The Inforum Economic Outlook

The U.S. economy expanded about 2.2% in 2017, the eighth consecutive year of moderate gains. Growing labor markets, relatively strong personal consumption spending, and recovering investment in energy exploration led the economy. These offset weak residential investment, a smaller inventory accumulation, and falling net exports. The unemployment rate fell to 4.4% and GDP inflation rose to 1.9%; the Federal Reserve responded by raising rates three times in 2017.

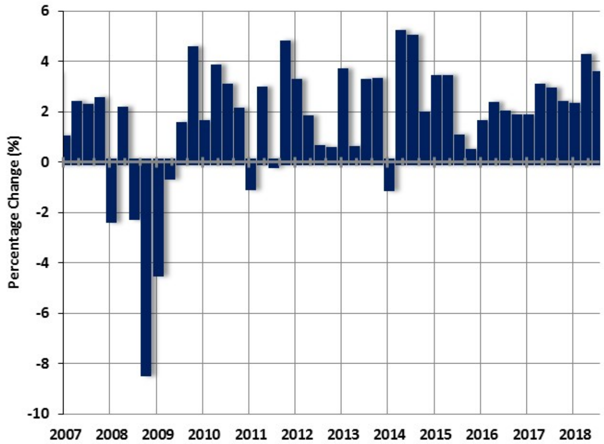
Growth reached 3.0% in the second quarter of 2017 and then fell before reaching 4.2% in the second quarter of 2018. The remaining quarters of 2018 hold potential for the best annual performance since 2015 and perhaps since the recession. According to current Inforum projections, growth will rise to at least 2.8% in 2018. The trade gap likely will widen further and personal spending will sustain a relatively high growth rate. Improved investment spending, especially energy-related investment, should contribute to faster overall expansion. The unemployment rate will continue to fall, and inflation will rise to about 2.3%.

The Current Economic Environment

The U.S. economy strengthened in 2017, with GDP reaching 3.0% in the second quarter before decelerating to 2.3% in the fourth quarter, to provide annual growth of 2.2% (see Table 1); this was a significant improvement over the anemic 2016 performance of 1.6%. Relatively strong consumption expenditures and stronger nonresidential investment led the economy once more. Petroleum prices rose just enough to reinvigorate energy production, and oil and gas development drove up nonresidential investment spending. Low inventory investment and surging imports, particularly in the fourth quarter, partially offset relatively strong personal consumption expenditures and improving residential investment. While the pace has been slow, the current economic expansion has reached eight years.

Private sector activity accelerated in 2017 after a slow winter season. Figure 1 shows that quarter-to-quarter annualized growth in real (inflation-adjusted) GDP was 1.8% in the first quarter following equally anemic Q4 2016 growth of 1.8%, but economic expansion reached 3.0% in Q2 and 2.8% in Q3 2017. Growth cooled to 2.3% in the fourth quarter even while most domestic activity accelerated, as inventory accumulation fell and as import growth reached double digits. The recovery from hurricane damage in Florida and Texas likely contributed to these patterns, including the surges in imports, consumer durables, residential construction, and government spending. Growth held at 2.2% in the first quarter of 2018 before surging to 4.2% in the second quarter, driven by strong consumer spending and nonresidential investment.

Figure 1: Quarterly Real GDP Growth
(Seasonally Adjusted Annual Rate)



A bright spot in the U.S. economic record of the past several years was growth of real disposable personal income. Growth rates of 4.0% in 2014 and 4.1% in 2015 unfortunately were not sustainable, and income decelerated to 1.7% in 2016 and 2.6% in 2017. In part, the slow rise of real income in 2017 was due to consumption price inflation that slowly has moved toward 2.0%. Consumer prices rose 1.8% in 2017, up from just 0.3% in 2015, and this normalization of inflation rates is an indication of improving economic health despite the reduction of purchasing power.

Consumption price inflation nevertheless remained low, unemployment rates continued to fall, and wages are trending higher in 2018, with all of these gradually pushing real income higher. Figure 2 shows that recent year-over-year nominal hourly earnings growth has been above 2.0% for private employees; wages in October 2018 were 3.1% greater than wages 12 months earlier. Wages began to climb as the unemployment rate moved below its natural rate of unemployment (known as NAIRU in economic literature) of about 5.0%. In Q2 2018, the Employment Cost Index rose at its fastest pace since 2008. Nominal wages climbed over the past several years for the median full-time worker, and real median wage growth sustained rates near 2.0% between Q1 2015 and Q3 2017, though growth faltered in Q4 before rising again in 2018. This suggests improvement in blue-collar occupations and others at the lower end of the wage distribution. Real compensation per hour for the nonfarm business sector, a broader measure of compensation that is adjusted for inflation, grew faster than 3.5% in the second and third quarters of 2015 relative to compensation rates a year earlier, but it fell by 0.6% Y/Y in the second and third quarters of 2016 and remained below the Q3 2015 peak until in Q1 2017. This deceleration and fall of real compensation was due, in part, to slowly rising consumer price inflation that offset moderate strengthening of wages and benefits. Higher wages, especially among blue-collar workers, and full employment supported relatively strong real consumption spending growth of 2.7% in 2016 and 2.5% in 2017, though this was below the growth of 3.7% in 2015. Consumer spending in Q1 2017 decelerated to 1.8% but rose 3.9% in the fourth quarter, with 3.8% following in the second quarter of 2018. Though performance was uneven, consumer spending supported stronger GDP growth each year since 2014.

Figure 2: Unemployment and Wage Growth
Rate and Year-on-Year Growth Rates

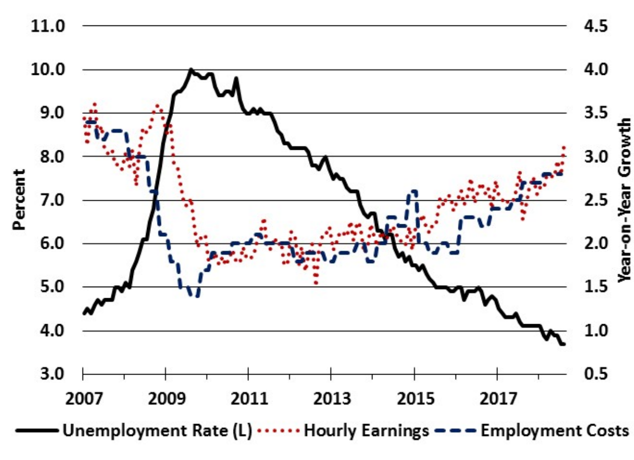


Figure 3 shows the contributions to real GDP growth of its major expenditure components. In contrast to government spending patterns that followed the troughs of other recessions in the past three decades, where fiscal policies typically were expansionary, overall fiscal policy following the Great Recession was contractionary. Inflation-adjusted government consumption and investment expenditures (which include goods and services but not entitlements) fell each year between 2011 and 2014. Expansion resumed in recent years, reaching 1.9% in 2015, but real spending fell 0.1% in 2017 as budgets remained tight even as prices rose. Federal non-defense expenditures accelerated to 3.1% growth in 2015, but spending then decelerated to 0.8% in 2017. Federal defense spending cuts subsided gradually, with reduction of 6.7% in 2013 slowing to just 0.6% in 2016; 2017 finally brought stabilization with 0.7% expansion. Inflation-adjusted state and local spending rose 3.0% in 2015, but it fell 0.5% in 2017. Weakness across all categories in 2017 meant that total government spending failed to contribute to economic growth.

Figure 3: Final Demand Expenditures
(Contributions to GDP Growth)

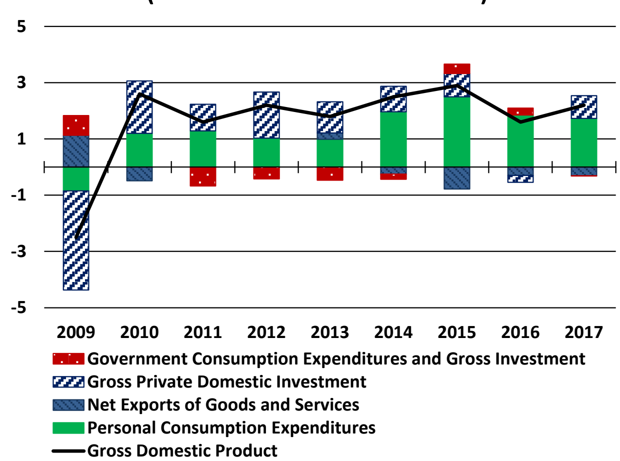


Figure 4 shows government deficits relative to GDP. By far, the greatest federal deficits since the 1930s came during WWII, with the gap exceeding 25% of GDP. The only other period in which federal deficits approached 10% of GDP was the Great Recession. Since the 2009 deficit of 9.8%, federal borrowing fell to 2.4% of GDP in fiscal year (FY) 2015. The deficit has risen since then, to 3.4% in FY 2017, despite moderately strong economic growth. In addition to defense and nondefense spending, other federal expenditures also contribute to the deficit, including entitlements such as Medicare and Social Security and interest payments on federal debt. Despite the paltry contribution of government consumption and investment to GDP growth, and even before the effects of tax cuts and spending hikes took hold, the federal deficit was expanding faster than the economy. The rising federal deficit presents cause for concern. State and local net borrowing also rose to historically high rates in 2009, at 3.0% of GDP, but since diminished to about 1.5% of GDP in 2017.

Figure 4: Government Surplus or Deficit
(Percent of GDP)

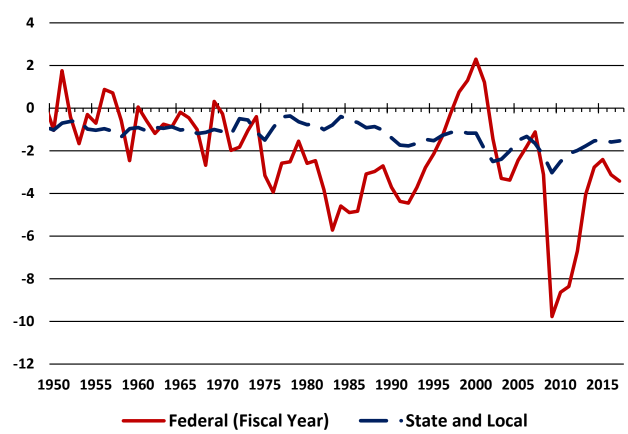


Figure 5: Quarterly Net Exports
(Billions of Dollars)

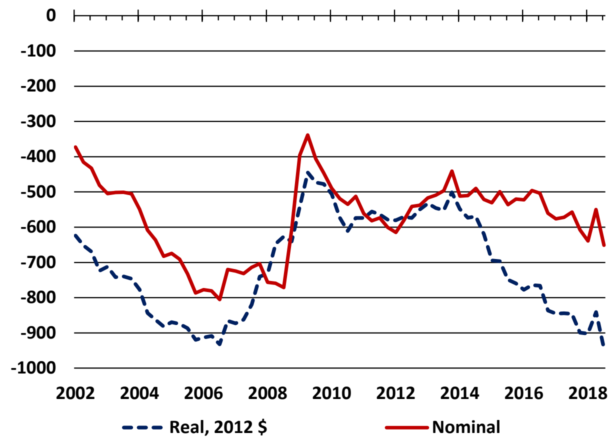
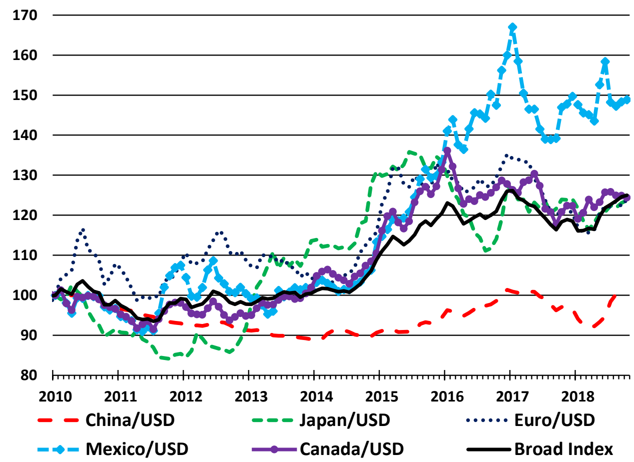


Figure 6: Foreign Exchange Rates
(January 2010 Q1 = 100)

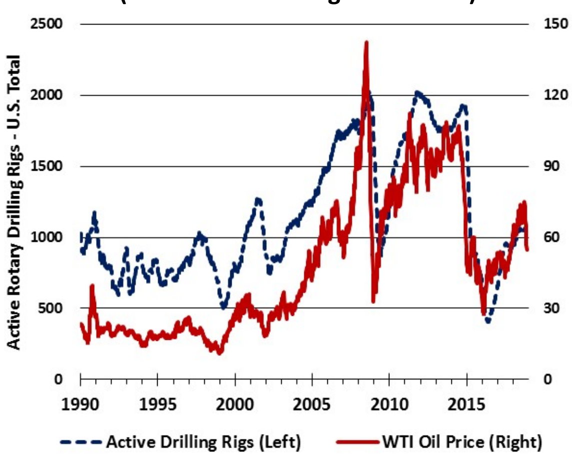


The U.S. dollar has maintained strength in recent years due to the comparative stability and relatively good health of the American economy. While cheaper prices of imports allow consumers to purchase greater quantities of goods and services, increased foreign competition leaves many American producers struggling to compete at home and abroad. Real net exports (Figure 5) dropped suddenly at the end of 2014 and beginning of 2015 and then stabilized, but the trade gap widened suddenly in the fourth quarter of 2016 when exports contracted and imports surged. Due partly to the strong U.S. dollar, the nominal trade balance mostly remained flat after 2014 despite the shift in trade volumes, but the nominal trade deficit then grew sharply late in 2016. Though it remained high, the dollar weakened in 2017 following a January 2017 peak, and the trade deficit remained flat through Q3 2017 before widening in Q4. The trade deficit grew despite strong exports growth, as imports grew faster still, in part due to replacement of vehicles and repair of homes damaged and destroyed by hurricanes.

Figure 6 shows the dynamics of exchange rates over the past eight years for the currencies of several major U.S. trading partners; these contribute to the patterns indicated by the Federal Reserve Board's Broad Currency Index. Between January 2014 and January 2017, the U.S. dollar strengthened 28.0% versus the euro, 20.5% versus the Canadian dollar, and 13.9% against the Chinese renminbi. At the same time, the U.S. dollar appreciated 61.8% against the Mexican peso; between October 2016 and January 2017 alone, the dollar gained 13.2% against the peso as the U.S. election cycle took its toll. This helped to boost the U.S. dollar 24.6% according to the broad index between 2014 and January 2017. Between January 2017 and January 2018, the broad index fell 8.0% as the euro gained 12.8%, the peso rose 11.6% (though it slipped again late in the period) and the renminbi strengthened 6.8%. The drop since January 2017 was considerable and acted to restrain imports, though the effects of strong U.S. consumption demand and rising investment spending drove the trade gap substantially wider in Q4 2017. Between January and October 2018, the dollar gained strength, with the Broad Index rising 8.0%.

Conditions in recent years have resembled the late 1990s, when the U.S. economy was expanding but most other major economies were struggling. Capital surged into the United States and the U.S. dollar appreciated strongly. The United States eventually experienced a relatively mild recession in 2001, but the effects of capital inflow and U.S. dollar appreciation had lasting consequences. U.S.-based manufacturing contracted sharply and generally failed to recover even after subsequent U.S. dollar depreciation. Cheap capital also fed sub-prime lending that led to the collapse of construction and other markets in the financial crisis of 2008. As foreign economies finally begin to strengthen, the U.S. dollar began to stabilize in 2017, though it climbed again through late 2018.

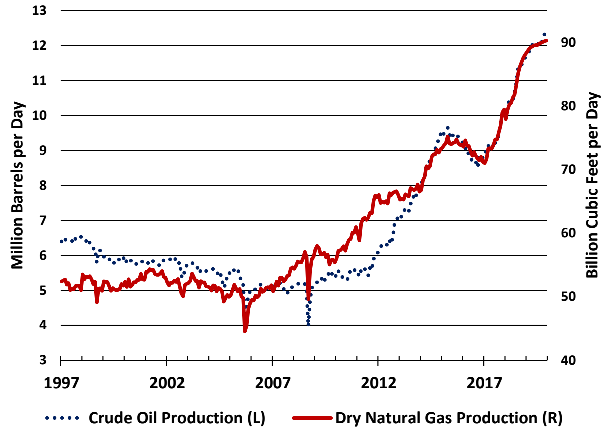
Figure 7: Drilling Activity and Oil Prices
(Sources: Baker Hughes and EIA)



West Texas Intermediate (WTI) oil prices plummeted from about $100 per barrel at the beginning of 2014 to $28 in February 2016, and this quickly led to plunging exploration activity in the oil and gas industry (Figure 7). The number of active drilling rigs fell to 404 in late May 2016, down from 1,866 just two years earlier and more than 2,000 rigs in 2008. Weak petroleum demand in Asia and Europe and steady production in OPEC nations largely brought the price decline in 2014, aided by rapid expansion of U.S. production. Action by OPEC and Russia to curtail production led to a price surge late in 2016. Oil prices quickly recovered to above $50 per barrel (WTI), bringing more than 750 rigs to active service by February 2017. Although prices were above $70 in September 2018, they dropped to just over $50 in November 2018, and the rig count stood at 1,076.

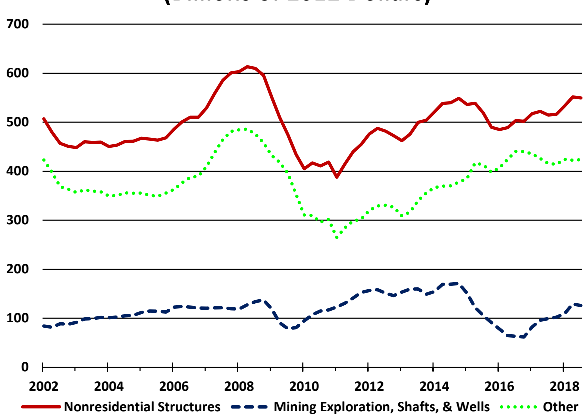
Indeed, the global energy market has changed markedly, with substantial effects on the American economy. U.S. production of crude oil rose quickly since 2008 and natural gas production sustained rapid growth since 2005; for a time, the nation became the top producer of both commodities. The energy sector saw consistent and strong capital investment since 2009, and new exploration, production, and ancillary activities created well-paid jobs. Plunging oil prices led to sharp declines in overall energy investment spending and moderate contraction of domestic oil and gas production, but dramatic recovery began in the middle of 2016. Following months of decline, crude oil and natural gas production began to rise again and both were at historic highs in November 2018 (Figure 8); crude oil production reached a record high in November 2017, surpassing production levels seen in the early 1970s. Reduced operating costs and new technology allowed production to remain high despite low prices and reduced exploration, and increased efficiencies will boost profits as output rises.

Figure 8: Production of Crude Oil and Natural Gas



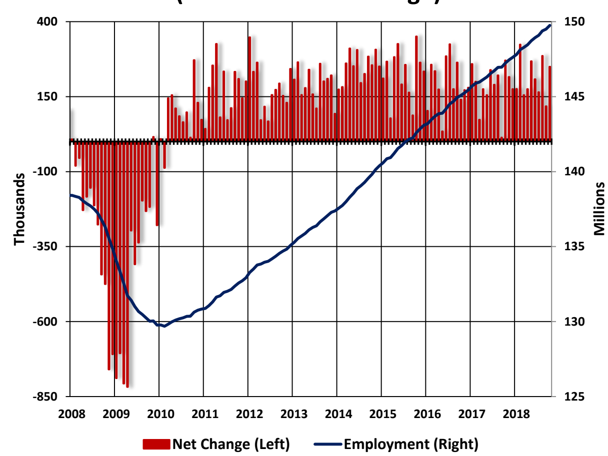
Recovery in energy exploration now is boosting employment and investment, even while prices remain relatively low. The collapse of domestic exploration was the primary reason for a fall in real nonresidential construction spending by 5.0% in 2016 (Figure 9). Most other nonresidential construction sectors fared better in 2016 before weakening in 2017. Another spending surge for energy development brought overall private nonresidential construction growth of 4.6% in 2017.

Figure 9: Nonresidential Construction
(Billions of 2012 Dollars)



The Federal Reserve considered a variety of promising indicators when it raised interest rates in December 2015 after holding rates near zero since 2009 with hopes of encouraging economic growth. Increasing strength in such indicators was expected to spur additional rate increases in 2016, but apparent mid-year weakening of labor markets convinced the Federal Reserve to defer such action until their December meeting, after hiring improved. In the first six months of 2017, Figure 10 shows that hiring remained strong at an average of 184,000 per month, supporting additional rate hikes in March and in June 2017. Employment gains were slight in September 2017, mainly due to hurricane disruptions, but hiring in October and November both exceeded 200,000 jobs and the unemployment rate dropped to 4.1%. The Federal Reserve raised interest rates again in December 2017, the fourth time in 12 months. Hiring continued at a rapid pace through October 2018 at an average of 213,000 jobs per month. Rates were pushed higher in March, June, and September 2018, with one more increase possible late in the year.

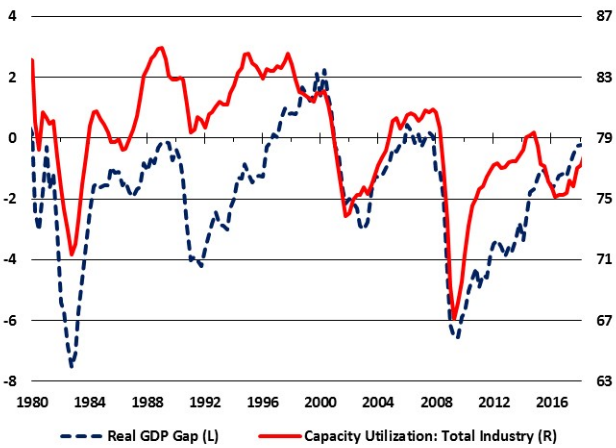
Figure 10: Nonfarm Employment
(Levels and Net Change)



The U.S. economy expanded eight consecutive years through 2017. Though recovery has come slowly and unevenly, by many measures it seems the losses of the Great Recession largely have been regained. Three indicators reveal the slow dissipation of recession losses.

First, productive slack widened suddenly as the economy slowed, and the gaps subsided slowly. Although real (2009$) GDP was well above its previous peak seen in 2007, Figure 11 shows that it long remained below its potential level as measured by the Congressional Budget Office (CBO), despite downward revisions to earlier estimates of potential output. The gap nearly closed in Q1 2018 for the first time since Q4 2007. Capacity utilization for manufacturing, mining, and utilities industries was 79.4% in Q4 2014; it fell to 75.2% in Q3 2016 before rising to 78.3% in Q3 2018. Although this was far above the 2009 average of 68.5%, it remains almost 3.0% below rates seen in 2007 and indicates that these industries still have unused capacity.

Figure 11: GDP Gap and Capacity Utilization
(Percentage Deviation of GDP from Potential GDP)



Second, this economic slack contributes to low general inflation, as is shown in Figure 12. Year-over-year core consumer price (Personal Consumption Expenditure deflator) growth since 2009 persistently remained below the Federal Reserve's target rate of 2.0%. Even extraordinary Federal Reserve efforts to raise inflation and spur growth seemed to have little effect, including policy interest rates near zero for seven years and "quantitative easing" (QE). The QE program ended in October 2014, and the Federal Reserve began to "normalize" monetary policy by increasing its policy rate in December 2015. Price and wage growth rose through 2016 and approached target rates, though prices decelerated again in 2017 as policy interest rates rose; inflation seems to be firming in 2018. Persistent weakness in trading partners led much of the world to loosen monetary policy, and raising interest rates too quickly threatens to intensify the low inflation problem by strengthening the U.S. dollar. Still, global growth has improved in recent years, and the Federal Reserve raised rates eight times between December 2015 and September 2018. The Federal Reserve also recently began reduction of its $4.5 trillion in holdings of Treasury and mortgage securities; while the pace will be slow, the action could lead to higher long-term rates. Figure 12 indeed shows a recent rise in long-term rates that might help to alleviate recent fears of possible yield curve inversion, where short-term rates exceed long-term rates and often portend recession. Figure 13 shows the level and changes of U.S. Treasury securities held by the Federal Reserve. For the first time since 2012, net holdings began to fall substantially in the final months of 2017; though the pace has quickened, the level remains high. Continued sales will sustain upward pressure on long-term rates.

Figure 12: Interest Rates and Inflation
(Percent)

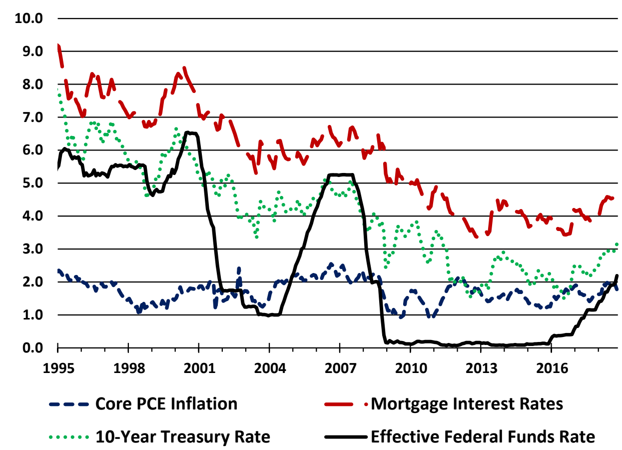
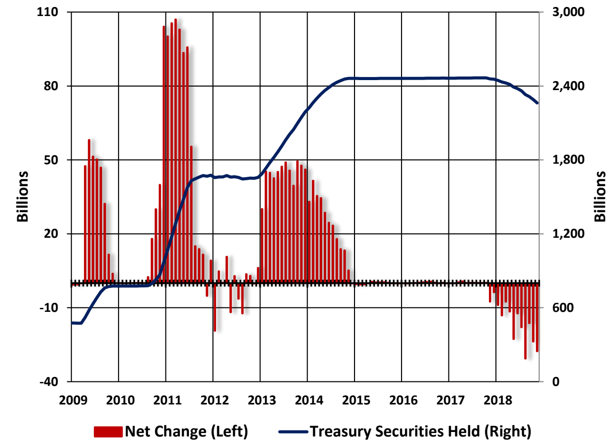


Figure 13: U.S. Treasury Securities Held by the Federal Reserve
(Billions of Dollars)



Finally, overall labor participation remained near 30-year lows of under 63% in 2018; participants include workers and those seeking jobs. Figure 14 illustrates that participation is down from 66% before the Great Recession and 67% in 2000, though rates seem to have stabilized since 2013. A substantial proportion of this reduction was occurring anyway, given the general aging of the workforce and other demographic changes. Attention recently has been drawn to the effects of the opioid epidemic on labor participation. A 2017 study by Alan Krueger suggests that rising opioid use accounts for 20% of the labor force participation rate reduction among men since 1999 and that nearly half of prime-age men not in the labor force consume prescription painkillers regularly. Full employment and rising wage rates might pull some back into the labor force and allow those who are underemployed to move to better jobs, but the number of people who have been unemployed for long periods has been slow to return to historic norms. Though available data are limited, Figure 15 shows that the number of those out of the labor force because of disabilities, in proportion to the labor force, swelled in the depths of the Great Recession; these numbers have fallen again in recent years, along with the number of disabled unemployed workers. Figure 16 shows NAIRU together with the standard unemployment rate and a broader measure of unemployment (U6) that includes marginally attached workers (discouraged workers who are not actively looking for jobs) and those who work part-time for economic reasons. Late in 2016, the standard unemployment rate finally slipped below NAIRU, indicating full employment, and the broader measure of unemployment returned to rates seen in the mid-1990s and just before the Great Recession. Any remaining slack in labor markets thus is more evident in participation rates than in unemployment rates. Another measure of slack also is shown: the share of workers holding full-time jobs. This share dropped from above 79% in 2008 to just above 72% in 2010; by Q2 2018, over 79% of the labor force held full-time jobs, again indicating substantial recovery in labor markets.

Figure 14: Labor Force Participation Rate
(Percent)

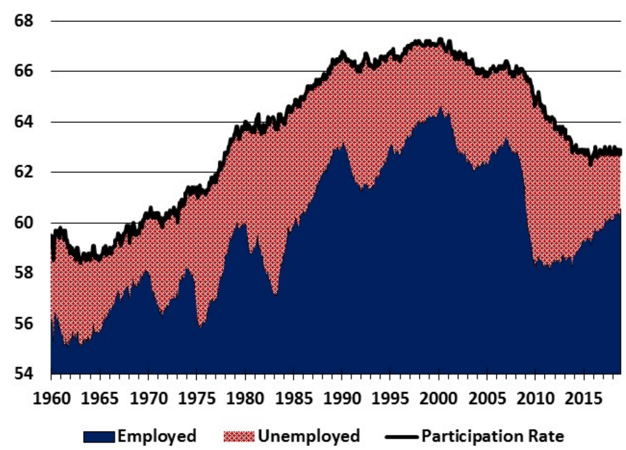


Figure 15: Adults with Disabilities in Proportion to Labor Force
(Percent)

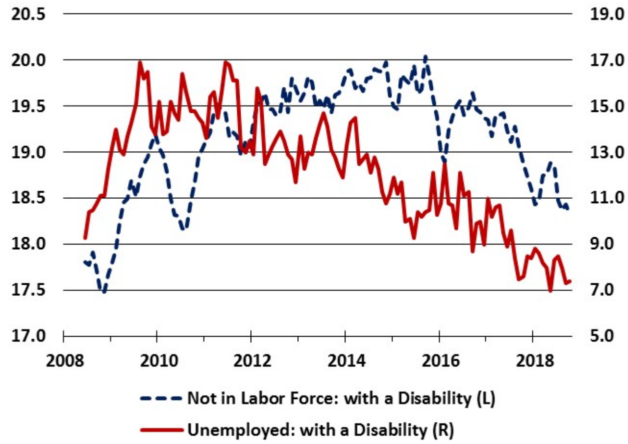
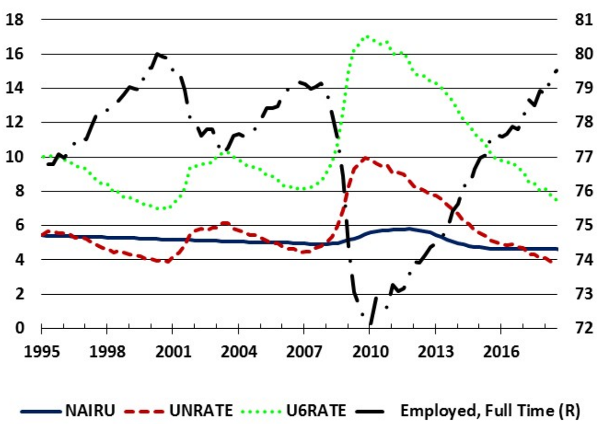


Figure 16: Unemployment Rates
(Percent)



These three indicators—excess production capacity, low inflation, and apparent slack in labor markets—show the long-lasting effects of the financial crisis, but many of these worrisome signs have faded considerably.

Home and other asset prices collapsed during 2008 to 2010, and net worth dropped dramatically for households and businesses. The sluggishness of subsequent economic recovery was due in part to efforts to reduce private and public debt. Though they were painful, these efforts ultimately were effective. Figure 17 shows the net worth of households and nonprofit institutions and its two major components—home equity and financial assets (stocks, bonds, businesses, etc.). Since 2009, net financial worth has risen steadily, driven mostly by rising financial asset prices. Growth of home prices and a slow recovery of the residential construction industry began to push up net home equity toward the end of 2012, and this rise in equity continued into 2018.

Figure 17: Household Net Worth
(Trillions of Dollars)

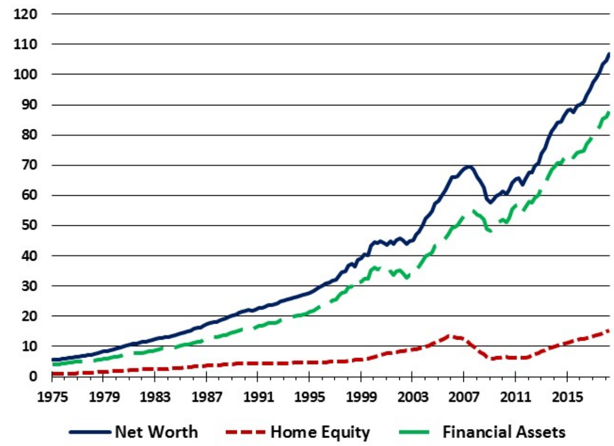
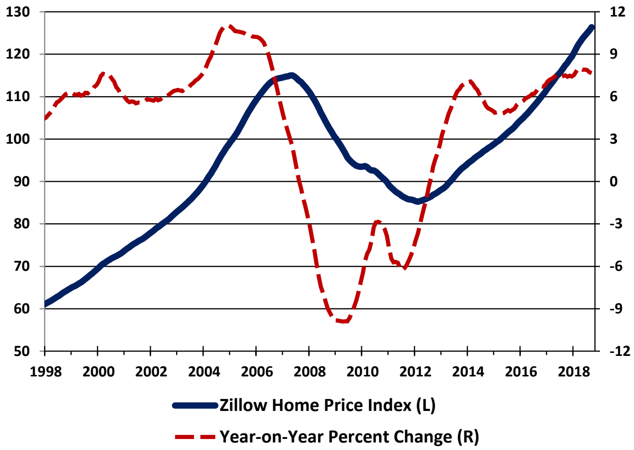


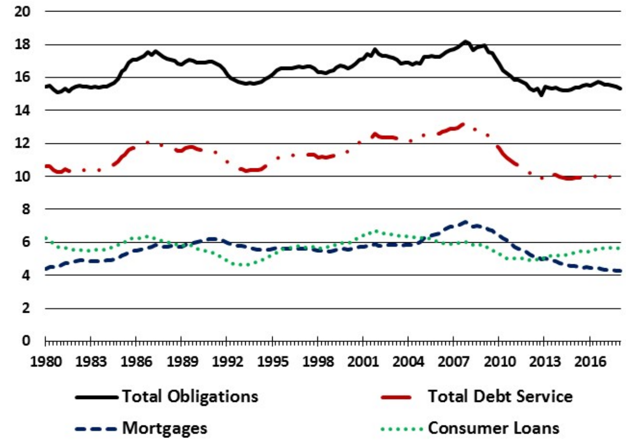
Figure 18 indicates the extent of the housing price collapse between 2007 and 2012, according to the Zillow Home Value Index. Over the past five years, home prices have risen far ahead of general inflation. In March 2017, home prices finally returned to peak levels of April 2007. In October 2018, national housing prices were 47.9% higher than in June 2012 and surpassed the high of April 2007 by 10.5%. Still, recovery remains uneven, and prices in many parts of the country continue to lag.

Figure 18: Zillow Home Prices
(Index (Jan 2009 = 100) and Year-on-Year Percent Change)



The deleveraging that followed the Great Recession, improved labor and asset income, and low interest rates allowed the reduced debt service ratio shown in Figure 19. The ratio of household debt to GDP fell from 99.2% in Q1 2008 to about 80% in recent years. Consumer debt service payments, including mortgage and consumer loan payments, fell from more than 13% in 2008 to about 10% of disposable income in 2012. This is the lowest ratio in more than three decades, and these ratios now have been stable for six years. Total obligations – a broader measure of consumer liabilities that includes rent payments on tenant-occupied property, auto lease payments, homeowners' insurance, and property tax payments – fell from about 18% in 2007 to below 15% in 2012; obligations since have been stable. Interest rates remain low, though they are beginning to climb following the Federal Funds rate increases and asset sales. Low rates helped to reduce debt service payments, but payments will tend to rise as rates continue to climb.

Figure 19: Household Debt Service Payments
(Percentage of Disposable Personal Income)



Improved creditworthiness and low interest rates helped to drive auto sales and residential investment. In late 2015, new car and light truck sales topped an annual rate of 18 million units, a pace seen only twice since 2001 (Figure 20). After weakening to 17.3 million units in June 2016, sales strengthened to 17.9 million units in December before decelerating to 16.5 million units in August 2017; hurricane recovery brought stronger sales in the final months of 2017, and sales have averaged about 17.1 million on an annual basis so far in 2018. New home construction recovered slowly from the Great Recession, with investment in multi-family homes rising faster than for single-family homes. Performance has been mixed, and recovery of residential construction markets remains far from complete, but the housing market is improving.

Figure 20: Vehicle Sales and Housing Starts
(Millions and Thousands)

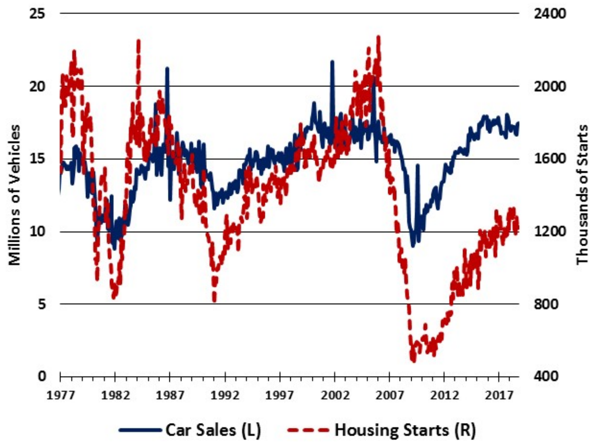
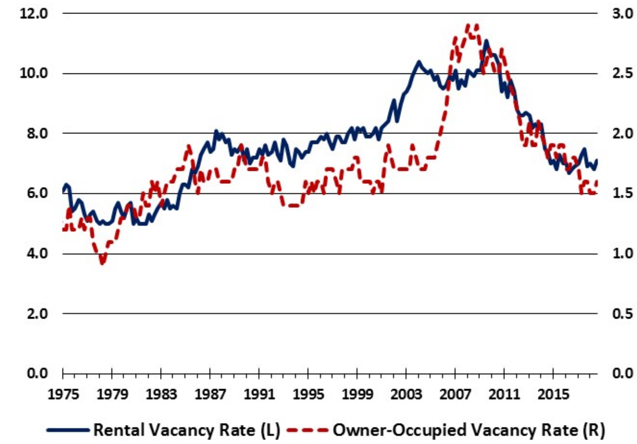


Figure 21: Residential Vacancy Rates
(Percent)



Housing starts dipped in 2017 but topped an annual rate of 1.3 million units in May 2018, approximately matching the best performance since residential construction was collapsing in 2007; since June, the rate of housing starts has averaged about 1.2 million units. Real residential investment similarly decelerated to 3.3% in 2017 after rising 10.1% in 2015 and 6.5% in 2016, despite continued historically low mortgage interest rates. Demand for new homes has been restrained by low population growth and slower household formation. Nevertheless, Figure 21 shows that vacancy rates for owner-occupied houses and for rental housing both have fallen considerably since the Great Recession. The fall in rental vacancy rates was particularly significant in light of the relatively rapid construction of multi-family housing units, and rental prices continue to climb faster than inflation rates. Vacancy rates for owner-occupied housing have returned to the range typically seen from 1985 to 2006. Both suggest that substantial slack has been removed from housing markets, and this could spur residential investment in coming years. Rental vacancy rates stabilized since 2016 while owner-occupied housing vacancy rates continued to fall, suggesting likely deceleration in multi-family construction markets and acceleration of single-family home construction.

Robust auto sales and improving housing starts spurred industrial production growth in 2014, but the widening trade gap and low oil prices in 2015 brought weakness to many sectors, and to mining in particular. Manufacturing activity held up overall, though some industries were hit hard. Figure 22 shows year-over-year growth rates of industrial production and its manufacturing component. Growth rates for the overall index, including mining, utilities, and manufacturing, were about 3.4% late in 2014, but production was falling a year later. While year-over-year growth returned in December 2016 and oil and gas exploration activities are recovering rapidly, continued expansion ultimately may depend on the strength of the U.S. dollar, growth of foreign economies, and avoidance of self-inflicted derailment through trade wars.

Figure 22: Industrial Production
(Year-on-Year Percent Change)

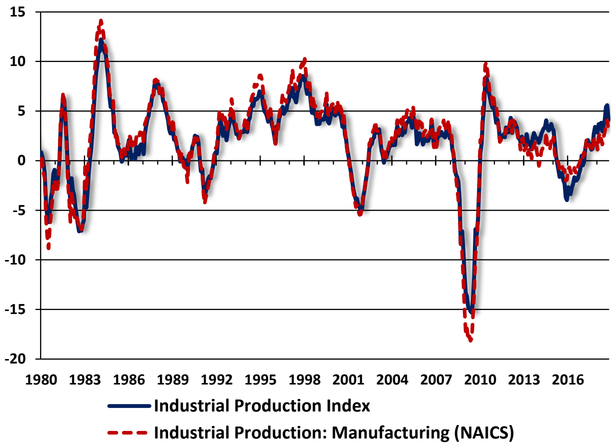
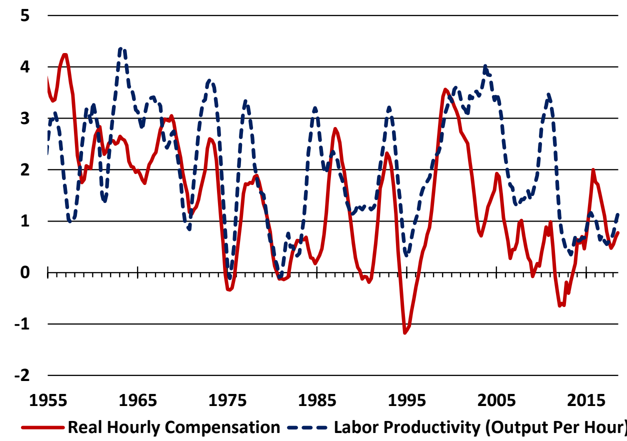


Figure 23: Productivity and Compensation
(Year-over-Year Growth, 2-Year Moving Average)



Although many sectors show signs of stabilization and strength, the retail sector is adjusting to changes in consumer demand and spending patterns. Traditional retail stores, including department stores, continue to lose ground to newer big box retail establishments. Even these newer establishments face rapidly-growing competition from non-store retailers, including internet sales. Consumers also are spending a declining share on goods and instead are spending more on consumer services. Spending on health care by far accounts for the greatest shift, and the aging population will sustain this expansion. Spending on other services has risen too, including telecommunications, financial services, and higher education. At the same time, the spending shares for food and clothing continue decades-long declines, and spending on motor vehicles and household furnishings has slipped more recently.

Productivity growth has been low since the Great Recession, both in the United States and in many other countries. Although productivity and real compensation tend to move together, Figure 23 shows that they have diverged. The fact that real compensation accelerated in 2015 after years of sluggish improvement was welcome news, but the higher compensation growth did not last, since nominal wages failed to accelerate as general inflation rose. Moreover, the low productivity growth is puzzling and perhaps presents reason for concern. It remains to be seen whether these low productivity growth rates present a worrisome structural shift; whether average rates are pulled down by heavily indebted and inefficient "zombie" firms that survive only because of low interest rates; whether they are a product of data measurement problems; or whether they simply are a symptom of continuing recovery from the Great Recession. Recently, nominal wages largely have risen faster as inflation continues to creep upward, though evidence on real wages and productivity lend less reason for optimism.

Inflation-adjusted (2012$) GDP accelerated in 2017 to 2.2%. According to projections shown in Table 1, growth will rise in 2018 to at least 2.8%. Personal spending will be strengthened following recent tax cuts that are expected to raise disposable personal income. Corporate tax cuts (reducing the corporate rate from 35% to 21%), allowing immediate deduction of certain business investment expenses, and encouraging repatriation of foreign earnings should improve private investment spending. Stronger government spending will provide modest stimulus. Export sales could accelerate further with rising international economic growth, but U.S. economic expansion will spur strong import demand, leading to a wider trade gap. Furthermore, the imposition of high tariffs on some imports, with retaliatory reactions by U.S. trading partners, threatens to limit potential for growth.

Robust job growth boosted personal income and consumer spending. In 2017, payroll employment rose by 1.6%, following an increase of 1.8% in 2016. Unemployment continued to fall gradually, to 4.4% in 2017 and 3.7% in October 2018. Job gains averaging 182,000 per month in 2017 and 208,000 per month in the first three quarters of 2018 were encouraging. Annual total employment gains of about 1.5% and 1.3% are anticipated in 2018 and 2019, respectively, before slipping below 1.0% annual expansion in 2020. Unemployment likely will remain below 4.0% through 2020 but then normalize over the forecast horizon.

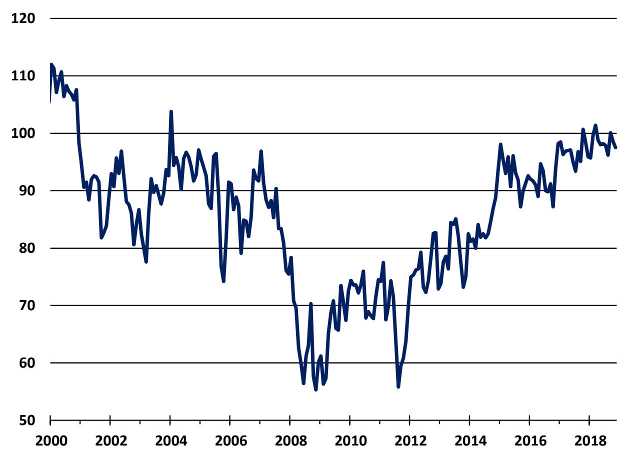
These new jobs help to bolster personal income and will continue to spur purchases of new vehicles, housing, and other goods and services. This spending, in turn, encourages businesses to invest in capital equipment and facilities. Finally, years of government spending cuts largely appear to have ended in 2014, with following years typically bringing modest gains in real government consumption and investment expenditures. The federal government passed a new spending bill early in 2018. The full effects on federal consumption and investment growth still are being assessed, but clearly defense and nondefense expenditures will rise relative to earlier expectations. State and local government real spending fell slightly in 2017, and the coming years likely will bring stronger but still moderate fiscal expansion rates.

The oil and gas industry renaissance should prove durable and propel the U.S. economy if oil and gas prices remain stable and above the threshold of profitability. Despite support from the Trump Administration, coal production has trended downward since 2008. The commitment to wind and solar electricity generation, to improved energy efficiency, and to development and adoption of electric vehicles is less clear. Still, rapid technological developments and falling prices for solar and other advanced technologies suggest that investment spending will remain strong for these sectors.

Net exports will continue to present a drag on the U.S. economy, as improving but still weak export and strong import demand leave a wide trade deficit. This will pose a challenge for manufacturing and other goods-producing industries overall, though even now some agricultural and other sectors are finding ways to compete effectively and new markets are opening for exports of natural gas and petroleum.

Reduced household debt levels, increased employment and income, and moderate inflation will continue to encourage personal consumption spending. Figure 24 shows March 2018 consumer sentiment at 101.4, a 13-year high. Consumer sentiment since has cooled slightly to 97.5 in November 2018. Inflation-adjusted consumer spending expanded 2.5% in 2017. Spending is paced by moderate growth for nondurables and services, with higher spending growth for automobiles and other durable goods. Average retail gasoline prices fell to $1.76 per gallon in February 2016 from $3.69 per gallon in June 2014, and they averaged $2.65 in November 2018; lower prices allow consumers to divert funds from their energy budgets to purchase other goods and services. Relatively low energy costs, strong employment gains, and tax cuts bode well for personal consumption expenditures. Personal consumption spending will continue to grow, boosted to at least 2.7% in 2018, but it may decelerate to about 2.2% by 2020.

Figure 24: University of Michigan Index of Consumer Sentiment
(1966 = 100)



Residential investment activity supported a sluggish economy with 13.0% growth in 2012, but spending since has been volatile. Housing investment decelerated to 3.3% in 2017, falling behind the overall economy. Residential investment growth is expected to slip to 0.5% in 2018 but should improve over the next several years. Sustained employment and income growth, better creditworthiness, and rising but still low mortgage rates will support continued recovery, particularly for the single-family construction market.

After expanding by 10.6% in 2014, real spending for nonresidential structures fell in 2015 and 2016. Weakness was concentrated primarily in drilling and other oil field development while investment growth continued for many other types of nonresidential structures, particularly for commercial and health care buildings. Oil field activity stabilized in 2017, and overall nonresidential construction activity growth of 4.6% in 2017 should improve further in 2018. Expansion may temper to 4.3% in 2019 before climbing back to 5.0% in 2020. Private equipment spending, which rose 6.1% in 2017, will rise by about 7.0% in 2018 and 4.1% in 2019. Investment in intellectual property products, including spending on software, research and development, and other intangible assets, rose 4.6% in 2017; similar annual growth should continue through 2020.

Over the past decade, sluggishness proved persistent not only in the United States but across much of the global economy. Only recently has worldwide growth begun to improve. Because the American economy increasingly depends on trade with its partners, projections of U.S. growth must account for the risks to foreign economies and trading relationships. U.S. producers of agricultural commodities, energy products, manufactured goods, and other trade-dependent firms are working against exchange rates that make American products relatively expensive both at home and abroad; moderation of the U.S. dollar in 2017 helped, but the dollar gained strength again in 2018. Economic indicators point to a synchronized worldwide economic growth such as continued expansion in Europe, Japan, and China, and recovery in other major emerging economies such as Brazil and Argentina. In October, the International Monetary Fund (IMF) lowered its global growth forecast by 0.2 percentage points to 3.7% for both 2018 and 2019, still the fastest rates since 2011. Despite regained strength of the U.S. dollar and other headwinds, strengthening international growth could bring export growth to 4.2% in 2018, compared to 3.0% in 2017. However, the Trump Administration's intended trade policies have the potential to incite trade wars that would be disastrous for U.S. exporters even as foreign economies recover and export sales of American products accelerate.

The strong U.S. dollar drove real import growth to 5.5% in 2015, substantially widening the trade gap. Import volumes rose 4.6% in 2017, though the increase was offset somewhat by strong export growth to produce a moderate increase in the trade deficit. Continued global growth will drive U.S. export sales through 2020, barring initiation of trade wars with major trading partners. Even with sustained growth in exports, high import demand means that net exports will remain a drag on GDP growth.

Table 1: Forecast for Economic Aggregates, Average Annual Percentage Growth Rate

	16-17	17-18	18-19	19-20	20-21	21-25	25-35	35-45
Real (Inflation-Adjusted) Quantities, Average Annual Growth Rates, Percent								
Gross Domestic Product	2.2	2.8	2.7	2.2	2.2	2.1	2.0	1.9
Personal Consumption	2.5	2.7	2.7	2.2	2.0	1.9	1.9	1.9
Durable Goods	6.8	5.7	3.7	1.8	2.0	2.4	2.4	2.3
Nondurable Goods	2.1	2.8	1.9	1.8	1.3	1.3	1.5	1.7
Services	2.0	2.2	2.7	2.4	2.2	2.1	2.0	1.9
Gross Private Domestic Investment	4.8	5.1	4.6	3.8	4.9	3.8	3.0	2.5
Gross Private Fixed Investment	4.8	5.1	3.8	4.1	5.0	3.9	3.0	2.5
Nonres. Fixed Investment	5.3	6.4	4.1	4.2	4.6	3.5	3.0	2.5
Nonresidential Structures	4.6	5.0	4.3	5.0	5.5	2.5	1.9	1.6
Equipment Investment	6.1	7.0	4.1	4.2	3.4	3.2	2.9	2.4
Intellectual Property	4.6	6.6	4.1	3.6	5.8	4.5	3.8	3.1
Residential Investment	3.3	0.5	2.6	3.8	6.1	5.3	3.3	2.4
	2017	2018	2019	2020	2021	2025	2030	2045
Inventory Change (billion 2012$)	22.5	51.8	78.2	71.6	73.8	76.4	85.5	107.5
Net exports (billion 2012$)	-858.7	-912.5	-972.1	-994.0	-1005.7	-1030.5	-1079.8	-1124.8
	16-17	17-18	18-19	19-20	20-21	21-25	25-35	35-45
Exports (% change)	3.0	4.2	3.1	2.9	3.0	3.4	3.3	3.4
Imports (% change)	4.6	4.8	4.0	2.7	2.5	2.7	2.8	2.8
Government	-0.1	1.6	1.9	0.8	0.0	0.4	0.7	1.0
Federal	0.7	2.6	2.5	-0.3	-1.8	-0.6	0.5	0.8
Defense	0.7	2.8	3.0	-1.0	-1.9	-1.0	0.6	0.7
Nondefense	0.8	2.4	1.8	0.6	-1.7	-0.1	0.3	0.9
State & Local	-0.5	1.0	1.5	1.4	1.1	1.0	0.9	1.1
GDP Deflator	1.9	2.3	2.3	2.1	2.0	2.0	2.0	2.0
Consumption Deflator	1.8	2.2	2.2	2.3	2.2	2.1	2.2	2.2
Population	0.7	0.9	1.0	0.9	0.9	0.9	0.7	0.5
Labor Force	0.7	1.0	1.0	1.0	0.8	0.5	0.4	0.5
Employment	1.6	1.5	1.3	0.8	0.6	0.5	0.4	0.5
Labor Productivity	0.5	1.3	1.4	1.5	1.6	1.6	1.6	1.4
Real Disposable Income (2012$)	2.6	2.5	2.6	2.7	2.8	2.4	1.9	1.9
	2017	2018	2019	2020	2021	2025	2030	2045
Unemployment Rate	4.4	3.9	3.6	3.8	4.1	4.6	4.6	4.6
Interest Rates								
Treasury Bills, 3-month	0.9	2.0	2.7	3.1	3.2	2.7	2.9	3.1
Yield, 10 yr. Treasury bonds	2.3	3.0	3.4	3.9	4.0	3.7	3.8	4.3
	2017	2018	2019	2020	2021	2025	2030	2045
Nominal Quantities, Billions of Dollars								
Current Account	-472.5	-505.2	-591.4	-615.6	-642.5	-731.7	-878.3	-1695.3
(% of GDP)	-2.4	-2.5	-2.7	-2.7	-2.7	-2.6	-2.6	-2.7
Federal Net Borrowing	-515.8	-923.0	-1079.1	-1158.6	-1252.0	-1497.9	-1730.1	-2913.5
(% of GDP)	-2.6	-4.5	-5.0	-5.1	-5.3	-5.4	-5.1	-4.7

Downside Risks

Federal Deficit: The federal deficit has grown substantially over the past year. The Tax Cut and Jobs Act widely is expected to cut government revenue. Increased federal spending, including substantial expansion of defense expenditure, only exacerbates the problem.

The deficit shrank from $1.41 trillion in 2009 to $0.44 trillion in 2015. Since then, however, it swelled to $0.66 trillion in 2017. The Congressional Budget Office projects that the deficit will reach $1 trillion by 2020 and $1.24 in 2024.

Other consequences of a growing federal deficit include higher interest payments and a reduced ability to respond to a crisis through aggressive fiscal policy. The long-term sustainability of a large deficit represents a significant risk to the domestic economy.

Trade Wars: The United States currently finds itself fighting trade battles on multiple fronts. Most importantly, conflicts between China and the U.S have escalated in recent months. The U.S. has imposed tariffs on billions of dollars of imported Chinese steel, aluminum, and an assortment of capital goods. In retaliation, China has placed tariffs on imported U.S. soybeans and transportation equipment. In response, the U.S. provided billions of dollars in subsidies to American farmers affected by the trade dispute. Negotiations are ongoing, but conditions are deteriorating.

The U.S. also has engaged in trade disputes with Mexico, Canada, and the European Union. The Trump administration made it a priority to renegotiate NAFTA, citing unfair trade practices. The United States-Mexico-Canada Agreement (USMCA), sometimes called "NAFTA 2.0," was signed by leaders of each country at the G-20 summit in Argentina in late November. However, it has yet to be approved by Congress. Implementation of the USMCA should bring greater access to Canada's dairy market, stiffer intellectual property rules, and greater incentives for domestic auto production. If ratified, the agreement will take effect in 2020.

The U.S. is also playing hardball with European Union trade representatives. The Trump administration initially made the European Union exempt from steel and aluminum tariffs. However, this policy changed on June 1st and tariffs were imposed. The EU retaliated by imposing tariffs on a variety of goods including bourbon, jeans, and motorcycles.

While some may benefit from the Trump administration's trade agenda, other segments of the economy will be hurt. At least a portion of the costs of tariffs will be borne by U.S. consumers. If escalation continues, the risk of a recession will rise.

Geopolitical Instability: Political uncertainties around the globe could prove damaging both to domestic and foreign economies. Allegations of election meddling and the poisoning of a former Russian intelligence officer in the United Kingdom led the United States to impose sanctions on Russia. Rising tensions between the two countries are distracting Congress from making progress on an array of other pressing matters, including healthcare, immigration, and infrastructure.

Ties between the U.S and North Korea remain strained, despite the historic summit between President Trump and Kim Jong Un. It is not clear at this point if recent negotiations will lead to denuclearization in North Korea and lasting peace on the Korean peninsula.

The Trump administration's decision to withdraw from the Iran nuclear agreement caused some consternation among Middle-East nations and European allies. Earlier this year, the Trump administration restricted Tehran's ability to access U.S. dollars and trade Iranian metals. Additionally, the sanctions disrupted Iran's automotive and civil aviation sectors. A second round of sanctions took hold in November 2018. These sanctions target Iran's banking and oil sectors. Significant destabilization could spread to other areas in the Middle East and potentially could affect petroleum markets.

Any new sanctions on oil-producing nations or sudden shift in policy by OPEC could complicate American business planning, disrupt mining investment, and hurt consumer spending on other goods and services. These and other possible problems could lead to widespread economic deceleration. Policy interest rates that remain low and the recent passage of fiscal stimulus allow less room for action to counter a slowing economy and avoid recession.

Climate Change: Greater attention is being paid to the effect of climate change on the economy. The National Climate Assessment, a report produced by the federal government, suggests that negative impacts of climate change could reduce U.S. GDP by up to ten percent by 2100. Reduced economic activity is associated with increased rates of health problems, reduced world trade, diminished agriculture yields, and other risks. While no location or industry is immune to the effects of climate change, some regions and sectors of the economy are predicted to be affected disproportionately. In particular, corn and soybean producers in the Midwest are expected to be hit hard by higher temperatures, droughts, and floods.

Upside Risks

Higher Investment: U.S. corporate tax rates long were among the highest in the world, and while firms found ways to cut tax bills, doing so was expensive and disruptive. Many firms yielded to the pressures imposed by tax and other policies by moving production elsewhere, inverting their corporate structures by moving headquarters to other countries, and by recording profits in nations with low tax rates. Many corporations built substantial cash reserves over the past few years. However, avoidance of U.S. corporate taxes and too few investment opportunities at home left much of the money overseas, and cash that was spent went to buy back equity. Capital spending in the United States suffered. Legislation passed in December 2017 cut the corporate rate from 35% to 21%, allows immediate deduction of certain business investment expenses, and encourages repatriation of foreign earnings. GOP politicians argue that the bill will help American workers and boost economic growth, and if deregulation progresses as the Administration intends, then such changes to tax and regulatory policy could spur additional private investment. With rising employment costs adding to the pressure, establishment of sensible federal tax policy is essential. Much remains to be learned about the merits of the current legislation. If firms respond by repatriating funds held overseas, and if these funds are put to effective use, then higher investment spending could boost labor productivity growth. The President's vision for improved infrastructure relies heavily on private investment, and so the potential for private funds to boost productivity extends beyond the traditional scope for capital deepening.

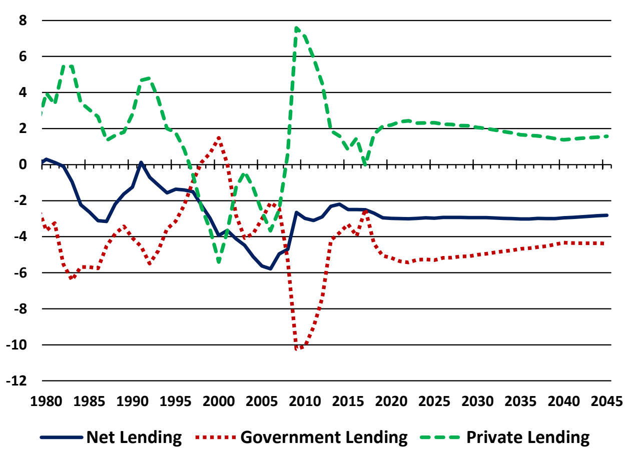
The general expansion of overall federal nondefense and state and local expenditures lends hope that agreement will be reached to make needed repairs and improvements on roads and highways, airports, waterways, and other long-neglected infrastructure. These are important factors in private activity, and domestic producers would welcome a boost to their productivity as they face fierce competition from abroad. If the federal government joins state and local governments, and perhaps the private sector too, in rebuilding aging equipment and structures, it could provide a substantial boost to GDP. Reduction of traffic congestion alone offers opportunity for investment to boost American efficiency and capacity for years to come.

Effective Stimulus: If productivity rises sufficiently to alleviate labor shortages and other potential bottlenecks, or if higher after-tax wage rates induce greater labor participation, then the recently-passed tax cuts and spending hikes could boost short-run growth beyond what was seen immediately after their passage. Nominal wages finally are creeping up, and tax cuts raise after-tax income further. Whether this will attract potential workers who have been on the sidelines remains to be seen, but higher participation rates could raise GDP and reduce the likelihood of overheating. Moreover, higher after-tax incomes for workers and firms will allow more consumption spending and greater expenditures for housing and other investments. However, timing matters, and many economists believe that multipliers for stimulus during expansions are significantly less than multipliers for recession-era stimulus, and so much depends on the supply-side response to federal policy changes.

Favorable Energy Prices: Energy producers provided an important exception during years of sluggish growth with substantial spending on oil and gas field development, pipelines, and elsewhere. Low energy prices finally discouraged investment spending in that industry in 2014 and into 2016. However, prices have risen since then, helping to sustain the investment and production surges seen in 2017. If petroleum and natural gas prices remain above the threshold of profitability for fracking operations, often believed to be in the $40 to $50 range for many fields, then the investment and production surges seen in 2017 could be sustained. The Energy Information Administration's Annual Energy Outlook projects that the U.S. will be a net exporter of fossil fuels every year between 2027 and 2050. Not only would this create jobs in the energy sectors, but investment provides additional jobs for equipment manufacturers and engineering services firms. If permission is granted to build new oil and gas pipelines, then this activity could drive employment in the construction industry and improve competitiveness by lowering energy production costs.

We calibrate the LIFT forecast to exhibit long-run sustainability of the economy's basic nominal balances as a percentage of GDP. Figure 25 depicts the long-term trajectories for net lending (or borrowing) as a percentage of GDP for the private sector (including both household and corporate business sectors), the government sector (federal plus state and local), and for the economy as a whole. Each line shows the excess of income over consumption and capital investment expenditures for the sector as a percentage of GDP. The line marked "Net Lending" is equal to the current account deficit, or the economy's net lending abroad, which mostly has been negative over the past four decades. It is the sum of household, business, and government (including state and local governments) net lending.

Figure 25: Net Lending
(Shares of Nominal GDP)



Note the unique circumstances of the recession years. Recession meant that the current account deficit as a percent of GDP fell from more than 6% in 2006 to about 3% in 2011 and 2.4% in 2016. Substantial deleveraging in the private sector that took place among businesses as well as consumers drove this retrenching. In 2009, the private sector lent, on a net basis, about 7% of its current income relative to GDP. The ratio was negative throughout much of the preceding decade.

Long-run forecasts of the real economy are guided by Social Security Administration projections of population growth and by labor force participation rates that are similar to projections the Congressional Budget Office (CBO). Together, these largely determine the size of the labor force. The natural rate of unemployment (NAIRU) largely follows the CBO outlook. The labor force level and NAIRU together determine the full-employment level. Potential growth of real GDP is informed by CBO projections through the medium term and growth rates remain approximately constant in the long run. The long-run LIFT forecast of the real economy thus converges to these projections of full employment and potential real activity levels. Prices largely are guided by GDP inflation rates that converge to the Federal Reserve target of approximately 2.0%. Energy prices are guided by Energy Information Administration projections. Transfer spending follows projections by the Centers for Medicare and Medicaid Services, the Social Security Administration, and the Congressional Budget Office.

Overview of the Sectoral Outlook

Mining – Domestic mining industries, particularly in the energy sector, have enjoyed relatively high commodity prices since 2017. The mining industrial production index, a measure of general mining activity, has risen every period since the third quarter of 2016. Healthy expansion is expected to continue. Output of mining support firms, including exploration, is expected to realize double-digit growth through 2021. Projections of crude oil output are strong in the near and medium-term. Natural gas extraction output is expected to gain strength over the longer term as electricity producers and others become more reliant on gas as fuel and feedstock.

Construction – Housing starts, an important indicator of the health of the residential construction sector, finished 2018 Q1 at an annual rate of roughly 1.3 million homes. This represents the fastest pace since 2007 Q2. Residential investment growth is expected to accelerate over the next several years from just 0.5% in 2018. Non-residential structures investment was relatively weak in 2015 and 2016, but this apparent sluggishness primarily was concentrated in the mining construction industry due to low energy prices. Increased business investment should help non-residential construction resume a strong growth trajectory in the coming years.

Manufacturing – The domestic manufacturing sector is realizing benefits of numerous Trump-era policies, including reduced regulations and lower corporate tax rates. The manufacturing industrial production index rose from 101.3 in November 2016 to 106.5 in November 2018. This represents the highest level since the Great Recession. Looking forward, however, several factors could limit the potential of a manufacturing resurgence. Such headwinds include trade wars with China, upward pressure on wages, and rising interest rates.

Retail – Rising wages and lower federal tax rates should boost disposable personal income levels and support stronger spending by U.S. consumers on goods and services. However, the face of retail is changing. Business is booming for internet retail establishments and package delivery services. Traditional brick-and-mortar stores, however, must adapt quickly to an increasingly digital marketplace that threatens to leave many establishments unable to compete.

Healthcare – Supply of healthcare remains one of the most hotly debated topics in the United States, and for good reason. Expenditures on health care accounted for 17.9% ($3.3 trillion) of GDP in 2016. This number is expected to grow further in the coming years, reaching 19.7% in 2026. While the fate of the Affordable Care Act remains in question, one thing is sure: the aging American population will continue to raise demand for health care products and services.

Table 2: Overview of the Inforum Outlook

	2017	2018	2019	2020	2021	2025	2030	2045	16-17	17-18	18-19	19-20	20-21	21-30	30-45
Gross domestic product	17,098	17,591	18,057	18,464	18,872	20,506	22,630	30,198	2.3	2.9	2.7	2.2	2.2	2.0	1.9
Personal consumption	11,886	12,207	12,532	12,807	13,064	14,110	15,516	20,528	2.7	2.7	2.7	2.2	2.0	1.9	1.9
Nonres structures investment	480	504	526	552	582	642	705	912	7.5	5.0	4.3	5.0	5.5	2.2	1.7
Equipment investment	1,085	1,162	1,209	1,260	1,302	1,476	1,706	2,486	3.6	7.0	4.1	4.2	3.4	3.0	2.5
Intellectual property	761	811	845	875	926	1,104	1,337	2,176	5.6	6.6	4.1	3.6	5.8	4.2	3.3
Res structures investment	597	600	616	639	678	835	1,003	1,475	1.7	0.5	2.6	3.8	6.1	4.4	2.6
Inventory Change	14	33	50	45	47	48	54	68							
Net exports, goods & services	-621	-663	-710	-725	-731	-735	-751	-683							
Exports	2,189	2,281	2,353	2,420	2,493	2,849	3,366	5,533	3.2	4.2	3.1	2.9	3.0	3.4	3.4
Imports	2,810	2,944	3,062	3,145	3,224	3,584	4,117	6,215	3.8	4.8	4.0	2.7	2.5	2.8	2.8
Govt consumption & investment	2,901	2,948	3,004	3,027	3,026	3,076	3,163	3,645	0.0	1.6	1.9	0.8	0.0	0.5	1.0
Federal defense	666	685	706	699	686	660	677	747	-0.1	2.8	3.0	-0.9	-1.8	-0.2	0.7
Federal nondefense	448	458	466	469	461	459	458	519	0.1	2.4	1.8	0.6	-1.8	-0.1	0.8
State & local	1,785	1,803	1,830	1,855	1,875	1,950	2,020	2,364	0.1	1.0	1.5	1.4	1.1	0.8	1.1
Disposable income in 2009$	12,744	13,062	13,402	13,757	14,146	15,543	17,083	22,517	1.1	2.5	2.6	2.6	2.8	2.1	1.9
NOMINAL ACTIVITY (Billions of $)															
Gross domestic product	19,407	20,421	21,435	22,367	23,318	27,457	33,596	60,338	4.2	5.2	5.0	4.3	4.3	4.1	4.0
Gross national product	19,624	20,647	21,673	22,617	23,578	27,764	33,972	61,014	4.3	5.2	5.0	4.4	4.3	4.1	4.0
Labor compensation	10,340	10,733	11,210	11,732	12,250	14,443	17,780	33,274	3.5	3.8	4.4	4.7	4.4	4.2	4.3
Taxes on production and imports	1,269	1,355	1,434	1,518	1,599	1,918	2,373	4,309	3.5	6.8	5.8	5.9	5.3	4.5	4.1
Corporate profits	1,891	2,043	2,132	2,169	2,221	2,485	2,946	4,801	7.0	8.0	4.3	1.7	2.4	3.2	3.3
Proprietor income	1,155	1,209	1,228	1,254	1,288	1,505	1,818	3,070	2.7	4.6	1.6	2.1	2.7	3.9	3.6
Capital consumption allowances	2,590	2,681	2,791	2,905	3,025	3,577	4,368	7,342	2.3	3.5	4.1	4.1	4.1	4.2	3.5
Personal income	16,409	17,208	18,099	19,060	20,015	24,059	30,095	56,352	3.0	4.9	5.2	5.3	5.0	4.6	4.3
Disposable income	14,362	15,047	15,778	16,573	17,410	20,753	25,395	46,384	2.8	4.8	4.9	5.0	5.0	4.3	4.1
Adjusted personal income	12,257	12,832	13,465	14,140	14,790	17,525	21,605	39,837	3.0	4.7	4.9	5.0	4.6	4.3	4.2
Fed. income taxes, % of adj. PI	13.1	12.9	12.9	12.9	12.8	13.7	16.6	19.8	1.0	-1.1	-0.1	-0.5	-0.5	2.9	1.2
Federal net borrowing	-476	-881	-1,036	-1,113	-1,204	-1,438	-1,650	-2,747	-35.6	85.3	17.6	7.4	8.2	3.6	3.5
CHAIN-TYPE PRICE INDEXES, 2009=100															
GDP deflator	113.5	116.1	118.7	121.1	123.6	133.9	148.5	199.8	1.9	2.3	2.3	2.1	2.0	2.1	2.0
PCE deflator	112.7	115.2	117.7	120.5	123.1	133.5	148.7	206.0	1.7	2.2	2.2	2.3	2.2	2.1	2.2
Export deflator	107.9	111.8	113.9	117.2	119.9	129.4	142.5	187.0	3.3	3.6	1.9	2.9	2.3	1.9	1.8
Imports deflator	103.9	107.0	110.0	113.0	115.8	126.6	141.3	197.5	2.8	3.0	2.8	2.7	2.5	2.2	2.3
INTEREST RATES															
Treasury bills, 3-month	0.9	2.0	2.7	3.1	3.2	2.7	2.9	3.1							
Yield, 10 yr. Treasury bonds	2.3	3.0	3.4	3.9	4.0	3.7	3.8	4.3							
EMPLOYMENT and POPULATION															
Unemployment Rate	4.4	3.9	3.6	3.8	4.1	4.6	4.6	4.6							
Labor productivity															
Real (2009$) GDP per hour	63.9	64.8	65.6	66.6	67.7	72.2	78.1	97.2	0.6	1.3	1.3	1.5	1.6	1.6	1.5
Demographic assumptions															
Civilian labor force (millions)	160.3	161.9	163.5	165.1	166.5	170.1	173.5	186.3	0.7	1.0	1.0	1.0	0.8	0.5	0.5
Labor force participation															
% of population 16-84 years	62.8	62.8	62.8	62.8	62.7	61.7	60.7	59.5							
Population, total (in millions)	325.7	328.8	331.9	335.0	338.1	350.1	363.9	396.9	0.7	0.9	1.0	0.9	0.9	0.8	0.6
Working age population	255.1	257.7	260.3	262.9	265.5	275.5	285.8	313.1	0.6	1.0	1.0	1.0	1.0	0.8	0.6
Eligible for social security	49.8	51.4	53.0	54.7	56.4	63.5	71.2	80.2	3.1	3.1	3.1	3.2	3.1	2.6	0.8
Ratio, Working Age to SocSec Pop	5.1	5.0	4.9	4.8	4.7	4.3	4.0	3.9							

Table 3: Output and Jobs by Aggregate Industry

PRODUCTION, Billions of 2009$	2017	2018	2019	2020	2021	2025	2030	2045	16-17	17-18	18-19	19-20	20-21	21-30	30-45
Agriculture, forestry, fishery	393	386	390	400	407	440	484	629	-0.1	-1.8	1.1	2.4	1.9	1.9	1.8
Mining	448	488	535	545	565	605	632	671	14.4	9.0	9.8	1.8	3.6	1.3	0.4
Utilities	496	503	505	510	514	532	549	612	1.7	1.4	0.4	0.9	0.8	0.7	0.7
Construction	916	929	954	984	1022	1142	1280	1725	0.7	1.4	2.7	3.2	3.9	2.5	2.0
Nondurables manufacturing	2668	2713	2766	2814	2857	3054	3325	4397	1.0	1.7	2.0	1.7	1.5	1.7	1.9
Durables manufacturing	2649	2727	2831	2924	3014	3330	3735	5295	4.1	2.9	3.8	3.3	3.1	2.4	2.4
Trade	2651	2728	2822	2901	2973	3287	3732	5443	4.3	2.9	3.4	2.8	2.5	2.6	2.5
Transportation	989	1023	1056	1084	1109	1224	1386	2028	2.2	3.4	3.3	2.6	2.4	2.5	2.6
Information	1546	1603	1668	1723	1780	2022	2364	3760	3.3	3.7	4.0	3.3	3.3	3.2	3.1
Finance,Insurance,Real estate	5273	5420	5568	5702	5838	6402	7177	10074	3.5	2.8	2.7	2.4	2.4	2.3	2.3
Professional, business services	4052	4211	4364	4497	4639	5221	6008	9035	4.3	3.9	3.6	3.1	3.2	2.9	2.8
Edu, health, social services	2614	2687	2776	2865	2958	3310	3717	5127	3.0	2.8	3.3	3.2	3.2	2.6	2.2
Arts, amusements, accomm, food	1276	1302	1336	1367	1395	1507	1659	2201	2.7	2.0	2.6	2.4	2.0	1.9	1.9
Other private services	754	769	790	808	823	888	979	1325	2.0	2.0	2.6	2.3	2.0	1.9	2.0
Government and govt enterprises	2369	2407	2448	2461	2462	2510	2589	3047	0.3	1.6	1.7	0.5	0.0	0.6	1.1
Miscellaneous	14	14	13	12	11	12	13	27	5.0	4.3	-7.2	-7.9	-6.9	1.6	4.9

JOBS, Millions of persons	2017	2018	2019	2020	2021	2025	2030	2045	16-17	17-18	18-19	19-20	20-21	21-30	30-45
Civilian jobs	158.6	161.0	163.2	164.4	165.3	168.3	171.9	184.9	1.6	1.5	1.3	0.8	0.6	0.4	0.5
Private sector jobs	137.7	140.1	142.2	143.4	144.2	146.9	150.0	161.4	1.8	1.7	1.5	0.8	0.6	0.4	0.5
Agriculture, forestry, fishing	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.0	1.1	-3.2	-0.1	0.4	-0.1	-0.2	-0.5
Mining	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.7	13.8	5.7	3.8	2.8	0.1	-0.6
Utilities	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.3	-0.3	0.9	-1.4	-1.3	-1.5	-1.7	-1.9
Construction	8.8	8.9	9.1	9.2	9.4	10.0	10.4	11.3	3.4	0.9	1.9	1.8	2.3	1.0	0.6
Nondurable manufacturing	5.2	5.2	5.2	5.2	5.2	5.1	5.0	5.0	1.3	-0.1	0.1	-0.2	-0.5	-0.3	-0.1
Durable manufacturing	7.5	7.6	7.6	7.7	7.6	7.4	7.2	6.6	0.3	1.2	0.8	0.4	-0.2	-0.7	-0.6
Wholesale trade	6.1	6.2	6.2	6.1	6.0	5.8	5.7	5.3	0.7	1.7	-0.5	-1.2	-1.2	-0.7	-0.5
Retail trade	16.8	17.2	17.5	17.6	17.6	17.6	17.8	18.4	0.3	2.8	1.7	0.4	-0.1	0.1	0.2
Transportation	5.6	5.8	5.8	5.9	5.9	6.0	6.2	7.0	2.9	2.6	1.5	0.6	0.2	0.5	0.9
Information	2.9	2.9	2.9	2.9	2.9	2.8	2.6	2.3	-0.3	0.8	-0.2	-1.0	-1.0	-1.0	-0.9
Finance, insurance, real estate	9.2	9.3	9.4	9.3	9.3	9.2	9.0	8.5	2.1	1.3	0.3	-0.3	-0.3	-0.3	-0.4
Professional, business services	22.7	23.3	23.8	24.0	24.2	24.9	25.6	28.1	2.1	2.5	1.9	1.0	0.9	0.6	0.6
Edu, health, social services	24.4	24.8	25.5	25.9	26.4	28.1	29.9	35.8	2.5	1.8	2.5	1.9	1.8	1.4	1.2
Arts and recreation	2.8	2.9	3.0	3.0	3.0	3.1	3.2	3.5	3.5	2.3	2.6	1.4	1.0	0.7	0.5
Accommodation and food services	14.0	14.1	14.3	14.4	14.5	14.8	15.1	16.7	2.4	1.0	1.3	1.1	0.6	0.5	0.7
Other services, except govt	8.1	8.3	8.4	8.5	8.5	8.6	8.8	9.9	1.5	1.4	1.6	0.9	0.4	0.4	0.8
Federal general govt defense	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.1	2.2	0.4	0.1	-0.6	0.1	0.3
Federal general govt nondefense	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	-1.9	0.1	0.5	0.1	0.1	0.2	0.3
Federal government enterprises	0.7	0.7	0.7	0.8	0.8	0.8	0.9	1.1	1.1	2.0	2.3	1.8	1.7	1.7	1.7
S&L general government	18.4	18.4	18.4	18.5	18.5	18.8	19.1	20.3	0.4	0.2	0.2	0.3	0.3	0.3	0.4
S&L government enterprises	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.6	1.1	0.9	1.0	0.5	0.6	0.7	0.8

ADDENDA															
Gross Domestic Product, bil 2009$	17098	17591	18057	18464	18872	20506	22630	30198	2.3	2.9	2.7	2.2	2.2	2.0	1.9
Labor productivity (GDP/Hr)	63.9	64.8	65.6	66.6	67.7	72.2	78.1	97.2	0.6	1.3	1.3	1.5	1.6	1.6	1.5
Civilian Labor Force (millions)	160.3	161.9	163.5	165.1	166.5	170.1	173.5	186.3	0.7	1.0	1.0	1.0	0.8	0.5	0.5