

Economic Outlook

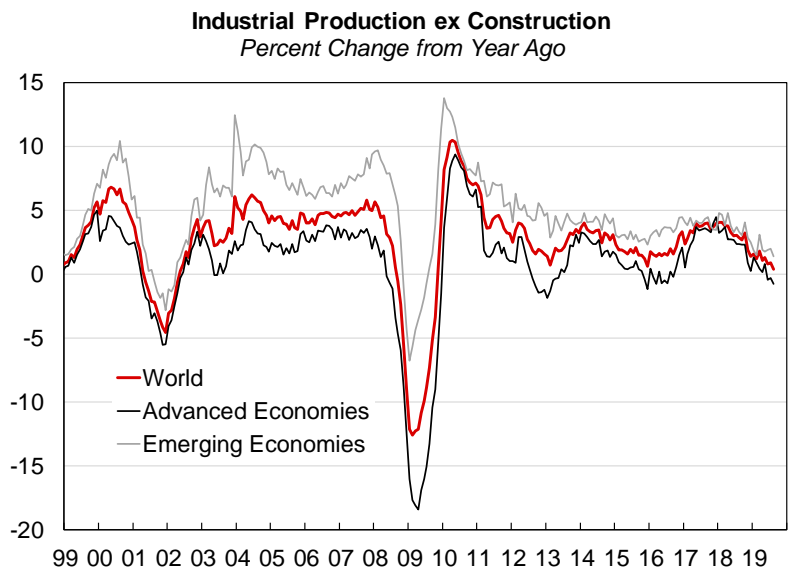
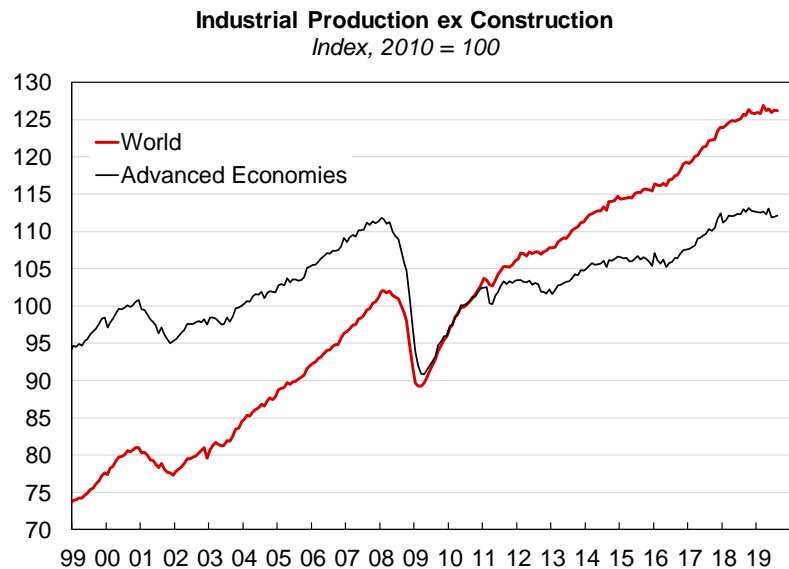
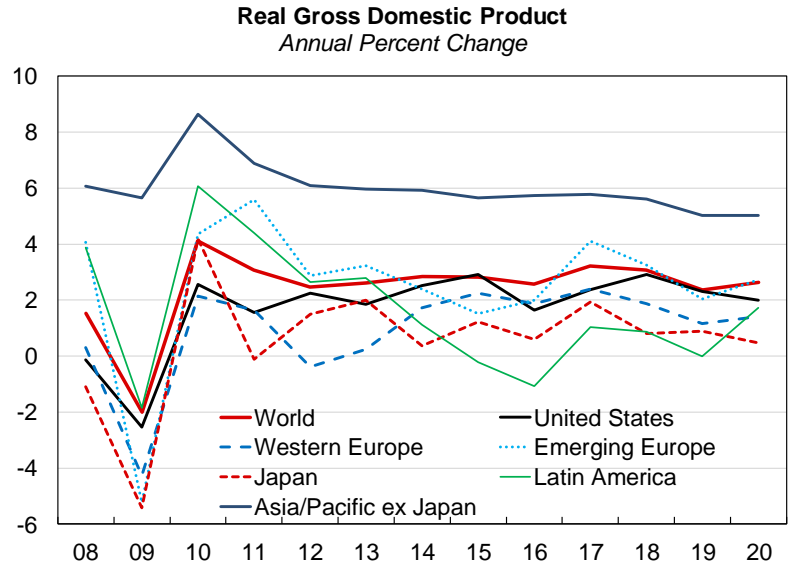
Robert C. Fry, Jr., Ph.D.

November 5, 2019

- The global economy, which slowed through 2018, has continued to slow in 2019. Year-over-year growth in global industrial production peaked at 4.1% in the first two months of 2018. It fell to 0.4% in August 2019. Year-over-year growth in the Advanced Economies has gone negative. The slowdown began outside the United States and has been most pronounced in Europe and China, but it spread to the United States in late 2018. Growth has been hurt by the trade war between the United States and China, Brexit concerns in Europe, counterproductive negative interest rates in Europe and Japan, and the statist economic policies of a Chinese President who seems more inclined to follow the failed policies of Mao Zedong than the successful policies of Deng Xiaoping.
- Real Gross Domestic Product in the United States rose at a 1.9% annual rate in the third quarter after rising at a 2.0% rate in the second quarter. Year-over-year growth slowed from 3.1% in the third quarter of 2018 to 2.0% in the third quarter of 2019. Consumer spending, particularly on goods, remained strong in the third quarter, but business investment in equipment and structures declined. I expect GDP growth to remain close to 2% if U.S. tariffs on Chinese goods remain at current levels rather than rising as previously scheduled or declining as part of a comprehensive trade deal. I expect annual growth to slow from 2.8% in 2018 to 2.3% in 2019 and 2.0% in 2020. Interest rate cuts and the suspension of scheduled tariff increases have reduced the risk of recession but aren't enough to produce strong growth. Even though the economy has slowed significantly after a five-quarter burst of strong growth, 1.9% growth in the wake of four interest-rate hikes in 2018 and an ongoing trade war suggests that the potential growth rate of the U.S. economy is much stronger than pessimists assume.
- Year-over-year growth in Chinese real GDP fell to 6% in the third quarter, the weakest growth since 1992. Year-over-year growth in Value Added of Industry, China's official measure of industrial production, fell to 4.4% in August. Except for January/February 2009, at the depths of the Great Recession, this was the weakest growth since the data series began in 1998. Growth recovered to 5.8% in September. My preferred measure of growth in industrial production, the median growth rate of 100 industrial products, was just 2.7% in September. Except for one month, it has remained between 0 and 5% for more than two years.
- Real GDP for the European Union rose 0.3% (1.2% annual rate) in the third quarter after rising just 0.2% (the weakest since 2013) in the second quarter. Year-over-year growth remained at 1.4%, also the weakest since 2013. Real GDP declined in Germany and the United Kingdom in the second quarter. (Data for the third quarter are not available yet.) Industrial production in European Union manufacturing was down 1.9% year-over-year in August. It is showing signs of stabilizing after an 18-month decline but is not showing any signs of a recovery.
- Industrial production in Japanese manufacturing was down 0.6% year-over-year in September.
- Real Gross Domestic Product for India was up 5% year-over-year in the second quarter, down from 8.1% growth in the first quarter of 2018. Industrial production in manufacturing fell below prior-year levels in August.
- Global Real Gross Domestic Product (based on market exchange rates, not purchasing power parity) is expected to grow 2.4% in 2019, down from 3.1% in 2018. Growth is expected to edge up to 2.6% in 2020. Global industrial production is expected to grow just 0.4% in 2019, down from 3.1% in 2018. Growth is expected to rise to 2.3% in 2020. Growth is expected to rise in response to a series of (small) interest rate cuts around the world and the end of an inventory adjustment that has hurt manufacturing. My forecast assumes that a skinny "Phase 1" trade agreement between the United States and China prevents a further escalation of their trade dispute but does not assume a comprehensive agreement that eliminates existing tariffs. Such a deal would yield faster growth.

Global Macroeconomic Overview

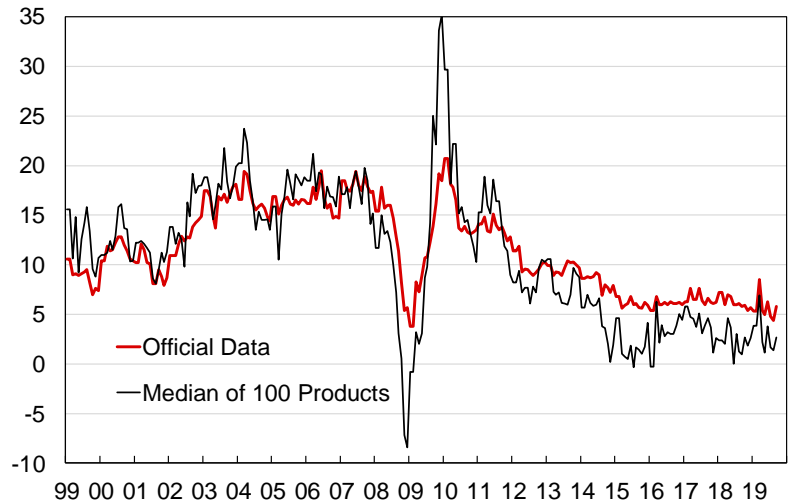
- Global real Gross Domestic Product (based on market exchange rates, not purchasing power parity) is expected to grow 2.4% in 2019, down from 3.1% in 2018. Growth is expected to edge up to 2.6% in 2020.
- Growth remains strongest in the emerging economies of the Asia/Pacific region and weakest in the advanced economies of Western Europe and Japan. Growth in the United States typically lies somewhere in between, close to the global growth rate.
- Global industrial production, as measured by the CPB Netherlands Bureau for Economic Policy Analysis, grew at a slowing rate through most of 2018 and has been essentially flat since October 2018.
- Industrial production in the Advanced Economies was lower in August 2019 than it was in December 2017.
- Year-over-year growth in global industrial production has fallen from 4.1 % in the first two months of 2018 to 0.4% in August 2019.
- While growth has remained faster in Emerging Economies than in Advanced Economies, it has slowed in both Emerging Economies and Advanced Economies.
- Year-over-year growth in Advanced Economies has fallen into negative territory.



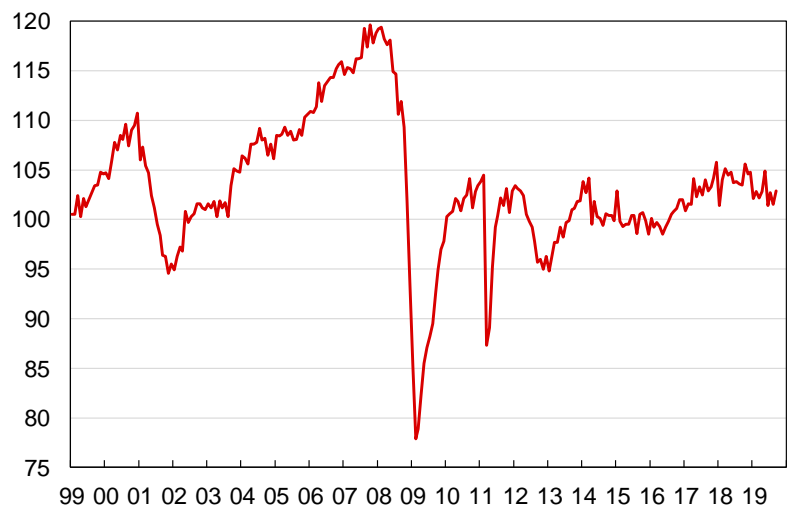
Asia

- Growth in China has slowed since 2017. Official data show an artificially gradual slowing.
- Year-over-year growth in Value Added of Industry, China's official measure of industrial production, fell to 4.4% in August; this was the slowest growth rate since 2009 and the second slowest ever. Growth recovered to 5.8% in September.
- My preferred measure of growth in industrial production, the median growth rate of 100 industrial products, stood at 2.7% in September.
- Industrial production in Japanese manufacturing has declined since nearing its post-2008 high in October 2018 but may be stabilizing.
- Production was down 0.6% year-over-year in September.
- Weakness in Japanese manufacturing reflects slowing growth in China.
- Year-over-year growth in Indian industrial production (manufacturing), which surged in late 2017, slowed through most of 2018 and was slightly negative in August 2019.
- Real GDP for India was up 5% year-over-year in the second quarter. Year-over-growth has slowed gradually since peaking at 8.1% in the first quarter of 2018.
- The International Monetary Fund has lowered its forecast for 2019 GDP growth to 6.1% but expects growth to rebound to 7.0% in 2020. GDP growth in India has surpassed the growth rate in China. India's population will surpass China's by 2030.

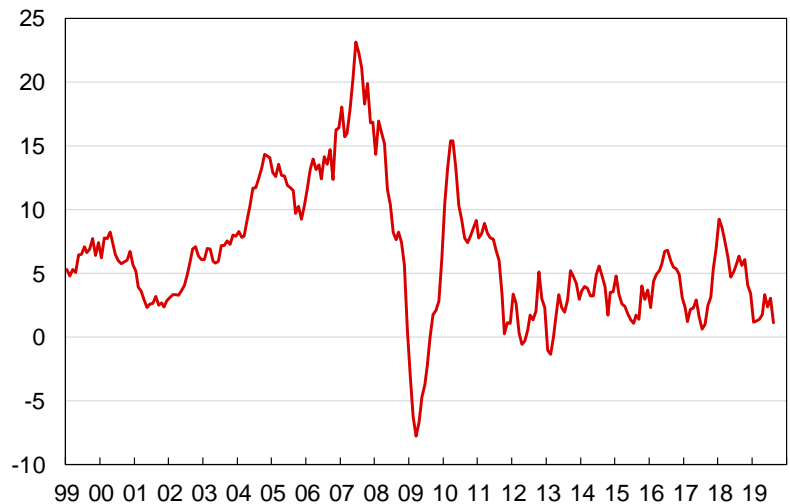
Value Added of Industry (Industrial Production): China
Percent Change from Year Ago



Industrial Production, Manufacturing: Japan
Index, 2015 = 100



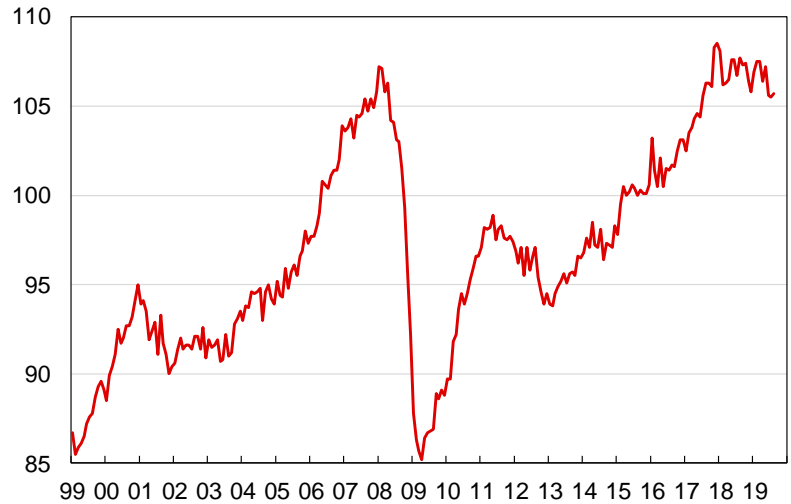
Industrial Production, Manufacturing: India
Percent Change from Year Ago, Smoothed



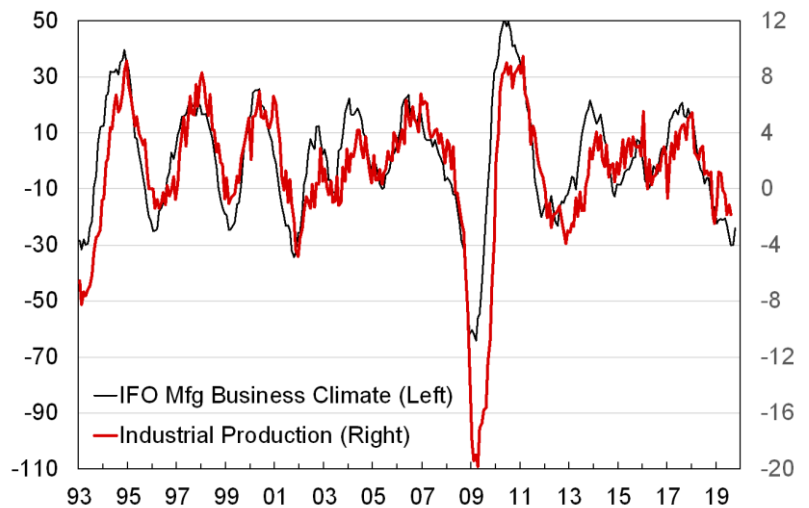
Europe

- Industrial production in European Union manufacturing was down 1.9% year-over-year in August but is showing signs of stabilizing after an 18-month decline.
- Real GDP in the EU rose 0.3% (1.2% annual rate) in the third quarter after rising just 0.2% in the second quarter. Year-over-year growth remained at 1.4%, the slowest since 2013.
- Growth has slowed in response to U.S. tax reform, which shifted economic activity to the United States, Brexit, and (counterproductive) negative interest rates.
- 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 fell sharply from November 2017 to September 2019, but it rose in October and its 12-month change has risen for two straight months. Year-over-year growth is likely to remain negative in coming months but is probably nearing a bottom.
- The downturn in industrial production in Western Europe caused growth to slow in the Czech Republic in 2018 but had little effect on Poland and Hungary until 2019.
- Industrial production in Polish manufacturing hit an all-time high in March but then declined 3.0% through August.
- Despite the recent decline, production was still up 3.5% year-over-year in Poland in September. It was up 3.1% in Hungary in August but up only 1.1% in the Czech Republic.

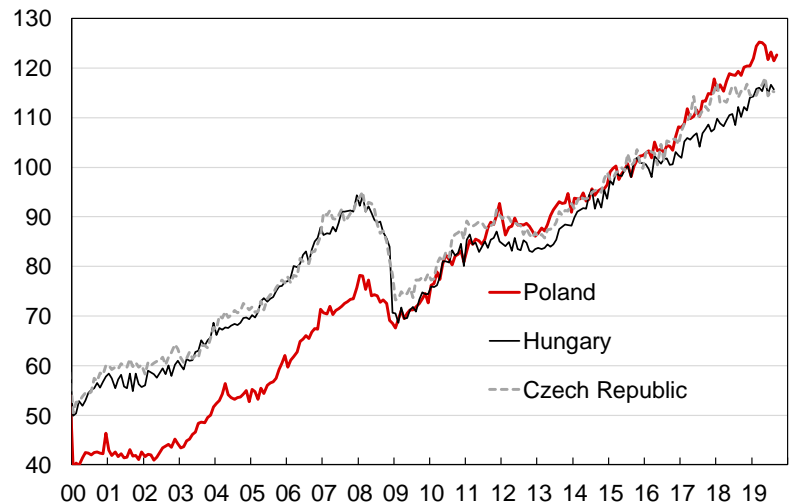
Industrial Production, Manufacturing: European Union
Index, 2015 = 100



Industrial Production, Manufacturing: European Union
Change/Percent Change from Year Ago



Industrial Production, Manufacturing: Central Europe
Index, 2015 = 100



Americas

- Industrial production in Brazilian manufacturing has stabilized but is showing little evidence of recovery.
- Production was up 0.8% year-over-year in September.



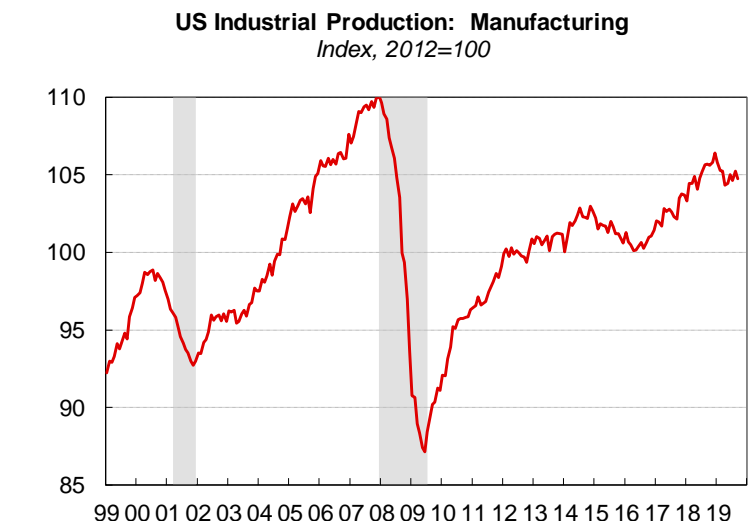
- Growth in industrial production in Mexican manufacturing has slowed since a burst of strong growth in late 2016 and early 2017. Year-over-year growth slowed to just 0.3% in August.



- Preliminary data show real GDP down 0.4% year-over-year in the third quarter.

- Failure to ratify the new U.S.-Mexico-Canada Agreement (USMCA) would do serious damage to all three North American economies. It would be especially harmful to those who make, sell, and buy motor vehicles.

- Industrial production in U.S. manufacturing peaked in December 2018 and fell 2% over the first four months of 2019. It rose 0.9% over the next four months but fell in September, leaving it down 0.9% year-over-year.

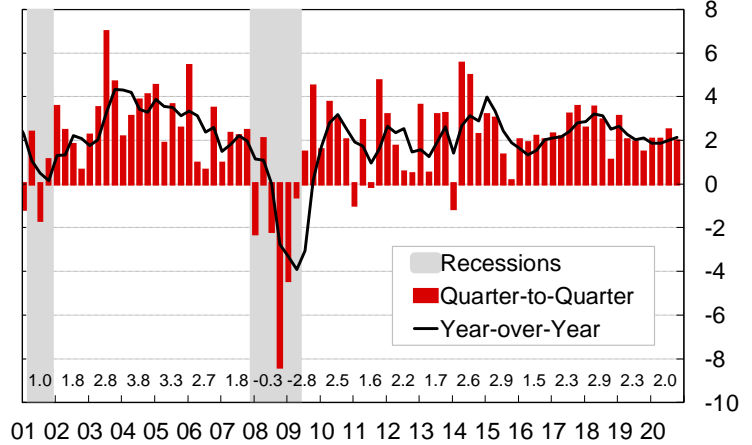


- I expect recent industrial production data to be revised down as actual data on aircraft production are incorporated into industrial production. Before periodic benchmarking to actual production data, many industrial production indexes, including the index for aircraft, are based on data on production worker hours. Boeing has cut production of the 737-MAX without cutting workers.

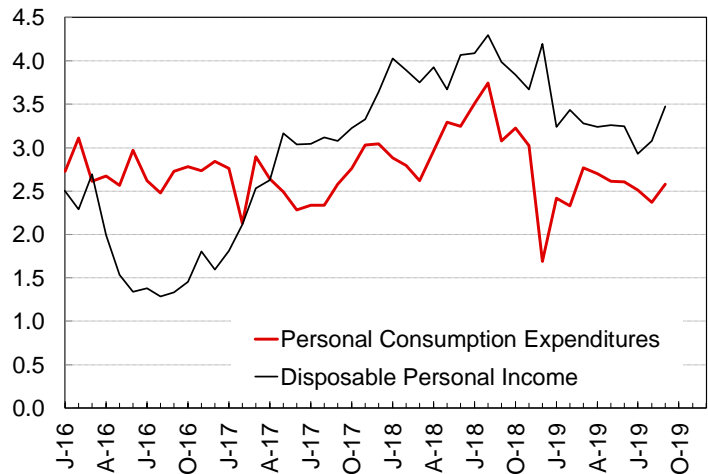
US Macroeconomic Overview

- Real Gross Domestic Product in the United States rose at a 1.9% annual rate in the third quarter after rising at a 2.0% rate in the second quarter. Year-over-year growth slowed to 2.0%, down from 3.1% a year earlier.
- Consumer spending, particularly on goods, remained strong in the third quarter, but business investment in equipment and structures declined. Growth is likely to remain close to 2% if a “Phase 1” trade deal between the United States and China prevents further tariff increases but doesn’t eliminate existing tariffs.
- Growth in real disposable personal income accelerated in 2017, was boosted by tax cuts in 2018, and has remained strong in 2019. Tight labor markets have boosted growth in wages and salaries.
- After the annual revision of GDP and its components in July, data on real personal consumption expenditures (PCE) show a boost from tax cuts in 2018 and a slowdown in 2019. Since 2017, consumption has grown less rapidly than income, implying that the savings rate has risen.
- Real PCE rose 0.2% in September.
- Light vehicles sales have exceeded 17 million for four straight years but are likely to fall slightly short of that level this year. Light vehicles sold at a 16.55 million seasonally adjusted annual rate in October, the lowest selling rate since April.
- With employment growth slowing and some consumers waiting for next-generation technology (electric, self-driving) before buying their next car, sales are likely to decline slightly in 2020. However, given the advanced age of the current vehicle fleet, strong replacement demand will keep vehicle sales from declining significantly until the economic expansion nears its end.

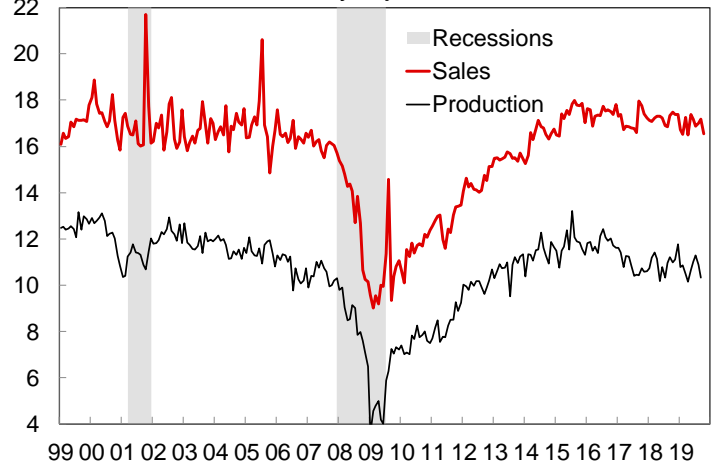
US Real Gross Domestic Product
Annualized Growth Rates



US Real Consumer Spending & Disposable Income
Percent Change from Year Ago, Chained 2012 Dollars



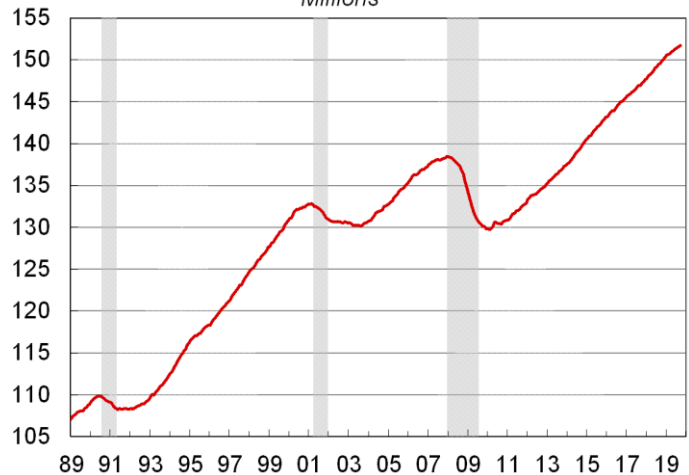
US Light Vehicle Sales & Production
Millions, Seasonally Adjusted Annual Rate



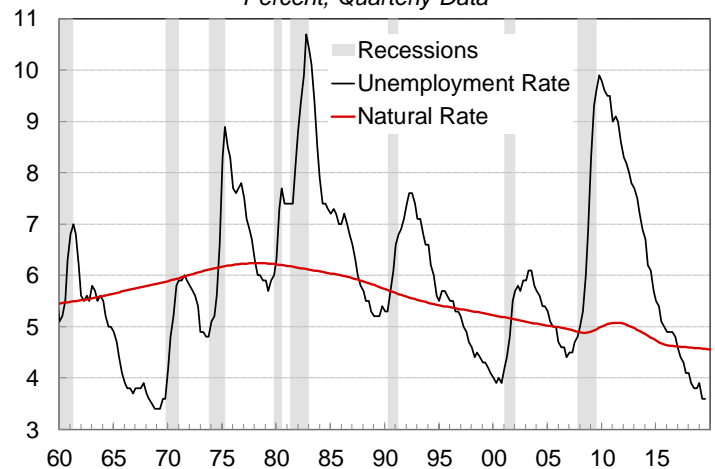
US Labor Market

- Nonfarm payrolls increased by 128,000 in October despite a strike at General Motors. Payroll growth has slowed this year but not nearly as much as it seemed before upward revisions to payroll data for August and September.
- The return of discouraged, retired, and formerly disabled workers to the labor force has allowed employment growth to exceed the roughly 100,000 per month needed to absorb growth in the adult population, but as that source of workers is depleted, growth in payroll employment will have to slow (unless immigration is increased).
- The civilian unemployment rate fell to 3.5% in September, the lowest since May 1969 and well below the Congressional Budget Office's 4.6% estimate of the natural rate of unemployment. It rose to 3.6% in October.
- According to the Phillips Curve theory used by many economists, inflation accelerates when the unemployment rate is below the natural rate. I believe that higher inflation requires tight markets for goods and services; tight labor markets cause labor costs to rise. Without tight product markets, higher labor costs are more likely to squeeze margins than to boost inflation.
- Average Hourly Earnings for production and nonsupervisory workers accelerated sharply in 2018, but the year-over-year increase has remained at 3.5% for four months. (Chart shows quarterly data.)
- The Employment Cost Index, which is not affected by changes in the age or job composition of the workforce, accelerated slowly from 2015 to 2018, but year-over-year growth has stabilized at around 2.8%.
- The Employment/Population ratio (ages 15-64) shows a little more slack in the labor market than does the unemployment rate, but that slack is being gradually eliminated.

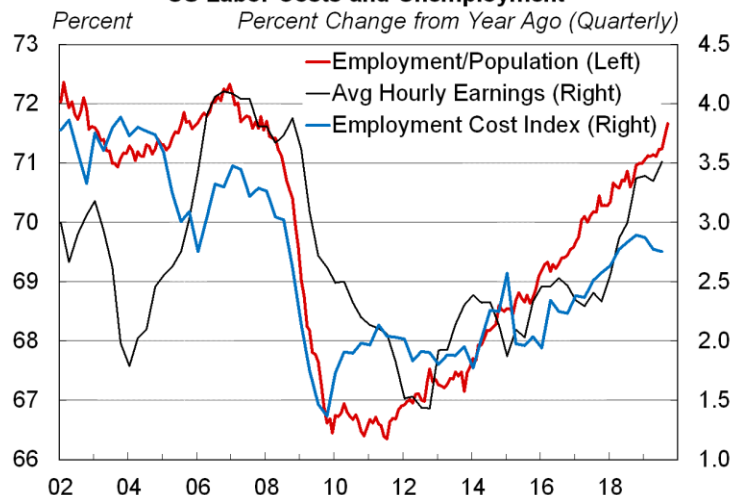
US Nonfarm Payroll Employment
Millions



US Civilian Unemployment Rate
Percent, Quarterly Data



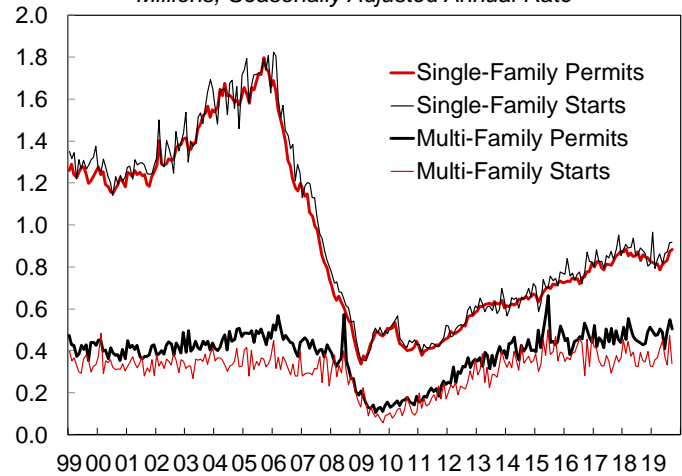
US Labor Costs and Unemployment



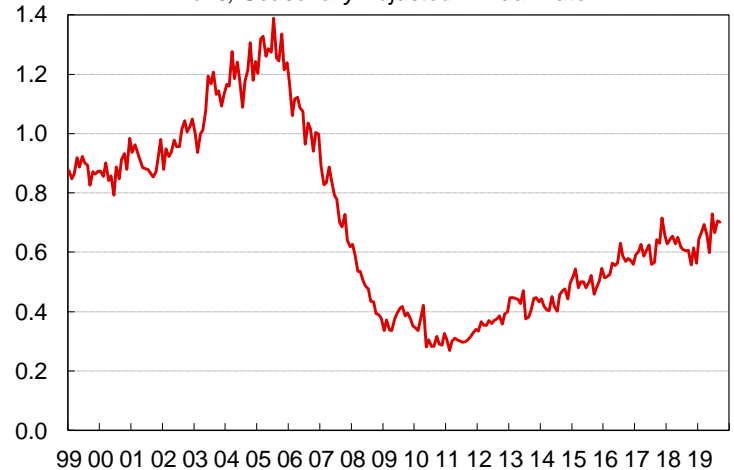
US Housing

- Housing starts and building permits have turned up in response to lower mortgage rates after declining in 2018 and early 2019.
- The seasonally adjusted annual rate of building permits for single-family homes (a better indicator of housing market activity than housing starts because they are less sensitive to weather) rose 12.2% from April to September, taking them to their second-highest level since 2007.
- A recession is unlikely without a sharp downturn in housing. It's hard to have a housing bust without first having a boom.
- New home sales have also risen strongly in response to lower mortgage rates, but the rebound has paused as mortgage rates have risen off their lows. Sales in September were up 25.9% from the low hit in October 2018, but lower than in June and August. Monthly data are very noisy; sales rose significantly in the third quarter.
- Existing-home sales (not shown) fell slightly in September but were still up 3.9% year-over-year. Sales are still being constrained by a lack of homes on the market.
- Investment in business equipment declined in the third quarter after stagnating in the prior two quarters. Orders for nondefense capital goods suggest further weakness. Investment in structures also declined.
- Tax reform will boost potential growth in the U.S. economy if and only if it causes businesses to boost investment in plant and equipment and intellectual property products (e.g., software).
- Business investment boosts productivity (output per hour worked). Productivity growth is the only sustainable source of higher living standards.

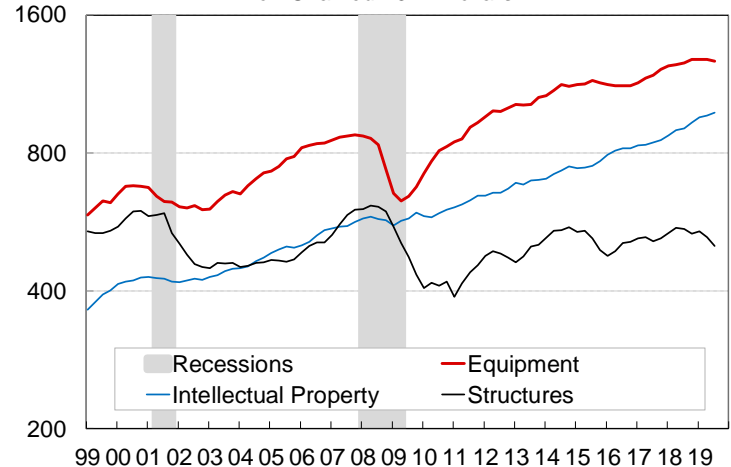
US Housing Starts & Building Permits
Millions, Seasonally Adjusted Annual Rate



US New Single-Family Home Sales
Millions, Seasonally Adjusted Annual Rate



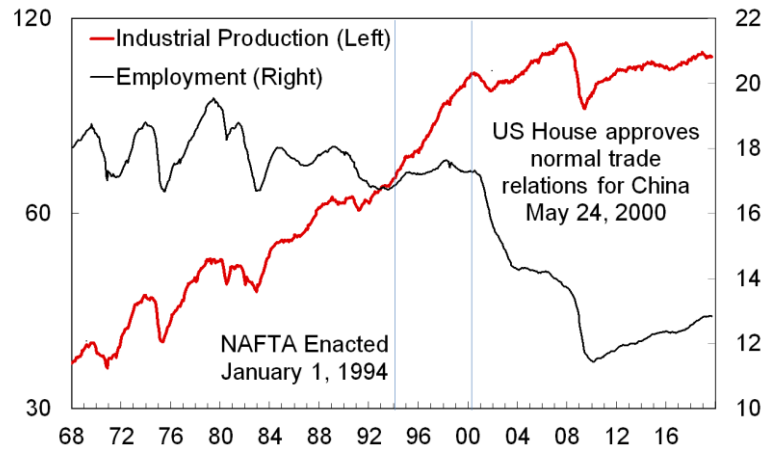
US Nonresidential Fixed Investment
Billion Chained 2012 Dollars



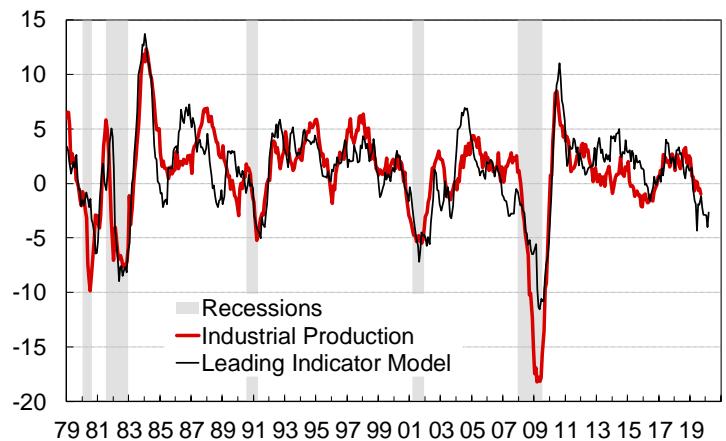
Industrial Production & Leading Indicators

- Aggregate data provide no evidence that the North American Free Trade Agreement hurt U.S. manufacturing. In the six years following enactment of NAFTA, industrial production in U.S. manufacturing grew at its fastest rate since the 1960s, and employment in manufacturing rose.
- After the U.S. Congress granted normal trade relations to China, clearing the way for China to join the World Trade Organization, the long-term growth rate of industrial production slowed from more than 3% to less than 1%, and millions of U.S. manufacturing jobs were lost.
- Industrial production for manufacturing (excluding computers, communication equipment, and semiconductors) was down 1% year-over-year in September.
- My leading indicator model suggests that year-over-year growth will remain negative over the next few months.
- With interest rates down, housing permits up, and stock prices setting new record highs, I expect my leading index to rise in coming months, but the strong dollar will temper the rebound.
- The Organization for Economic Cooperation and Development (OECD) publishes leading indicators for OECD members and six non-member developing countries. Their broadest leading indicator is highly correlated with year-over-year growth in global industrial production.
- The OECD “leading” indicator doesn’t lead by much, if at all, but because it doesn’t change direction often, it can confirm whether an apparent turning point in growth in industrial production is a true turning point or just statistical “noise”. The indicator has been declining since 2017, but the rate of decline has slowed to a crawl.

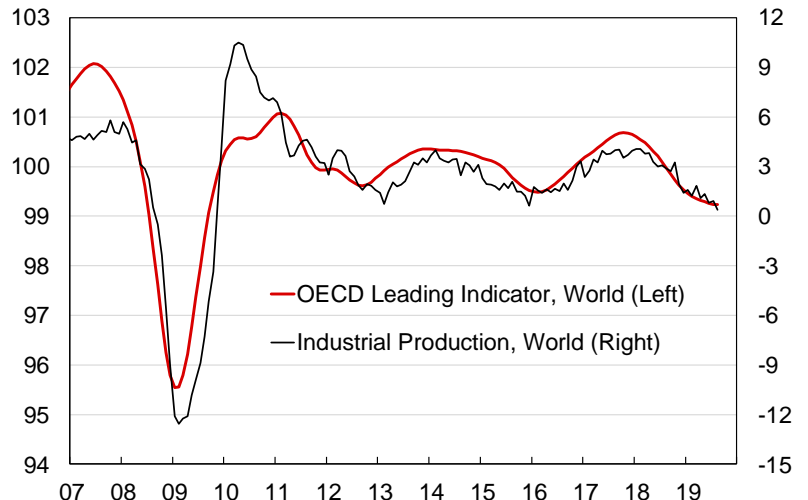
US Industrial Production & Employment: Manufacturing
Index, 2012=100 Millions



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



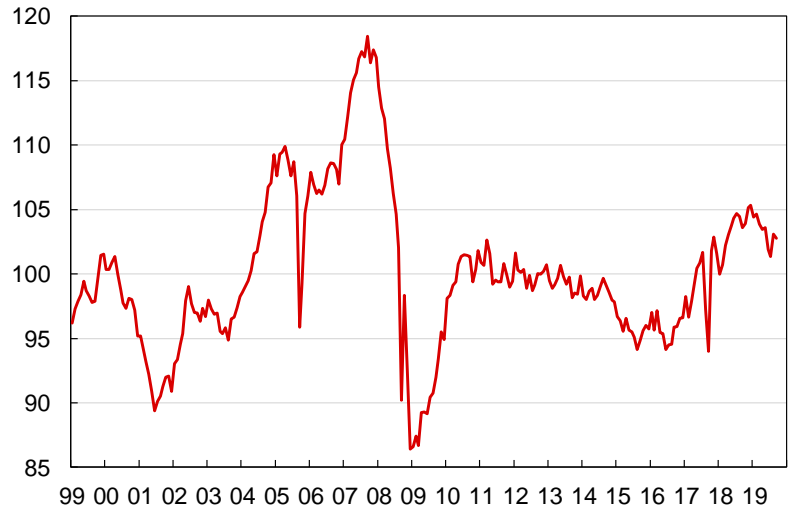
OECD Leading Indicator & Global Industrial Production
Trend = 100 Percent Change from Year Ago



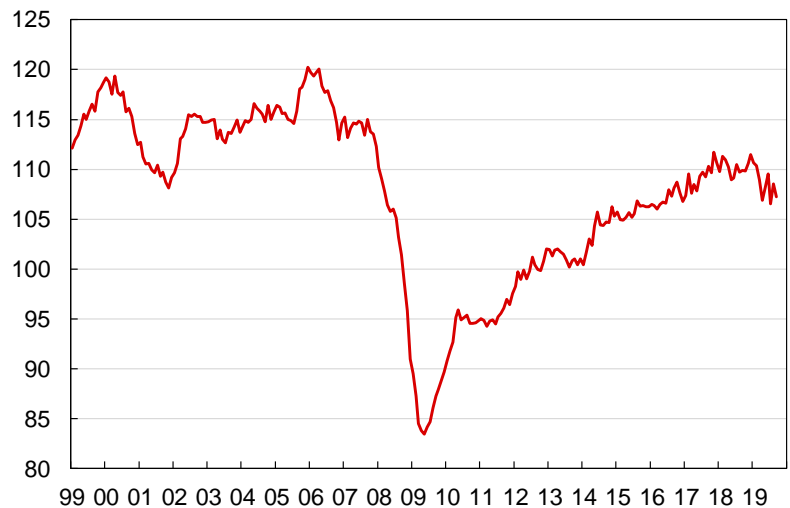
US Industrial Production

- Industrial production of chemicals (excluding pharmaceuticals) turned up in 2016 as cheap natural gas liquids from shale formations boosted the competitiveness of North American chemical producers. However, production has fallen with overall manufacturing in 2019. Production fell 3.8% from December to July and was down 0.8% year-over-year in September.
- U.S. chemical industry capacity (and production) will expand going forward as new facilities built in response to the shale boom come online.
- U.S. industrial production of plastic and rubber products has also declined in 2019 and was down 2.4% year-over-year in September.
- Plastic and rubber production was boosted by the strong recovery in motor vehicle sales and production from 2009 to 2015. With the peak in motor vehicle production likely behind us, future growth in plastic and rubber products will have to depend on other sources of demand. 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, which rose after oil prices hit bottom in early 2016, fell 16.2% from October 2018 to September 2019.

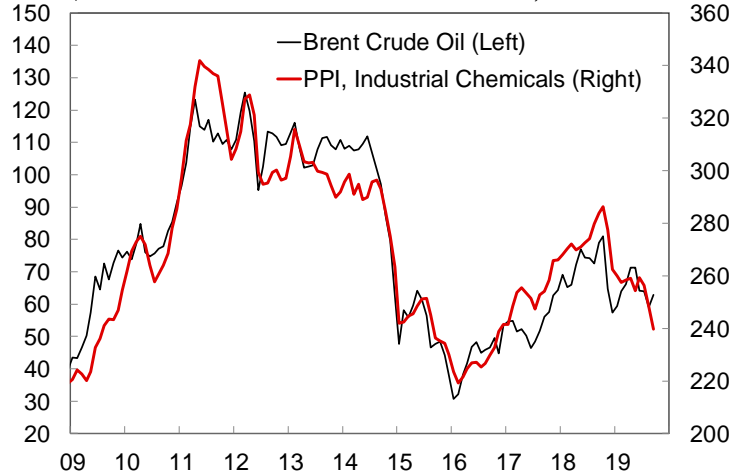
US Industrial Production: Chemicals ex pharma
Index, 2012=100



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



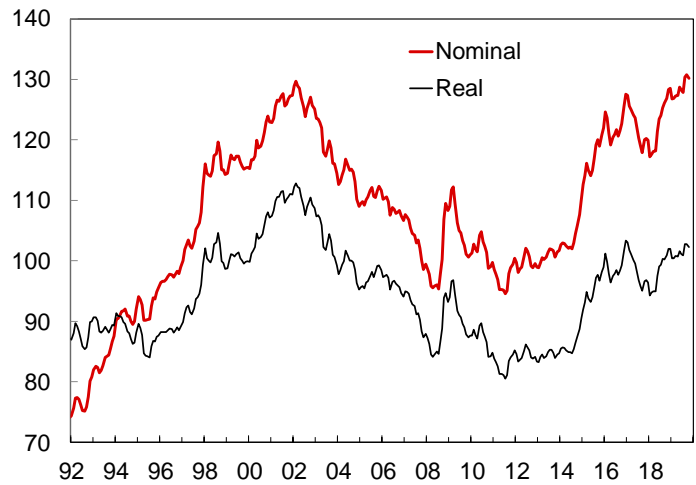
Brent Oil Price vs Industrial Chemical Prices
\$/Barrel (Left) Index, 1982 = 100 (Right)



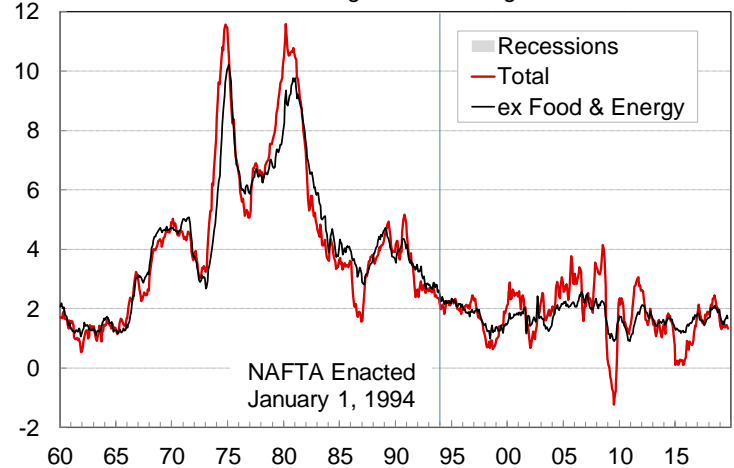
Exchange Rates, Inflation, and Interest Rates

- The trade-weighted foreign exchange value of the U.S. dollar hit a post-1973 high in September before declining slightly in October.
- A strong dollar helps keep inflation low, but it reduces the competitiveness of U.S.-produced goods and services, especially in agriculture, mining, and manufacturing.
- For all but a few industries (e.g., steel and aluminum), the negative impact of the strong dollar on competitiveness will exceed any benefits from tariffs.
- 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 was up just 1.3% year-over-year in September. The “core” (ex food and energy) index was up 1.7%.
- As long as inflation remains below 2%, there is little pressure on the Fed to raise interest rates.
- The Federal Reserve cut its federal funds rate target by a quarter point (to 1.50-1.75%) on October 30, following similar cuts in July and September.
- The (closing) yield on 10-year Treasury notes, which fell from a high of 3.24% in October 2018 to a low of 1.39% in March 2019, has moved up to about 1.80% as the perceived risk of recession has diminished.
- The federal funds rate is now below the 10-year Treasury yield, i.e., the yield curve is no longer inverted. The inversion was not long enough in duration or large enough in magnitude to signal a recession.

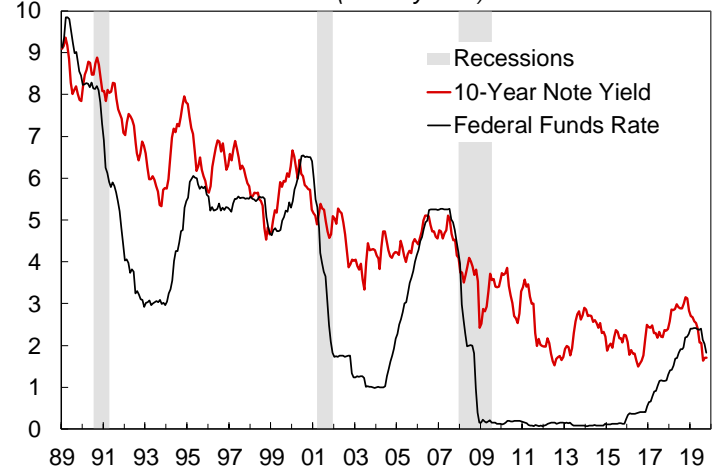
Federal Reserve Broad Dollar Index



US Personal Consumption Expenditures Price Index
Percent Change from Year Ago



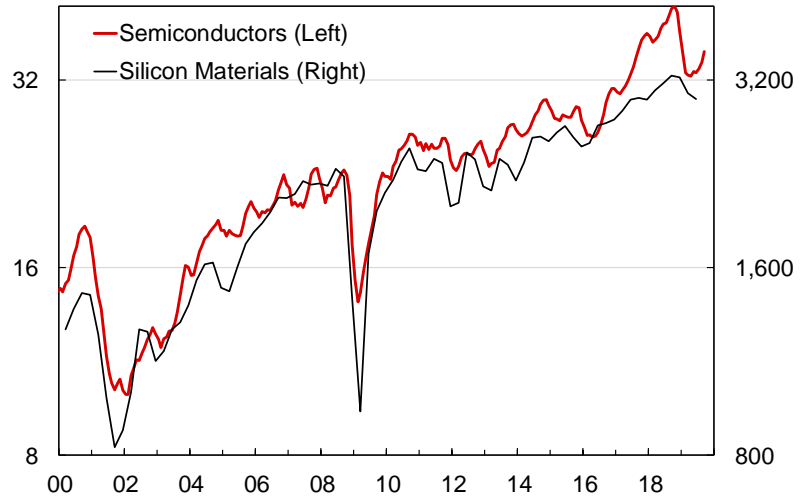
US Interest Rates
Percent (Monthly data)



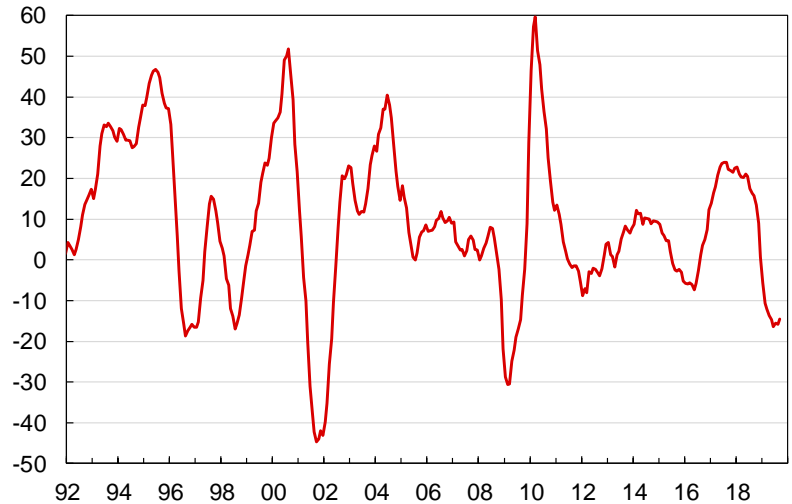
Electronics & Communication

- Shipments of silicon materials are a good indicator of global demand for products going into the electronics industry. Shipments have fallen for three straight quarters since hitting a record high in the third quarter of 2018. They were down 5.6% year-over-year in the second quarter.
- The data (from SEMI®) 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, reported by the Semiconductor Industry Association, fell sharply after reaching a record high in the three months ending in October 2018.
- Shipments bottomed in the first half of 2019 but were still down 14.6% year-over-year in the three months ending in September. Year-over-year growth was above 20% as recently as June 2018.
- Industrial production of wire and cable used in communication and energy applications fell by two-thirds from its 2000 dot.com bubble peak to its 2009 trough. The recovery since then, while significant in percentage terms, has erased little of the 2001-2009 decline.
- Wire and cable production hit an 11-year high in June but fell sharply in September. Production was down 0.8% year-over-year in September.

Worldwide Semiconductor & Silicon Material Shipments
Million\$, 3-Month Moving Average Million Square Inches



Worldwide Semiconductor Shipments
Percent Change from Year Ago, 3-Month Moving Average



US Industrial Production: Wire & Cable
Index, 2012=100



Global GDP Growth

	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
World	2.8	2.6	3.2	3.1	2.4	2.6	2.8	2.8	2.9
North America	2.7	1.6	2.4	2.8	2.2	1.9	2.0	2.0	2.0
United States	2.9	1.6	2.4	2.9	2.3	2.0	2.0	2.0	2.0
Canada	0.7	1.1	3.0	1.9	1.5	1.8	1.8	1.7	1.7
Mexico	3.3	2.9	2.1	2.0	0.4	1.3	1.9	2.1	2.3
Western Europe	2.3	1.9	2.4	1.9	1.2	1.4	1.5	1.4	1.4
France	1.1	1.1	2.3	1.7	1.2	1.3	1.3	1.4	1.4
Germany	1.7	2.2	2.5	1.5	0.5	1.2	1.4	1.3	1.2
Italy	0.9	1.1	1.7	0.9	0.0	0.5	0.8	0.7	0.6
Spain	3.7	3.2	3.0	2.6	2.2	1.8	1.7	1.7	1.6
U.K.	2.3	1.8	1.8	1.4	1.2	1.4	1.5	1.5	1.5
C & E Europe	1.5	2.0	4.1	3.2	2.0	2.7	2.7	2.7	2.8
Middle East & Africa	2.4	3.3	1.8	1.7	1.0	2.8	3.0	3.0	3.0
Asia/Pacific	4.5	4.5	4.9	4.5	4.1	4.1	4.3	4.4	4.4
Japan	1.2	0.6	1.9	0.8	0.9	0.5	0.5	0.5	0.5
ex Japan	5.6	5.7	5.8	5.6	5.0	5.0	5.3	5.3	5.3
Australia	2.5	2.8	2.4	2.7	1.7	2.3	2.6	2.7	2.7
China	6.9	6.7	6.8	6.6	6.1	5.7	5.9	5.7	5.6
India	8.0	8.2	7.2	6.8	6.1	7.0	7.4	7.4	7.4
Indonesia	4.9	5.0	5.1	5.2	5.0	5.1	5.2	5.3	5.3
Korea (South)	2.8	2.9	3.2	2.7	2.0	2.2	2.7	2.9	2.9
Malaysia	5.0	4.5	5.7	4.7	4.5	4.4	4.9	4.8	4.8
Philippines	6.1	6.9	6.7	6.2	5.7	6.2	6.4	6.5	6.5
Singapore	2.9	3.0	3.7	3.1	0.5	1.0	1.6	2.2	2.4
Taiwan	0.8	1.5	3.1	2.6	2.0	1.9	2.1	2.1	2.1
Thailand	3.1	3.4	4.0	4.1	2.9	3.0	3.5	3.6	3.6
Vietnam	6.7	6.2	6.8	7.1	6.5	6.5	6.5	6.5	6.5
Latin America	-1.1	-2.1	0.8	0.6	-0.1	1.8	2.5	2.7	2.8
Argentina	2.7	-2.1	2.7	-2.5	-3.1	-1.3	1.4	2.3	3.1
Brazil	-3.6	-3.3	1.1	1.1	0.9	2.0	2.4	2.4	2.4
Colombia	3.0	2.1	1.4	2.6	3.4	3.6	3.7	3.8	3.8
Venezuela	-6.2	-17.0	-15.7	-18.0	-35.0	-10.0	-5.0	0.0	0.0

Global Industrial Production Growth

	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
World	1.9	3.5	3.1	0.4	2.3	2.8	2.4
Advanced economies	0.2	3.1	2.4	-0.1	1.2	2.0	1.3
United States	-2.0	2.3	3.9	1.0	1.5	2.2	1.8
Japan	0.2	2.6	1.0	-1.0	0.5	1.0	0.5
Euro Area	1.7	3.1	1.0	-1.5	0.5	2.0	1.2
Other advanced	1.4	4.3	2.9	1.0	2.0	2.5	1.5
Emerging economies	3.6	4.0	3.7	0.9	3.5	3.7	3.5
China	6.1	6.6	6.2	5.5	4.5	4.5	4.0
Emerging Asia ex Chi	3.7	4.1	3.8	1.0	4.0	5.0	4.0
C & E Europe	1.6	3.2	2.9	2.0	2.0	2.5	2.0
Latin America	-3.6	-0.8	-2.1	-5.5	2.0	2.0	2.5

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