

Economic Outlook

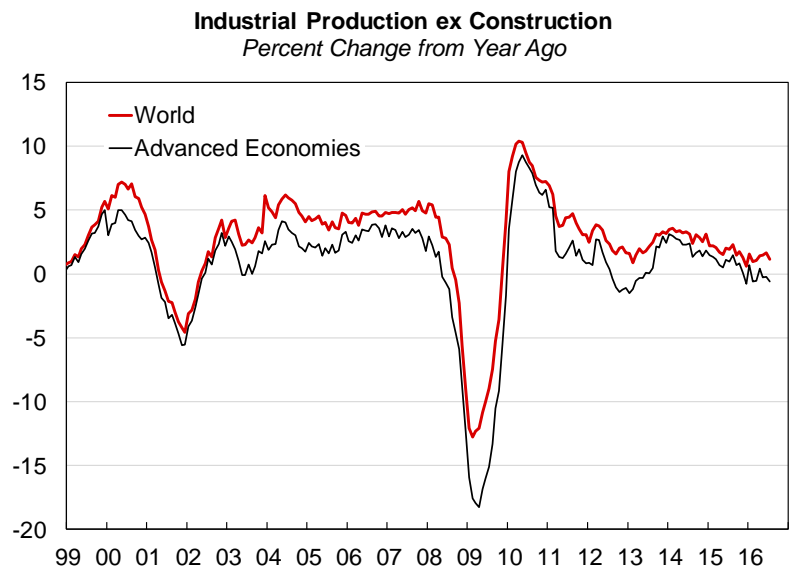
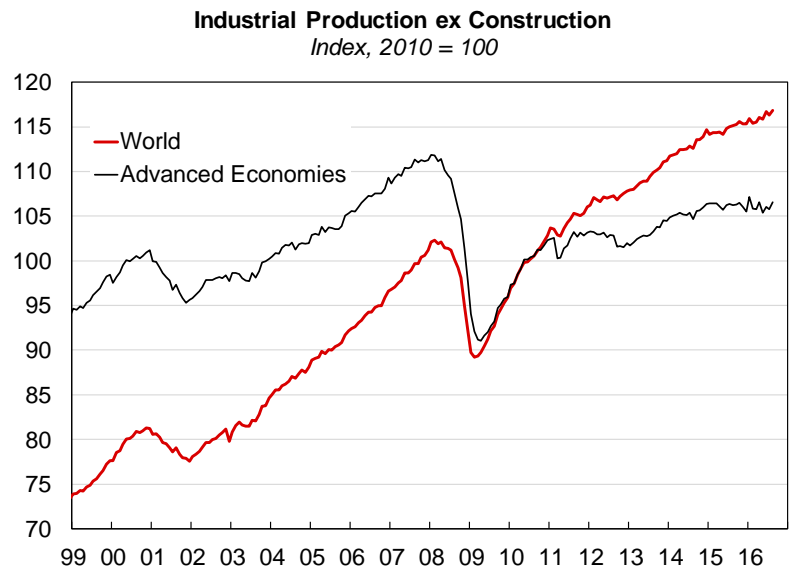
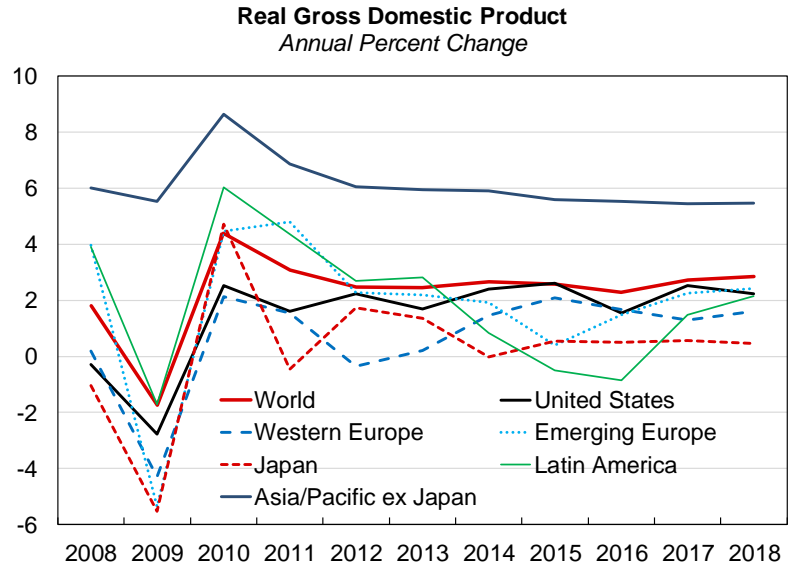
Robert C. Fry, Jr., Ph.D.

November 4, 2016

- Global economic growth remains disappointingly slow. Growth in global industrial production, which includes manufacturing, mining, and utilities, slowed noticeably in late 2014, and most of the growth since then has been due to the inclusion of Chinese data, which significantly overstate actual growth; there has been essentially no growth in industrial production in the advanced economies of the world. Industrial production in U.S. manufacturing was flat year-over-year in September and has not managed to rise above the level first hit in November 2014. Industrial production in Japanese manufacturing has been similarly flat since late 2014, but was up 0.9% year-over-year in September. Industrial production in European manufacturing is stronger than most would expect and was up 2.1% year-over-year in August. Industrial production is at or near record highs in relatively few countries, most notably Indonesia, Malaysia, Mexico, many of the countries of Central Europe, and, perhaps surprisingly, in Germany. At the other extreme, production remains near a 12-year low in Brazil. Official data show industrial production up 6.1% year-over-year in China in September. Data on individual industrial products suggest that growth is about half that strong, but no longer decelerating.
- U.S. real Gross Domestic Product grew at a 2.9% annual rate in the third quarter after growing at a 1.0% rate over the prior three quarters. Year-over-year growth rose from 1.3% in the second quarter to 1.5% in the third quarter. The rebound in growth in third quarter was due to a one-time surge in exports of soybeans and the end of a five-quarter slowdown in the rate of inventory accumulation. The surge in soybean exports will likely be reversed in the fourth quarter, but a two-quarter decline in residential construction is likely to end. Inventory rebuilding and a resumption of growth in residential construction will boost growth over the coming year.
- Real GDP for the European Union rose 0.3% (1.4% annual rate) in the third quarter; it was up 1.6% year-over-year. While these top-line growth rates are disappointing by global and historical standards, and labor market slack in many countries allows for faster growth for the next few years, per capita growth rates are not especially weak. Population growth is very slow in most European countries and even negative in some. Failure to take that into account leads to unrealistic growth expectations and makes European economic performance look worse than it really is.
- Japan's overall economy continues to grow slowly. Real GDP grew at a 0.7% annual rate in the second quarter and was up 0.8% year-over-year. These growth rates are also weak by global and historical standards, but are at or slightly above Japan's long-run potential growth rate. Stagnation in Korean manufacturing is due to weak demand for exports, not to weak domestic demand. Korean real GDP, which is not as dependent on exports as is manufacturing, was up 2.7% year-over-year in the third quarter.
- China continues to report growth that is strong by global standards, but actual growth is much slower than official data indicate. Value Added of Industry, China's official measure of industrial production, was up 6.1% year-over-year in September, but my measure, based on production of 100 industrial products, was up just 3.0%.
- Industrial production in Brazilian manufacturing remains close to the 12-year low hit in February. It was down 6.4% year-over-year in September.
- Global real GDP is expected to grow 2.3% in 2016, slightly less than in the four prior years. Growth is expected to accelerate slightly, to 2.7%, in 2017, led by better growth in the Americas. Global industrial production is expected to rise just 0.8% in 2016. Growth in total industrial production, which includes mining, has been pulled down by a big decline in oil and gas drilling. Global industrial production is expected to grow 2.5% in 2017.

Global Macroeconomic Overview

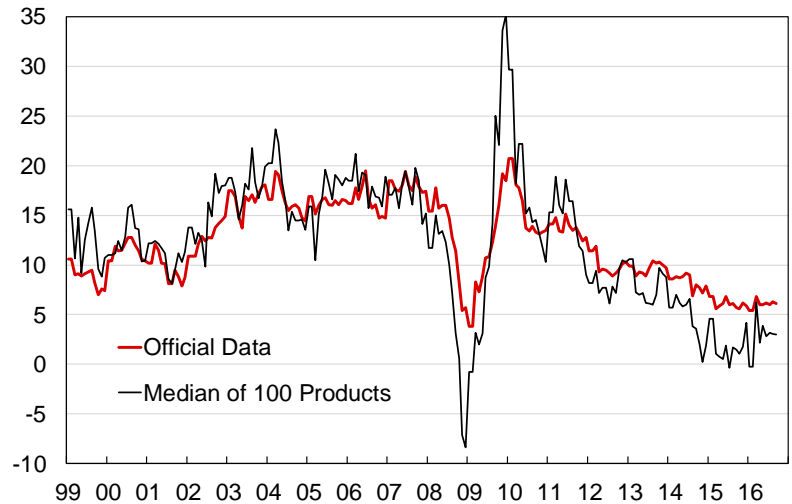
- Global real GDP is expected to grow 2.3% in 2016, slightly slower than in the four prior years. Growth is expected to accelerate slightly, to 2.7%, in 2017, as recessions end in South America and growth firms in North America, but growth is not expected to return to the unsustainable rates of the 2003-2007 period.
- Growth remains highest in the Asia/Pacific region, excluding Japan, but growth there has clearly downshifted since 2010.
- Industrial production in the Advanced Economies has stagnated since late 2014 and remains well below its early-2008 peak.
- Global industrial production has continued to grow, but the rate of growth has slowed since 2014.
- Most of the growth in global industrial production since 2014 is due to the inclusion of Chinese data, which significantly overstate growth in China.
- Year-over-year growth in global industrial production has been narrowly fluctuating around zero since late 2015.
- Year-over-year growth is positive only in the developing countries of the Asia/Pacific and Middle East & Africa regions.
- Because total industrial production includes mining, which was hit hard by falling oil and gas prices and declining commodity demand, it has grown more slowly than industrial production in manufacturing.



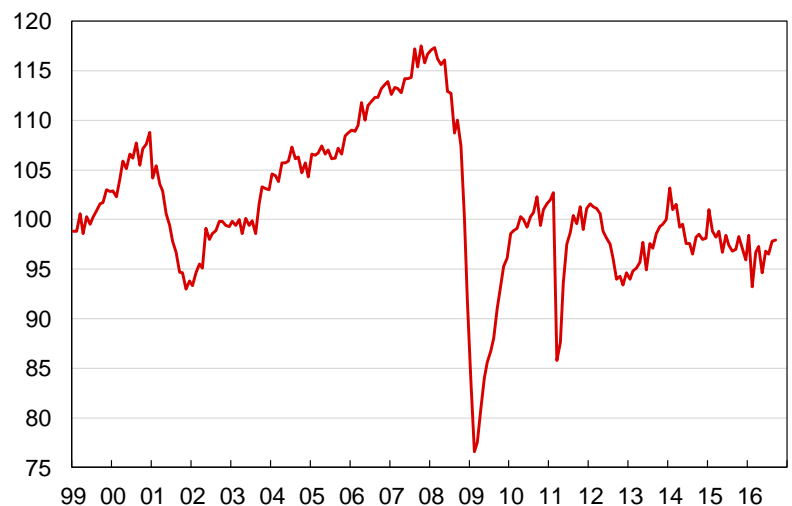
Global Macroeconomic Overview

- Value Added of Industry, China's official measure of industrial production, was up 6.1% year-over-year in September.
- My alternative index based on production of 100 industrial products was up just 3.0%.
- Growth in Chinese manufacturing is slower than suggested by "official" data, but has stopped decelerating. Electric output and auto sales/production have strengthened.
- Japan's overall economy continues to grow slowly. Real GDP rose at a 0.7% annual rate in the second quarter and was up 0.8% year-over-year. These growth rates are weak by global and historical standards, but are at or slightly above Japan's long-run potential growth rate.
- Industrial production in Japanese manufacturing rose 0.1% in September, to its highest level since January, and was up 0.9% year-over-year. Except for the sharp drop after the earthquake and tsunami in 2011, industrial production has fluctuated within a narrow range since 2010.
- The stagnation in Korean manufacturing continues. Industrial production in Korean manufacturing was slightly lower in September than it was in February 2012 and was down 1.9% year-over-year.
- Stagnation in manufacturing is due to weak demand for exports, not to weak domestic demand. GDP, which is not as dependent on exports as is manufacturing, was up 2.7% year-over-year in the third quarter.
- Korean manufacturing was hit first by the depreciation of the Japanese yen, then by the slowing of the Chinese economy.

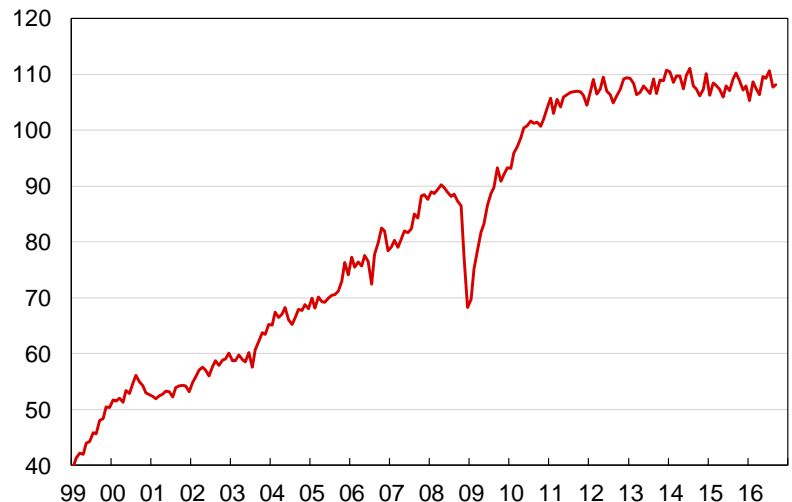
Value Added of Industry (Industrial Production): China
Percent Change from Year Ago



Industrial Production, Manufacturing: Japan
Index, 2010 = 100



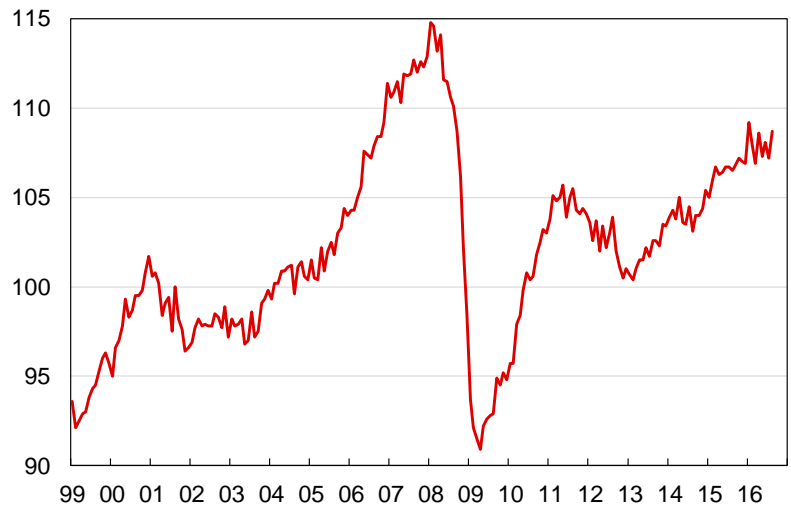
Industrial Production, Manufacturing: South Korea
Index, 2010 = 100



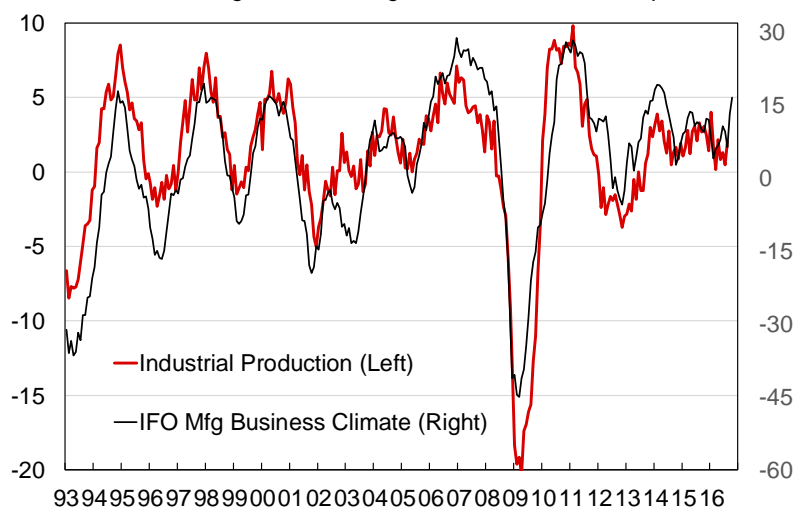
Global Macroeconomic Overview

- Industrial production in European Union manufacturing rose in August to its second-highest monthly level since 2008; it was up 2.1% year-over-year.
- The European economy is not as weak as commonly believed. Negative depictions result from a) a failure to take slow population growth into account, b) a focus on revenue **declines**, due to price declines, rather than on volume **growth**, and c) an effort to bolster European exporters by talking down the value of the Euro versus the U.S. dollar.
- The 12-month change in the German IFO manufacturing business climate index has historically led year-over-year growth in European Union manufacturing production by three months and is reported in a timelier manner.
- The IFO index jumped in September and October, taking it to the highest level since 2014. The index suggests that year-over-year growth in industrial production will rise significantly in coming months.
- Industrial production in manufacturing rose to a record high in August in the Czech Republic and remains near record highs in Poland and Hungary. From a manufacturing standpoint, these have been among the best-performing economies in the world over the last several years.
- Industrial production in manufacturing was up 10.1% year-over-year in the Czech Republic in August.
- While growth in Central Europe has been reasonably strong, growth in Eastern Europe, including Russia, has been weak or negative.

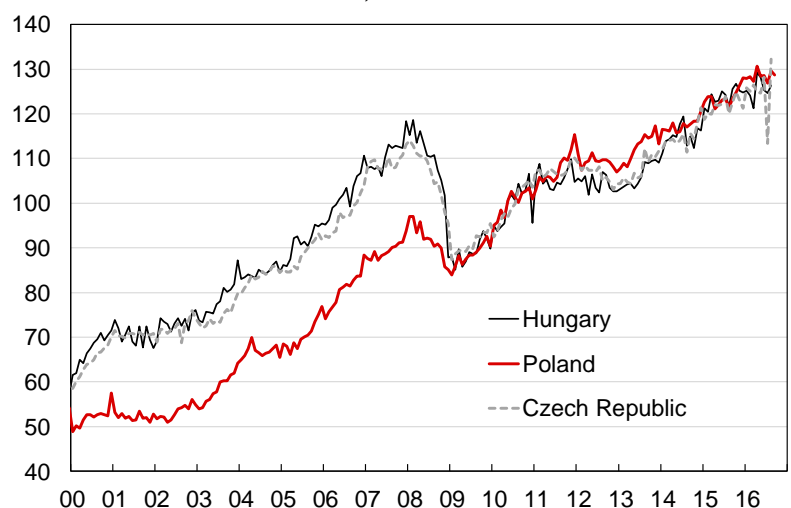
Industrial Production, Manufacturing: European Union
Index, 2010 = 100



Industrial Production, Manufacturing: European Union
Percent Change from Year Ago *Balance of Opinion*



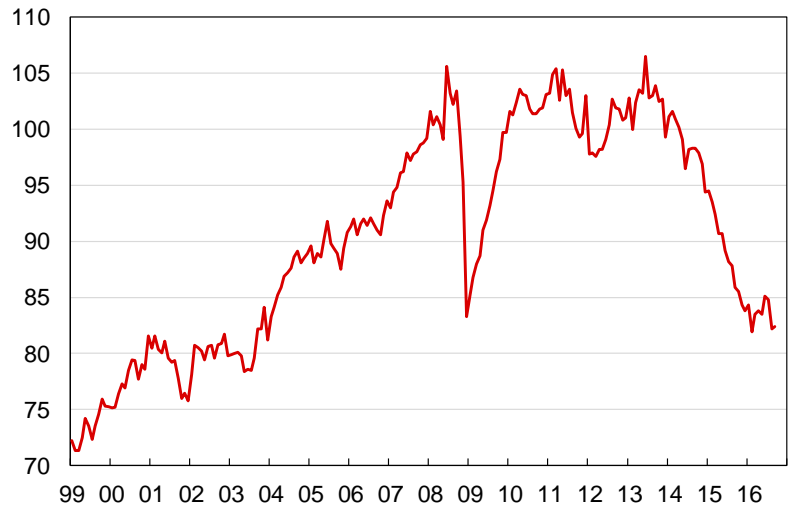
Industrial Production, Manufacturing: Central Europe
Index, 2010 = 100



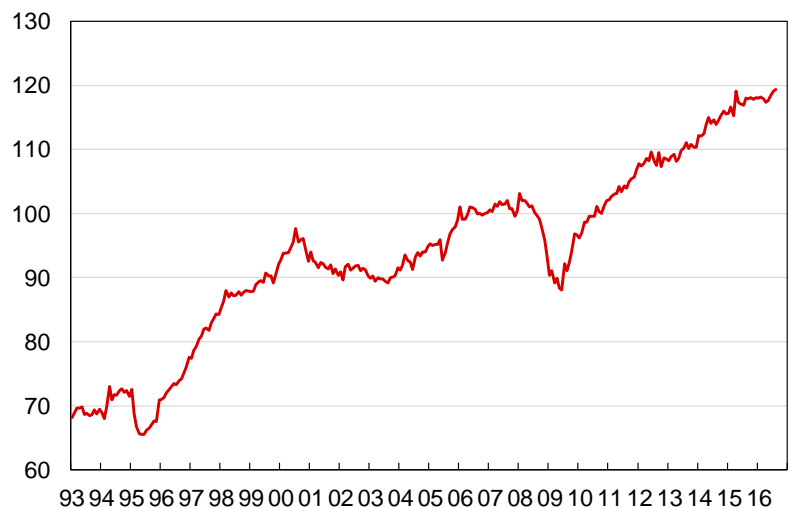
Global Macroeconomic Overview

- Brazil has been, by far, the worst-performing major economy in the world over the last two years.
- Industrial production in Brazilian manufacturing remains close to the 12-year low hit in February. It was down 6.4% year-over-year in September.
- Brazil's problems reflect a combination of slower growth in China, which has hurt commodity producers like Brazil, and the bad policies undertaken by the Brazilian government. Without new policies, Brazil will never realize its economic potential.
- Industrial production in Mexican manufacturing continues to trend upward, but slowly. Production hit an all-time high in August, but was up just 1.2% year-over-year. It is up about 20% from its 2008 pre-recession high.
- Although better economic policies have not boosted growth nearly as much as some had hoped, Mexico is doing far better than most Latin American economies.
- Industrial production in U.S. manufacturing was flat year-over-year in September and has been essentially flat since November 2014.
- The decline in oil and gas drilling that was triggered by the drop in oil prices that began in mid-2014 has cut demand for metals (think "well casings") and machinery.
- More recently, a two-quarter decline in residential construction has hurt demand for building materials and home furnishings. That decline is likely to end soon.

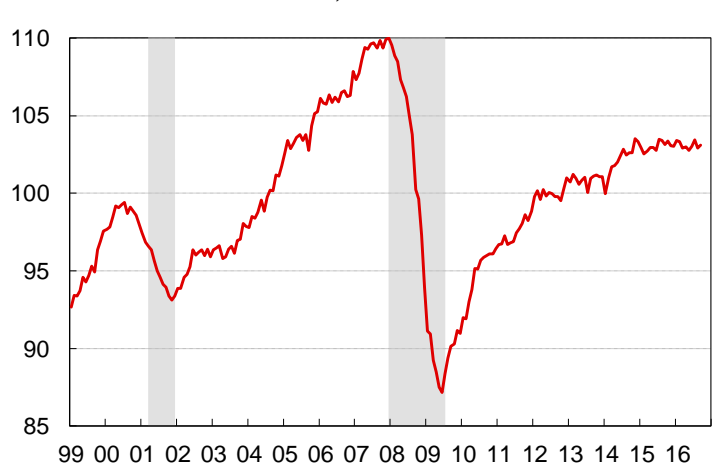
Industrial Production, Manufacturing: Brazil
Index, 2012 = 100



Industrial Production, Manufacturing: Mexico
Index, 2008 = 100



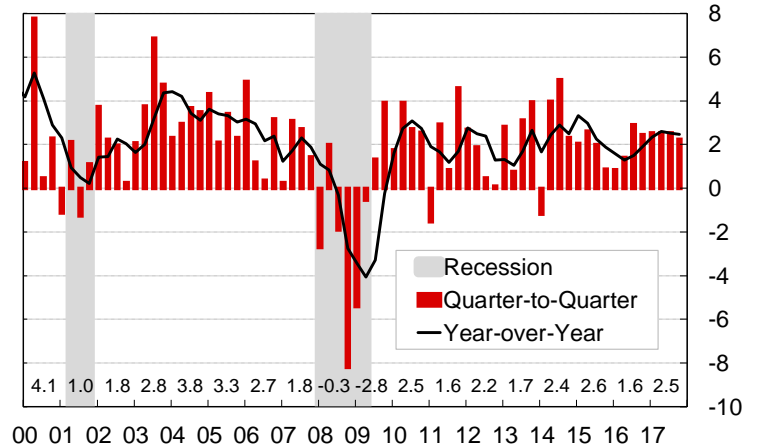
US Industrial Production: Manufacturing
Index, 2012=100



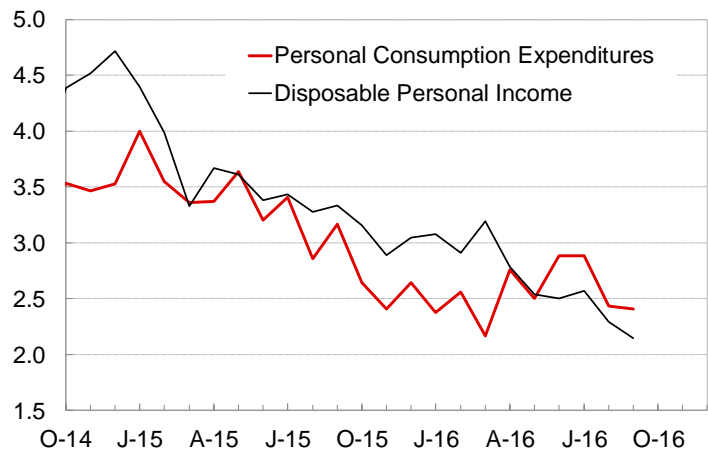
Global Macroeconomic Overview

- U.S. real Gross Domestic Product grew at a 2.9% annual rate in the third quarter after growing at a 1.0% rate over the prior three quarters. Year-over-year growth rose from 1.3% in the second quarter to 1.5% in the third quarter.
- The rebound in growth in third quarter was due to a one-time surge in exports of soybeans and the end of a five-quarter slowdown in the rate of inventory accumulation. The surge in soybean exports will likely be reversed in the fourth quarter, but a two-quarter decline in residential construction is likely to end.
- Growth in real consumer spending has stabilized at about 2.5% despite a deceleration in disposable income growth.
- Wages and salaries are starting to accelerate in response to a tightening labor market. (Average hourly earnings rose 2.8% year-over-year in October.) That will boost incomes and, presumably, spending.
- Real (inflation-adjusted) consumer spending has been boosted by the decline in oil prices since mid-2014, but this effect has been offset by the negative impact of higher health insurance premiums.
- Growth in nominal GDP has slowed due to both slower real growth and slower inflation. Given the relationship between corporate profits and nominal GDP, for most companies, expectations of double-digit earnings growth are not realistic, and futile efforts to achieve such growth have caused U.S. companies to cede market share to foreign competitors.
- Total corporate profits are likely to grow at a 3-5% rate once oil prices and the dollar stabilize. Earnings **per share** on the S&P500, which are artificially boosted by stock buybacks that shrink the denominator, can grow at a faster rate.

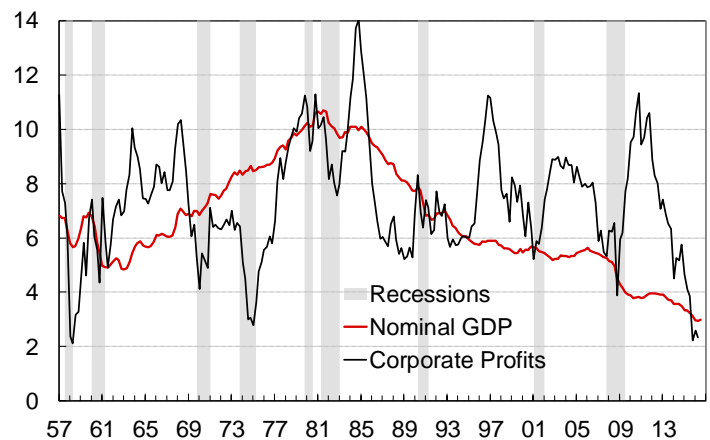
US Real Gross Domestic Product
Annualized Growth Rates



US Real Consumer Spending & Disposable Income
Percent Change from Year Ago, Chained 2009 Dollars

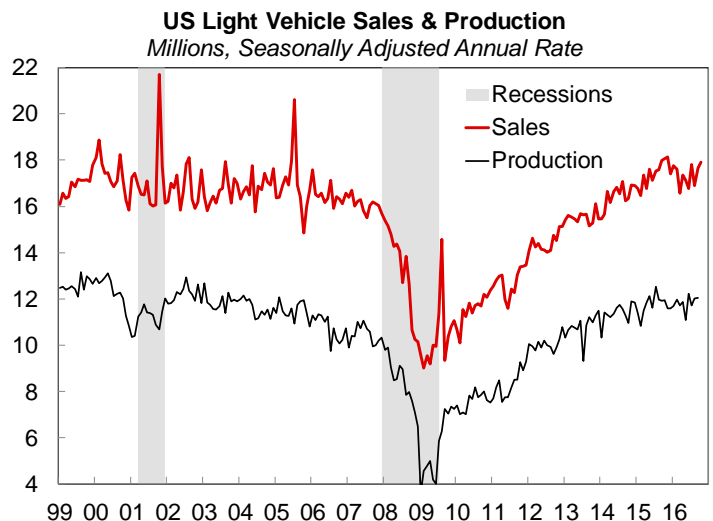
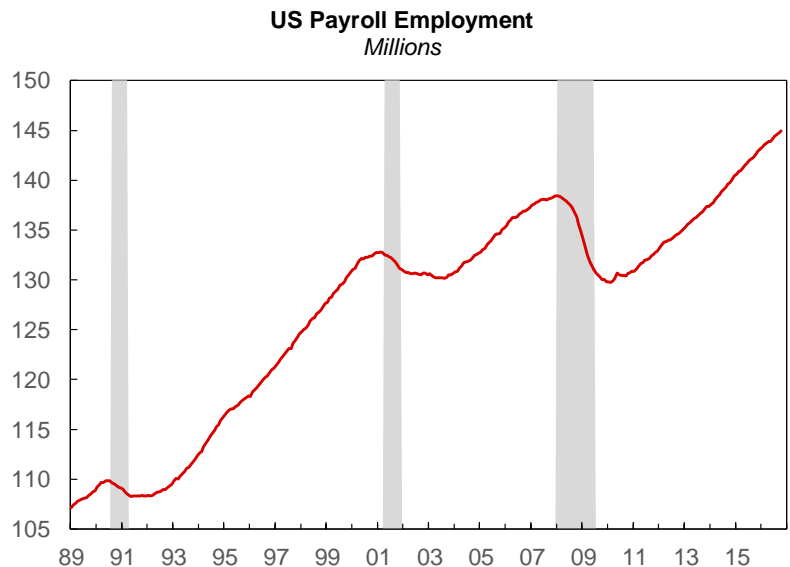


US Corporate Profits After Tax vs Nominal GDP
10-Year Annualized Growth Rate



Global Macroeconomic Overview

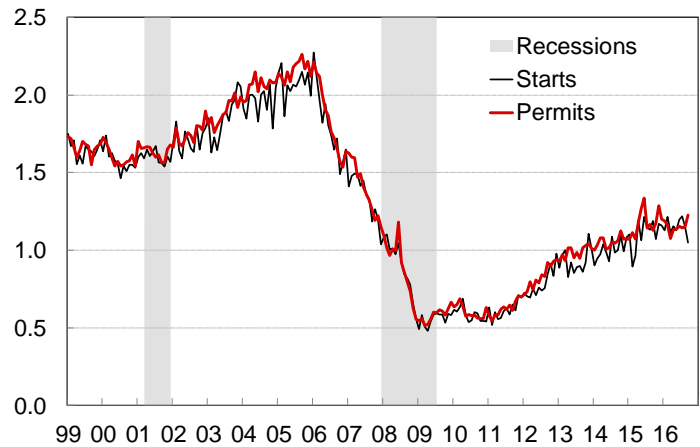
- The civilian unemployment rate has stabilized in the 4.7-5% range, consistent with the Congressional Budget Office's 4.8% estimate of full employment.
- The U-6 measure of unemployment, which includes people who are working part-time but would prefer to work full-time and those who have stopped looking for a job because they are discouraged, fell to 9.5% in October, the lowest since 2008. That is still 0.5-1.0 percentage points higher than the level consistent with full employment, suggesting there is still some slack in the labor market.
- Nonfarm payrolls rose by 161,000 in October. While job growth has decelerated this year, it still exceeds what is required to absorb growth in the adult population.
- Barring the return of discouraged workers to the labor force, growth in payroll employment will soon have to slow to less than 150,000. Such a return to the labor force would lower the U-6 unemployment rate but would have little impact on the headline (U-3) measure.
- Light vehicles sold at a surprisingly strong 17.9 million seasonally adjusted annual rate in October, the best since last fall's record three-month string.
- Further significant growth in vehicle sales is unlikely, but with no sign of an impending decline, annual sales are likely to stay close to 2015's record high in 2016 and 2017.
- Sales have risen more than U.S. production in recent years as vehicle imports, including, most notably, imports from Mexico, have risen.



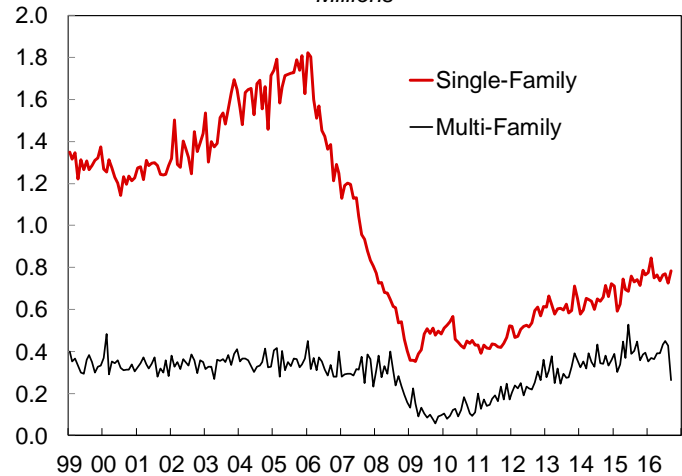
Global Macroeconomic Overview

- Housing starts fell to their **lowest** seasonally adjusted rate of the year in September, but housing permits, a better indicator of housing conditions because they are less sensitive to the weather, rose to their **highest** level of the year.
- September's surge in permits and the need for more housing to satisfy growth in the adult population suggest that the recovery in housing starts, which has stalled since early 2015, will resume. Demographics favor a strong rebound, but cautious lending standards, which affect builders more than buyers, are preventing that.
- The decline in housing starts in September was due entirely to a decline in multi-family starts. Multi-family structures (apartments and condominiums) account for much of the recovery in housing starts since the recession, but the "lumpiness" of multi-family starts also accounts for much of the volatility in starts over the last few years.
- The increase in multi-family starts (until September) might reflect difficulties in qualifying for a mortgage stemming in part from student-loan debt, but it also reflects a generational shift in locational preferences and attitudes towards home ownership.
- Existing home sales continue to be held back by a lack of houses on the market.
- New home sales hit a post-recession high in July and show a more-consistent upward trend than housing starts. If new home sales continue to rise, that will quickly deplete the limited inventory of unsold homes, triggering an increase in housing starts.

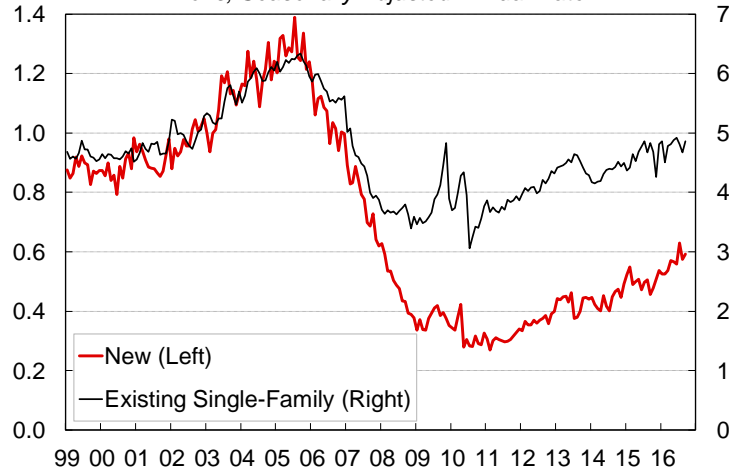
US Housing Starts & Building Permits
Millions, Seasonally Adjusted Annual Rate



US Housing Starts
Millions



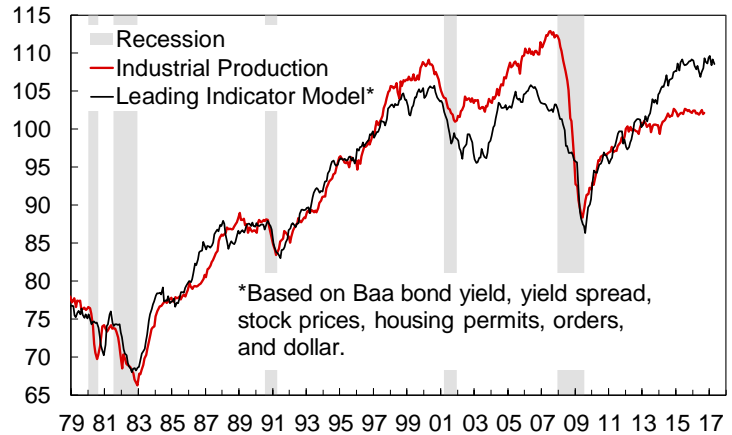
US Home Sales
Millions, Seasonally Adjusted Annual Rate



Global Macroeconomic Overview

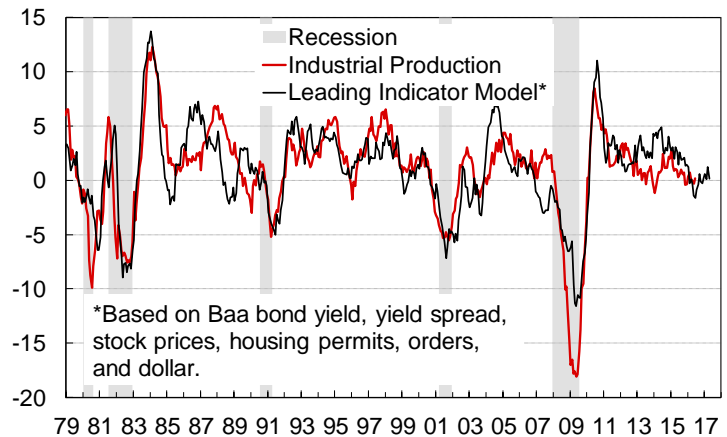
- Industrial production in U.S. manufacturing (excluding computers, communication equipment, and semiconductors) rose slightly in September, but has been essentially flat since late 2014.
- My own leading indicator for industrial production declined slightly in October. Except for a decline in late 2015 and a rebound in early 2016, it has been essentially flat since August 2014.

US Industrial Production: Manufacturing ex high-tech
Index 2012 = 100



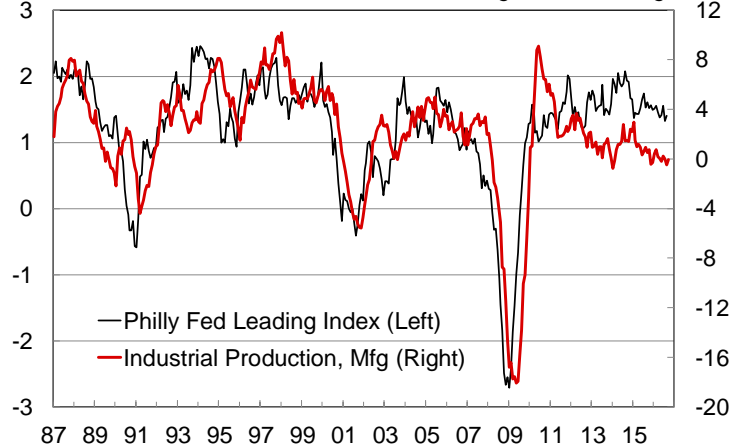
- Industrial production for manufacturing (excluding the high-tech sectors) was down 0.2% in September.
- My leading index for industrial production suggests that year-over-year growth will remain near zero over the next few months. My forecast for positive (albeit slow) growth is contingent on a resumption of growth in housing starts and an end to the inventory adjustment that has slowed growth over the last year or so.

US Industrial Production: Manufacturing ex high-tech
Percent Change from Year Ago



- Historically, the Federal Reserve Bank of Philadelphia's leading index has been highly correlated with industrial production in U.S. manufacturing.
- This correlation has broken down in recent years. This could be because low interest rates, faster money supply growth, and higher stock prices are no longer boosting growth as they have in the past.
- Extremely low interest rates are actually hurting rather than helping economic growth, and higher stock prices are not boosting consumer spending or business investment.

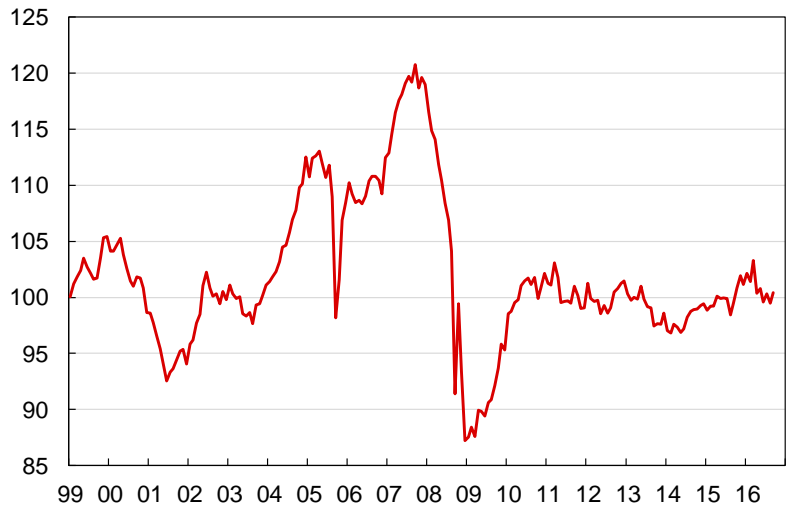
US Industrial Production vs Philly Fed Leading Index
Diffusion Index Percent Change from Year Ago



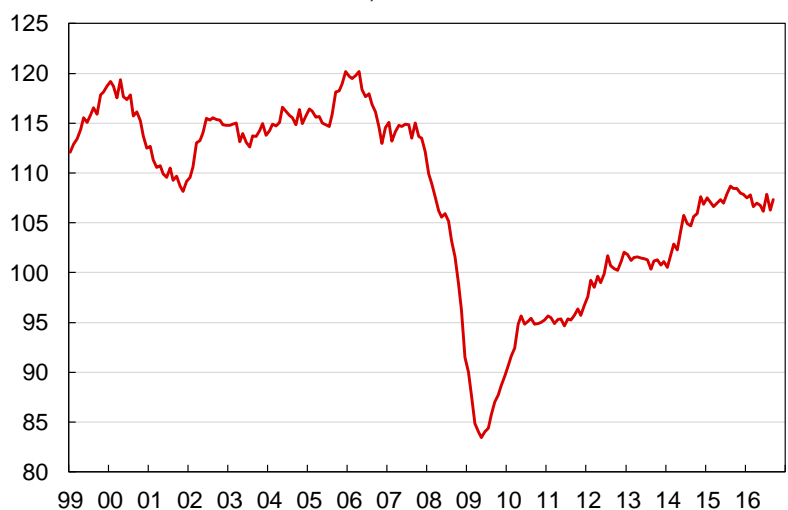
Global Macroeconomic Overview

- Industrial production for chemicals (excluding pharmaceuticals) was up just 0.9% year-over-year in September and has been essentially flat since early 2010.
- The annual revision of industrial production data in March significantly lowered reported growth over the last three years.
- Chemical industry capacity in the United States is expanding as new facilities are built to take advantage of the abundance of cheap natural gas liquids from shale formations. Strong growth in production is likely over the rest of the decade.
- U.S. industrial production of plastic and rubber products was down 1.1% in September. The annual revision also reduced growth in this industry.
- Plastic and rubber production was boosted by the strong recovery in motor vehicle sales and production from 2009 to 2015, but peaked about the time that motor vehicle sales did. As in the case of chemicals, production is likely to be boosted in the future by the abundance of cheap natural gas liquids.
- Even though natural gas liquids are the primary feedstock for the North American chemical industry, industrial chemical prices are more highly correlated with global oil prices than with natural gas prices because oil-based imports are the marginal source of supply.
- The Producer Price Index for industrial chemicals fell sharply following the collapse in oil prices that began in mid-2014, but stopped falling when oil prices hit bottom earlier this year.

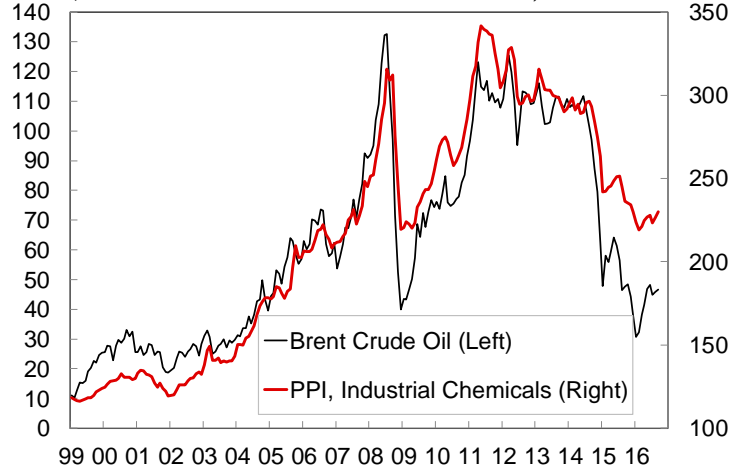
US Industrial Production: Chemicals ex pharmaceuticals
Index, 2012=100



US Industrial Production: Plastic & Rubber Products
Index, 2012=100

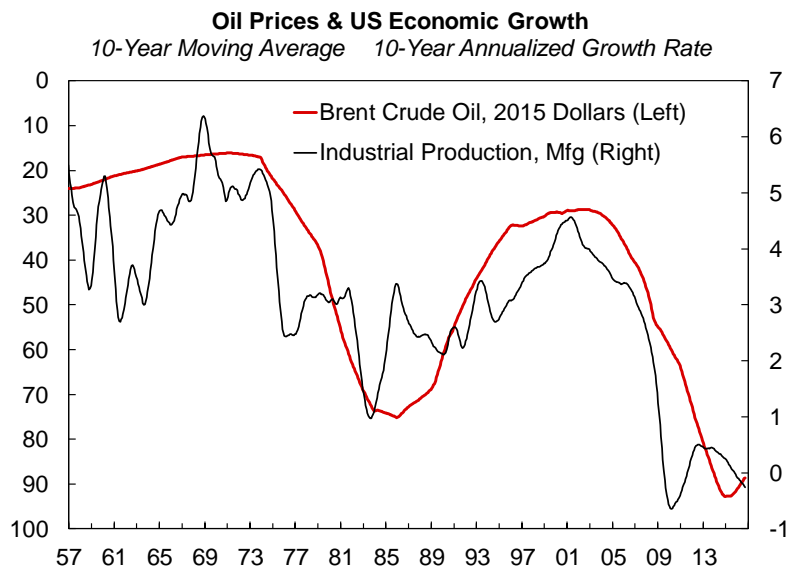
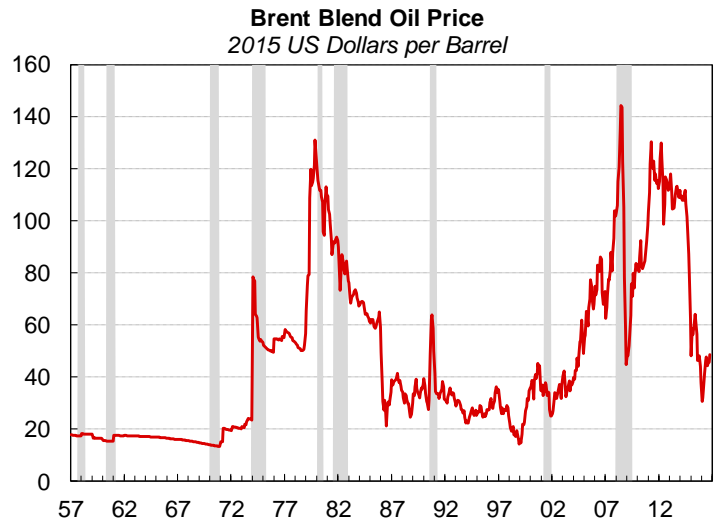
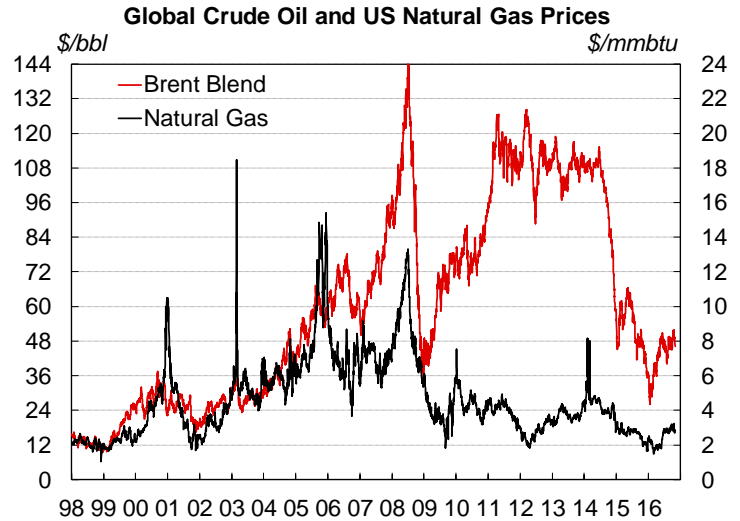


Brent Oil Price vs Industrial Chemical Prices
\$/Barrel (Left) Index, 1982 = 100 (Right)



Global Macroeconomic Overview

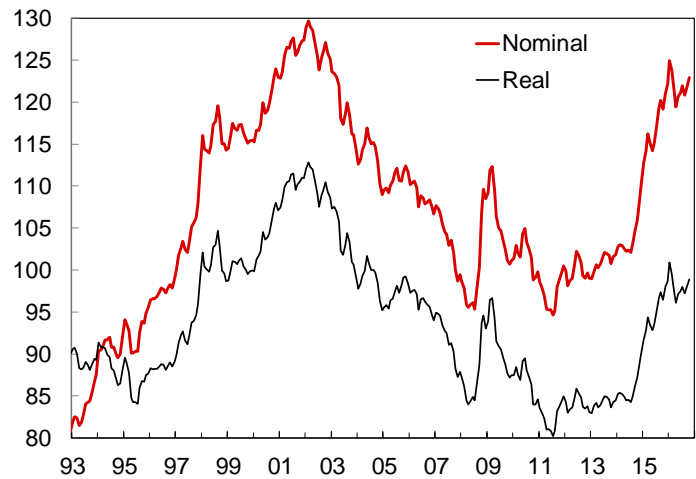
- Natural gas prices have recovered from the 17-year lows hit earlier this year. Low prices for natural gas and natural gas liquids boost the competitiveness of North American chemical producers, which tend to use natural gas liquids as a feedstock while most of their foreign competitors rely on naphtha, a crude oil derivative.
- The North American chemical industry still has a significant feedstock-cost advantage, but that advantage has shrunk this year as the decline in oil prices has lowered costs for competitors abroad and the recovery in natural gas prices has raised the costs of North American chemical companies.
- Oil prices don't exhibit smooth cycles. Instead, they are marked by sudden regime shifts, shown by nearly-vertical lines on the chart.
- The real (inflation-adjusted) price of Brent Blend crude oil peaked in November 1979 and did not set another new high until May 2008. It remained above its November 1979 peak for only three months.
- Because of hydraulic fracturing and horizontal drilling in shale formations, real oil prices could remain below their 2008 highs for decades.
- Economic growth, particularly growth in U.S. industrial production in manufacturing, has been significantly stronger during periods of low real oil prices than during periods of high prices.
- Although real oil prices peaked in 2008 and have fallen sharply since mid-2014, the 10-year moving average of real oil prices did not begin to decline until 2015.
- So far, the positive impact of lower oil prices has been offset by the negative impacts of higher health insurance premiums, a stronger dollar, and slower growth abroad.



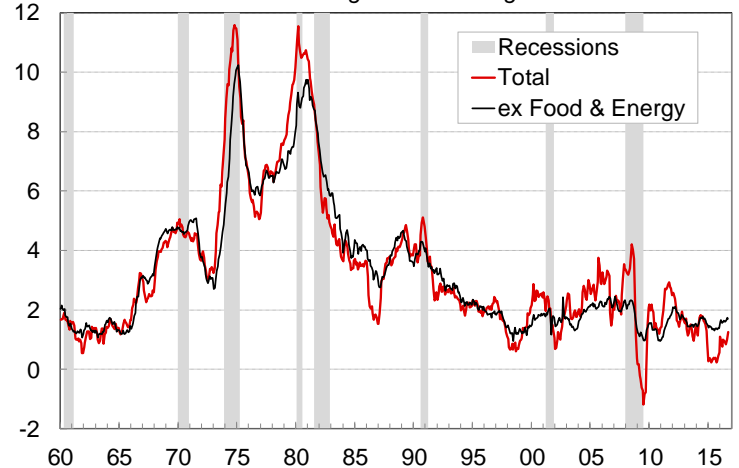
Global Macroeconomic Overview

- The U.S. dollar has strengthened in recent months and is close to the 13-year high hit late last year.
- A strong dollar reduces the competitiveness of U.S.-produced goods and services. The negative impact of the strong dollar on U.S. manufacturers has offset some of the positive impact of lower oil and natural gas prices.
- The U.S. Federal Reserve seeks to keep inflation, as measured by the year-over-year change in the Personal Consumption Expenditure Price Index, near 2%.
- The total PCE Price Index, which was up just 0.2% year-over-year in October 2015, was up 1.2% year-over-year in September 2016. The “core” (ex food and energy) index was up 1.7% in September. The core inflation rate has been between 1.3% and 1.8% for more than four years. Core inflation hasn’t risen above 2.5% since NAFTA was enacted in 1994. Before then, it hadn’t fallen below 2.5% for 27 years.
- The Federal Reserve raised its target federal funds rate by a quarter point at its December 2015 meeting. It is likely to raise its target again at the December 2016 meeting. I expect two or three quarter-point hikes in 2017.
- I believe low interest rates have suppressed economic growth by reducing the interest income of the elderly and by forcing young people to save more to fund their future retirements.
- The yield on 10-year Treasury notes hit an all-time low in July. Rates are likely to rise gradually over the next several years.

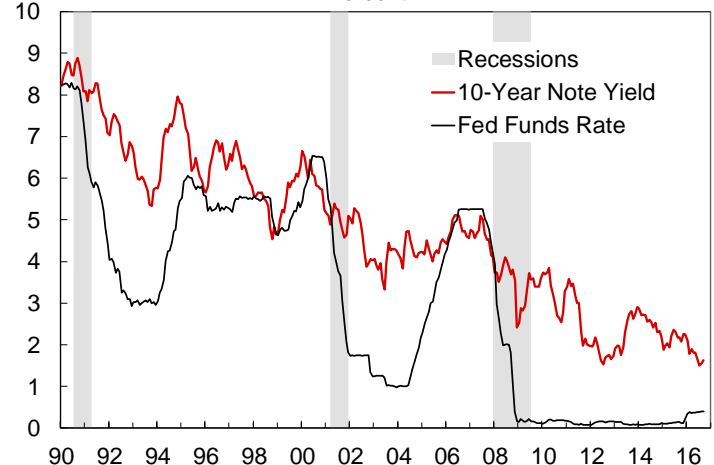
Federal Reserve Broad Dollar Index



US Personal Consumption Expenditures Price Index
Percent Change from Year Ago

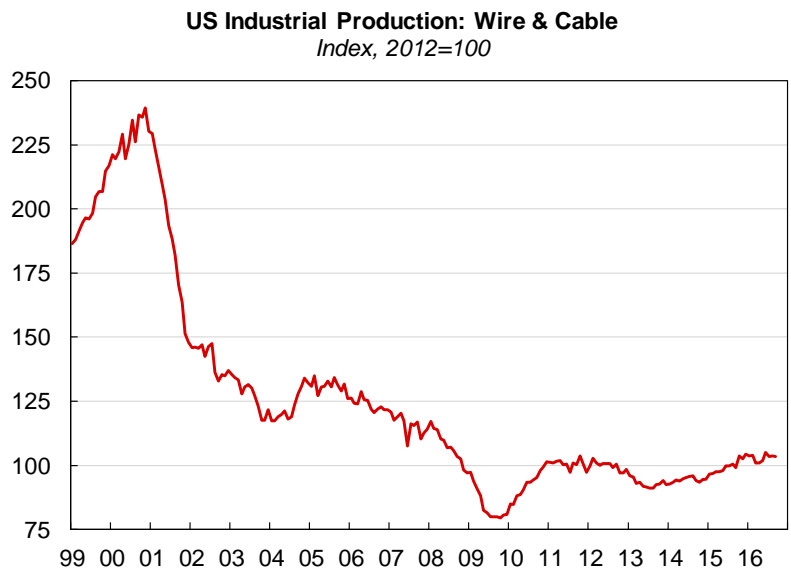
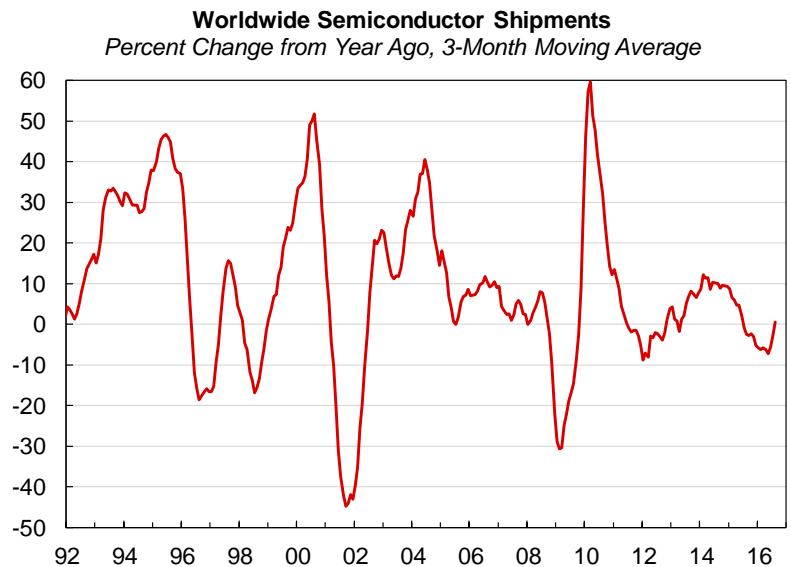
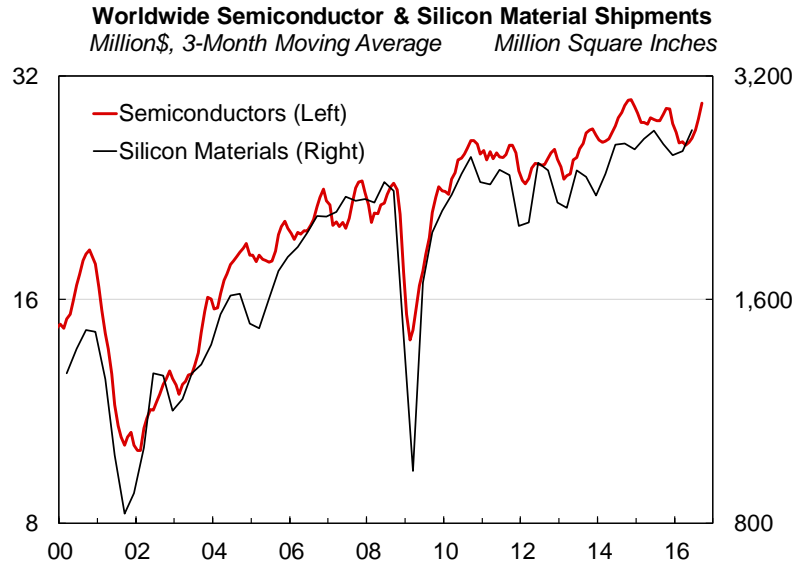


US Interest Rates
Percent



Global Macroeconomic Overview

- Shipments of silicon materials are a good indicator of global demand for products going into the electronics industry. Shipments rose to a new record high in the second quarter, but were barely above the previous high set a year earlier.
- The data are only reported quarterly back to 2000, but silicon wafer area (in square inches) has been strongly correlated with semiconductor shipments (in dollars), which are reported monthly back to 1976.
- Worldwide semiconductor shipments in the three months ending in September were the highest since the three months ending in November 2014.
- Worldwide semiconductor shipments were up 3.6% year-over-year in the three months ending in September. It was the second straight year-over-year increase after 14 straight year-over-year declines.
- Industrial production of wire and cable used in communication and energy applications fell by two-thirds from its 2000 “bubble” peak to its 2009 trough. The recovery since then, while significant in percentage terms, has erased little of the decline.
- Wire and cable production was up 4.6% year-over-year in September, but all of that increase took place in October 2015. Production has been flat since then.



Global GDP Growth

						Forecast				
	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	
World	2.5	2.7	2.6	2.3	2.7	2.9	2.9	3.0	3.0	
North America	1.8	2.4	2.5	1.5	2.5	2.2	2.0	2.0	2.0	
United States	1.7	2.4	2.6	1.6	2.5	2.2	2.0	2.0	2.0	
Canada	2.2	2.5	1.1	1.2	1.9	1.9	1.9	1.9	1.9	
Mexico	1.4	2.2	2.5	2.1	2.3	2.6	2.9	3.0	2.9	
Western Europe	0.2	1.5	2.1	1.7	1.3	1.6	1.6	1.6	1.6	
France	0.6	0.6	1.3	1.3	1.2	1.6	1.7	1.8	1.8	
Germany	0.6	1.6	1.5	1.8	1.3	1.4	1.3	1.3	1.2	
Italy	-1.7	-0.3	0.8	0.8	0.7	1.1	0.9	0.9	0.9	
Spain	-1.7	1.4	3.2	3.1	2.1	1.9	1.9	1.8	1.6	
U.K.	1.9	3.1	2.2	1.9	0.9	1.7	1.8	1.9	1.9	
C & E Europe	2.2	1.9	0.4	1.5	2.3	2.4	2.6	2.7	2.8	
Middle East & Africa	3.0	3.1	2.4	2.1	2.7	3.2	3.6	3.7	3.6	
Asia/Pacific	4.7	4.3	4.3	4.3	4.3	4.4	4.5	4.5	4.6	
Japan	1.4	0.0	0.5	0.5	0.6	0.6	0.6	0.6	0.6	
ex Japan	6.0	5.9	5.6	5.5	5.4	5.5	5.5	5.5	5.5	
Australia	2.0	2.7	2.4	2.9	2.7	2.9	3.0	2.9	2.8	
China	7.8	7.3	6.9	6.6	6.2	6.0	6.0	5.9	5.8	
India	6.6	7.2	7.6	7.6	7.6	7.7	7.8	8.0	8.1	
Indonesia	5.6	5.0	4.8	4.9	5.3	5.5	5.8	6.0	6.0	
Korea (South)	2.9	3.3	2.6	2.7	3.0	3.1	3.0	3.0	3.0	
Malaysia	4.7	6.0	5.0	4.3	4.6	4.7	4.9	5.0	5.0	
Philippines	7.1	6.2	5.9	6.4	6.7	6.8	6.9	7.0	7.0	
Singapore	4.7	3.3	2.0	1.7	2.2	2.6	2.6	2.6	2.6	
Taiwan	2.2	3.9	0.6	1.0	1.7	1.9	2.2	2.5	2.7	
Thailand	2.7	0.8	2.8	3.2	3.3	3.1	3.0	3.0	3.0	
Vietnam	5.4	6.0	6.7	6.1	6.2	6.2	6.2	6.2	6.2	
Latin America	3.2	0.5	-1.3	-1.6	1.3	2.0	2.5	2.6	2.6	
Argentina	2.4	-2.5	2.5	-1.8	2.7	2.8	2.9	3.1	3.3	
Brazil	3.0	0.1	-3.8	-3.3	0.5	1.5	2.0	2.0	2.0	
Colombia	4.9	4.4	3.1	2.2	2.7	3.8	4.3	4.3	4.0	
Venezuela	1.3	-3.9	-6.2	-10.0	-4.5	-3.0	-1.0	0.0	0.0	

Global Industrial Production Growth

					Forecast				2021
	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>-2026</u>
World	3.1	1.7	0.8	2.5	2.5	2.4	2.3	2.2	2.1
Advanced economies	2.2	0.8	0.0	1.5	1.7	1.6	1.5	1.4	1.2
United States	2.9	0.3	-0.9	1.6	2.0	2.0	1.8	1.6	1.5
Japan	1.9	-1.3	-2.0	1.0	1.0	0.5	0.5	0.5	0.5
Euro Area	0.9	2.0	1.0	1.5	1.5	1.5	1.5	1.5	1.2
Other advanced	3.0	1.4	2.0	2.0	2.0	2.0	2.0	2.0	1.5
Emerging economies	4.0	2.7	2.0	3.9	3.9	3.8	3.5	3.5	3.4
Emerging Asia	6.4	4.8	4.5	5.0	5.0	5.0	4.5	4.5	4.0
C & E Europe	0.8	-3.7	0.0	3.0	3.0	3.0	3.0	3.0	2.5
Latin America	-0.7	-2.4	-3.5	3.0	3.0	2.0	2.0	2.0	2.5
Middle East & Africa	1.0	1.6	2.0	3.0	3.0	3.0	3.0	3.0	3.5

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