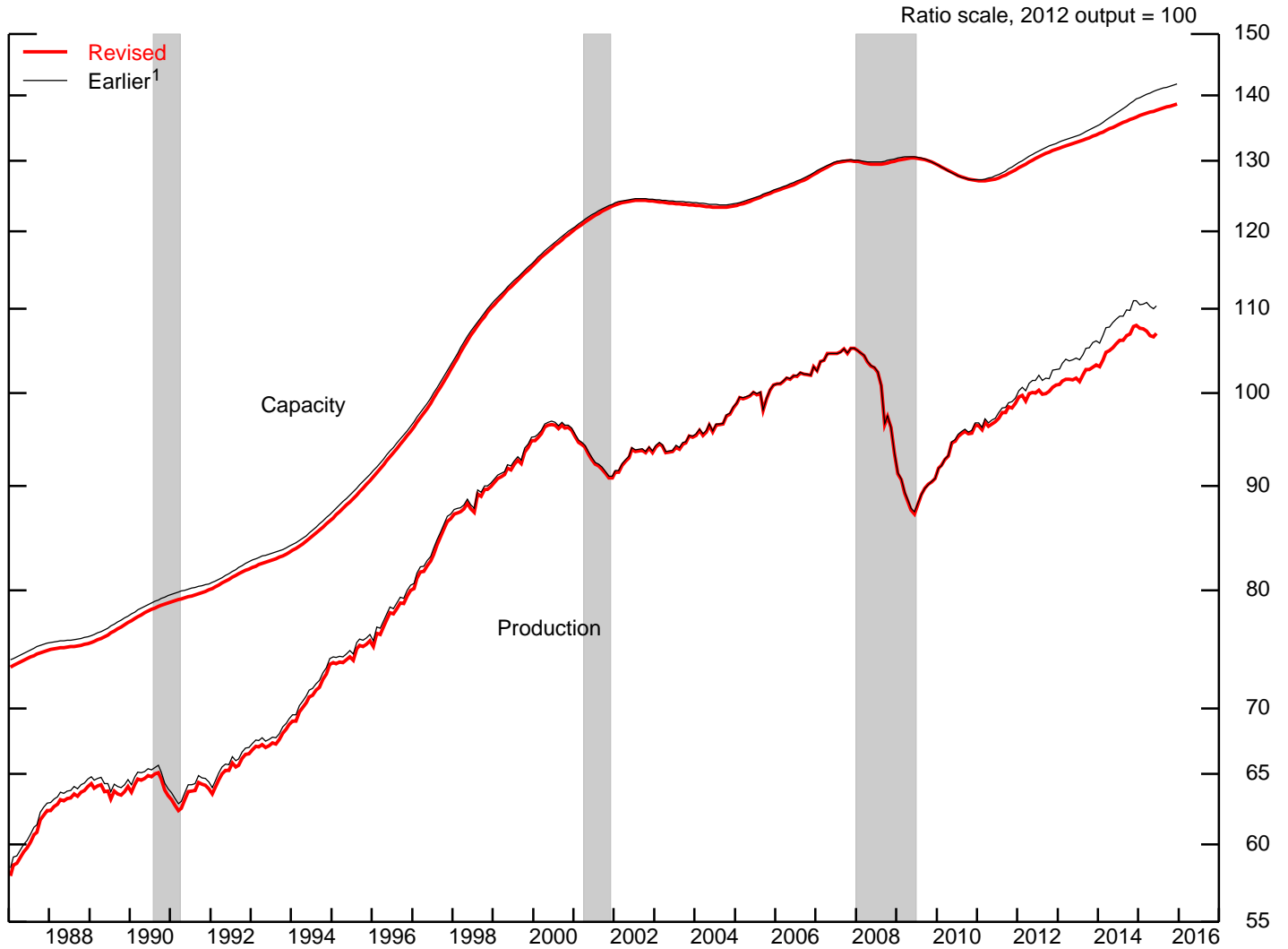
Seasonal factors for unit motor vehicle assemblies have been updated, and projections through December 2016 are available on the Board's website at [www.federalreserve.gov/releases/g17/mvsf.htm](http://www.federalreserve.gov/releases/g17/mvsf.htm). These factors are based on production data through April 2015 and were revised back to January 1996. The seasonal factors explicitly incorporate the holiday schedule for the vehicle assembly lines. The AFL-CIO's current collective bargaining agreements with domestic manufacturers, however, expire at the end of the third quarter of 2015. Factors for the fourth quarter of 2015 and for 2016 were estimated based on the holiday schedule in place over the past three years. Once the new agreements are finalized, the seasonal factors will be updated to reflect the agreed-upon holiday schedule over the terms of the contracts.

### **Data Availability and Publication Changes**

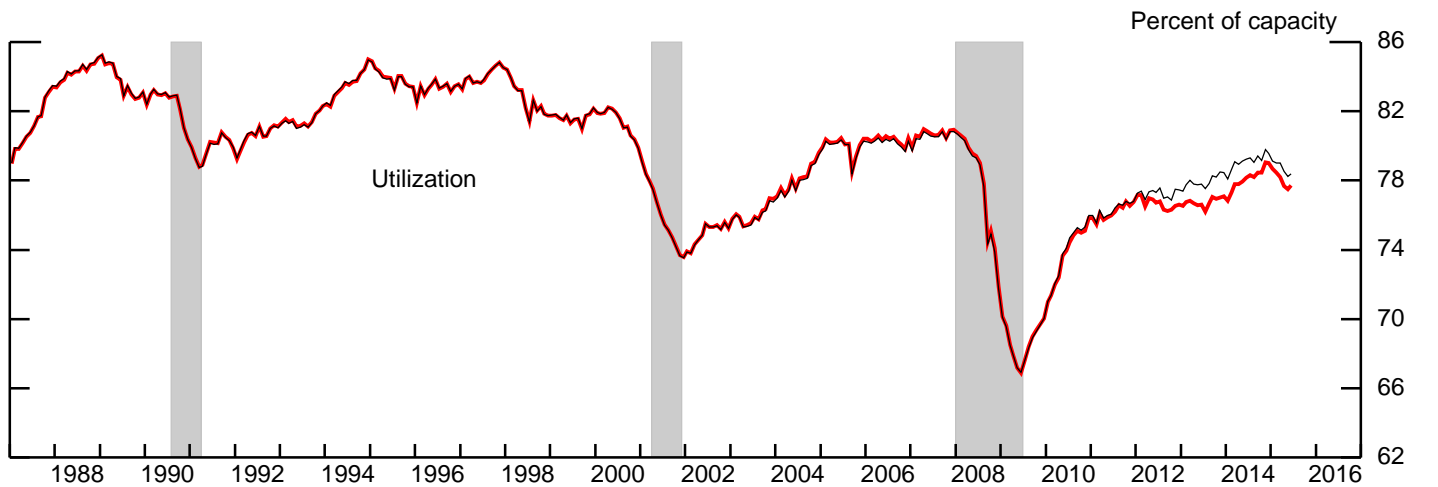
Files containing the revised data and the text and tables from this release are available on the Board's website at [www.federalreserve.gov/releases/g17](http://www.federalreserve.gov/releases/g17), as are updated data for the annual revision and for all of the regularly issued series on industrial production, capacity, and capacity utilization. As part of the reclassification from 2007 NAICS codes to 2012 NAICS codes, a number of changes will be made to the published indexes. The aggregate index for all other basic inorganic chemicals (2007 NAICS 325188) has been discontinued. Other changes are listed on the Board's website at [www.federalreserve.gov/releases/g17/g17\\_revision\\_series.htm](http://www.federalreserve.gov/releases/g17/g17_revision_series.htm).

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

# 1. Total industrial production, capacity, and utilization

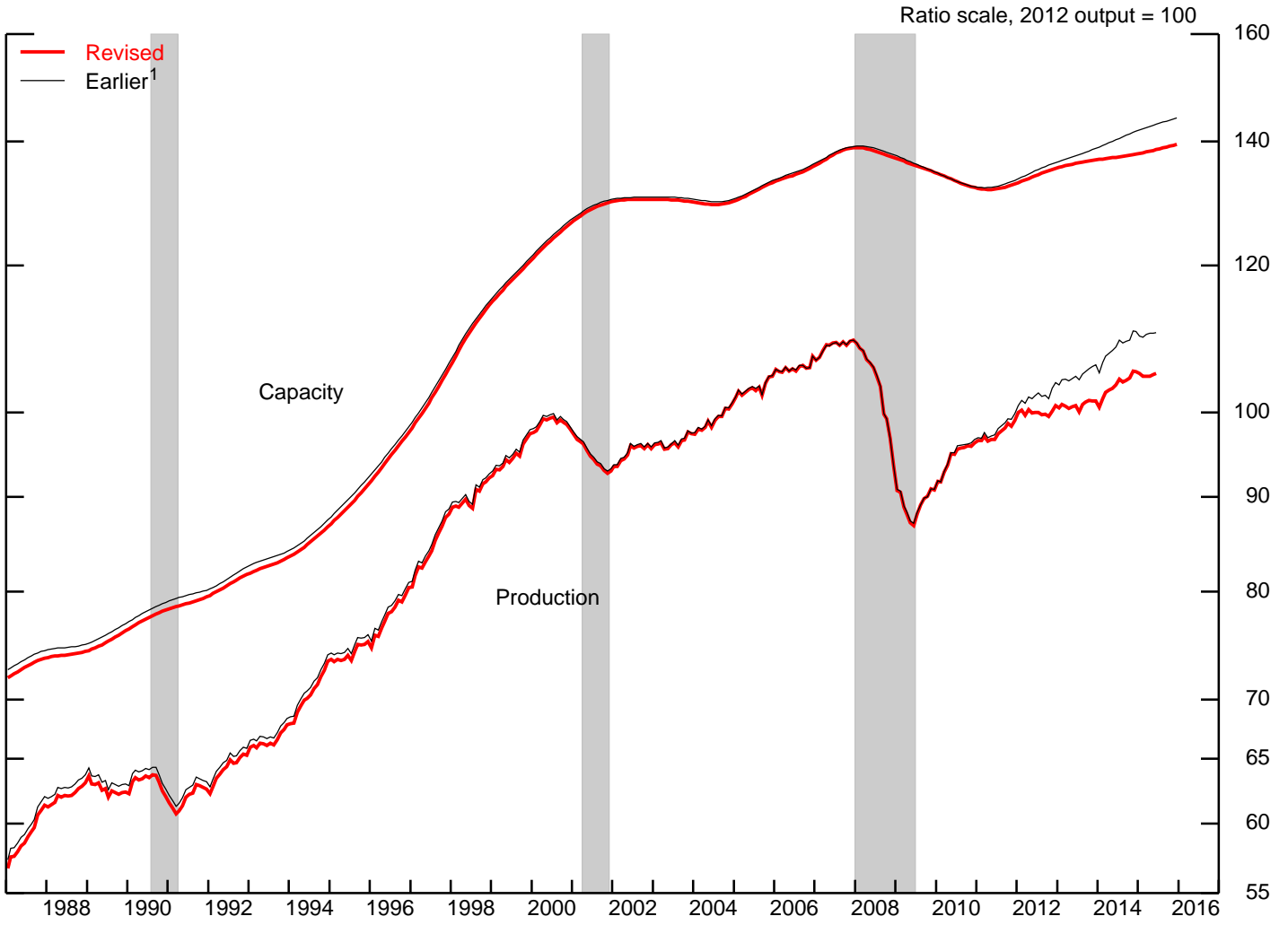


1. For ease of comparison, the earlier indexes are adjusted to equal the revised 2012-based indexes in 2007.

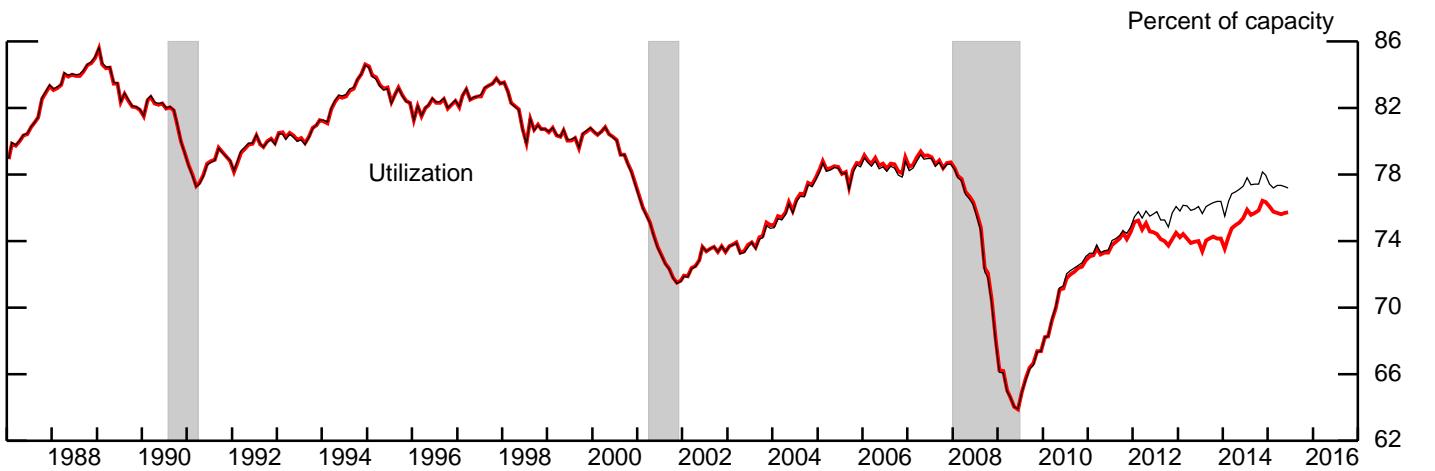


Note: The shaded areas represent periods of business recession as defined by the National Bureau of Economic Research (NBER).

## 2. Manufacturing industrial production, capacity, and utilization

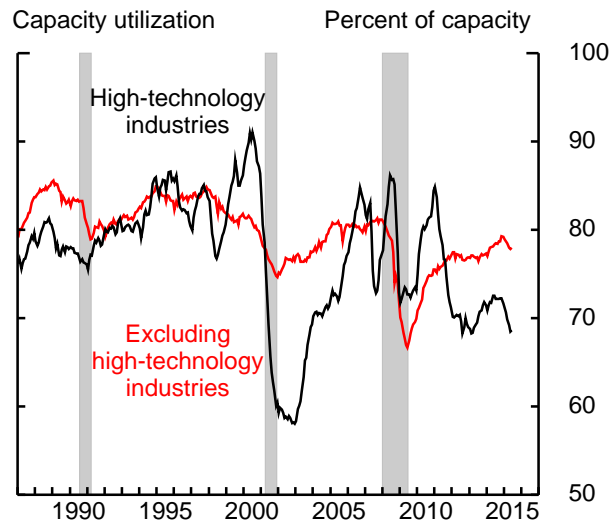
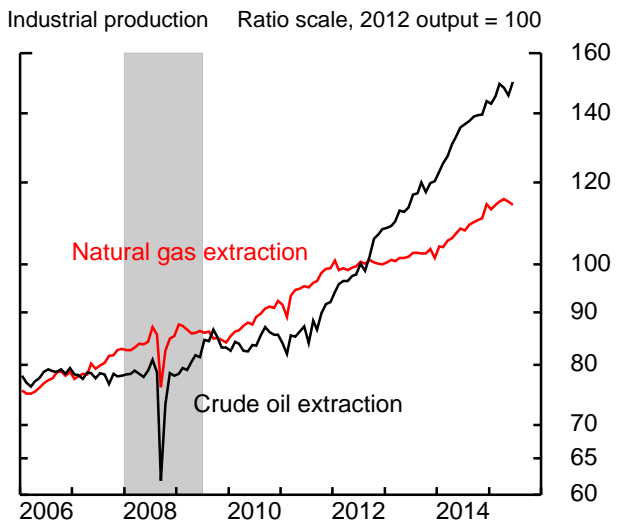
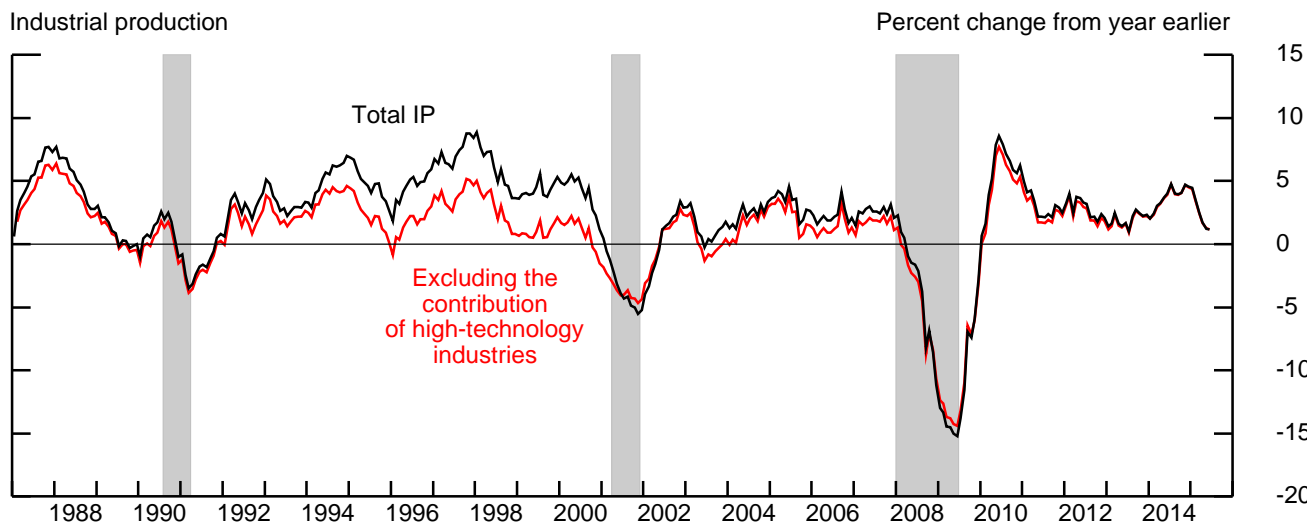
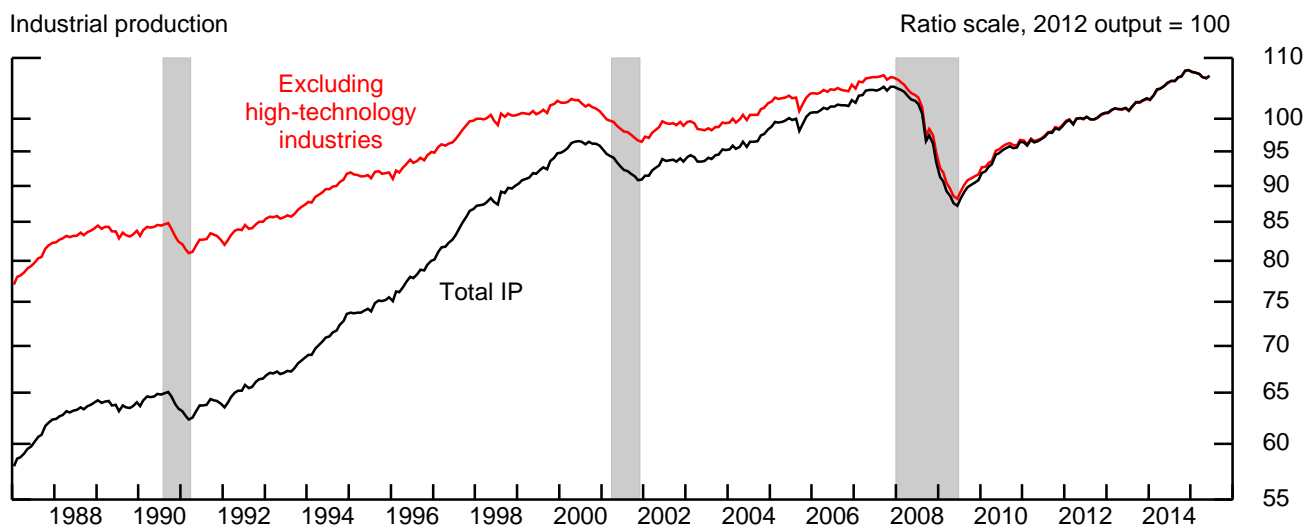


1. For ease of comparison, the earlier indexes are adjusted to equal the revised 2012-based indexes in 2007.



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

### 3. Industrial production and capacity utilization

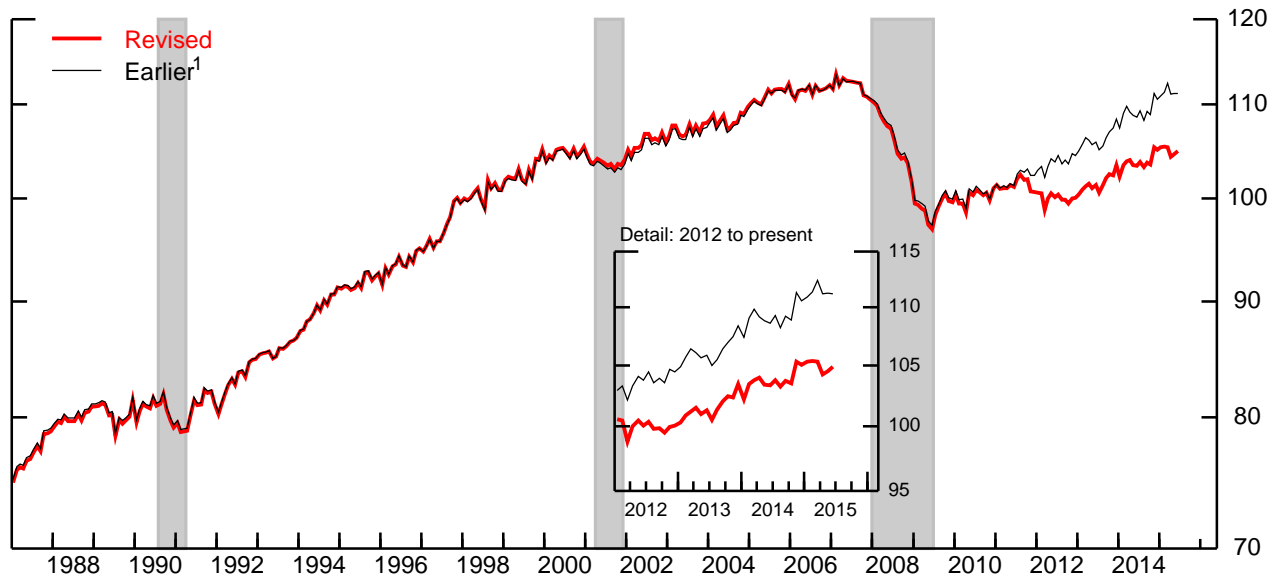


Notes: High-technology industries are defined as semiconductors and related electronic components (NAICS 3344), computers (NAICS 3341), and communications equipment (NAICS 3342). The shaded areas represent periods of business recession as defined by the NBER.

## 4. Consumer goods

Total

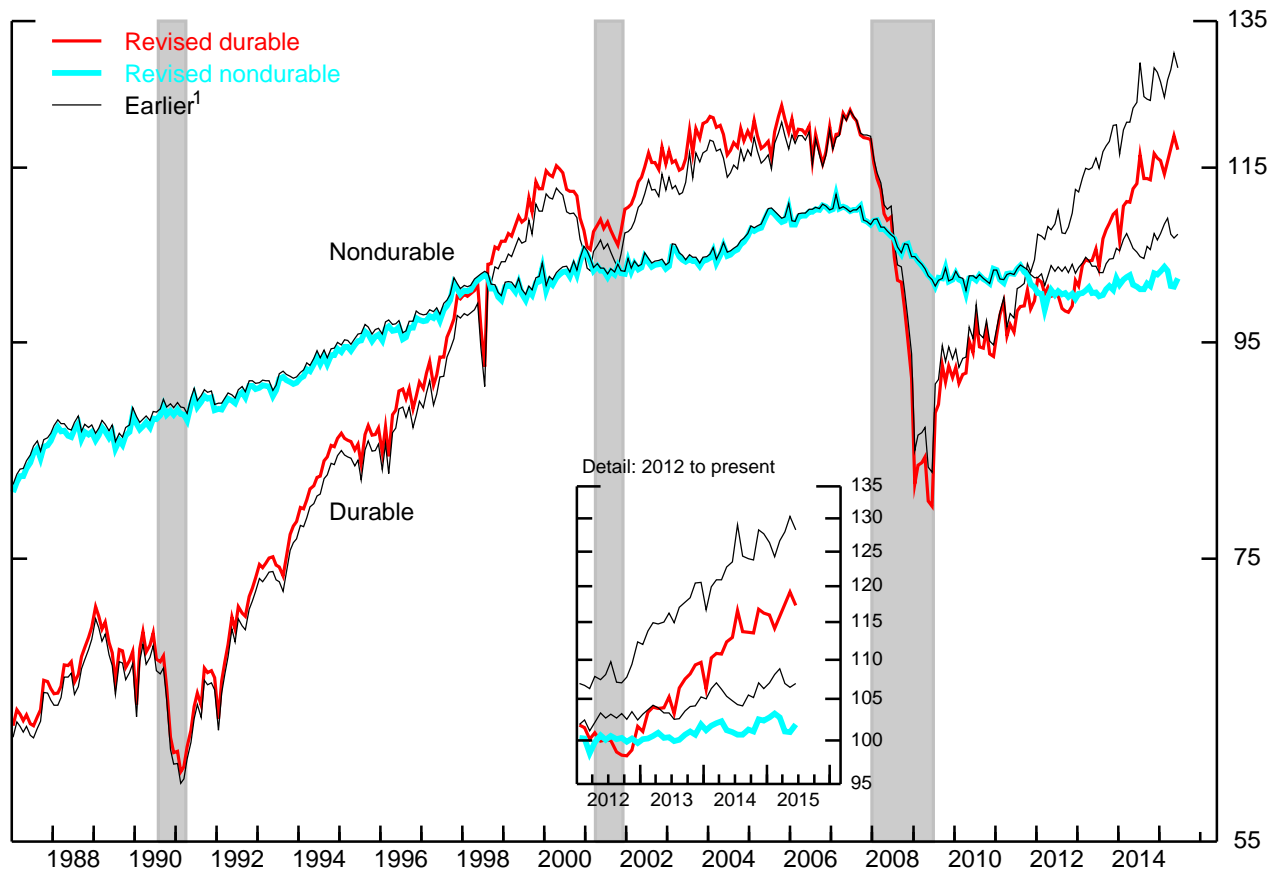
Ratio scale, 2012 output = 100



1. For ease of comparison, the earlier indexes are adjusted to equal the revised 2012-based indexes in 2007.

Components of consumer goods

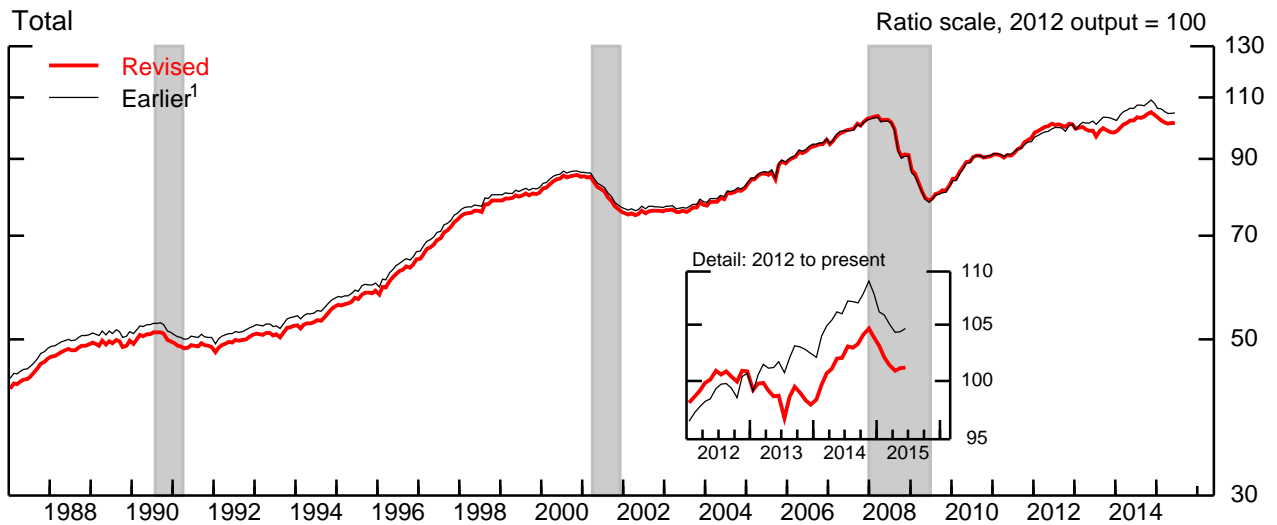
Ratio scale, 2012 output = 100



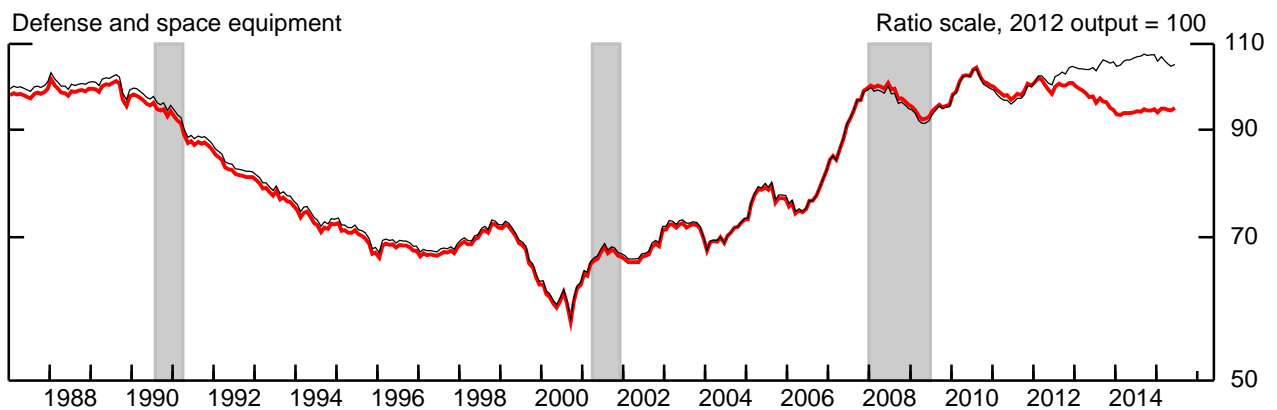
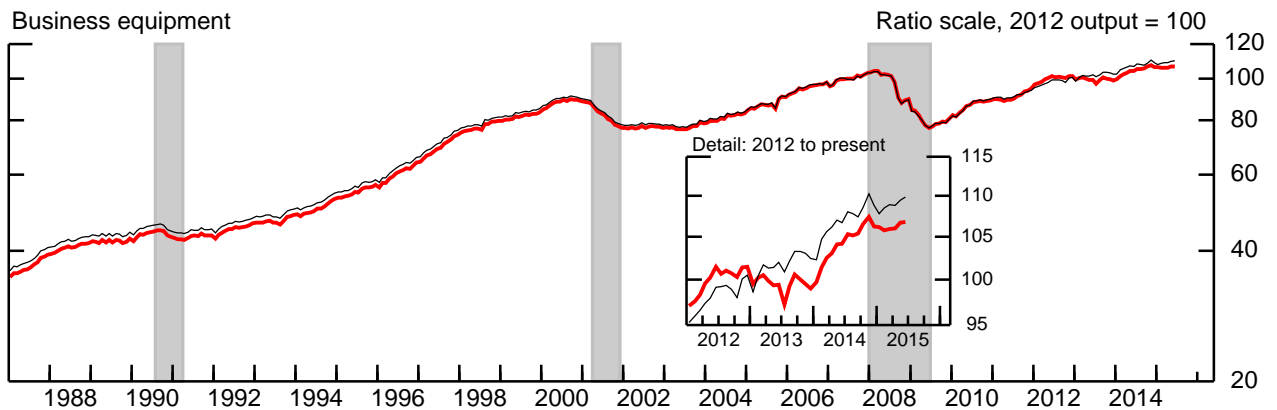
1. For ease of comparison, the earlier indexes are adjusted to equal the revised 2012-based indexes in 2007.

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.

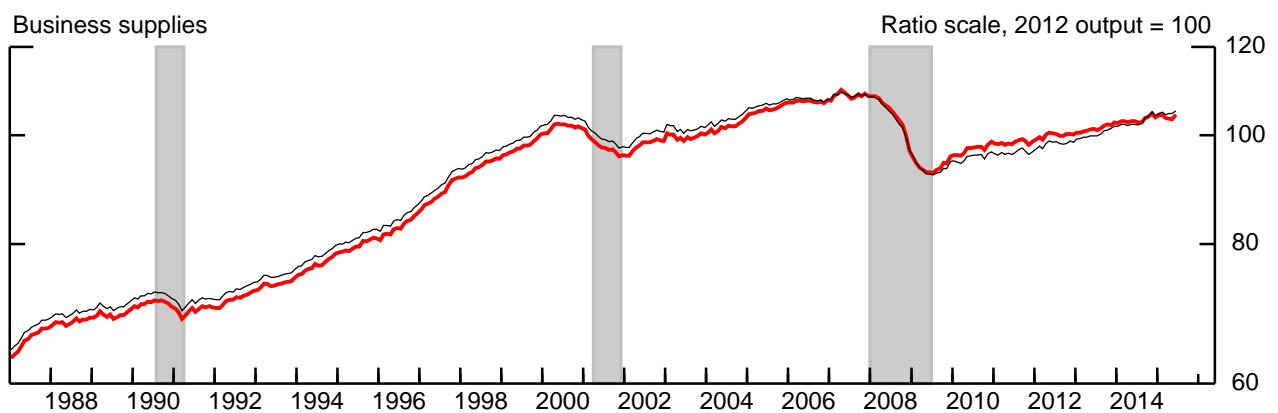
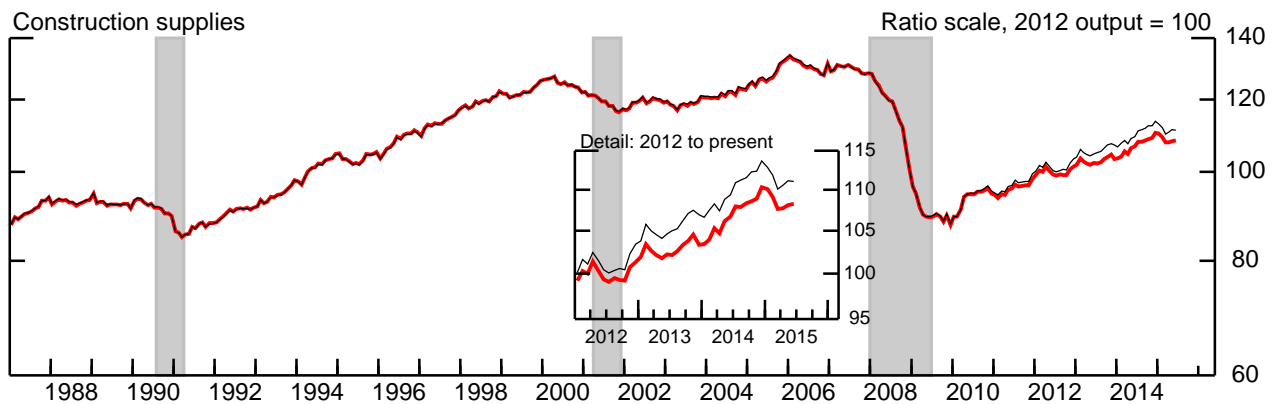
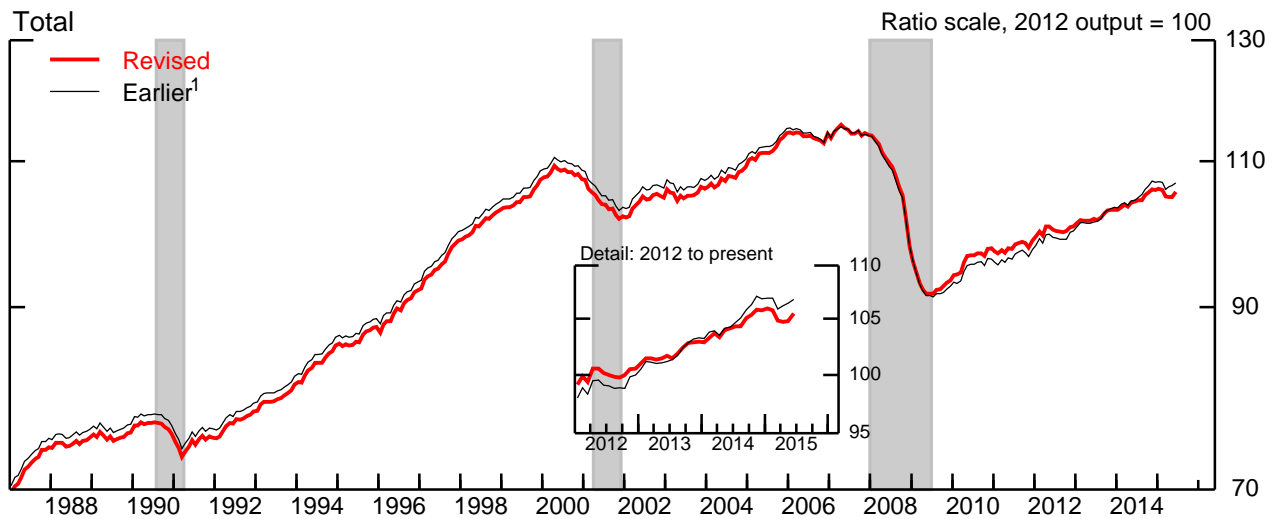


1. For ease of comparison, the earlier indexes are adjusted to equal the revised 2012-based indexes in 2007.

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

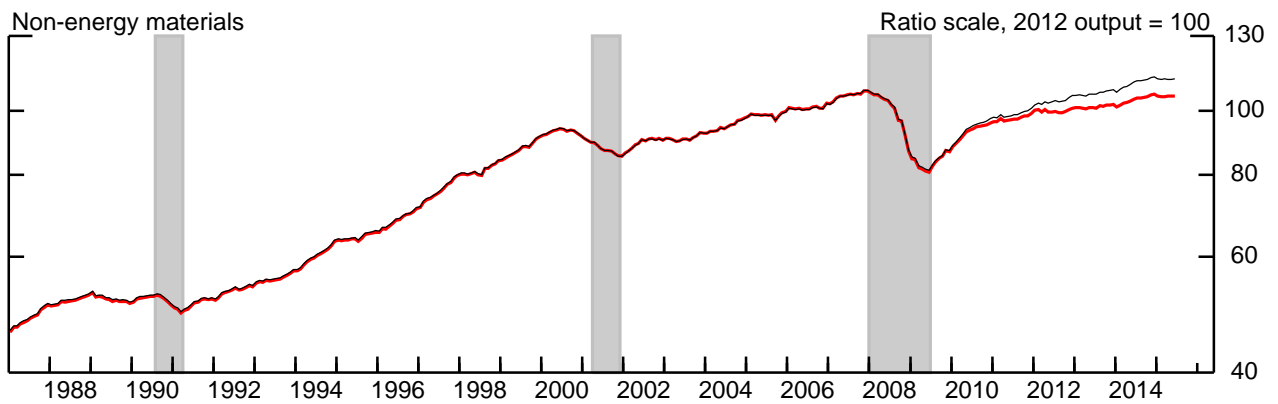
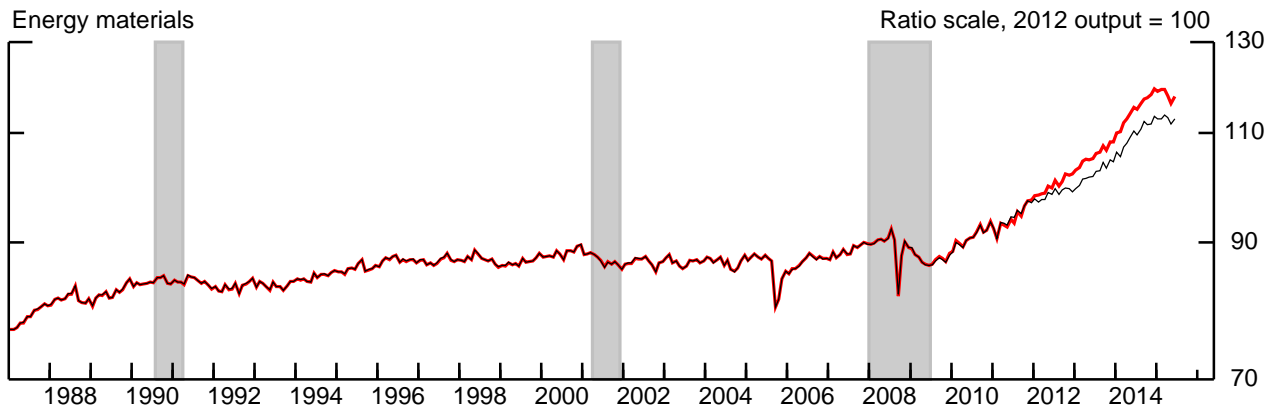
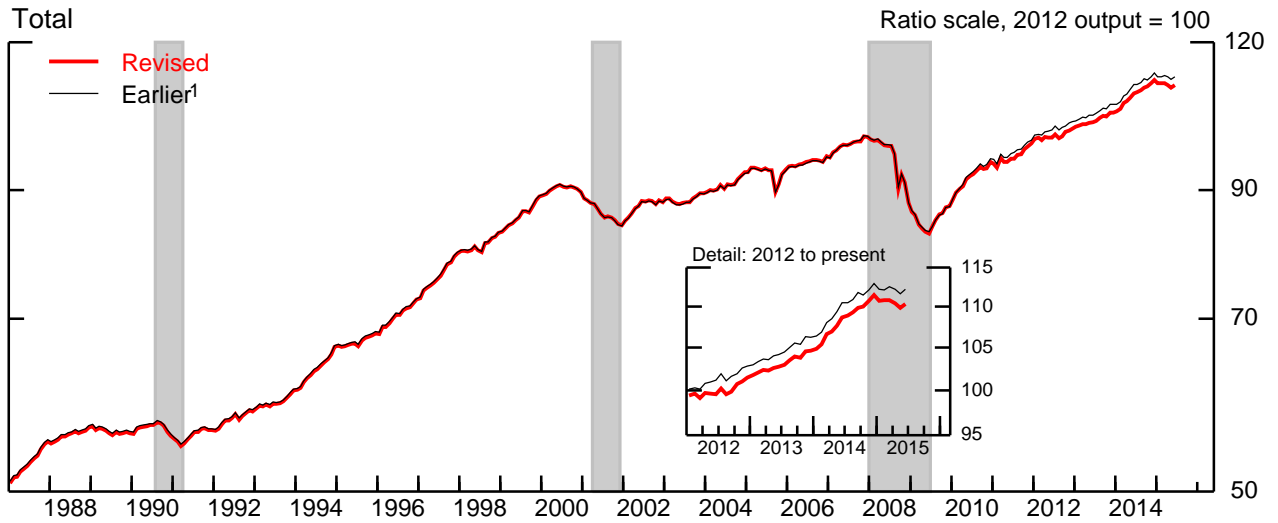


## 6. Nonindustrial supplies



1. For ease of comparison, the earlier indexes are adjusted to equal the revised 2012-based indexes in 2007.  
 Note: The shaded areas represent periods of business recession as defined by the NBER.

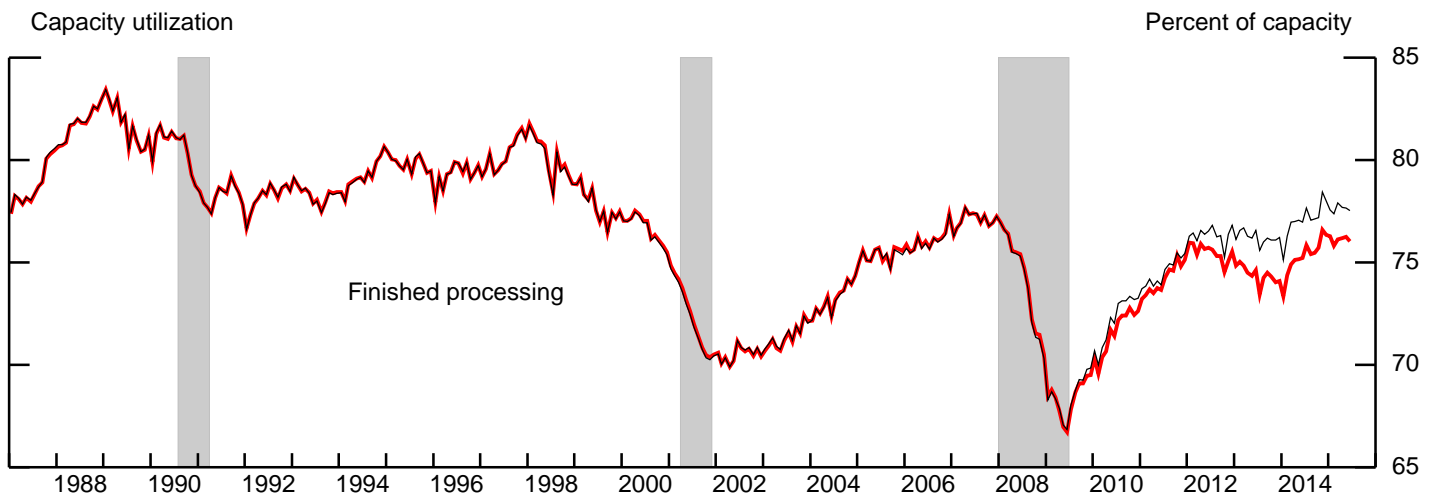
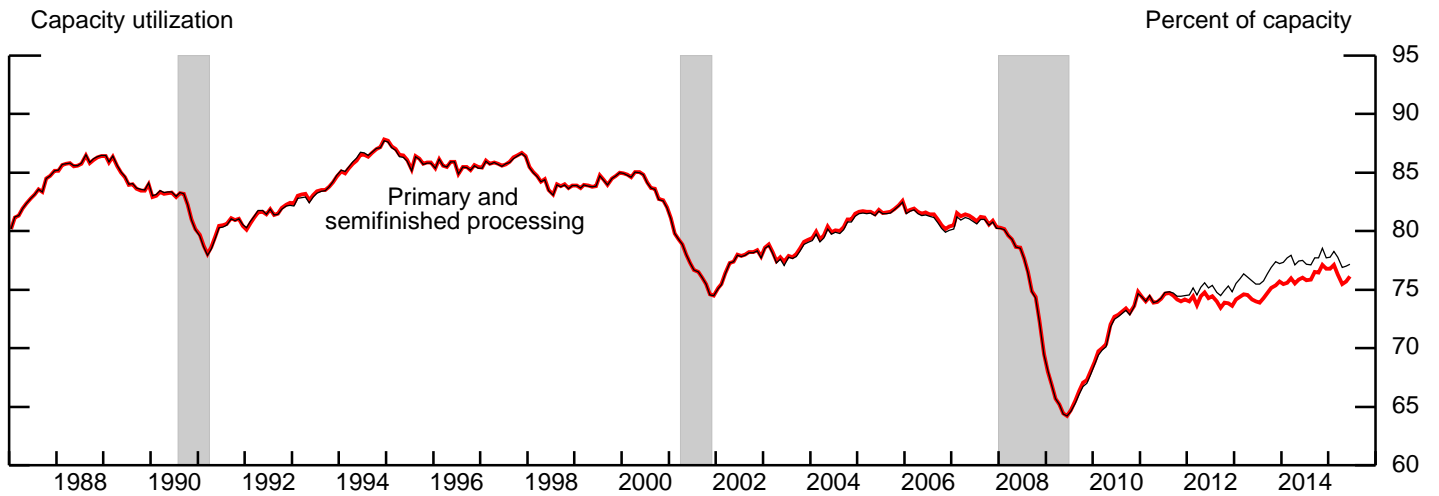
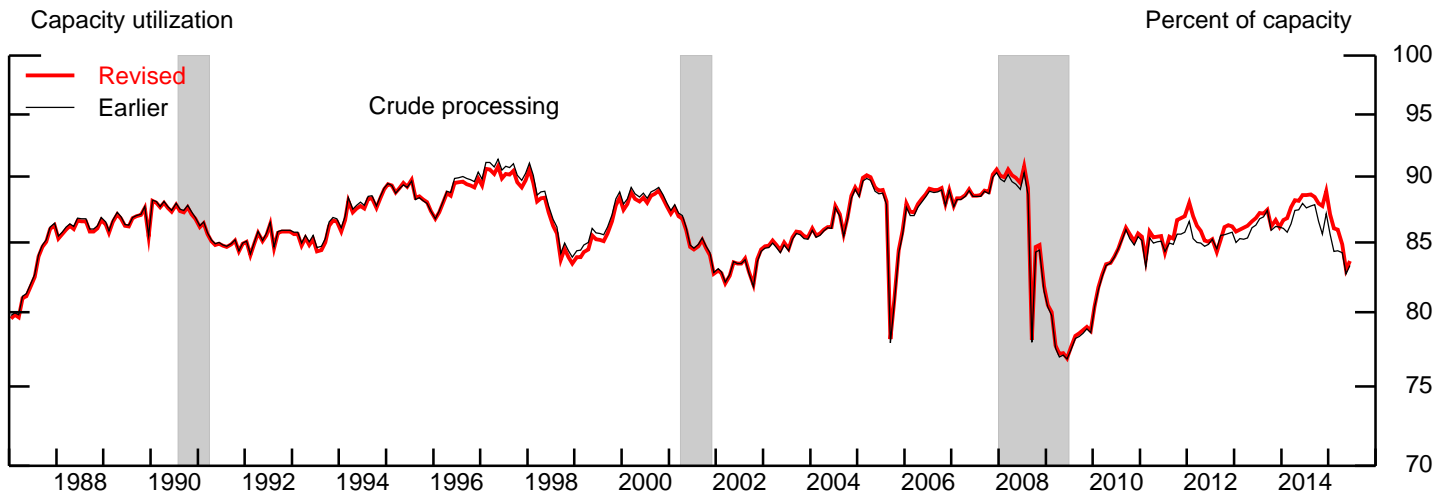
## 7. Industrial materials



1. For ease of comparison, the earlier indexes are adjusted to equal the revised 2012-based indexes in 2007.

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 2**  
**RATES OF CHANGE IN INDUSTRIAL PRODUCTION, MARKET AND INDUSTRY GROUP SUMMARY: 2011–15<sup>1</sup>**

Item	Revised change (percent)					Difference between revised and earlier changes (percentage points)				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>Total IP</b>	2.8	2.1	2.3	4.5	-1.0	-3	-1.1	-1.0	-1	-3
MARKET GROUPS										
<b>Final products and nonindustrial supplies</b>	1.9	1.2	1.6	3.0	-9	-5	-1.6	-1.6	-4	.0
<b>Consumer goods</b>	.6	-1.2	2.9	1.8	1.5	-1.4	-2.9	-.3	-7	-2
<b>Durable</b>	5.2	.1	9.5	5.9	4.3	-2.8	-6.2	.5	.3	.6
Automotive products	11.6	-1.9	15.5	6.8	9.4	-3.5	-8.4	4.2	-5	1.4
Home electronics	12.1	7.0	2.4	3.4	4.8	6.9	9.6	-2.2	-2.5	2.7
Appliances, furniture, carpeting	1.0	2.0	5.6	7.6	-1.9	-.3	-1.7	-1.8	-5	.9
Miscellaneous goods	-2.1	1.4	3.8	4.2	-5	-2.9	-6.1	-2.9	2.1	-4
<b>Nondurable</b>	-5	-1.6	1.3	.8	.8	-9	-2.0	-.4	-8	-4
Non-energy	.0	-2.5	-.9	1.8	.7	-1.1	-2.7	-1.2	-7	-1
Foods and tobacco	-9	1.0	1.1	.4	1.3	-1.8	-2.1	.3	-1.8	.4
Clothing	-5.8	-6.7	-1.5	.1	-4.8	2.0	-5.2	-7.8	-2.3	-4.2
Chemical products	2.0	-8.1	-4.9	6.3	2.3	-.6	-4.3	-4.6	1.7	-5
Paper products	.7	-4.8	-.5	-5.6	-6.9	1.0	1.5	2.4	-.7	-1.7
Energy	-1.6	1.1	7.3	-1.8	.8	-.4	.0	1.6	-1.0	-1.7
<b>Business equipment</b>	6.1	7.4	-1.5	7.3	-.4	1.5	.8	-4.9	1.1	-.7
Transit	8.6	19.5	1.4	11.8	4.4	1.5	4.9	-1.8	6.2	1.2
Information processing	2.4	5.8	-.2	3.4	1.1	1.6	-.6	-4.1	.8	-1.0
Industrial and other	6.8	3.6	-3.3	6.9	-3.3	1.5	.0	-6.6	-.8	-1.7
<b>Defense and space equipment</b>	-.7	.6	-5.2	-.8	.3	-.1	-4.0	-6.9	-2.5	4.7
<b>Construction supplies</b>	2.0	3.2	3.4	5.2	-2.2	-.5	-.6	-1.6	.0	1.0
<b>Business supplies</b>	.6	1.7	2.2	1.7	-.2	.1	-.4	-.8	-1.2	-.9
<b>Materials</b>	4.0	3.2	3.2	6.1	-1.0	-.1	-.6	-.2	.3	-.6
<b>Non-energy</b>	3.4	1.9	1.6	3.4	-.6	-.3	-2.6	-.9	-1.1	.4
<b>Durable</b>	6.5	3.0	2.4	4.8	-1.3	-.6	-3.1	-1.7	-1.1	.5
Consumer parts	8.8	8.7	4.0	9.0	4.8	3.6	.0	-2.4	.9	3.8
Equipment parts	10.6	2.4	.8	4.0	-2.7	-1.3	-5.8	-3.3	-3.3	-.1
Other	2.8	1.7	3.0	3.8	-2.7	-1.3	-2.1	-.5	-.4	-.7
<b>Nondurable</b>	-1.0	.2	.4	1.1	.5	.1	-1.9	.3	-1.0	.3
Textile	-6.5	-1.4	6.7	1.5	4.3	-4.0	.2	5.0	-3.8	-1.4
Paper	-.2	1.1	-1.4	-1.8	.1	1.1	3.4	-1.0	-.7	.1
Chemical	-1.2	-.2	.0	2.4	.2	-.4	-4.8	-.1	-1.1	-.1
<b>Energy</b>	4.9	5.2	5.6	9.9	-1.8	.1	2.6	.6	2.0	-2.4
INDUSTRY GROUPS										
<b>Manufacturing</b>	2.7	1.5	1.3	3.4	.4	-.4	-1.9	-1.7	-.7	.1
<b>Manufacturing (NAICS)</b>	31–33	2.9	1.9	1.4	3.9	.5	-.4	-2.0	-1.8	-.6
<b>Durable manufacturing</b>		5.4	3.6	2.0	5.1	-.3	-.6	-2.6	-2.9	-.5
Wood products	321	1.0	7.8	5.3	4.2	-6.0	.1	.0	-3.7	.8
Nonmetallic mineral products	327	-.4	3.9	3.6	5.2	1.5	-.3	1.7	-.3	-.7
Primary metals	331	6.5	-4.5	5.5	1.2	-10.3	-2.0	-3.1	1.5	-1.2
Fabricated metal products	332	4.2	1.4	2.9	2.4	-.4	-2.3	-4.1	-1.9	-1.2
Machinery	333	10.0	2.3	-3.6	8.2	-5.2	1.9	.5	-8.5	-.9
Computer and electronic products	334	6.4	6.3	-.5	3.6	-1.7	-.3	-6.6	-4.6	-1.4
Electrical equip., appliances, and components	335	1.5	2.2	-.7	2.6	4.8	-.7	-1.8	-3.3	-.6
Motor vehicles and parts	3361–3	11.2	6.3	10.2	9.8	8.5	-.1	-5.3	1.3	2.6
Aerospace and miscellaneous transportation equipment	3364–9	6.4	8.2	-1.1	3.0	4.0	.0	3.2	-3.4	-2.5
Furniture and related products	337	1.4	6.3	3.2	9.3	-2.1	1.5	2.0	-1.5	-.1
Miscellaneous	339	-4.2	.0	5.6	5.8	-2.5	-3.7	-7.3	-1.1	.9
<b>Nondurable manufacturing</b>		.2	.0	.7	2.6	1.4	-.2	-1.3	-.5	-.7
Food, beverage, and tobacco products	311,2	-1.0	1.0	1.4	.7	1.6	-1.7	-2.3	.5	-1.8
Textile and product mills	313,4	-4.0	-2.1	5.5	1.7	.9	-3.5	-1.1	4.7	-2.4
Apparel and leather	315,6	-5.9	-7.2	-.7	.4	-4.4	-.7	-5.3	-6.6	-1.2
Paper	322	1.3	2.6	-2.0	-.9	-.5	1.8	4.7	-.6	.0
Printing and support	323	-3.5	-.5	3.0	.2	.6	.1	2.1	-.1	-1.5
Petroleum and coal products	324	2.8	-.5	5.6	.1	5.5	-.2	1.0	4.0	-2.0
Chemicals	325	.8	-2.2	-1.9	4.5	.9	.7	-3.2	-2.6	-.4
Plastics and rubber products	326	1.4	4.8	2.1	9.7	1.5	.6	-.1	-2.3	.7
<b>Other manufacturing (non-NAICS)</b>	1133,5111	-.5	-6.5	-1.6	-8.6	-2.9	-.3	-.3	1.8	-1.3
<b>Mining</b>	21	7.1	6.2	5.8	12.3	-8.2	-.3	2.0	1.0	2.2
<b>Utilities</b>	2211,2	-2.2	.1	4.6	-1.0	-.8	.0	.0	.4	-.2
Electric	2211	-1.7	-.4	3.7	-.6	-.4	.0	.0	.4	-.3
Natural gas	2212	-5.7	4.0	11.0	-3.2	-4.2	.1	.0	.4	-.9

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. For 2015, the rates are calculated from the fourth quarter of 2014 to the second quarter 2015 and are annualized.

**Table 3**  
**RATES OF CHANGE IN INDUSTRIAL PRODUCTION, SPECIAL AGGREGATES AND SELECTED DETAIL: 2011–15<sup>1</sup>**

Item	Revised change (percent)					Difference between revised and earlier changes (percentage points)					
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	
<b>Total industry</b>	2.8	2.1	2.3	4.5	-1.0	-3	-1.1	-1.0	-1	-3	
<b>Energy</b>	3.3	3.6	5.6	6.6	-3.9	.0	1.8	.8	1.0	-2.0	
Consumer products	-1.6	1.1	7.3	-1.8	.8	-4	.0	1.6	-1.0	-1.7	
Commercial products	-4	1.4	4.7	1.3	.6	-2	.0	.7	-4	-1	
Oil and gas well drilling	213111	21.1	-7.6	-1.3	7.3	-76.7	-2	-1	-2	.0	.2
Converted fuel	.0	4.6	.9	.8	1.2	1.4	4.3	-1	.0	-1.0	
Primary energy	6.3	5.4	6.8	12.2	-2.7	-3	2.1	.8	2.5	-2.9	
<b>Non-energy</b>	2.7	1.5	1.1	3.6	.0	-.5	-2.2	-1.7	-.6	.2	
<b>Selected high-technology industries</b>	8.0	9.8	2.6	1.6	-4.0	-.8	-7.1	-2.9	-4.6	-.8	
Computers and peripheral equipment	3341	.6	20.6	-.9	10.3	6.9	20.6	18.0	-14.5	11.0	4.8
Communications equipment	3342	3.7	3.0	13.6	-10.7	1.9	-7.4	4.5	11.0	-11.1	5.8
Semiconductors and related electronic components	3344	10.3	9.7	.2	4.1	-7.6	-3.2	-13.9	-4.7	-4.4	-3.9
<b>Excluding selected high-technology industries</b>	2.4	1.1	1.0	3.6	.1	-.5	-2.0	-1.7	-.5	.2	
<b>Motor vehicles and parts</b>	3361-3	11.2	6.3	10.2	9.8	8.5	-.1	-5.3	1.3	2.6	2.3
Motor vehicles	3361	13.2	1.1	14.6	8.1	9.3	-4.8	-11.5	2.9	2.0	-.1
Motor vehicle parts	3363	9.1	10.5	5.4	11.6	8.6	4.3	.7	-.5	4.5	5.5
<b>Excluding motor vehicles and parts</b>	1.8	.8	.4	3.2	-.5	-.5	-1.7	-1.9	-.7	-.1	
Consumer goods	.0	-2.1	-.1	2.4	.7	-1.4	-3.2	-1.4	-.5	-.2	
Business equipment	7.0	6.8	-2.4	7.3	-1.4	1.5	.9	-6.1	.5	-1.2	
Construction supplies	1.9	3.2	3.4	5.3	-2.3	-.5	-.6	-1.6	.0	.9	
Business supplies	.0	.9	1.1	1.5	.1	-.2	-.6	-1.1	-1.6	-.9	
Materials	2.3	.6	1.5	2.7	-1.1	-.5	-1.9	-.5	-1.1	.0	
<b>Measures excluding selected high-technology industries</b>											
Total industry	2.6	1.8	2.3	4.5	-.9	-.3	-.9	-.9	.0	-.3	
Manufacturing <sup>2</sup>	2.4	1.2	1.2	3.5	.5	-.4	-1.7	-1.6	-.5	.1	
Durable	5.1	3.0	2.0	5.3	-.2	-.6	-2.1	-2.9	-.1	.4	
<b>Measures excluding motor vehicles and parts</b>											
Total industry	2.5	1.9	2.0	4.2	-1.5	-.4	-.9	-1.1	-.3	-.5	
Manufacturing <sup>2</sup>	2.2	1.2	.7	3.0	-.2	-.4	-1.7	-1.9	-.9	-.1	
Durable	4.7	3.2	.9	4.3	-1.7	-.7	-2.2	-3.5	-1.0	.0	
<b>Measures excluding selected high-technology industries and motor vehicles and parts</b>											
Total industry	2.2	1.6	2.0	4.3	-1.4	-.3	-.7	-1.0	-.1	-.5	
Manufacturing <sup>2</sup>	1.9	.8	.6	3.0	-.1	-.4	-1.4	-1.8	-.8	-.1	
<b>Stage-of-process components of non-energy materials, measures of the input to</b>											
Finished processors	7.4	3.5	1.4	4.2	.1	.1	-2.5	-2.3	-1.8	1.2	
Primary and semifinished processors	.9	.8	1.8	2.8	-1.2	-.6	-2.7	.0	-.6	-.1	
<b>STAGE-OF-PROCESS GROUPS</b>											
Crude	4.9	5.6	4.8	9.0	-1.7	.3	1.8	1.0	1.7	-3.1	
Primary and semifinished	1.7	1.3	3.1	2.3	-.5	-.5	-1.3	-.3	-1.0	.5	
Finished	3.2	1.1	-.1	4.5	-1.4	-.5	-2.6	-3.2	.0	.2	

1. See footnote 1 to table 2.

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 4**  
**ANNUAL RATES OF CHANGE FOR INDUSTRIAL PRODUCTION: 2010–14<sup>1</sup>**

Item	Revised change (percent)					Difference between revised and earlier changes (percentage points)				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
<b>Total IP</b>	5.6	3.0	2.8	1.9	3.7	-1	-3	-9	-9	-4
MARKET GROUPS										
<b>Consumer goods</b>	1.2	1.2	-1.4	1.5	2.2	.1	-3	-3.1	-9	-7
Durable	8.8	4.4	2.0	5.5	7.0	1.5	-5	-6.0	-2.1	1.0
Nondurable	-7	.4	-2.2	.6	.9	-1	-2	-2.2	-4	-1.0
Business equipment	7.9	5.3	9.9	-4	4.7	-3	-2	2.4	-4.0	-3
Defense and space equipment	7.5	-2.8	1.8	-3.1	-3.2	-4	.6	-2.9	-5.4	-5.0
Construction supplies	3.6	2.3	4.3	2.9	3.9	-1	-7	-3	-1.4	-3
Business supplies	3.5	1.4	1.5	1.5	1.7	1.2	.4	-3	-5	-8
<b>Materials</b>	8.4	4.2	4.1	3.1	5.1	-4	-5	-4	-1	.0
Non-energy	11.1	4.7	2.8	1.4	2.5	-5	-5	-1.9	-1.5	-1.1
Energy	4.2	3.4	6.3	5.7	8.7	.0	-3	1.9	1.8	1.4
INDUSTRY GROUPS										
<b>Manufacturing<sup>2</sup></b>	5.9	3.0	2.7	.9	2.5	-1	-3	-1.5	-1.7	-1.0
Manufacturing (NAICS)	6.5	3.3	2.9	1.1	2.8	-1	-4	-1.5	-1.9	-9
Durable manufacturing	10.7	6.2	5.5	1.4	4.1	-3	-6	-1.8	-3.1	-1.1
Nondurable manufacturing	2.2	.2	.1	.7	1.4	.0	-1	-1.2	-5	-7
Other manufacturing (non-NAICS)	-5.3	-2.7	-2.7	-3.3	-5.6	.0	.1	-7	2.1	-1.1
Mining	5.2	5.6	7.5	6.5	10.8	.0	-5	1.2	1.8	1.8
Utilities	3.6	-2	-2.2	2.5	1.1	.0	.0	.0	.4	-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 3.

**Table 5**  
**RATES OF CHANGE IN CAPACITY, BY INDUSTRY GROUPS: 2011–15<sup>1</sup>**

Item	Revised change (percent)					Difference between revised and earlier changes (percentage points)				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>Total industry</b>	.9	2.4	1.6	2.1	1.5	-5	-2	-2	-1.1	-3
<b>Manufacturing<sup>2</sup></b>	.2	1.9	1.1	.7	1.2	-3	-3	-7	-1.4	-5
Manufacturing (NAICS)	.2	2.0	1.2	.9	1.3	-4	-4	-7	-1.4	-5
Durable manufacturing	2.1	2.2	1.8	1.6	1.9	-5	-1.7	-1.3	-1.6	-9
Nondurable manufacturing	-1.6	1.8	.6	.0	.8	-2	1.2	-1	-1.3	.0
Other manufacturing (non-NAICS)	-2	.0	-1.2	-2.3	-2.2	.0	1.2	.1	-1.4	-7
Mining	4.5	5.8	6.4	9.3	4.2	-1.5	1.0	2.4	.1	.9
Utilities	1.9	1.2	.3	1.2	.8	.0	-1	-1	.1	.5
<b>Selected high-technology industries</b>	24.5	13.7	-.5	.9	5.9	-1.4	-5.3	-5.2	-7.7	-2.3
Manufacturing <sup>2</sup> ex. selected high-technology industries	-9	1.4	1.3	.7	.9	-3	.0	-4	-1.1	-4
STAGE-OF-PROCESS GROUPS										
Crude	4.0	6.3	4.4	7.0	3.3	-6	2.8	1.3	-4	.4
Primary and semifinished	1.4	1.8	.7	.5	1.0	.3	-2	.0	-1.4	-5
Finished	-8	1.2	1.6	1.3	1.5	-1.3	-1.4	-1.3	-1.0	-3

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 3.



**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)				
	1972-2014 Ave.	2011 Q4	2012 Q4	2013 Q4	2014 Q4	2011 Q4	2012 Q4	2013 Q4	2014 Q4	
<b>Total industry</b>		80.1	76.7	76.5	77.0	78.8	-1	-8	-1.4	-7
<b>Manufacturing<sup>1</sup></b>		78.5	74.4	74.1	74.2	76.2	-3	-1.4	-2.2	-1.6
<b>Manufacturing (NAICS)</b>	31-33	78.4	74.7	74.6	74.7	77.0	-3	-1.5	-2.3	-1.7
<b>Durable manufacturing</b>		76.9	73.2	74.2	74.4	76.9	-1	-7	-1.9	-1.1
Wood products	321	76.4	60.7	66.3	70.1	71.9	.2	-3	-2.5	.0
Nonmetallic mineral products	327	74.2	53.3	55.8	59.0	62.5	-1	-5	-9	-2.6
Primary metals	331	79.0	76.1	76.1	76.0	77.8	.0	.9	-1.4	-.7
Fabricated metal products	332	77.6	78.2	77.2	79.5	81.5	-1.4	-3.0	-1.3	.9
Machinery	333	77.8	78.5	79.2	74.0	78.0	-1.0	1.4	-4.8	-5.1
Computer and electronic products	334	77.9	74.1	73.2	73.0	74.1	.4	-7	-.2	2.6
Electrical equip., appliances, and components	335	82.2	80.4	81.7	81.1	83.0	.1	-9	-2.3	-1.6
Motor vehicles and parts	3361-3	74.8	67.0	69.4	73.0	76.5	-4	-3.4	-5.2	-6.1
Aerospace and miscellaneous transportation equipment	3364-9	73.8	74.2	78.7	76.5	78.3	.7	3.1	1.0	.0
Furniture and related products	337	76.5	66.4	69.8	72.2	78.9	.7	-.5	-1.7	-1.3
Miscellaneous	339	76.3	76.8	76.0	77.4	78.9	1.6	-1.1	1.6	2.9
<b>Nondurable manufacturing</b>		80.4	76.4	75.0	75.1	77.0	-6	-2.5	-2.8	-2.5
Food, beverage, and tobacco products	311,2	80.8	77.6	78.2	79.0	79.1	-.8	-2.2	-1.2	-1.5
Textile and product mills	313,4	79.5	65.6	66.1	71.1	73.2	-8	-2.0	.7	-1.2
Apparel and leather	315,6	76.9	66.1	63.0	64.0	65.7	-.5	-5.2	-11.0	-12.3
Paper	322	86.6	81.7	83.6	82.5	83.5	-.5	1.1	.1	-.2
Printing and support	323	80.0	62.2	62.0	63.2	63.3	-4.2	-5.1	-7.6	-9.8
Petroleum and coal products	324	85.4	83.7	81.0	82.3	83.4	-1.4	-1.1	-.9	-1.1
Chemicals	325	77.2	75.7	71.5	70.1	73.7	.1	-4.1	-5.1	-3.6
Plastics and rubber products	326	82.0	73.6	76.0	76.0	80.7	1.2	1.3	-.5	1.0
<b>Other manufacturing (non-NAICS)</b>	1133,5111	81.4	67.1	62.7	62.5	58.5	1.1	.1	1.2	1.2
<b>Mining</b>	21	87.5	88.4	88.8	88.3	90.7	1.0	1.9	.7	2.4
<b>Utilities</b>	2211,2	85.9	79.2	78.4	81.7	80.0	-.1	.0	.4	.1
<b>Selected high-technology industries</b>		77.7	71.9	69.4	71.5	72.0	-.4	-1.5	.1	2.1
Computers and peripheral equipment	3341	77.8	73.5	67.1	64.1	66.4	1.5	-2.6	-4.9	-3.2
Communications equipment	3342	76.8	74.1	76.2	85.9	74.1	-2.9	-.4	7.7	-2.6
Semiconductors and related electronic components	3344	79.1	71.1	68.1	69.2	72.9	.1	-1.7	-1.4	4.3
<b>Measures excluding selected high-technology industries</b>										
Total industry		80.2	76.9	76.7	77.2	79.0	.0	-.8	-1.4	-.9
Manufacturing <sup>1</sup>		78.6	74.5	74.3	74.3	76.4	-.2	-1.5	-2.3	-1.9
<b>STAGE-OF-PROCESS GROUPS</b>										
Crude		86.3	86.8	86.2	86.3	88.2	1.1	.5	.3	1.7
Primary and semifinished		80.7	74.1	73.8	75.4	76.8	-.4	-1.2	-1.7	-1.2
Finished		77.0	75.1	75.1	74.1	76.2	-.3	-1.1	-2.0	-1.6

1. See footnote 2 to table 3.

**Table 7**  
**RATES OF CHANGE IN INDUSTRIAL PRODUCTION, 2010 H2–2015 H1**

Item	NAICS code	2010 H2	2011 H1	2011 H2	2012 H1	2012 H2	2013 H1	2013 H2	2014 H1	2014 H2	2015 H1
<b>Total IP</b>		3.7	1.5	4.1	3.0	1.2	2.0	2.7	4.6	4.3	-1.0
<b>MARKET GROUPS</b>											
<b>Final products and nonindustrial supplies</b>		2.2	.9	2.8	2.6	-.3	1.2	2.0	2.9	3.2	-.9
<b>Consumer goods</b>		1.3	1.4	-.2	-1.8	-.7	2.9	2.9	1.6	2.0	1.5
<b>Durable</b>		2.0	3.4	7.0	1.6	-1.5	9.8	9.3	5.6	6.3	4.3
Automotive products		4.9	6.6	16.7	-.9	-2.8	17.0	13.9	6.4	7.2	9.4
Home electronics		-6.3	12.6	11.6	10.2	4.0	7.3	-2.2	-2.0	9.1	4.8
Appliances, furniture, carpeting		-5.8	.3	1.6	5.0	-.9	4.9	6.3	7.0	8.2	-1.9
<b>Miscellaneous goods</b>		-.6	-.7	-3.4	3.0	-.3	2.5	5.2	4.5	3.9	-.5
<b>Nondurable</b>		1.1	.9	-1.8	-2.6	-.5	1.2	1.3	.6	.9	.8
<b>Non-energy</b>		.4	.9	-.9	-2.8	-2.2	-1.0	-.7	2.1	1.4	.7
Foods and tobacco		1.6	-.6	-1.3	.3	1.7	1.7	.4	.6	.1	1.3
Clothing		4.3	-4.8	-6.8	-1.5	-11.7	-7.1	4.4	-.5	.8	-4.8
Chemical products		-1.7	5.6	-1.5	-7.7	-8.5	-6.0	-3.8	6.8	5.8	2.3
Paper products		-.6	-4.5	6.2	-6.4	-3.1	-.4	-.7	-4.4	-6.7	-6.9
Energy		3.6	1.1	-4.3	-2.2	4.5	7.5	7.0	-3.2	-.3	.8
<b>Business equipment</b>		6.4	1.0	11.5	13.9	1.3	-3.0	-.1	8.8	5.8	-.4
Transit		.5	-5.3	24.6	27.9	11.6	1.8	1.1	14.3	9.3	4.4
Information processing		-1.7	-2.2	7.2	11.0	.8	-2.6	2.2	1.3	5.6	1.1
Industrial and other		12.9	4.8	8.8	10.1	-2.4	-5.1	-1.5	9.6	4.3	-3.3
<b>Defense and space equipment</b>		-3.6	-6.0	4.9	-1.3	2.6	-5.4	-5.1	-2.8	1.2	.3
<b>Construction supplies</b>		2.2	-.2	4.1	6.5	.1	3.3	3.6	3.9	6.5	-2.2
<b>Business supplies</b>		1.8	.5	.7	3.7	-.3	1.9	2.4	1.0	2.3	-.2
<b>Materials</b>		5.6	2.2	5.7	3.5	2.9	2.9	3.6	6.6	5.6	-1.0
<b>Non-energy</b>		5.8	2.8	4.0	2.6	1.2	1.0	2.3	2.6	4.1	-.6
<b>Durable</b>		9.8	7.1	5.9	5.8	.4	.8	4.1	4.6	5.0	-1.3
Consumer parts		9.5	2.1	16.0	14.7	2.9	2.3	5.8	6.8	11.2	4.8
Equipment parts		17.1	11.9	9.2	8.9	-3.8	-1.4	3.1	3.0	5.1	-2.7
Other		4.9	5.2	.5	.7	2.6	1.8	4.2	5.0	2.7	-2.7
<b>Nondurable</b>		.3	-3.2	1.3	-1.9	2.4	1.4	-.5	-.4	2.8	.5
Textile		.1	-4.1	-8.8	.7	-3.5	9.4	4.0	-3.5	6.7	4.3
Paper		-1.2	-1.4	1.1	1.8	.5	.9	-3.6	-2.4	-1.2	.1
Chemical		-.1	-4.6	2.3	-4.5	4.2	.7	-.6	.4	4.5	.2
<b>Energy</b>		5.2	1.5	8.4	5.0	5.5	5.7	5.4	12.2	7.6	-1.8
<b>INDUSTRY GROUPS</b>											
<b>Manufacturing<sup>2</sup></b>		3.2	1.3	4.2	3.0	.2	1.0	1.6	3.3	3.6	.4
<b>Manufacturing (NAICS)</b>	31–33	3.5	1.5	4.2	3.3	.5	1.1	1.7	3.6	4.2	.5
<b>Durable manufacturing</b>		6.9	3.5	7.3	7.2	.2	.9	3.1	5.0	5.1	-.3
Wood products	321	-4.8	-.4	2.5	10.6	5.1	2.5	8.2	1.5	7.1	-6.0
Nonmetallic mineral products	327	3.6	-.5	-.3	4.6	3.2	4.9	2.3	5.1	5.3	1.5
Primary metals	331	2.9	8.6	4.4	-7.1	-1.9	5.3	5.7	2.2	.2	-10.3
Fabricated metal products	332	10.9	5.7	2.6	4.3	-1.4	1.3	4.5	2.8	2.0	-.4
Machinery	333	15.8	7.0	13.1	12.5	-7.0	-6.9	-.2	9.1	7.2	-5.2
Computer and electronic products	334	9.2	5.7	7.1	11.5	1.4	-3.6	2.8	3.5	3.6	-1.7
Selected high-technology industries		14.7	10.2	5.8	14.5	5.2	.3	4.8	1.2	2.1	-4.0
Computers and peripheral equipment	3341	-25.0	-12.4	15.4	46.6	-.8	-6.7	5.4	1.5	19.8	6.9
Communications equipment	3342	7.8	11.3	-3.3	-8.2	15.6	25.9	2.5	-19.1	-1.5	1.9
Semiconductors and related electronic components	3344	26.7	14.0	6.7	15.6	4.1	-4.7	5.4	8.7	-.3	-7.6
Electrical equip., appliances, and components	335	10.9	.2	2.9	3.4	1.1	-2.8	1.4	2.8	2.4	4.8
Motor vehicles and parts	3361–3	9.5	2.4	20.7	12.1	.7	9.9	10.5	9.7	9.8	8.5
Aerospace and miscellaneous transportation equipment	3364–9	-4.0	-1.7	15.2	7.7	8.7	2.2	-4.3	1.7	4.2	4.0
Furniture and related products	337	3.2	3.3	-.5	10.9	1.9	5.3	1.0	8.1	10.4	-2.1
Miscellaneous	339	1.3	-1.5	-6.8	.3	-.2	4.7	6.4	5.8	5.8	-2.5
<b>Nondurable manufacturing</b>		-.2	-.5	.9	-.8	.8	1.3	.1	2.1	3.1	1.4
Food, beverage, and tobacco products	311,2	1.8	-.8	-1.1	.3	1.8	1.9	1.0	.5	.9	1.6
Textile and product mills	313,4	-.9	-.5	-7.4	-1.7	-2.4	6.9	4.1	-1.4	4.9	.9
Apparel and leather	315,6	6.1	-4.4	-7.3	-2.9	-11.3	-6.0	4.9	.6	.2	-4.4
Paper	322	-2.0	-.7	3.5	3.2	2.0	.8	-4.7	-1.5	-.3	-.5
Printing and support	323	.5	-3.3	-3.8	1.8	-2.8	2.7	3.4	-1.7	2.1	.6
Petroleum and coal products	324	-.2	.9	4.8	-4.1	3.2	8.1	3.2	1.3	-1.1	5.5
Chemicals	325	-1.7	-.3	1.8	-3.6	-.8	-1.7	-2.1	2.9	6.1	.9
Plastics and rubber products	326	-.2	.2	2.6	6.9	2.8	1.1	3.1	11.4	8.1	1.5
<b>Other manufacturing (non-NAICS)</b>	<b>1133,5111</b>	-2.4	-5.1	4.3	-5.5	-7.5	-1.6	-1.5	-5.0	-12.0	-2.9
<b>Mining</b>	<b>21</b>	6.8	5.2	9.1	4.2	8.2	5.5	6.2	16.6	8.1	-8.2
<b>Utilities</b>	<b>2211,2</b>	3.1	-1.5	-3.0	1.8	-1.6	3.8	5.4	-4.7	2.9	-.8

NOTE: The data are semiannual. Rates of change are calculated as the annualized percent change in the seasonally adjusted index from the second quarter of the previous half-year to the second quarter of the half-year specified in the column heading.

1. See footnote 2 to table 3.

**Table 8**  
**CAPACITY UTILIZATION RATES, BY INDUSTRY GROUPS, 2010 Q4–2015 Q2**

Percent of capacity, seasonally adjusted

Item	NAICS code	2010 Q4	2011 Q2	2011 Q4	2012 Q2	2012 Q4	2013 Q2	2013 Q4	2014 Q2	2014 Q4	2015 Q2
<b>Total industry</b>		75.3	75.9	76.7	76.9	76.5	76.6	77.0	78.0	78.8	77.8
<b>Manufacturing<sup>1</sup></b>		72.5	73.3	74.4	74.7	74.1	73.9	74.2	75.1	76.2	75.9
<b>Manufacturing (NAICS)</b>	<b>31–33</b>	<b>72.8</b>	<b>73.6</b>	<b>74.7</b>	<b>75.2</b>	<b>74.6</b>	<b>74.5</b>	<b>74.7</b>	<b>75.7</b>	<b>77.0</b>	<b>76.7</b>
<b>Durable manufacturing</b>		70.9	71.7	73.2	74.9	74.2	73.9	74.4	75.6	76.9	76.1
Wood products	321	56.9	58.5	60.7	64.5	66.3	67.3	70.1	70.3	71.9	68.9
Nonmetallic mineral products	327	51.5	52.6	53.3	54.7	55.8	57.8	59.0	60.8	62.5	63.0
Primary metals	331	71.6	74.1	76.1	75.5	76.1	76.3	76.0	76.8	77.8	73.6
Fabricated metal products	332	75.3	77.7	78.2	78.8	77.2	77.6	79.5	80.7	81.5	81.4
Machinery	333	74.0	75.2	78.5	82.5	79.2	75.5	74.0	76.0	78.0	75.5
Computer and electronic products	334	78.8	76.9	74.1	74.3	73.2	71.7	73.0	74.1	74.1	71.7
Selected high-technology industries		82.8	79.2	71.9	70.3	69.4	69.2	71.5	72.3	72.0	68.8
Computers and peripheral equipment	3341	90.9	79.3	73.5	75.5	67.1	62.4	64.1	63.2	66.4	66.4
Communications equipment	3342	79.2	79.5	74.1	70.0	76.2	85.8	85.9	76.2	74.1	73.0
Semiconductors and related electronic components	3344	82.7	79.1	71.1	69.5	68.1	66.3	69.2	73.3	72.9	68.3
Electrical equip., appliances, and components	335	77.4	78.6	80.4	81.6	81.7	80.5	81.1	82.1	83.0	85.1
Motor vehicles and parts	3361–3	60.6	61.1	67.0	70.4	69.4	71.1	73.0	74.6	76.5	78.3
Aerospace and miscellaneous transportation equipment	3364–9	72.0	70.2	74.2	76.2	78.7	78.7	76.5	76.9	78.3	79.6
Furniture and related products	337	63.4	65.7	66.4	69.7	69.8	71.6	72.2	75.1	78.9	78.0
Miscellaneous	339	78.1	78.9	76.8	76.9	76.0	76.5	77.4	78.0	78.9	76.6
<b>Nondurable manufacturing</b>		75.0	75.8	76.4	75.5	75.0	75.1	75.1	75.9	77.0	77.3
Food, beverage, and tobacco products	311,2	76.7	77.4	77.6	77.8	78.2	78.7	79.0	78.9	79.1	79.4
Textile and product mills	313,4	65.6	66.9	65.6	66.0	66.1	69.0	71.1	71.1	73.2	73.7
Apparel and leather	315,6	68.5	67.9	66.1	66.1	63.0	61.8	64.0	64.9	65.7	65.0
Paper	322	81.3	80.7	81.7	82.8	83.6	84.0	82.5	82.9	83.5	83.6
Printing and support	323	65.0	63.9	62.2	62.8	62.0	62.5	63.2	62.6	63.3	63.1
Petroleum and coal products	324	82.0	82.6	83.7	81.0	81.0	82.3	82.3	83.1	83.4	85.5
Chemicals	325	73.3	74.7	75.7	73.2	71.5	70.4	70.1	71.5	73.7	73.8
Plastics and rubber products	326	72.2	72.7	73.6	75.6	76.0	75.8	76.0	78.8	80.7	80.7
<b>Other manufacturing (non-NAICS)</b>	<b>1133,5111</b>	67.3	65.7	67.1	65.1	62.7	62.5	62.5	61.6	58.5	58.3
<b>Mining</b>	<b>21</b>	86.2	86.8	88.4	87.8	88.8	88.7	88.3	91.1	90.7	84.7
<b>Utilities</b>	<b>2211,2</b>	82.5	81.2	79.2	79.3	78.4	79.8	81.7	79.4	80.0	79.3

1. See footnote 2 to table 3.















Table 12

## ANNUAL PROPORTIONS IN INDUSTRIAL PRODUCTION, MARKET AND INDUSTRY GROUP SUMMARY

Item		2007	2008	2009	2010	2011	2012	2013	2014
<b>Total IP</b>		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
MARKET GROUPS									
<b>Final products and nonindustrial supplies</b>		55.8	56.1	57.4	55.1	54.5	54.1	53.5	54.5
<b>Consumer goods</b>		27.2	27.1	29.3	27.7	27.3	26.4	26.4	26.7
<b>Durable</b>		6.4	6.0	5.7	5.5	5.3	5.3	5.4	5.7
Automotive products		3.1	2.7	2.7	2.7	2.6	2.5	2.6	2.8
Home electronics		.4	.4	.3	.2	.2	.2	.2	.2
Appliances, furniture, carpeting		1.0	1.0	.9	.8	.7	.8	.8	.8
Miscellaneous goods		2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.9
<b>Nondurable</b>		20.8	21.1	23.6	22.2	22.0	21.1	21.0	21.0
Non-energy		15.8	16.3	18.1	16.6	16.2	15.7	15.4	15.7
Foods and tobacco		8.2	8.6	9.9	9.2	8.9	8.7	8.7	8.7
Clothing		.4	.4	.3	.3	.3	.3	.2	.2
Chemical products		5.2	5.3	5.8	5.2	5.2	4.9	4.6	5.0
Paper products		1.5	1.5	1.6	1.5	1.4	1.4	1.3	1.3
Energy		5.0	4.8	5.5	5.6	5.8	5.5	5.7	5.3
<b>Business equipment</b>		9.8	10.0	9.4	9.3	9.3	10.0	9.7	10.2
Transit		2.0	2.0	1.9	2.0	1.9	2.2	2.3	2.5
Information processing		2.7	2.7	2.6	2.3	2.2	2.3	2.2	2.2
Industrial and other		5.0	5.3	4.9	4.9	5.3	5.5	5.2	5.5
<b>Defense and space equipment</b>		2.0	2.2	2.5	2.6	2.4	2.3	2.2	2.2
<b>Construction supplies</b>		5.2	5.0	4.4	4.2	4.2	4.3	4.3	4.5
<b>Business supplies</b>		10.9	11.1	11.2	10.7	10.5	10.3	10.1	10.1
<b>Materials</b>		44.2	43.9	42.6	44.9	45.5	45.9	46.5	45.5
<b>Non-energy</b>		27.2	27.1	26.1	27.3	27.7	27.5	26.9	27.1
<b>Durable</b>		16.7	16.6	14.9	16.0	16.5	16.5	16.2	16.6
Consumer parts		3.0	2.7	2.2	2.5	2.6	2.8	2.8	2.9
Equipment parts		5.6	5.9	5.4	5.6	5.9	5.7	5.4	5.5
Other		8.1	7.9	7.3	7.9	8.1	8.0	8.0	8.2
<b>Nondurable</b>		10.5	10.5	11.2	11.3	11.2	11.0	10.8	10.5
Textile		.5	.4	.4	.5	.4	.4	.4	.4
Paper		2.1	2.2	2.2	2.1	2.0	2.0	2.0	1.9
Chemical		5.0	4.7	5.0	5.5	5.6	5.4	5.2	5.1
<b>Energy</b>		17.0	16.8	16.5	17.6	17.8	18.4	19.5	18.4
INDUSTRY GROUPS									
<b>Manufacturing</b>		76.1	75.8	75.7	74.7	74.5	74.3	73.0	73.9
<b>Manufacturing (NAICS)</b>	31–33	72.5	72.2	72.1	71.6	71.6	71.5	70.3	71.4
<b>Durable manufacturing</b>		39.2	39.2	36.5	36.9	37.0	37.6	36.9	38.1
Wood products	321	1.2	1.1	1.0	.9	.9	1.0	1.1	1.1
Nonmetallic mineral products	327	2.2	2.0	1.7	1.6	1.6	1.7	1.7	1.8
Primary metals	331	2.7	2.5	2.1	2.8	2.8	2.6	2.6	2.6
Fabricated metal products	332	5.8	6.0	5.3	5.2	5.4	5.4	5.4	5.5
Machinery	333	5.1	5.4	4.9	5.1	5.6	6.0	5.6	5.9
Computer and electronic products	334	6.9	7.0	6.6	6.4	6.3	6.1	5.7	5.7
Electrical equip., appliances, and components	335	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8
Motor vehicles and parts	3361–3	5.2	4.5	4.0	4.5	4.2	4.5	4.7	5.1
Aerospace and miscellaneous transportation equipment	3364–9	4.0	4.3	4.6	4.4	4.2	4.4	4.4	4.4
Furniture and related products	337	1.4	1.4	1.1	1.0	1.0	1.1	1.1	1.1
Miscellaneous	339	2.9	3.2	3.4	3.2	3.1	2.9	2.9	3.0
<b>Nondurable manufacturing</b>		33.3	33.0	35.6	34.7	34.6	33.9	33.5	33.2
Food, beverage, and tobacco products	311,2	9.9	10.5	12.1	11.2	10.7	10.5	10.5	10.5
Textile and product mills	313,4	.9	.8	.7	.7	.7	.7	.7	.7
Apparel and leather	315,6	.4	.4	.3	.3	.3	.3	.3	.3
Paper	322	2.5	2.6	2.8	2.6	2.5	2.6	2.6	2.6
Printing and support	323	1.9	1.9	1.8	1.6	1.5	1.5	1.4	1.4
Petroleum and coal products	324	3.3	2.7	3.1	3.6	4.0	3.8	3.8	3.2
Chemicals	325	11.3	11.3	11.9	11.8	11.9	11.6	11.1	11.3
Plastics and rubber products	326	3.0	3.0	2.9	2.9	2.9	3.0	3.1	3.3
<b>Other manufacturing (non-NAICS)</b>	<b>1133,5111</b>	3.6	3.6	3.6	3.1	3.0	2.8	2.7	2.6
<b>Mining</b>	<b>21</b>	14.1	13.7	12.6	14.1	14.8	15.5	16.6	15.5
<b>Utilities</b>	<b>2211,2</b>	9.8	10.5	11.7	11.2	10.7	10.2	10.4	10.6
Electric	2211	8.1	8.8	10.0	9.7	9.4	9.0	9.1	9.3
Natural gas	2212	1.7	1.7	1.7	1.5	1.3	1.2	1.3	1.3

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 2014 and 2015 would account for a 0.381 percent increase in total IP.

**Table 13**

**INDUSTRIAL PRODUCTION AND CAPACITY UTILIZATION: SUMMARY**

Seasonally adjusted

Industrial production	2012=100						Percent change						June '14 to June '15
	2015 Jan. <sup>r</sup>	Feb. <sup>r</sup>	Mar. <sup>r</sup>	Apr. <sup>r</sup>	May <sup>r</sup>	June <sup>r</sup>	2015 Jan. <sup>r</sup>	Feb. <sup>r</sup>	Mar. <sup>r</sup>	Apr. <sup>r</sup>	May <sup>r</sup>	June <sup>r</sup>	
<b>Total index</b>	107.6	107.5	107.4	107.0	106.9	107.1	-3	-1	-1	-3	-2	.2	1.3
<i>Previous estimates</i>	105.8	105.9	106.1	105.6	105.4	105.7	-4	.0	.2	-5	-2	.3	1.5
<b>Major market groups</b>													
Final Products	104.6	104.3	104.2	103.9	104.0	103.9	-1	-3	.0	-3	.2	-1	1.0
Consumer goods	105.3	105.4	105.6	105.4	105.5	105.4	.2	.0	.3	-2	.1	-1	1.9
Business equipment	106.2	105.8	105.9	106.0	106.8	106.8	-1	-4	.1	.1	.7	.0	2.5
Nonindustrial supplies	105.9	105.8	105.0	105.1	105.0	105.6	.2	-2	-8	.1	.0	.5	1.4
Construction	110.1	109.2	107.7	107.7	108.2	108.3	-2	-9	-1.4	.0	.4	.1	1.4
Materials	110.7	110.8	110.8	110.4	109.8	110.3	-6	.1	.0	-4	-5	.4	1.5
<b>Major industry groups</b>													
Manufacturing (see note below)	104.9	104.6	104.7	105.1	105.2	105.1	-3	-3	.2	.3	.1	-1	1.6
<i>Previous estimates</i>	101.3	101.2	101.5	101.6	101.7	101.7	-6	-1	.3	.1	.0	.0	1.8
Mining	122.1	120.2	120.6	118.6	115.5	116.8	-1.6	-1.6	.3	-1.7	-2.6	1.1	-1.8
Utilities	104.6	108.2	105.5	102.7	103.3	104.8	1.5	3.5	-2.5	-2.6	.6	1.5	3.1
													Capacity growth
Capacity utilization	Percent of capacity												June '14 to June '15
	Average 1972-2014	1988-89 high	1990-91 low	1994-95 high	2008-09 low	2014 June	2015 Jan. <sup>r</sup>	Feb. <sup>r</sup>	Mar. <sup>r</sup>	Apr. <sup>r</sup>	May <sup>r</sup>	June <sup>r</sup>	
<b>Total industry</b>	80.1	85.2	78.8	85.0	66.9	78.2	78.7	78.5	78.3	78.0	77.7	77.8	1.8
<i>Previous estimates</i>	80.1	85.3	78.7	85.0	66.9	79.2	79.1	79.0	79.0	78.5	78.2	78.4	2.6
Manufacturing (see note below)	78.5	85.6	77.3	84.6	63.9	75.4	76.1	75.7	75.8	76.0	76.0	75.8	1.0
<i>Previous estimates</i>	78.6	85.6	77.3	84.6	63.9	77.3	77.4	77.2	77.3	77.3	77.3	77.2	1.9
Mining	87.5	86.2	83.8	88.7	79.0	91.6	89.8	88.0	88.0	86.2	83.7	84.4	6.6
Utilities	85.9	92.9	84.3	93.3	78.5	78.6	80.3	83.0	80.9	78.7	79.1	80.2	1.0
<b>Stage-of-process groups</b>													
Crude	86.3	87.6	84.3	89.8	76.9	88.6	87.1	86.1	85.9	84.9	83.0	83.6	5.1
Primary and semifinished	80.7	86.5	78.1	87.8	64.2	76.0	76.8	77.1	76.5	76.1	76.2	76.3	.8
Finished	77.0	83.4	77.4	80.7	66.7	75.2	76.3	75.8	76.1	76.2	76.3	76.0	1.3

<sup>r</sup> Revised.

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.

Table 14

## NETWORKING EQUIPMENT, 2001–2013

	Production Index (2012=100)	Price Index (2012=100)	Value of Production (millions of dollars)
Annual Estimates			
2001	245.1	374.6	24,640.7
2002	161.3	338.8	14,682.0
2003	167.1	287.6	12,900.4
2004	165.0	250.0	11,087.1
2005	209.6	223.1	12,540.0
2006	341.0	204.3	18,498.8
2007	239.0	183.4	12,117.4
2008	21.0	169.7	956.3
2009	60.1	148.8	2,387.8
2010	81.3	130.9	2,860.5
2011	82.3	110.2	2,427.7
2012	100.0	100.0	2,677.0
2013	110.1	90.7	2,669.9
Quarterly Estimates			
2001Q1	272.6	380.1	27,754.5
Q2	253.1	373.9	25,347.7
Q3	235.8	372.2	23,502.0
Q4	220.1	372.5	21,955.3
2002Q1	177.4	355.8	16,907.3
Q2	161.1	342.1	14,757.6
Q3	155.0	334.1	13,867.8
Q4	152.5	323.9	13,231.5
2003Q1	151.9	300.1	12,214.7
Q2	172.0	302.3	13,928.9
Q3	182.7	287.3	14,055.6
Q4	163.8	260.8	11,443.7
2004Q1	180.1	269.3	12,989.0
Q2	157.6	254.6	10,746.6
Q3	160.3	244.1	10,480.5
Q4	169.9	232.7	10,584.0
2005Q1	169.0	225.3	10,200.8
Q2	191.0	222.6	11,389.5
Q3	230.7	222.8	13,767.8
Q4	264.9	222.2	15,765.1
2006Q1	235.2	217.5	13,701.6
Q2	273.1	206.0	15,062.7
Q3	382.6	199.2	20,408.5
Q4	522.7	194.4	27,214.3
2007Q1	431.6	190.6	22,031.5
Q2	373.2	188.0	18,785.5
Q3	38.1	180.8	1,845.2
Q4	43.7	174.0	2,036.5
2008Q1	22.2	177.5	1,056.3
Q2	16.6	172.0	763.1
Q3	19.0	169.1	860.3
Q4	27.1	159.6	1,157.5
2009Q1	27.5	150.8	1,112.7
Q2	50.4	151.5	2,045.2
Q3	75.6	144.5	2,928.0
Q4	90.6	147.9	3,589.4
2010Q1	84.0	139.5	3,138.0
Q2	77.2	132.4	2,739.6
Q3	83.2	127.9	2,848.0
Q4	78.3	123.6	2,591.3
2011Q1	71.2	116.0	2,213.3
Q2	79.0	109.5	2,317.7
Q3	84.8	109.1	2,476.9
Q4	91.6	106.3	2,607.4
2012Q1	95.7	104.5	2,680.1
Q2	97.8	102.5	2,684.5
Q3	101.1	97.2	2,634.4
Q4	105.3	95.9	2,703.6
2013Q1	103.6	95.4	2,646.0
Q2	108.0	92.8	2,684.2
Q3	112.3	89.5	2,690.6
Q4	116.3	85.2	2,655.2

NOTE: The production index in the table is calculated as the value of production divided by the price index and then indexed to 2012. The production index does not reflect changes to IP for benchmark purposes and so it is not equivalent to the IP index for data networking equipment.

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](http://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](http://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 or sales and unit values) 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 ( $0.06 \times 10\% = 0.6\%$ ). 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](http://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 67 percent of the source data (in value-added terms) are available; the fraction of available source data increases to 81 percent for estimates in the second month that the estimate is published, 93 percent in the third month, 96 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 2011 is summarized in the table below:

**Availability of Monthly IP Data in Publication Window**  
(Percent of value added in 2011)

Type of data	Month of estimate					
	1st	2nd	3rd	4th	5th	6th
Physical product	27	41	53	55	58	58
Production-worker hours	41	41	41	41	41	41
IP data received	67	81	93	96	99	99
IP data estimated	33	19	7	4	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 (27 percent out of a total of 58 percent). Of the 27 percent, about two-thirds (19 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 May 2015; for other series, the factors were estimated with data through at least March 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.

**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 1987–2013 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 1987–2013 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 88 detailed industries (70 in manufacturing, 16 in mining, and 2 in utilities), which mostly correspond to industries at the three- and four-digit 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 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. 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 a bit less than 70 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 5 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/CapNotes.htm](http://www.federalreserve.gov/releases/G17/CapNotes.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 1972–2014 period, the average total industry utilization rate was 80.1 percent; for manufacturing, the average factory operating rate was 78.7 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 annual revision published in June 2010 is described in an article published in the *Federal Reserve Bulletin*, available on the Board's website at [www.federalreserve.gov/releases/G17/About.htm](http://www.federalreserve.gov/releases/G17/About.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.151-76. 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](http://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).

## Release Schedule

On the day the G.17 is released it is published at 9:15 a.m., the publication schedule for 2015 is January 16, February 18, March 16, April 15, May 15, June 15, July 15, August 14, September 15, October 16, November 17, and December 16.

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