

The Economic Outlook

Overview

In the Congressional Budget Office’s projections for 2018 through 2028, the economy follows a marked cyclical path: Economic growth rises notably this year, slows during the next few years, and then rises to match the growth of potential output—the maximum sustainable output of the economy—in the last years of the projection period. Over the next few years, the demand for output exceeds the sustainable supply of output (that is, there is excess demand in the economy). That excess demand pushes up inflation and interest rates and exerts downward pressure on the unemployment rate, which was already below CBO’s estimate of the natural rate of unemployment (the rate arising from all sources other than fluctuations in the economy) at the end of last year. Higher interest rates slow the growth of output, and the excess demand begins to diminish after 2019. By 2022, the excess demand disappears, easing the pressure on inflation, interest rates, and the labor market.

The cyclical path in CBO’s economic forecast reflects recent economic developments; the changes to federal tax policies made by Public Law 115-97, referred to here as the 2017 tax act; recent legislation that increased projected discretionary spending; and the assumption that fiscal policy will generally unfold as scheduled under current law. At the end of last year, the growth rate of the U.S. economy was trending upward, and the slack in the economy—that is, underused productive resources, such as unemployed workers—was almost gone. The recent tax cuts will, in CBO’s view, increase the supply of labor and capital in the economy, thereby raising potential output throughout the projection period. Nevertheless, because the tax cuts boost after-tax incomes, they, along with the increases in federal spending, are expected to add excess demand in the next few years. Near the end of the projection period, the scheduled expiration of the reduction in tax rates on personal income temporarily and slightly reduces demand in the economy.

CBO’s current projections suggest a stronger economic outlook than those that the agency published in

June 2017; in particular, the amount of output is higher throughout the projection period. CBO’s current outlook also is stronger than the consensus outlook of about 50 private-sector forecasters. Although all forecasts involve some degree of uncertainty, CBO’s current projections are particularly uncertain because they incorporate estimates of the likely economic impact of the recent changes in fiscal policy that, although based on past experience, are themselves uncertain.

The Overall Pattern of CBO’s Economic Projections

In CBO’s current projections, both real gross domestic product (or GDP, the total output of goods and services adjusted to remove the effects of inflation) and real potential GDP grow at an average annual rate of 1.9 percent over the 2018–2028 period.¹ Projected growth of real GDP over the next two years is faster than it is during the rest of the projection period (see Figure 1-1). The growth of real potential GDP also is faster over the next few years than it is in later years.

Potential Output. In CBO’s analysis, potential GDP represents the agency’s estimate of the trend around which actual GDP fluctuates over business cycles.² Given the state of the economy, the average growth of real potential GDP is the key determinant of CBO’s projection of the average growth of real GDP over the next 11 years.

In CBO’s forecast, real potential GDP grows faster, on average, over the projection period than it has over the past decade. That occurs mainly because the growth in productivity per unit of combined labor and capital services is projected to rise to nearly its average over the

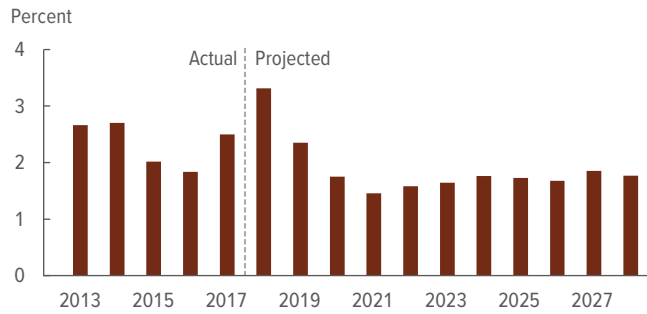
1. For an explanation of how CBO constructs its projections, see Robert W. Arnold, *How CBO Produces Its 10-Year Economic Forecast*, Working Paper 2018-02 (Congressional Budget Office, February 2018), www.cbo.gov/publication/53537.

2. See Robert Shackleton, *Estimating and Projecting Potential Output Using CBO’s Forecasting Growth Model*, Working Paper 2018-03 (Congressional Budget Office, February 2018), www.cbo.gov/publication/53558.

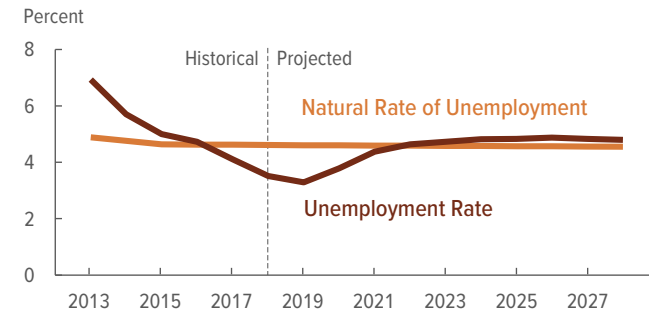
Figure 1-1.

CBO's Economic Forecast at a Glance

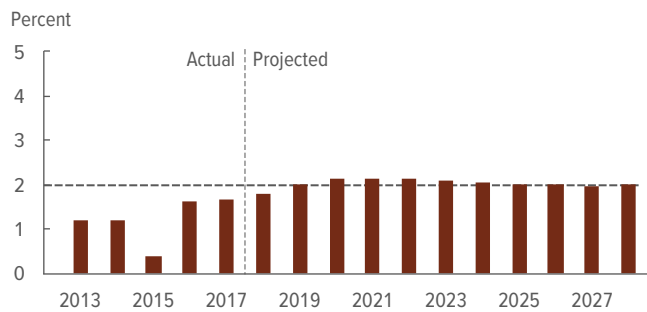
1 Spurred by fiscal stimulus, **real GDP growth** is expected to be 3.3 percent this year and 2.4 percent next year.



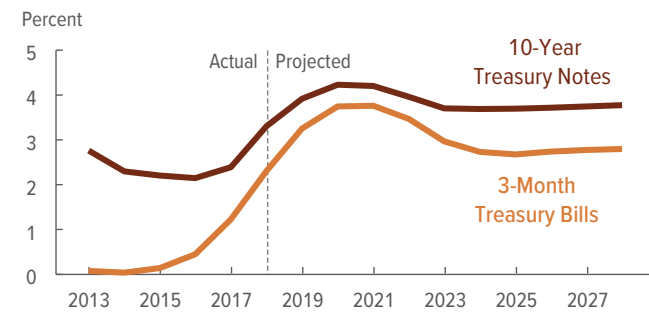
2 The projected growth creates excess demand in the economy, pushing the **unemployment rate** significantly below the **natural rate**.



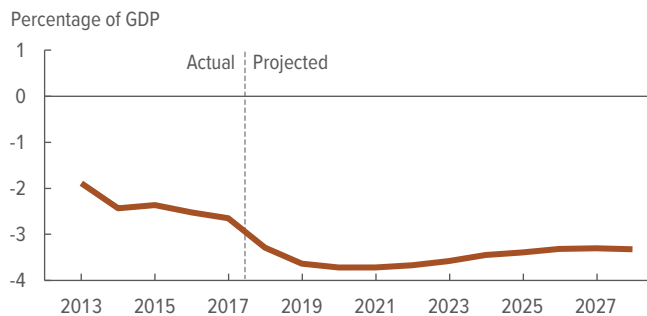
3 By 2020, excess demand pushes **consumer price inflation** slightly above the Federal Reserve's target of 2 percent.



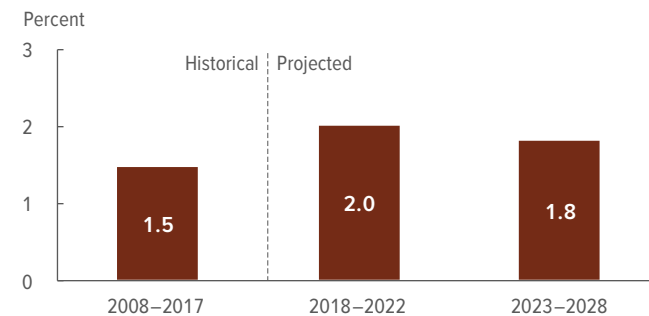
4 **Interest rates** rise over the next few years as the Federal Reserve raises the federal funds rate to reduce inflationary pressures.



5 Because the fiscal stimulus lowers national saving, **net international lending** by the United States decreases (that is, the nation's borrowing from abroad increases).



6 CBO expects the **average annual growth of real potential GDP** to be faster over the next five years than it has been in recent years, in part because of the greater incentives to work and invest that stem from the 2017 tax act.



Sources: Congressional Budget Office; Bureau of Economic Analysis; Bureau of Labor Statistics; Federal Reserve.

Real values are nominal values that have been adjusted to remove the effects of inflation. Excess demand exists when the demand for goods and services exceeds the amount that the economy can sustainably supply. The unemployment rate is the number of jobless people who are available for and actively seeking work, expressed as a percentage of the labor force. The natural unemployment rate is the rate arising from all sources except fluctuations in the overall demand for goods and services. Consumer price inflation is based on the price index for personal consumption expenditures. The federal funds rate is the interest rate financial institutions charge each other for overnight loans of their monetary reserves. Net international lending by the United States is national saving minus domestic investment. Potential GDP is CBO's estimate of the maximum sustainable output of the economy. Real GDP growth and inflation are measured from the fourth quarter of one calendar year to the fourth quarter of the next. For the unemployment rate and interest rates, data are fourth-quarter values. The average annual growth rates of real potential GDP are compound annual growth rates over the specified period calculated using calendar year data.

GDP = gross domestic product.

past 25 years. Also, the agency projects that reductions in marginal income tax rates will boost incentives to work and invest and thereby raise potential output.

At the same time, in CBO's forecast, the larger federal deficits projected under current law lower national saving and increase the nation's borrowing from abroad, raising interest rates and thus tending to slow potential output growth by reducing—or crowding out—some capital investment. Finally, the expiration of the cuts in individual income taxes that will, under current law, take effect at the end of 2025, reduces the incentive to work, modestly slowing the growth of hours worked and potential output.

The Outlook for the Next Two Years. CBO projects that recent legislation—the 2017 tax act and the legislation affecting discretionary spending—will strengthen the momentum in household and business spending, adding to the excess demand in the economy. In percentage terms, the resulting gap between real GDP and real potential GDP would be the largest it has been since 2000. Correspondingly, in CBO's projections, employment picks up considerably this year, and during this year and next, the unemployment rate falls significantly below the agency's estimate of the natural rate of unemployment, and inflation and interest rates rise (see Table 1-1).

The Outlook for the Rest of the Projection Period. Rising interest rates and prices, along with the slower growth in federal outlays after 2019 projected under current law, restrain demand and thus keep the growth of actual GDP below the growth of potential GDP from 2020 to 2026, in CBO's projections. (The excess demand in the economy is eliminated by 2022, and actual GDP returns to a level slightly below potential GDP—the historical relationship between the two measures—by 2024.) The higher marginal tax rates on personal income that follow from the expiration of temporary provisions of the 2017 tax act at the end of calendar year 2025 also contribute to the slower growth in actual GDP in 2025 and 2026 because the reduction in disposable personal income restrains consumer spending (and some consumers change their behavior in anticipation of the rise in taxes). That slower growth, in turn, raises the unemployment rate slightly and somewhat lowers short-term interest rates in those years.

CBO anticipates an end to that episode of slightly slower growth by 2027. In the agency's projections, the growth

of output rises slightly in 2027, once again returning output to its historical level relative to potential output in 2027 and 2028. Also in 2027, the unemployment rate falls and returns to its historical level relative to the natural rate, interest rates rise, and the rate of inflation is 2 percent.

Uncertainty Surrounding the Projections

CBO's current economic projection is particularly uncertain. The recent changes in fiscal policy add uncertainty to those projections throughout the forecast period. CBO's estimates of the responses of households and businesses to changes in incentives to work and invest are based on the effects of similar policies in the past, but none of those previous episodes is a perfect guide to the future. Moreover, because many of the recent tax provisions are scheduled to change during the projection period, CBO estimated how individuals and businesses might react to the scheduled shifts in policy. The forecast for economic growth could be understated if capital investment and the labor supply increase more than CBO anticipates in response to changes in the tax code. Conversely, economic growth could be overstated if the incentive effects of the tax changes are smaller than the agency expects.

In the long term, key determinants of long-run growth, such as the labor force, the capital stock (equipment, structures, intellectual property products, and inventories), and productivity, could evolve much differently than expected. In the near term, many developments, including changes in consumer or business confidence or in international conditions and trade agreements, could make economic outcomes differ significantly from CBO's projections. Although inflation has been low for a long time, it might rise more than CBO expects in response to excess demand over the next few years, causing the Federal Reserve to raise its policy interest rate more than CBO anticipates. History suggests that the risks of recession may increase when the economy's growth begins to slow over the next few years, especially if, for example, households or businesses take on too much debt during the current upturn.

Comparisons With Other Projections

CBO's current economic projections differ from those that it published in June 2017. In large part, those differences reflect recent enactment of the 2017 tax act and legislation that increased projected discretionary spending. In particular, CBO now anticipates a more

Table 1-1.

CBO's Economic Projections for Calendar Years 2018 to 2028

	Actual, 2017	2018	2019	2020	Annual Average	
					2021– 2022	2023– 2028
Percentage Change From Fourth Quarter to Fourth Quarter						
Gross Domestic Product						
Real ^a	2.6	3.3	2.4	1.8	1.5	1.7
Nominal	4.5	5.2	4.5	3.9	3.7	3.9
Inflation						
PCE price index	1.7	1.8	2.0	2.1	2.1	2.0
Core PCE price index ^b	1.5	1.9	2.1	2.2	2.1	2.0
Consumer price index ^c	2.1	2.0	2.3	2.4	2.5	2.4
Core consumer price index ^b	1.7	2.3	2.5	2.6	2.5	2.4
GDP price index	1.9	1.8	2.1	2.1	2.2	2.1
Employment Cost Index ^d	2.8	3.1	3.6	3.6	3.4	3.2
Fourth-Quarter Level (Percent)						
Unemployment Rate	4.1	3.5	3.3	3.8	4.6 ^e	4.8 ^f
Percentage Change From Year to Year						
Gross Domestic Product						
Real ^a	2.3	3.0	2.9	2.0	1.5	1.7
Nominal	4.1	5.0	4.9	4.1	3.7	3.9
Inflation						
PCE price index	1.7	1.8	1.9	2.1	2.1	2.0
Core PCE price index ^b	1.5	1.8	2.0	2.2	2.2	2.0
Consumer price index ^c	2.1	2.2	2.2	2.4	2.5	2.4
Core consumer price index ^b	1.8	2.1	2.4	2.6	2.6	2.4
GDP price index	1.8	1.9	2.0	2.1	2.2	2.1
Employment Cost Index ^d	2.6	2.9	3.4	3.6	3.5	3.2
Annual Average						
Unemployment Rate (Percent)	4.4	3.8	3.3	3.6	4.4	4.8
Payroll Employment (Monthly change, in thousands) ^g	181	211	182	62	25	57
Interest Rates (Percent)						
Three-month Treasury bills	0.9	1.9	2.9	3.6	3.7	2.8
Ten-year Treasury notes	2.3	3.0	3.7	4.1	4.1	3.7
Tax Bases (Percentage of GDP)						
Wages and salaries	43.1	43.2	43.5	43.9	44.1	44.3
Domestic corporate profits ^h	8.9	9.5	9.6	9.0	8.4	8.0

Sources: Congressional Budget Office; Bureau of Economic Analysis; Bureau of Labor Statistics; Federal Reserve.

Economic projections for each year from 2018 to 2028 appear in Appendix D.

GDP = gross domestic product; PCE = personal consumption expenditures.

a. Real values are nominal values that have been adjusted to remove the effects of inflation.

b. Excludes prices for food and energy.

c. The consumer price index for all urban consumers.

d. The employment cost index for wages and salaries of workers in private industry.

e. Value for the fourth quarter of 2022.

f. Value for the fourth quarter of 2028.

g. Calculated as the change in payroll employment from the fourth quarter of one calendar year to the fourth quarter of the next, divided by 12 (the average monthly amount).

h. Consists of domestic profits, adjusted to remove distortions in depreciation allowances caused by tax rules and to exclude the effect of inflation on the value of inventories.

pronounced cyclical pattern of faster growth followed by slower growth over the first half of the projection period, as the current expansion is fortified by a fiscal policy that expands overall demand by significantly more than it expands overall supply in the first few years.

CBO's estimate of potential output has risen because the 2017 tax act's changes to incentives increase potential GDP in the early years of the forecast period above the levels that CBO projected in June. That difference diminishes in later years as some of the incentive effects of the tax changes are reversed, but potential output remains higher throughout the period than it was in the agency's June projections. As economic output returns over the projection period to its average historical level relative to potential output, those higher estimates of potential output translate into projections of actual output that are also higher than the agency projected last summer.

The economic projections in this report differ somewhat from those of most other forecasters. The agency's projections for 2018 and 2019 suggest a stronger economic outlook than does the *Blue Chip* consensus (the average of the roughly 50 forecasts by private-sector economists published in the March 2018 *Blue Chip Economic Indicators*) or the latest forecasts by Federal Reserve officials.

Recent Economic Developments

Economic conditions at the end of last year were robust. The growth of real GDP, measured on a year-over-year basis, had been rising for a year and a half (see Figure 1-2). Slack in the labor market, as measured by the employment gap, had almost disappeared, and wage growth continued to climb gradually, although price inflation remained low. (The employment gap is the difference between the number of people employed and an estimate of the number of people who would be employed in the absence of cyclical fluctuations in the economy.) In response to the improving economic conditions, the Federal Reserve had raised its policy interest rate—the federal funds rate (the interest rate that financial institutions charge each other for overnight loans of their monetary reserves).

Developments so far this year suggest that actual output will continue to grow faster than potential output, as it did last year. In the first two months of 2018, employment grew notably faster than its 2017 monthly average,

and the unemployment rate remained near its low for the current cycle, 4.1 percent. Consumer and business confidence are both high, at least in part because of recent tax legislation. The *Blue Chip* consensus forecast of the growth of real GDP for 2018 published in early March was higher than the consensus forecast published at the end of last year. Those developments, along with the expected boost to near-term growth stemming from fiscal policy, helped push the interest rate on 10-year Treasury notes to a four-year high of 2.9 percent in February.

The Economic Effects of Recent Changes in Fiscal Policy

Three major pieces of legislation enacted in the past few months significantly changed fiscal policy and, in CBO's estimation, will have measurable economic effects. One, the 2017 tax act, substantially altered the taxation of personal and business income. The second, the Bipartisan Budget Act of 2018 (P.L. 115-123), increased the caps on discretionary funding in 2018 and 2019 and provided substantial funding for emergency disaster assistance. The third, the Consolidated Appropriations Act, 2018 (P.L. 115-141), provided appropriations for 2018.

In CBO's view, the effects of the tax act on incentives to work, save, and invest will raise real potential GDP. Effects of the tax and spending legislation are projected to raise the level of real GDP significantly in the coming years through fiscal stimulus, increasing real GDP by more than they raise potential GDP in the near term. In CBO's projections, those effects, as well as the larger federal budget deficits that will result from the new laws, put upward pressure on interest rates and prices, which tempers the increase in real output over the longer term.

Effects of the 2017 Tax Act

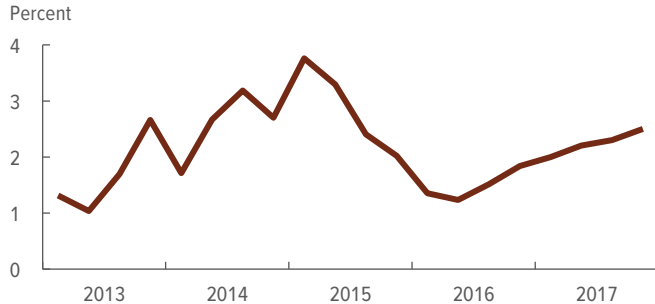
CBO estimates that the new tax law will have appreciable effects on the U.S. economy (see Figure 1-3). The lower marginal income tax rates that will be in place for much of the projection period will encourage workers to work more hours and businesses to increase investment in productive capital, thereby raising employment, income, and potential output. In addition, the increase in after-tax income will boost spending in the near term, boosting actual output relative to potential output.

Many of the law's provisions are scheduled to phase out or expire over the 2023–2026 period, so by 2028, the anticipated economic effects are less pronounced but still

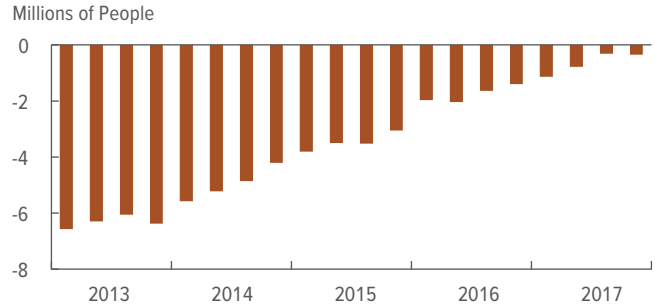
Figure 1-2.

Economic Conditions at the End of 2017

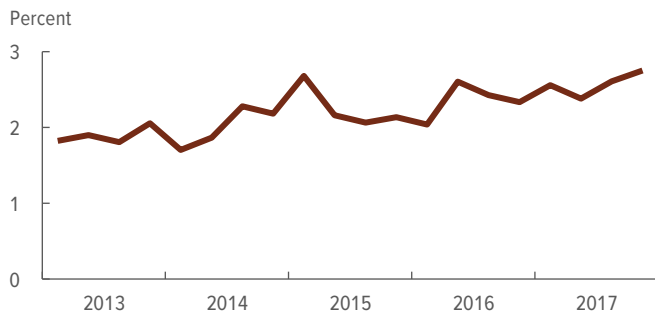
1 Momentum of **real GDP growth** was solid, . . .



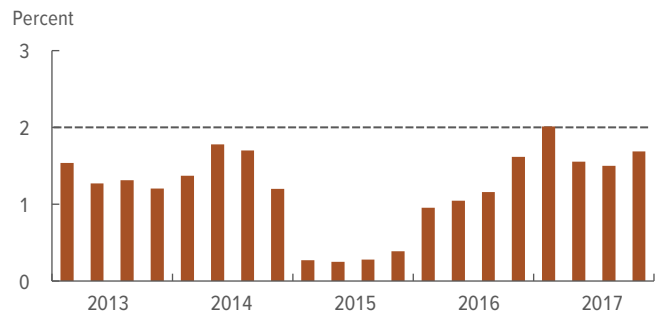
2 . . . and the **employment gap** was nearly closed.



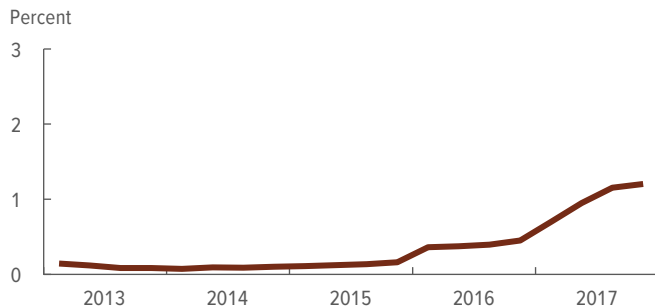
3 Strong demand for workers was putting some upward pressure on **wage growth**, . . .



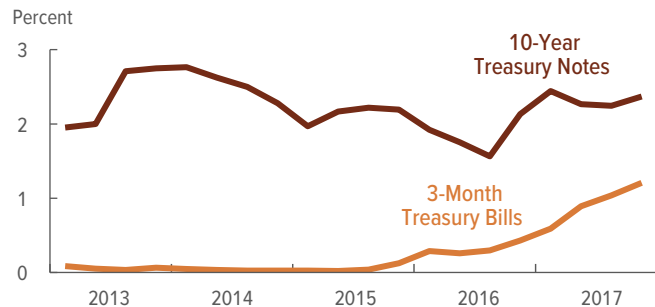
4 . . . but **consumer price inflation** remained below the Federal Reserve's target of 2 percent.



5 The Federal Reserve had raised **the federal funds rate**, . . .



6 . . . and **interest rates**, particularly short-term rates, were rising.



Sources: Congressional Budget Office; Bureau of Economic Analysis; Bureau of Labor Statistics; Federal Reserve.

Real values are nominal values that have been adjusted to remove the effects of inflation. The employment gap is the difference between the number of people employed and CBO's estimate of the number of people who would be employed in the absence of cyclical fluctuations in the economy. Wages are measured by the employment cost index for wages and salaries of workers in private industry. Consumer price inflation is based on the price index for personal consumption expenditures. The federal funds rate is the interest rate that financial institutions charge each other for overnight loans of their monetary reserves.

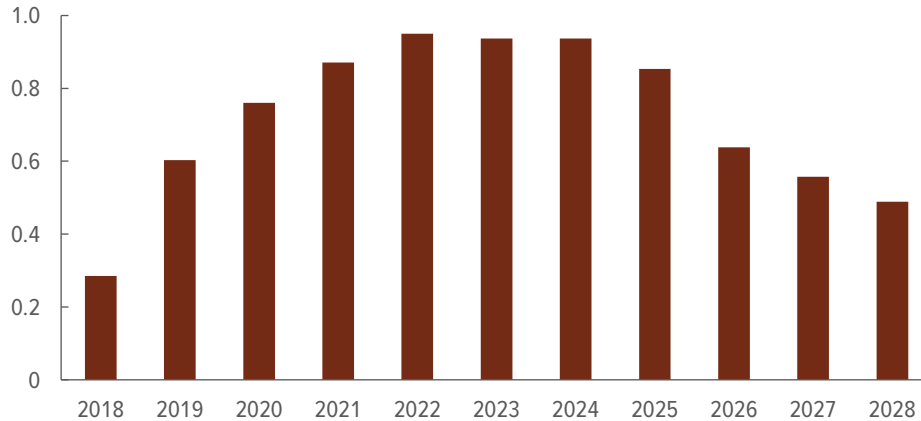
Data are quarterly. Real GDP growth, wage growth, and inflation are measured as percentage changes from the same quarter of the previous year.

GDP = gross domestic product.

Figure 1-3.

Economic Effects of the 2017 Tax Act on Real GDP

Percent



In CBO's projections, the effect of the 2017 tax act is an **increase in the level of real GDP** by 0.7 percent, on average, over the 2018–2028 period. Later in the period, the effects are tempered as some tax provisions expire and as increased borrowing crowds out private investment.

Source: Congressional Budget Office.

Real values are nominal values that have been adjusted to remove the effects of inflation. Percentage differences are calculated using calendar year values.

GDP = gross domestic product.

positive. Over the projection period, annual real GDP in CBO's forecast is 0.7 percent higher, on average, because of the tax law, and nonfarm employment is projected to be higher by about 0.9 million jobs, on average.* (For details on CBO's estimates of the effects of the law, see Appendix B.)

Effects of Federal Spending Policies

CBO projects a substantial increase in federal outlays in both 2018 and 2019 as a result of the Bipartisan Budget Act of 2018 and the Consolidated Appropriations Act, 2018. Most of that projected increase in outlays stems from higher spending for goods and services. The effects of recent spending legislation are projected to boost the annual level of real GDP by 0.3 percent in 2018 and by 0.6 percent in 2019. Although the rise in federal spending is likely to stimulate the economy in the near term, it is projected to lower real GDP in later years because of the larger budget deficits that result.³

3. Those estimates of the effect of spending on real GDP are consistent with the path of discretionary spending in CBO's baseline budget projections. However, those estimates are not fully reflected in CBO's economic forecast. CBO had completed that forecast before the enactment of the Consolidated Appropriations Act, 2018, which provided discretionary funding. That economic forecast incorporates a preliminary projection

Federal Deficits and the Crowding Out of Private Activity

The recent changes in fiscal policy will, in CBO's estimation, add a significant amount to the federal deficit, particularly in the next few years. The agency estimates that greater federal borrowing ultimately reduces private investment below what it would have been without the additional borrowing.

When the government borrows, it borrows from households and businesses whose saving would otherwise be financing private investment. Although an increase in government borrowing strengthens people's incentive to save, the additional saving by households and businesses is less than the increase in borrowing. The result is not only reduced private investment but also lower economic output and national saving (that is, total saving by all

of discretionary spending that is greater for most of the 2018–2028 period than the amounts included in the agency's baseline budget projections. The lower path of discretionary spending implies a smaller boost to GDP in the near term, which would reduce projected real GDP by about one-quarter of a percent in 2020 compared with CBO's economic projections. In addition, real GDP would be slightly greater in later years because the smaller projected deficits would encourage greater private investment.

[*Value for nonfarm employment corrected on April 17, 2018]

sectors of the economy). However, private investment generally falls less than national saving does because the higher interest rates that result from increased federal borrowing typically attract more foreign capital to the United States.

In CBO's projections, the crowding out of private investment occurs gradually, as interest rates and the funds available for private investment adjust in response to increased federal deficits. In the longer term, the net decline in national saving would tend to reduce the stock of capital—and thus GDP—below what it would have been without the increased federal borrowing. Moreover, the additional net inflows of capital from abroad would cause more profits and interest payments to flow overseas, leading to a greater decline in gross national product (GNP) than in GDP.⁴

Potential Output

Potential GDP is an estimate of the economy's production when labor and capital are supplied and employed at their maximum sustainable levels. In CBO's analysis, it is the agency's estimate of the long-term trend around which actual GDP fluctuates over business cycles. Moreover, growth of potential GDP is the key determinant of CBO's current forecast of the growth of actual GDP over the 11-year projection period, because actual output is currently very near its potential level and is also projected to be near its potential level at the end of the period.

CBO formulates its estimate of potential GDP using estimates of a number of inputs, including potential labor inputs, flows of capital services, and potential productivity. Fiscal policy influences the agency's projections of potential GDP because of the incentive and crowding out effects that changes in policy can have.

Potential output is projected to grow by an average of 1.9 percent per year from 2018 to 2028, faster than the 1.5 percent average annual growth of potential GDP since 2008 (see Figure 1-4 and Table 1-2). Even though that projected growth rate is higher than the rate in recent years, it is more than a percentage point lower than the 3.1 percent growth that potential GDP

averaged annually between 1981 and 2007. More than three-quarters of that difference reflects slower projected growth of the potential labor force, which will result mainly from the ongoing retirement of baby boomers and from a relatively stable labor force participation rate among working-age women.⁵

Provisions of the 2017 tax act contribute to a front-loading of potential GDP growth over the projection period. Growth in the supply of labor and the amount of investment, in particular, are boosted over the next few years in CBO's forecast, as reductions in effective marginal tax rates raise the desired amounts of those inputs.

In CBO's forecast, potential GDP growth is higher over the next four years than in later years of the projection period: Potential GDP grows by an average of 2.0 percent per year from 2018 to 2022 but by an average of only 1.8 percent per year from 2023 to 2028. Growth of potential GDP in the nonfarm business sector, which accounts for about 75 percent of economic activity and a disproportionately large share of overall economic growth, is projected to average about 2.3 percent per year from 2018 to 2022; it slows to about 2.1 percent per year from 2023 to 2028.

Potential Labor Inputs

In CBO's projections, the contributions of labor to potential GDP are built up from several components. The potential rates at which various groups of people are expected to participate in the labor force (that is, to work or, if unemployed, to seek work) constitute one component. Another is CBO's estimate of the natural rate of unemployment. And the last is the distribution of potential workers among different sectors of the economy and the potential number of hours that they could work per week.

The Potential Labor Force. Growth of the potential labor force has been gradually slowing since the mid-1970s and is generally projected to continue to slow for some time to come. In addition to the demographic factors that are dampening growth in the labor force, long-term trends involving particular groups (such as a

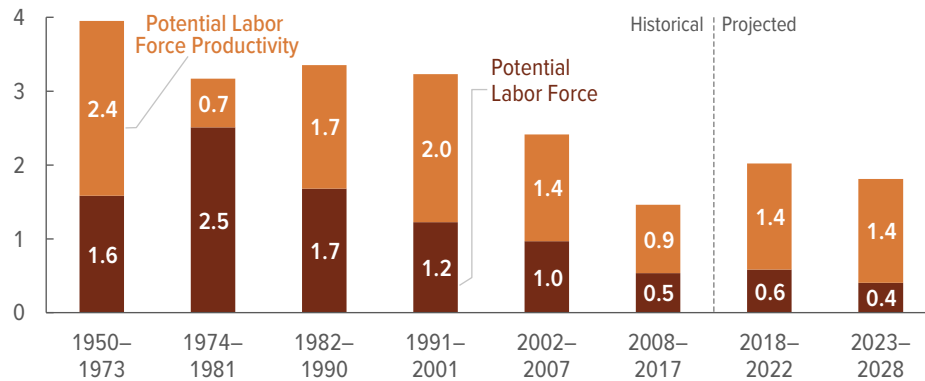
4. GNP differs from GDP by including the various types of income that residents earn from working and investing abroad and excluding the income that nonresidents earn from working and investing in the United States.

5. After steadily rising for decades, participation of working-age females in the labor force peaked in the late 1990s. The participation rate of that group declined slightly in the wake of each of the last two recessions and started to rebound in 2016. CBO projects that it will essentially remain constant over the coming decade.

Figure 1-4.

Determinants of the Growth of Real Potential GDP

Percent



Growth in potential GDP, driven in large part by faster productivity growth, is projected to be stronger over the next 10 years than it has been since the recession that began in December 2007.

Source: Congressional Budget Office.

Real values are nominal values that have been adjusted to remove the effects of inflation. Potential GDP is CBO's estimate of the maximum sustainable output of the economy. Potential labor force productivity is the ratio of real potential GDP to the potential labor force, which is CBO's estimate of the size of the labor force arising from all sources except fluctuations in the overall demand for goods and services.

The bars show compound annual growth rates over the specified periods calculated using calendar year data. The sum of the determinants in each bar equals the growth of real potential GDP.

GDP = gross domestic product.

growing number of people with disabilities) are projected to push down the overall participation rate slightly.

Nevertheless, CBO anticipates that several provisions of the recent tax legislation will encourage more people to seek work than would have otherwise. Those incentives will slightly boost the size of the potential labor force. As the labor supply adjusts to that change in incentives, growth in the potential labor force in CBO's projections rises from its average rate of about 0.5 percent per year since 2008 to an average of about 0.6 percent over the 2018–2022 period. However, as some temporary provisions of the legislation expire—most notably the reductions in individual income tax rates, which, under current law, will expire at the end of calendar year 2025—the size of the potential labor force is reduced. As a result, growth in the potential labor force slows to 0.4 percent per year over the 2023–2028 period.

The Natural Rate of Unemployment. In CBO's projections, the natural rate of unemployment—the rate that occurs when workers are employed at maximum sustainable levels—gradually declines over the 2018–2028 period, falling from slightly more than 4.6 percent to just under that value. The natural rate's decline over

the period reflects two shifts in the composition of the workforce. First, the average age of workers is increasing, and older workers tend to have lower unemployment rates. Second, workers are becoming more educated, on average, and more educated workers are less likely to be unemployed. CBO expects that the share of younger workers in the working-age population will continue to decline and that less-educated workers will continue to participate in the labor market at lower rates.

Potential Hours Worked. CBO concludes that the same provisions of the recent tax legislation that are projected to temporarily boost the size of the potential labor force will also encourage employees to seek more hours of work. (See Appendix B for further discussion.) Because of that increase in the average number of potential hours worked per employee, the number of potential hours worked in the overall economy grows in CBO's projections by about 0.6 percent per year over the 2018–2022 period—slightly more than the growth in the potential labor force (although rounding to the same percentage). That growth is up from the rate of about 0.5 percent that potential hours worked has averaged annually since 2008. However, the growth of potential hours worked decelerates to less than 0.4 percent per

Table 1-2.

Key Inputs in CBO's Projections of Real Potential GDP

Percent

	Average Annual Growth							Projected Average Annual Growth		
	1950–1973	1974–1981	1982–1990	1991–2001	2002–2007	2008–2017	Total, 1950–2017	2018–2022	2023–2028	Total, 2018–2028
Overall Economy										
Real Potential GDP	4.0	3.2	3.4	3.3	2.4	1.5	3.2	2.0	1.8	1.9
Potential Labor Force	1.6	2.5	1.7	1.2	1.0	0.5	1.4	0.6	0.4	0.5
Potential Labor Force Productivity ^a	2.4	0.7	1.7	2.0	1.4	0.9	1.7	1.4	1.4	1.4
Nonfarm Business Sector										
Real Potential Output	4.1	3.5	3.6	3.7	2.7	1.7	3.4	2.3	2.1	2.2
Potential Hours Worked	1.4	2.3	1.8	1.3	0.3	0.4	1.3	0.5	0.3	0.4
Capital Services	3.7	3.8	3.6	3.8	2.9	1.8	3.4	2.5	2.1	2.3
Potential Total Factor Productivity	1.9	0.9	1.2	1.5	1.6	0.7	1.4	1.0	1.2	1.1
Contributions to the Growth of Real Potential Output (Percentage points)										
Potential hours worked	1.0	1.6	1.2	0.9	0.2	0.3	0.9	0.3	0.2	0.3
Capital input	1.1	1.2	1.2	1.3	1.0	0.7	1.1	0.9	0.7	0.8
Potential total factor productivity	1.9	0.9	1.2	1.5	1.6	0.7	1.4	1.0	1.2	1.1
Total Contributions	4.0	3.7	3.6	3.6	2.7	1.7	3.4	2.3	2.1	2.2
Potential Labor Productivity ^b	2.7	1.2	1.8	2.3	2.4	1.2	2.1	1.8	1.8	1.8

Source: Congressional Budget Office.

Real values are nominal values that have been adjusted to remove the effects of inflation. Potential GDP is CBO's estimate of the maximum sustainable output of the economy.

The table shows compound annual growth rates over the specified periods calculated using calendar year data.

GDP = gross domestic product.

a. The ratio of potential GDP to the potential labor force.

b. The ratio of potential output to potential hours worked in the nonfarm business sector.

year in the latter part of the projection period when, at the end of calendar year 2025, the scheduled expiration of the temporary provisions of the 2017 tax act would raise individual tax rates. Potential hours worked will grow less rapidly in the nonfarm business sector than in the economy as a whole over the 11-year projection period, CBO projects.

Flows of Capital Services

In the nonfarm business sector, stronger investment is projected to boost annual growth of capital services from its average rate of 1.8 percent since 2008 to an average of 2.5 percent from 2018 to 2022. Following that burst of investment, growth in CBO's projections eases back to an average of 2.1 percent from 2023 to 2028.

Growth is particularly strong through 2022, as businesses respond to the pickup in the growth of demand for their output. Greater labor force participation stemming from lower marginal tax rates on wages is likely to boost investment as businesses endeavor to equip the larger workforce with capital. In addition, some provisions of the recent tax legislation—for example, lower tax rates for businesses and more favorable tax treatment of depreciation for equipment and some types of structures—will also encourage investment. (By contrast, other provisions of the tax legislation will tend to lower investment in residential housing and reduce the growth of capital services from the housing stock, but that negative effect is expected to be much smaller than the positive effect of tax changes on other types of investment.)

In subsequent years, growth of capital services is projected to slow because of several factors restraining investment. Slower growth of the labor supply contributes to the slower growth of capital services from 2023 to 2028 in CBO's projections. Investment is also slowed by the introduction of less favorable treatment for spending on research and development in 2022. More broadly, rising federal deficits are projected to crowd out investment throughout the next decade.

Since early 2017, the Administration and the Congress have made several changes to regulations and the regulatory environment that, in CBO's judgment, should modestly boost investment and therefore increase potential output. Those changes have affected the energy production and transmission sectors, Internet service providers, the financial industry, and health care markets, in particular. Some of the changes in regulation will reduce the cost of producing goods and providing services and thereby increase returns on investment, ultimately boosting investment and the capital stock.

Potential Total Factor Productivity

CBO expects growth in potential total factor productivity in the nonfarm business sector (that is, the average real output per unit of combined labor and capital services in that sector) to gradually increase over the next five years from the unusually low rate of around 0.7 percent per year in recent years to about 1.2 percent per year during the 2023–2028 period. That estimate largely reflects the agency's assessment that growth of total factor productivity tends to revert to long-term historical averages over time. A slight portion of the increase in productivity growth results from provisions of the recent tax law that are expected to encourage businesses to report as domestic production the output of intellectual property assets that were previously reported as production abroad.

Actual Output

In CBO's projections, the growth of real actual GDP (as distinct from real potential GDP) follows a marked cyclical path, rising notably this year, slowing during the next few years, and then rising to match the growth of real potential output, on average, in the last years of the projection period (see Figure 1-5). This year, spending by consumers and businesses accounts for most of the projected growth of real output, but federal spending also contributes a notable amount. Residential

investment and spending by state and local governments provide positive contributions as well, but net exports subtract from real GDP. The slower growth of output in later years primarily reflects smaller contributions from business investment and federal spending.⁶

The cyclical pattern of the growth of actual output is reflected in the changes in the output gap—the difference between actual and potential GDP, expressed as a percentage of potential GDP—which is one measure of excess demand in the overall economy. In CBO's projections, that gap rises to 1.2 percent next year (that is, actual GDP exceeds potential GDP by 1.2 percent), which is notable because the output gap has exceeded 1.0 percent only three times in the past 45 years, most recently in 2000. The gap then falls steadily to –0.6 percent in 2026 (that is, actual GDP falls short of potential GDP by 0.6 percent), before it rises to its historical average of –0.5 percent in 2027 and 2028.

Consumer Spending

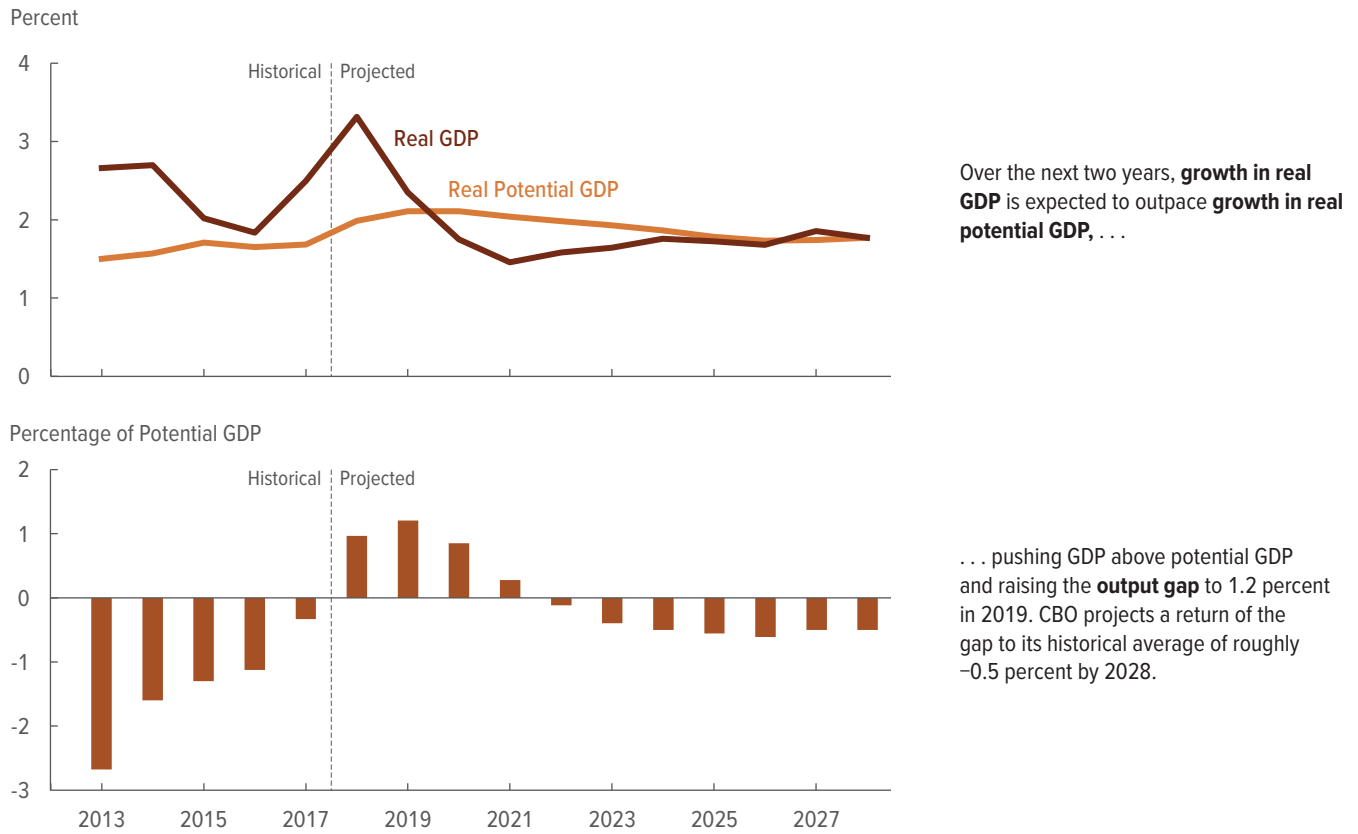
In CBO's projections, real consumer spending contributes 1.7 percentage points to the growth of real GDP in 2018 and 1.8 percentage points in 2019 (see Figure 1-6). Those contributions reflect projected growth in real consumer spending of 2.5 percent in 2018 and 2.7 percent in 2019, slightly slower than the 2.8 percent pace in 2017 (see Table 1-3 on page 20). The main factor underlying that forecast is the outlook for disposable (after-tax) personal income, but other factors also play a role.

Real disposable income is projected to grow at an average annual rate of 4.4 percent in 2018 and 2019, considerably faster than its average annual growth rate of 1.0 percent in 2016 and 2017. That growth in real disposable income is driven in part by the reduction in individual income tax payments stemming from the recent tax legislation. In addition, income growth is spurred by the tightening of labor markets, as employers raise wages to attract workers. In the next two years, demand for labor is boosted by the stimulative effects of recent changes in fiscal policy.

6. CBO calculates the contributions of the major components of GDP to the growth rate of real GDP by weighting their growth rates by their shares of nominal GDP. The sum of all the components' contributions, measured in percentage points, is approximately equal to the growth rate of real GDP.

Figure 1-5.

Growth of Real GDP and Real Potential GDP and the Size of the Output Gap



Over the next two years, **growth in real GDP** is expected to outpace **growth in real potential GDP**, . . .

. . . pushing GDP above potential GDP and raising the **output gap** to 1.2 percent in 2019. CBO projects a return of the gap to its historical average of roughly -0.5 percent by 2028.

Sources: Congressional Budget Office; Bureau of Economic Analysis.

Real values are nominal values that have been adjusted to remove the effects of inflation. Potential GDP is CBO’s estimate of the maximum sustainable output of the economy. Growth of real GDP and of real potential GDP is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The output gap is the difference between historical or projected GDP and potential GDP, expressed as a percentage of potential GDP. A positive value indicates that GDP exceeds potential GDP; a negative value indicates that GDP falls short of potential GDP. Values for the output gap are for the fourth quarter of each year.

GDP = gross domestic product.

Other factors contribute to the projected growth of consumer spending in 2018 and 2019. The large gains in stock market wealth and more modest gains in housing wealth in 2017 should continue to support spending into early 2019. Continuing optimism about employment prospects will, in CBO’s assessment, also boost spending. Meanwhile, healthy consumer credit indicators, such as low delinquencies and write-downs, will most likely encourage further expansion of consumer lending.

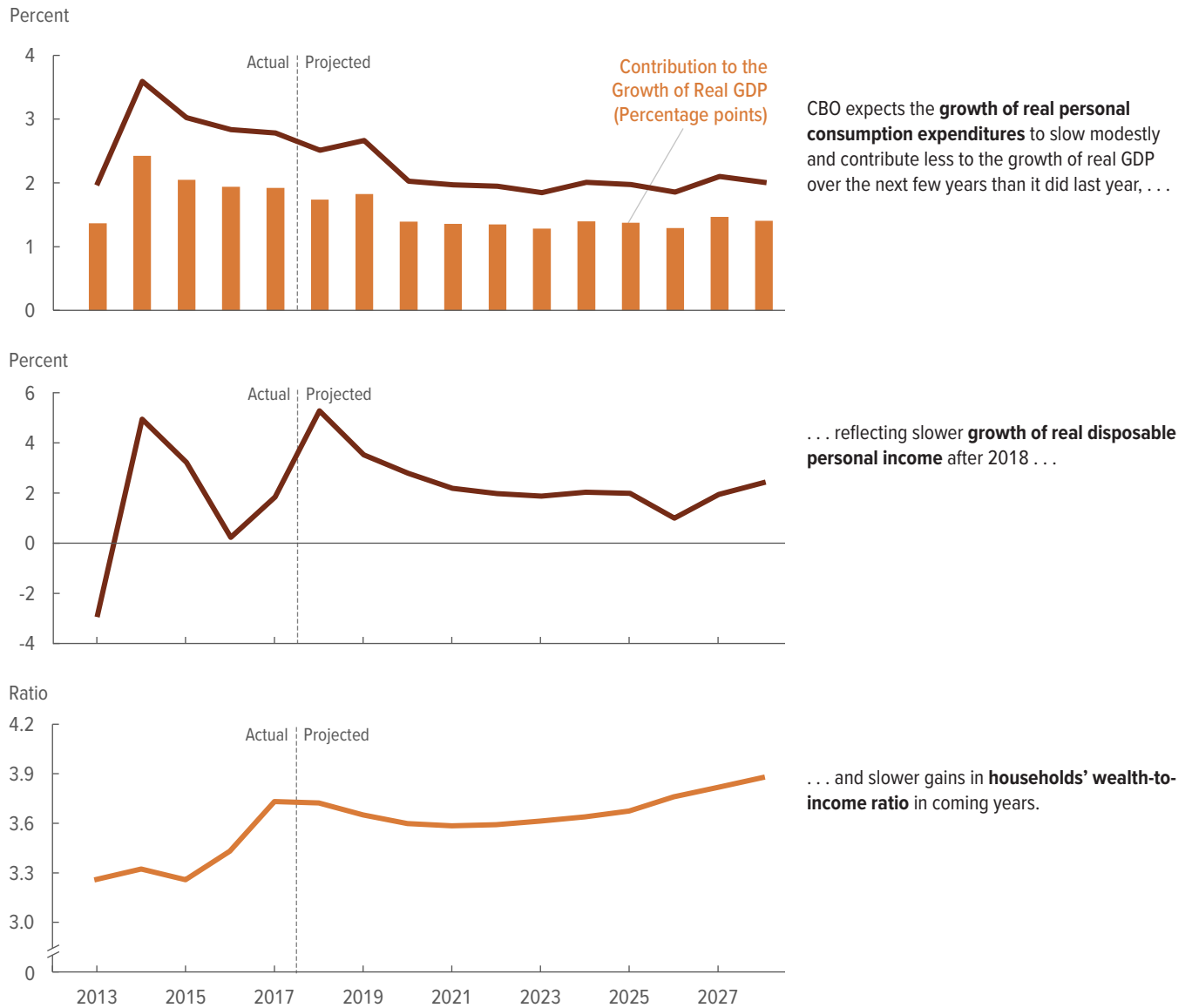
CBO expects real consumer spending to grow more slowly during the 2020–2028 period—at an average

annual rate of 2.0 percent—largely because the agency expects disposable income to grow more slowly in those years. The projected reduction in the growth of disposable income stems from the waning effects of the cuts in individual tax rates (which lower tax payments directly) and from the slower growth of labor income that is expected to occur as economic growth slows in those years. In addition, the effects of past wealth gains will have run their course, further slowing growth in consumer spending.

In 2026, the growth of disposable income is projected to slow abruptly because, under current law, effective

Figure 1-6.

Real Personal Consumption Expenditures



CBO expects the **growth of real personal consumption expenditures** to slow modestly and contribute less to the growth of real GDP over the next few years than it did last year, . . .

. . . reflecting slower **growth of real disposable personal income** after 2018 . . .

. . . and slower gains in **households' wealth-to-income ratio** in coming years.

Sources: Congressional Budget Office; Bureau of Economic Analysis; Federal Reserve.

Real values are nominal values that have been adjusted to remove the effects of inflation. The bars in the top panel show the contribution of personal consumption expenditures to the growth rate of real GDP, measured from the fourth quarter of one calendar year to the fourth quarter of the next. Disposable personal income is the income that people receive minus the taxes and fees that they pay to governments. Growth of personal consumption expenditures and of disposable personal income is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

Households' wealth-to-income ratio is the sum of households' equity holdings and real estate assets, divided by households' disposable personal income.

GDP = gross domestic product.

Table 1-3.

Projected Growth of Real GDP and Its Components

Percent

	Actual, 2017	2018	2019	2020	Annual Average	
					2021–2022	2023–2028
Real GDP	2.6	3.3	2.4	1.8	1.5	1.7
Components of Real GDP						
Consumer spending	2.8	2.5	2.7	2.0	2.0	2.0
Business investment	3.9	8.5	2.5	0.8	0.8	2.6
Business fixed investment	6.3	5.9	3.1	1.6	0.9	2.5
Residential investment	2.6	5.0	4.9	4.8	3.0	-0.2
Purchases by federal, state, and local governments	0.7	3.6	1.1	0.4	0.0	0.5
Federal	1.0	6.9	0.9	-0.5	-1.4	0.3
State and local	0.5	1.6	1.3	1.0	0.8	0.6
Exports	5.0	2.9	2.9	2.6	2.5	2.7
Imports	4.7	4.4	3.6	2.1	2.4	2.4
Memorandum:						
Net Exports (Change in billions of 2009 dollars)	-22.8	-63.1	-41.5	-3.6	-13.7	-10.0

Source: Congressional Budget Office.

Real values are nominal values that have been adjusted to remove the effects of inflation. Consumer spending consists of personal consumption expenditures. Business investment includes purchases of equipment, nonresidential structures, and intellectual property products, as well as the change in inventories. Residential investment includes the construction of single-family and multifamily structures, manufactured homes, and dormitories; spending on home improvements; and brokers' commissions and other ownership transfer costs. Purchases by federal, state, and local governments are taken from the national income and product accounts. Net exports are exports minus imports.

Data are annual. Changes are measured from the fourth quarter of one calendar year to the fourth quarter of the next.

GDP = gross domestic product.

personal income tax rates would rise above their previous levels as the temporary individual tax cuts expire. CBO expects that a significant portion of consumers (particularly those who expected the lower tax rates to be extended) would reduce their spending in response. As a result, the growth of consumer spending is also projected to slow that year although not by as much as the growth of disposable income.

Business Investment

In CBO's forecast, real business investment adds a substantial 1.1 percentage points to the growth of real GDP in 2018 but only 0.3 percentage points in 2019 (see Figure 1-7). Real business investment grows by 8.5 percent in 2018, significantly more than it increased in 2017.

Robust growth of investment spending expected in 2018 reflects a number of factors—for example, the increased incentives to invest stemming from lower tax rates, the pickup in GDP growth that is expected to

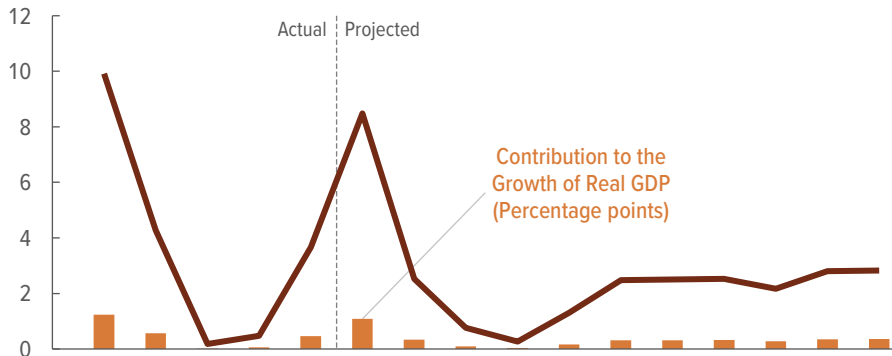
follow, greater investment in inventories, and the easing of regulations and slowdown in new regulatory activity that have occurred over the past year. In addition, investment in oil exploration and development is likely to increase significantly in 2018 because oil prices are rising; such investment is expected to decrease in 2019 when oil prices are projected to fall. With little need for businesses to expand capacity at an even more rapid rate and with oil-related investment slowing, growth in real business investment is projected to slow to 2.5 percent in 2019—a pace that is still faster than the growth rate of real GDP.

Reductions in tax rates and changes in other tax provisions that took effect in 2018 will raise the stock of capital that businesses desire to serve their customers: Such changes in tax policy affect the capital stock in two ways—they boost after-tax returns on capital over the decade, and they boost the supply of labor over the next few years. Together those incentives will prompt new investment as businesses seek to increase the capital

Figure 1-7.

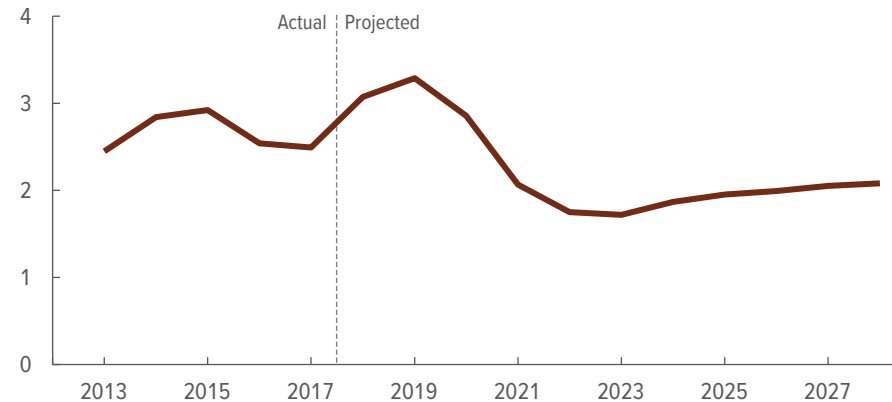
Real Business Investment

Percent



In CBO's projections, the **growth in real business investment** rises substantially this year and then slows, . . .

Percent



. . . in part because slower **growth in the output of nonfarm businesses** causes them to need less additional capacity to meet demand for their goods and services.

Sources: Congressional Budget Office; Bureau of Economic Analysis.

Real values are nominal values that have been adjusted to remove the effects of inflation. Business investment includes purchases of equipment, nonresidential structures, and intellectual property products, as well as the change in inventories. Growth of business investment is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The bars in the top panel show the contribution of business investment to the growth rate of real GDP, measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The demand for businesses' goods and services is represented by the annual average growth rate of the real output of the nonfarm business sector over the current and previous two years. The nonfarm business sector produces about three-quarters of the nation's output.

GDP = gross domestic product.

available to each worker and to equip new workers. In addition, in the near term, increased demand for goods and services in the economy will prompt new production, requiring further investment in capital.

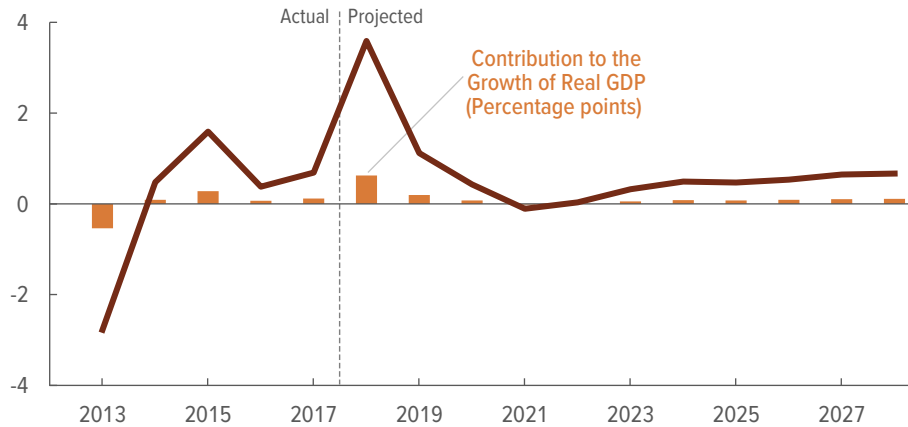
Slowing GDP growth after 2019 is projected to erode the need for businesses to expand their capacity, inducing a sharp slowdown in the growth of real business investment during the 2020–2022 period. From 2023

to 2028, real business investment is estimated to grow at an average annual rate of 2.6 percent, still significantly faster than the growth rate of real GDP. That projected difference is attributable primarily to the expectation that prices for capital will increase more slowly than prices in the economy as a whole, continuing a trend that has made capital more affordable. Nominal business investment is expected to grow at roughly the same rate as nominal GDP during those years.

Figure 1-8.

Real Government Purchases

Percent



CBO projects **growth in real purchases by federal, state, and local governments** to be rapid this year because of recent changes in federal spending policies.

Sources: Congressional Budget Office; Bureau of Economic Analysis.

Real values are nominal values that have been adjusted to remove the effects of inflation. Government purchases are the purchases of goods and services by federal, state, and local governments that are included in GDP. Growth of government purchases is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The bars show the contribution of government purchases to the growth rate of real GDP, measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The Bipartisan Budget Act of 2018 increased limits on discretionary funding for fiscal years 2018 and 2019, but it did not provide such funding. Because CBO completed its economic forecast before the enactment of the Consolidated Appropriations Act, 2018, its economic forecast incorporated a preliminary projection of discretionary spending. For most of the 2018–2028 period, that projection incorporated more discretionary spending than is included in CBO’s baseline budget projections. Relative to that preliminary path, the lower path of discretionary spending would imply a smaller contribution of government purchases to growth in real GDP in the near term, particularly in 2019. In later years, the contribution would be roughly unchanged.

GDP = gross domestic product.

Government Purchases

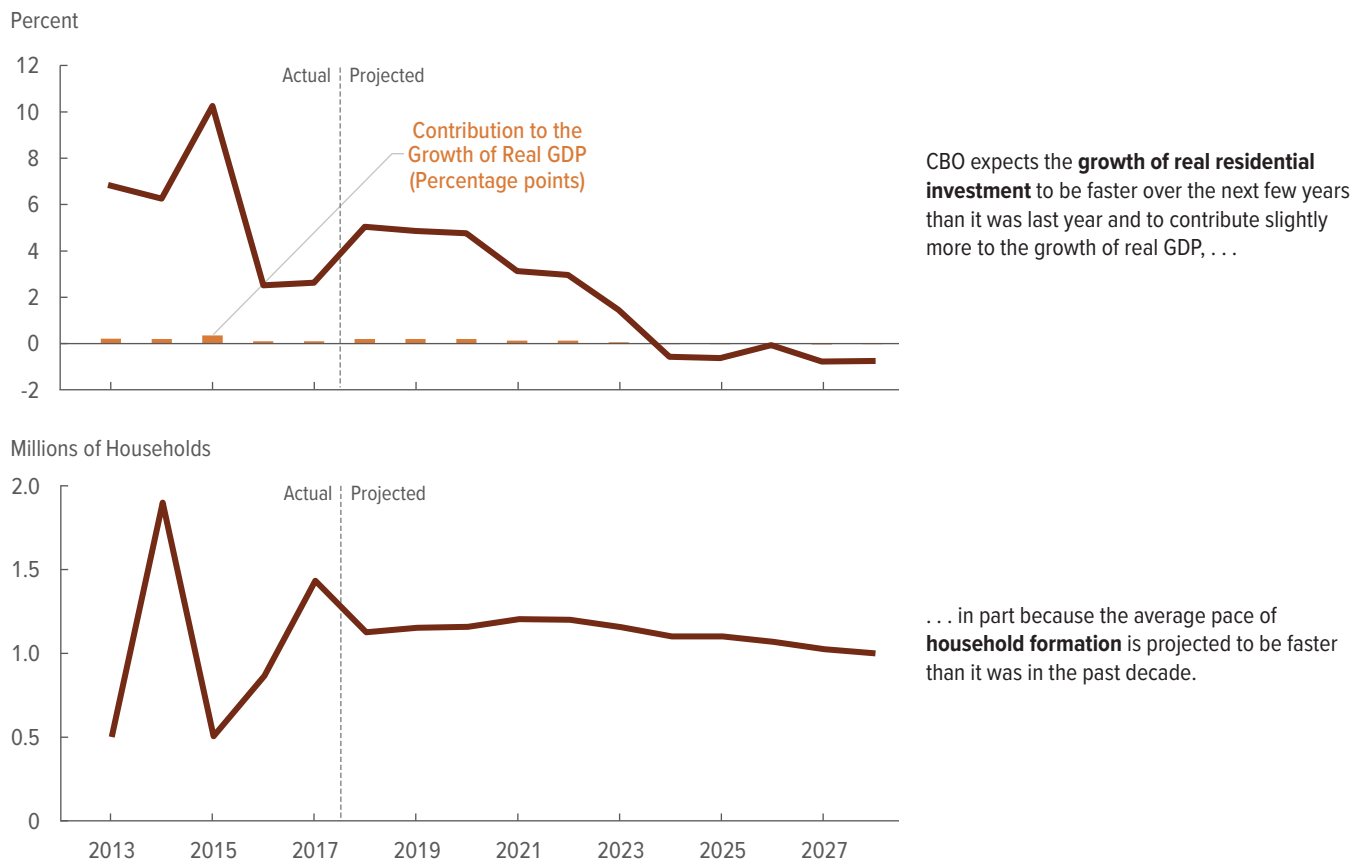
Purchases of goods and services by federal, state, and local governments would, under current law, be a significant contributor to the growth of the economy this year (see Figure 1-8). In CBO’s projections, they add 0.6 percentage points in 2018 and 0.2 percentage points in 2019 to the growth of real GDP. Real purchases by federal, state, and local governments expand by a robust 3.6 percent in 2018 and by 1.1 percent in 2019. In CBO’s projections, real government purchases increase slightly from 2020 through 2023 and then grow at an average annual rate of 0.6 percent from 2024 to 2028.⁷

In CBO’s forecast, real federal purchases of goods and services increase by 6.9 percent in 2018 and by 0.9 percent in 2019. In CBO’s 11-year projections, real federal purchases fall by an average of almost 1 percent per year from 2020 to 2023 and grow modestly through the rest of the projection period, reflecting the existing caps on discretionary funding through fiscal year 2021 and the assumption that funding will grow at the rate of inflation thereafter.

State and local governments are expected to increase spending in response to economic expansion and the

7. The Bipartisan Budget Act of 2018 increased limits on discretionary funding for fiscal years 2018 and 2019, but it did not provide such funding. Because CBO completed its economic forecast before the enactment of the Consolidated Appropriations Act, 2018, its economic forecast incorporated a preliminary projection of discretionary spending. For most of the 2018–2028

period, that projection incorporated more discretionary spending than is included in CBO’s baseline budget projections. Relative to that preliminary path, the lower path of discretionary spending would imply a smaller contribution of government purchases to growth in real GDP in the near term, particularly in 2019. In later years, the contribution would be roughly unchanged.

Figure 1-9.**Real Residential Investment**

Sources: Congressional Budget Office; Bureau of Economic Analysis.

Real values are nominal values that have been adjusted to remove the effects of inflation. Residential investment includes the construction of single-family and multifamily structures, manufactured homes, and dormitories; spending on home improvements; and brokers' commissions and other ownership transfer costs. Growth of residential investment is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The bars in the top panel show the contribution of residential investment to the growth rate of real GDP, measured from the fourth quarter of one calendar year to the fourth quarter of the next.

Household formation is the change in the number of occupied housing units from the fourth quarter of one calendar year to the fourth quarter of the next.

GDP = gross domestic product.

resulting increases in the demand for government services and in state and local government revenues. Greater federal funding for emergency disaster assistance also is expected to modestly boost gross investment by state and local governments in the near term as they spend on reconstruction efforts related to last year's hurricanes and wildfires. In CBO's projections, the annual growth rate of real state and local purchases is 1.6 percent in 2018 and then declines—to 1.3 percent in 2019 and to 1.0 percent in 2020—before settling at 0.6 percent in 2024, roughly the rate of population growth.

Residential investment

CBO expects residential investment to contribute 0.2 percentage points to the growth of real GDP in each of the first three years of the projection period (see Figure 1-9). The growth of real residential investment is estimated to rise to 5.0 percent in 2018, slowing only slightly over the subsequent two years, to 4.8 percent in 2020. That outlook reflects continuing strength in household formation, favorable developments in the mortgage market, and recent tax changes.

An important factor underlying CBO's forecast is the expected pace of household formation, or the net change in the total number of occupied housing units. With the tightening labor market translating into higher employment and faster growth in compensation, CBO expects the rate of household formation over the next few years to remain close to the 1.2 million per year it averaged from 2014 to 2017. During those four years, household formation recovered from a period of unusually slow growth that lasted from 2006 to 2013 and contributed to the concurrent sharp decline in residential investment. The continuing growth in the number of households is expected to motivate builders to build more housing in order to bring the number of new homes being constructed further into alignment with the growth in households.

CBO forecasts that mortgage-lending standards will continue to ease during much of the projection period, further encouraging stronger investment in housing despite projected higher mortgage rates in the near term. Lending standards for mortgages had remained tighter for longer than those in other credit markets.

Recent changes in the tax code made by the 2017 tax act will hold down the growth of residential investment over the next few years, CBO estimates. A higher standard deduction for personal income taxes will reduce by more than 50 percent the number of households who find it advantageous to itemize their deductions. Households that do not itemize will not receive an explicit tax subsidy for homeownership. For homeowners who continue to itemize their deductions, the after-tax cost of owning a home will rise because of limitations on the amounts of property taxes and mortgage interest payments that can be deducted. In the longer term, residential investment will benefit when the tax changes discouraging homeownership end in 2026.

Because its cycle has lagged behind that of the economy as a whole, residential investment is expected to slow less markedly than other parts of the economy between 2020 and 2023. In the agency's projections, the rate of growth in real residential investment slows to 3.1 percent in 2021, to 3.0 percent in 2022, and to 1.5 percent in 2023. Thereafter, real spending on residential investment declines modestly as slower population growth curtails household formation.

Imports and Exports

In CBO's projections, real imports of goods and services increase rapidly in 2018 and 2019 but then rise at a more moderate pace from 2020 through 2028 (see Figure 1-10). Real exports of goods and services, by contrast, grow at a steady rate over the next 11 years. Real net exports—the difference between real exports and real imports—are projected to reduce growth in real GDP by 0.3 percentage points in 2018 and by 0.2 percentage points in 2019. That contribution becomes less negative in later years and is roughly zero in the last half of the projection period. That outlook reflects CBO's projections of the growth of domestic purchases of goods and services, foreign economic activity, and the exchange value of the dollar.

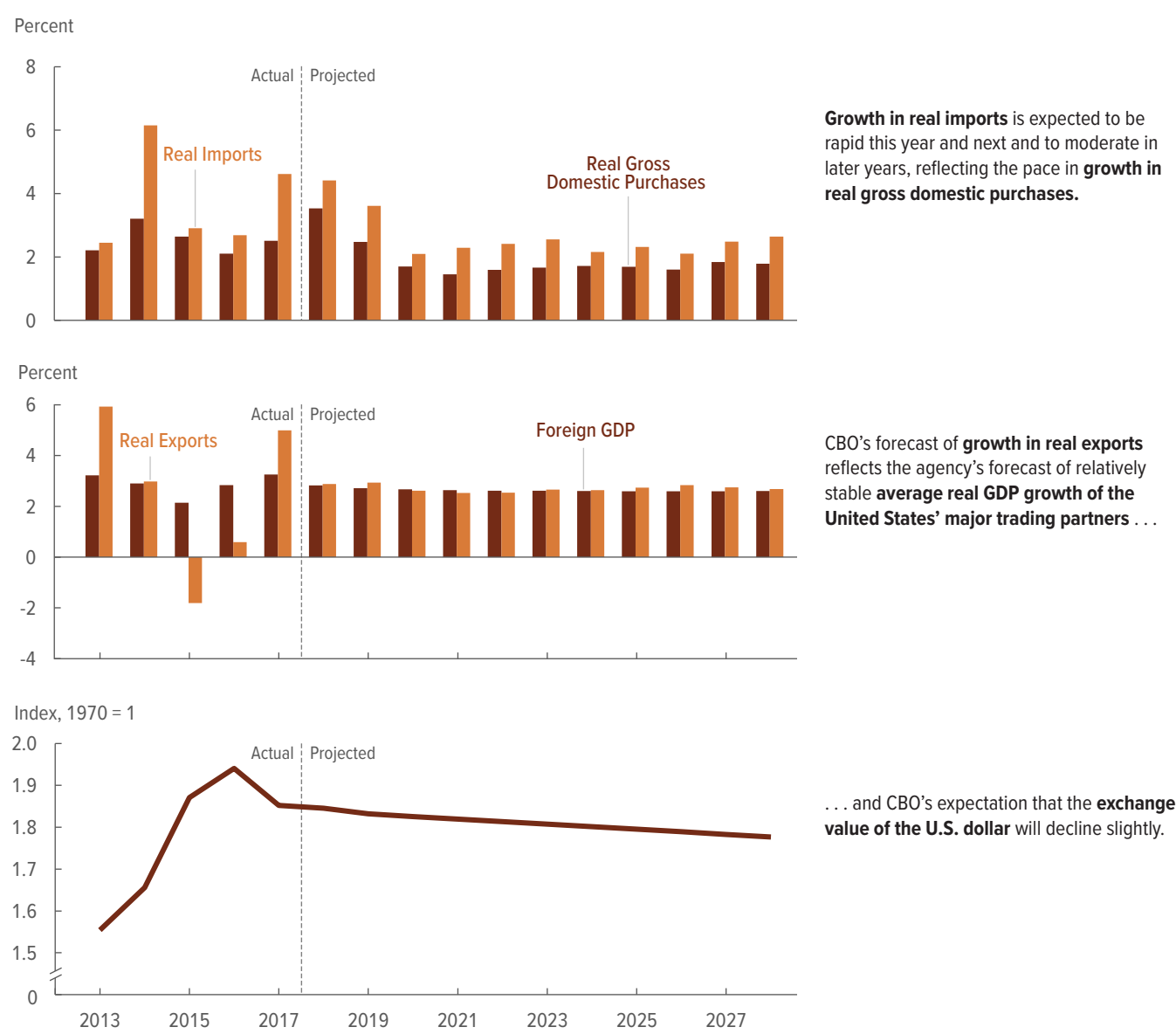
Real imports grow by 4.4 percent in 2018 and by 3.6 percent in 2019 in CBO's projections. Growth in domestic purchases of goods and services is projected to exceed growth in output during those two years, and the volume of imports is anticipated to help meet that demand. After 2019, real import growth slows with the deceleration of domestic purchases in CBO's forecast, although it continues to outpace those purchases, as it has in recent years.

After a strong year in 2017, real export growth is projected to fall to 2.9 percent in 2018 and 2019. Real exports are expected to grow at a similar pace from 2020 through 2028 in response to the steady growth of foreign economic activity and a slight reduction in the exchange value of the dollar, which would maintain growth in demand for U.S. exports.

The projected decline in the exchange value of the dollar modestly slows import growth and boosts export growth over the projection period, in the agency's estimation. The trade-weighted exchange value of the dollar fell by nearly 5 percent in 2017, reflecting strong economic growth among U.S. trading partners (particularly in the euro zone) and expectations that those countries would tighten their monetary policies. The value of the dollar is projected to remain stable over the next year and to decline slightly thereafter. That assessment reflects the expectation that an increase in demand for foreign assets caused by steady economic growth of the United States' major trading partners would roughly offset the increase in demand for dollar-denominated assets caused by rising

Figure 1-10.

Real Imports and Real Exports



Growth in real imports is expected to be rapid this year and next and to moderate in later years, reflecting the pace in growth in real gross domestic purchases.

CBO's forecast of growth in real exports reflects the agency's forecast of relatively stable average real GDP growth of the United States' major trading partners . . .

. . . and CBO's expectation that the exchange value of the U.S. dollar will decline slightly.

Sources: Congressional Budget Office; Bureau of Economic Analysis.

Real values are nominal values that have been adjusted to remove the effects of inflation. Gross domestic purchases are the sum of personal consumption expenditures, gross private domestic investment, and government consumption expenditures and gross investment. Growth is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The average growth rate of real GDP of the United States' major trading partners is calculated using an average of individual countries' rates of growth of real GDP, weighted by their shares of U.S. exports. The trading partners included in the average are Australia, Brazil, Canada, China, Hong Kong, India, Japan, Mexico, Singapore, South Korea, Taiwan, the United Kingdom, and the countries of the euro zone. Growth is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The exchange value of the U.S. dollar is an index of the export-weighted average of exchange rates between the dollar and the currencies of the United States' major trading partners. A higher value indicates a stronger dollar.

GDP = gross domestic product.

federal borrowing and rising interest rates in the United States.

Throughout the 2018–2028 period, nominal net exports are negative. Relative to GDP, that deficit shrinks after 2019. In CBO’s projections, the trade deficit grows from 3.0 percent of GDP at the end of 2017 to 3.4 percent of GDP by the end of 2019. From the end of 2020 through the end of 2028, it decreases from 3.3 percent of GDP to 2.8 percent of GDP.

The Labor Market

CBO’s projections of the labor market reflect its projections of actual output. With actual GDP greater than potential GDP in the near term in the agency’s forecast, employment and participation in the labor market are above their maximum sustainable amounts and the unemployment rate is below the natural rate (see Figure 1-11). In turn, the positive employment gap leads to more rapid growth in hourly compensation. In subsequent years, employment—following that path of output—increases less rapidly, and the unemployment rate rises steadily until it slightly exceeds the natural rate. Because of that slower growth in employment, rates of hourly compensation rise more slowly, and real hourly compensation in the nonfarm business sector grows in line with that sector’s labor productivity during the later years of the projection period. The labor force participation rate begins to fall in 2021 and returns to the underlying downward trend that is rooted in demographic patterns.

Employment

In CBO’s forecast, nonfarm payroll employment increases by 211,000 jobs per month in 2018—compared with 181,000 jobs per month in 2017—reflecting the strong demand for labor arising from the growth in output. In subsequent years, however, the slowing growth of demand slows the growth of employment. Payroll employment expansion averages 62,000 jobs in 2020 but slows to an average of only 30,000 jobs per month between 2021 and 2023. After 2023, the pace of employment picks up, in step with the growth of real GDP, and reaches 66,000 jobs per month in 2028.

Labor Force Participation

The labor force participation rate has hovered around 62.8 percent since 2014. That nearly constant rate reflects a balance between demographic forces, which have been gradually pushing potential and actual

participation down, and the ongoing economic recovery, which has been gradually pushing actual participation up. The same balance of forces is projected to keep the participation rate at an average of 62.8 percent through 2020. The long-term factors pushing the rate down are expected to be largely offset by continued improvement in hiring, as solid employment growth and rising wages draw some workers back into the labor force and keep others from leaving.

After 2020, demographic pressures predominate in CBO’s projections, gradually pushing the actual and potential participation rates down to about 61 percent by 2028. By 2028, CBO projects the actual participation rate to settle at roughly 0.1 percentage point below the potential rate, which is the agency’s estimate of the long-term relationship between the two rates.

Unemployment

Growth of the demand for goods and services in 2018 and 2019 lowers the unemployment rate in CBO’s projections to 3.3 percent in 2019—0.8 percentage points below the 4.1 percent recorded in the fourth quarter of 2017 and about 1.3 percentage points below the agency’s estimate of the natural rate. As growth in demand slows after 2019, the unemployment rate rises to 3.6 percent in 2020 and then to 4.6 percent—which is CBO’s estimate of the natural rate for the entire projection period—in 2022. The unemployment rate increases to 4.8 percent in 2023 and remains there throughout most of the rest of the projection period: There is a slight uptick to 4.9 percent in 2026 as spending slows in the face of the increase in personal tax rates scheduled under current law. That unemployment rate is about one-quarter of a percentage point more than the natural rate, which is CBO’s estimate of the long-term relationship between the two.

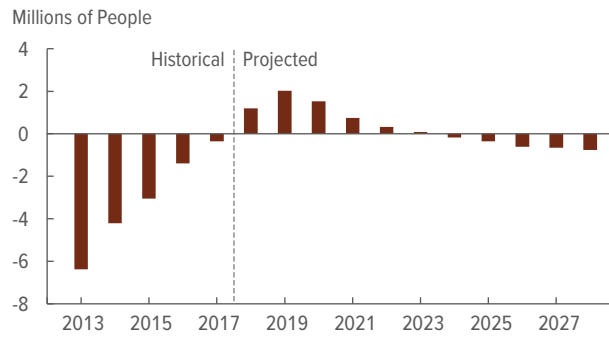
Hourly Compensation

The continued growth in demand for workers in the early years of the projection period is expected to boost the growth of hourly compensation. In a tight labor market, businesses must compete harder for scarce labor, bidding up wages to retain existing workers and attract new ones. Wage rates, as measured by the employment cost index (ECI) for workers in private industry, have been growing a little faster each year since 2011, and since 2014 there has been an increase in the pace of those gains that corresponds to a reduction of slack in the labor market.

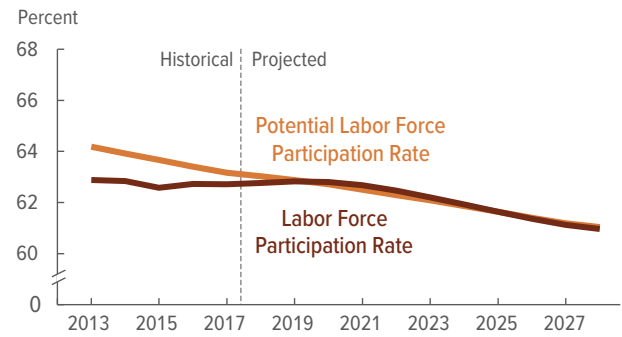
Figure 1-11.

The Labor Market

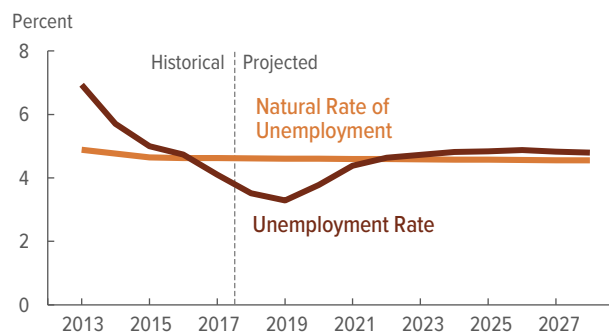
1 In CBO’s projections for the near term, output growth boosts the estimated **employment gap**, . . .



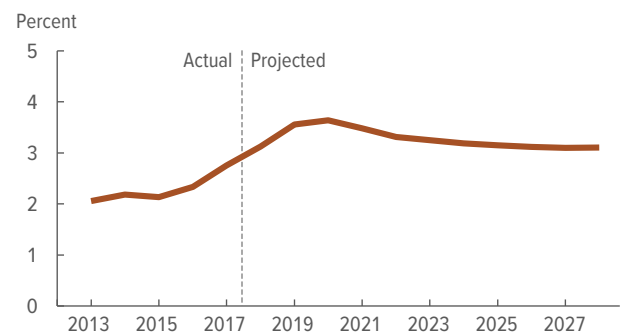
2 . . . pushing the **labor force participation rate** above CBO’s estimate of the **potential rate** and . . .



3 . . . driving the **unemployment rate** below CBO’s estimate of the **natural rate**.



4 The demand for labor puts upward pressure on **growth in wages**.



Sources: Congressional Budget Office; Bureau of Labor Statistics.

The employment gap is the difference between the number of employed people and the number who would be employed in the absence of fluctuations in the overall demand for goods and services.

The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are at least 16 years old and either working or seeking work. The potential labor force participation rate is the rate that CBO estimates to arise from all sources except fluctuations in the overall demand for goods and services.

The unemployment rate is the number of jobless people who are available for and seeking work, expressed as a percentage of the labor force. The natural unemployment rate is CBO’s estimate of the rate of unemployment arising from all sources except fluctuations in the overall demand for goods and services.

Wages are measured by the employment cost index for wages and salaries of workers in private industry. Growth in wages is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

For the labor force participation and unemployment rates, data are fourth-quarter values.

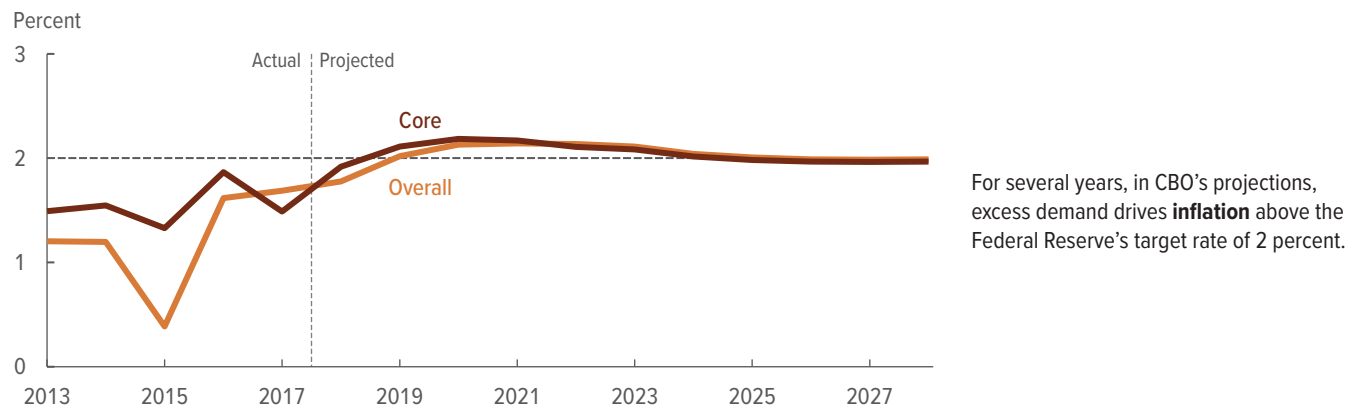
The ECI for wages and salaries of workers in private industry is projected to grow by 3.1 percent in 2018, by 3.6 percent in 2019, and by 3.6 percent in 2020. Those rates are all appreciably higher than the 2.8 percent growth recorded in 2017. When benefits are included, the ECI for total compensation of workers in private industry is projected to grow by 3.5 percent, 3.7 percent, and 4.0 percent in those years, whereas it grew by only

2.6 percent in 2017. Other measures of labor compensation, including average hourly earnings for production and nonsupervisory workers in private industry, are likewise expected to grow more quickly than in recent years.

As the tightness in the labor market dissipates later in the projection period and the unemployment rate rises to a level just above the natural rate, growth rates of hourly

Figure 1-12.

Inflation



Sources: Congressional Budget Office; Bureau of Economic Analysis.

Excess demand exists when the demand for goods and services exceeds the amount that the economy can sustainably supply. The overall inflation rate is based on the price index for personal consumption expenditures; the core rate excludes prices for food and energy.

Inflation is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

compensation are expected to ease. In the later years of the projection period, real hourly compensation grows with labor productivity. The growth of the ECI for wages and salaries of workers in private industry settles at an annual rate of 3.1 percent by 2026 in CBO's projections, and the broader measure of total compensation in private industry grows at an annual rate of about 3.5 percent.

Inflation

Inflation picks up in the next few years in CBO's forecast, as upward price pressure develops because of excess demand in the economy. The core price index for personal consumption expenditures (PCE, which excludes food and energy prices) rises by 1.9 percent in 2018 and by 2.1 percent in 2019—considerably more than the 1.5 percent it rose in 2017 (see Figure 1-12). The overall PCE index also increases more rapidly in coming years, reaching the Federal Reserve's target rate of 2.0 percent by early 2019. Between 2019 and 2023, the PCE price index grows by an average of 2.1 percent each year, and the consumer price index for all urban consumers (CPI-U) grows by an average of 2.5 percent annually.⁸

8. The chained CPI-U, an alternative measure of price inflation faced by urban households, is projected to grow by an average of 2.2 percent per year between 2020 and 2023 and by 2.1 percent annually thereafter. The chained CPI-U tends to grow more slowly than the standard CPI-U because it uses a formula that better accounts for households' tendency to substitute among

similar goods and services when relative prices change and because, unlike the CPI-U, it is little affected by statistical bias related to the sample sizes that the Bureau of Labor Statistics uses in computing each index. Historically, inflation as measured by the chained CPI-U has been 0.25 percentage points lower, on average, than inflation as measured by the CPI-U. CBO's projections reflect that average difference between the two measures.

Inflation, as measured by both PCE price indexes, falls back to 2.0 percent in 2024 and remains at that rate for the rest of the projection period.

The temporary factors that held down inflation in recent years are expected to dissipate either completely or partially in the next few years. They include a one-time price reduction in telecommunication services; the strong dollar, which has depressed the growth of prices on imported goods; and the slow growth of Medicare's reimbursement rates, which has held down inflation in the costs of health care services as measured by the PCE price index. In addition, a tight labor market and excess domestic demand are expected to exert upward pressure on wages and prices.

In CBO's projections, that upward pressure on prices is largely offset by tighter monetary policy, supported by market participants' expectations that inflation will remain low and stable. The Federal Reserve is expected

similar goods and services when relative prices change and because, unlike the CPI-U, it is little affected by statistical bias related to the sample sizes that the Bureau of Labor Statistics uses in computing each index. Historically, inflation as measured by the chained CPI-U has been 0.25 percentage points lower, on average, than inflation as measured by the CPI-U. CBO's projections reflect that average difference between the two measures.

to raise interest rates to prevent inflation from substantially exceeding its target. A variety of survey-based and market-based measures of long-run inflation expectations support the notion that people expect that the Federal Reserve will succeed. Because inflation expectations influence how prices and wages are set in markets for goods and services and in labor markets, expectations of low and stable inflation act like an anchor on inflation.

Monetary Policy and Interest Rates

CBO expects the Federal Reserve to respond to the increase in the output gap and in inflation over the next few years by continuing to raise the federal funds rate (see Figure 1-13). In CBO's forecast, the federal funds rate reaches 2.4 percent in the fourth quarter of 2018, rises to 3.4 percent by the end of 2019, and then peaks at 4.0 percent in 2021. After 2021, the Federal Reserve reduces the federal funds rate as the economy slows, and the rate reaches 3.0 percent by mid-2024. From mid-2025 through 2026, the Federal Reserve is projected to reduce the rate slightly in anticipation of the slower growth stemming from the expiration of the cuts in the personal income tax the following year.

In the agency's projections, interest rates on government debt are influenced not only by the increases in the output gap and in the rate of inflation over the next few years but by longer-term factors as well. Throughout the projection period, rising federal debt relative to GDP exerts upward pressure on short- and long-term interest rates. In addition, long-term interest rates are projected to rise gradually relative to short-term interest rates as the term premium (the premium paid to bondholders for the extra risk associated with holding longer-term bonds) moves up from its recent low levels. Various factors—investors' heightened concern about relatively weak global economic growth and the increased demand for long-term Treasury securities as a hedge against unexpected declines in inflation, for example—have pushed the term premium downward over the past few years. Those factors have begun to dissipate, and CBO expects that decline to contribute to the rise in the rate on 10-year Treasury notes over the next several years. In addition, CBO expects the ongoing reduction in the Federal Reserve's portfolio of long-term assets to contribute to the increase in the term premium over the next few years. Although in CBO's projections, the term premium rises throughout the 11-year period, it does so gradually and remains below its historical value.

In CBO's projections, the interest rate on 3-month Treasury bills rises from 1.2 percent in the fourth quarter of 2017 to 3.8 percent by early 2021. Meanwhile, the interest rate on 10-year Treasury notes increases from its average of 2.4 percent in the latter part of 2017 to 4.3 percent by the middle of 2021. From 2024 to 2028, the interest rate on 3-month Treasury bills averages 2.7 percent, and the rate on 10-year Treasury notes, 3.7 percent. In those years, the *real* interest rate on 10-year Treasury notes (that is, the rate after the effect of expected inflation, as measured by the CPI-U, has been removed) is 1.3 percent—well above the current real rate but more than 1 percentage point below the average real rate between 1990 and 2007. (The 1990–2007 period is useful for comparison because there were no severe economic downturns or financial crises during those years and because expectations at the time were that inflation would remain fairly stable.)

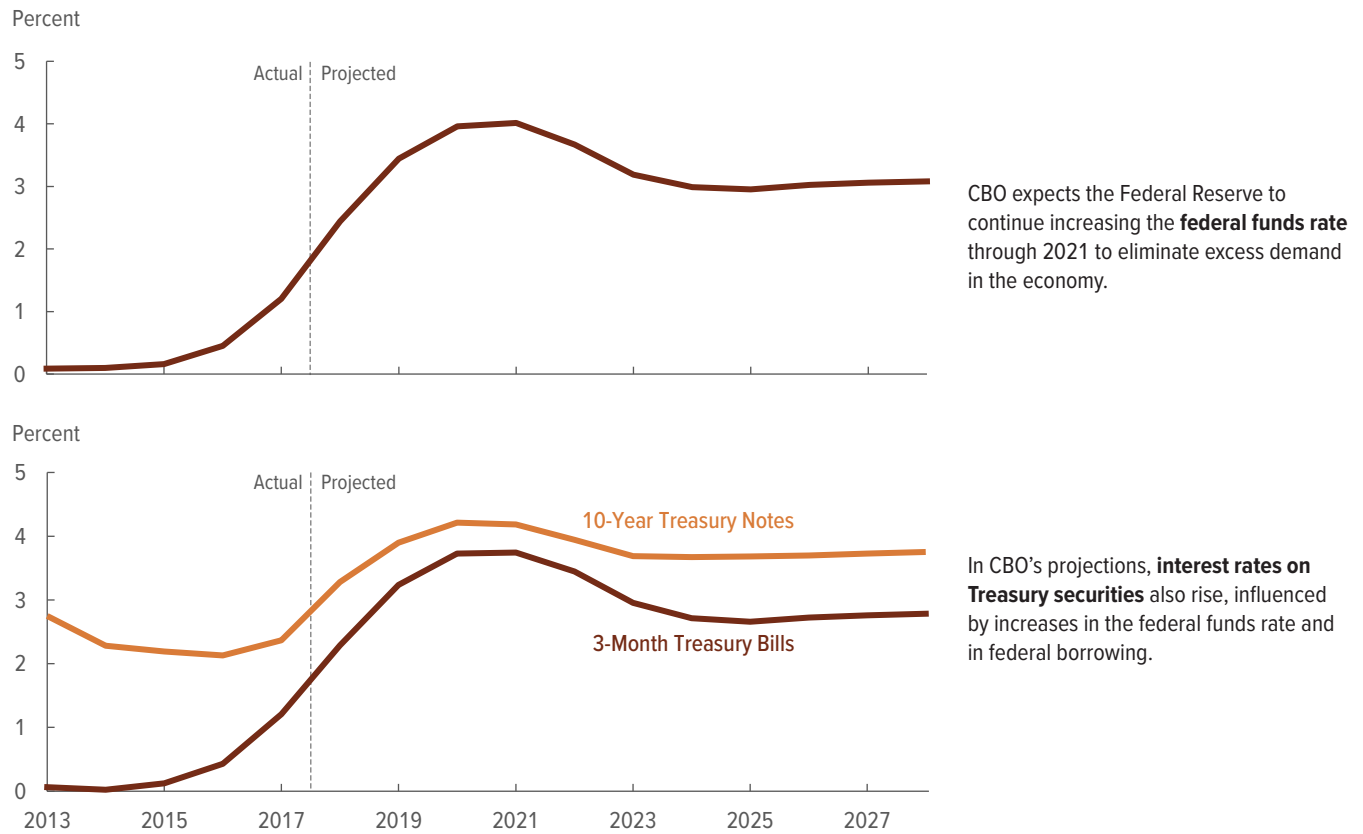
Average real interest rates on Treasury securities are projected to be lower over the projection period than they were between 1990 and 2007 for several reasons: slower growth in the labor force, slightly slower growth of productivity, an increase in the share of income going to high-income households (which tends to increase saving), investors' increased preference for Treasury securities over riskier assets, and greater net inflows of capital from abroad (measured as a percentage of GDP) than in that earlier period. Other factors are projected to drive real interest rates up, including a larger amount of federal debt relative to GDP, a larger number of older people who will be drawing down their savings, and a larger share of income going to capital. On balance, the factors pushing long-term rates below their previous averages outweigh the factors that put upward pressure on them.

Income

Projections of federal revenues depend on aggregate income—the total amount of income in the economy—and on the way it is distributed among various categories, such as labor income, domestic corporate profits, proprietors' income, and interest and dividend income. CBO therefore projects income in those categories over the next 11 years, estimating each category's share of GDP. The categories that affect revenues most strongly are labor income (especially wage and salary payments) and domestic corporate profits. Increases in U.S. borrowing from abroad imply that a greater share of domestically generated income will flow to foreign investors.

Figure 1-13.

Interest Rates



CBO expects the Federal Reserve to continue increasing the **federal funds rate** through 2021 to eliminate excess demand in the economy.

In CBO's projections, **interest rates on Treasury securities** also rise, influenced by increases in the federal funds rate and in federal borrowing.

Sources: Congressional Budget Office; Federal Reserve.

The federal funds rate is the interest rate that financial institutions charge each other for overnight loans of their monetary reserves. Excess demand exists when the demand for goods and services exceeds the amount that the economy can sustainably supply.

Data are fourth-quarter values.

Labor Income

In CBO's projections, labor income grows fairly steadily as a share of GDP over the period (see Figure 1-14). Labor income measured as a share of GDP in 2018 is slightly above 57.2 percent, a little more than the 57.0 percent recorded for 2017. It continues to climb, in CBO's projections, reaching 58.6 percent in 2022, reflecting a tight labor market that improves workers' bargaining power, raises compensation per hour, and reduces the share of income that goes to domestic corporate profits. After 2022, when the unemployment rate exceeds CBO's estimate of the natural rate, the growth of hourly compensation slows. Nevertheless, labor income as a share of GDP continues to rise, albeit at a slower pace than before, reaching 59.2 percent in 2028.

Even though labor income as a share of GDP rises in CBO's projections over the next decade, it remains affected by factors that have notably depressed that share since 2000. One such factor is globalization, which has tended to move the production of labor-intensive goods and services to countries with lower labor costs. Another factor is technological change, which appears to have increased returns on capital more than returns on labor.

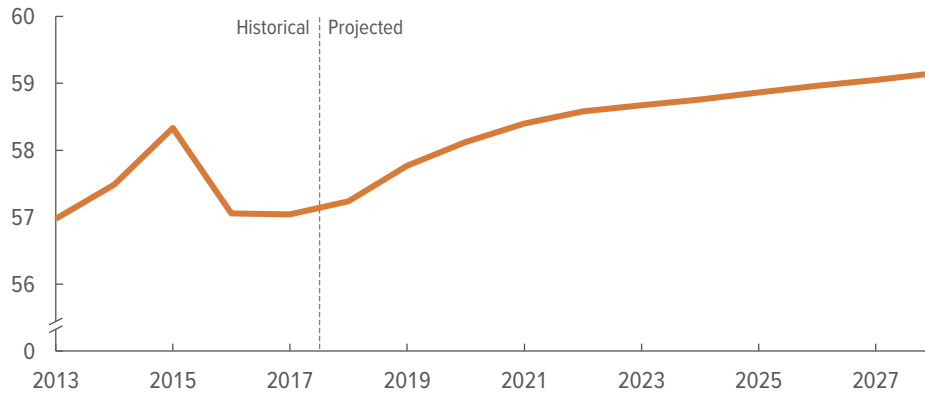
Domestic Corporate Profits

Domestic corporate profits, which equaled an estimated 9.0 percent of GDP in 2017, rise in CBO's projections to 9.8 percent of GDP in 2018. (Profits' share of GDP increases despite the slight rise in labor income's share in 2018 because other major components of national income, such as interest income, rental income,

Figure 1-14.

Labor Income

Percentage of GDP



Because of tighter labor markets in the near term, **labor income** is projected to increase as a share of GDP over the projection period.

Sources: Congressional Budget Office; Bureau of Economic Analysis.

Labor income is the sum of employees' compensation and CBO's estimate of proprietors' income that is attributable to labor.

Data are fourth-quarter values.

GDP = gross domestic product.

proprietors' income, and depreciation, fall as a share of GDP.) In subsequent years, domestic corporate profits' share of GDP is projected to fall, down to 8.0 percent by 2028. That decline occurs largely because labor compensation is expected to rise as a share of GDP but also because corporate interest payments are projected to increase as a result of higher interest rates.⁹

Domestic Income Earned by Foreign Investors

Over the next 11 years, U.S. national income (the income that accrues to U.S. residents as measured by GNP) is projected to grow at a slightly slower pace than income from U.S. domestic production (as measured by GDP). GNP is a better measure of the income available to U.S. residents because it includes net international income flows—the income that U.S. residents earn from working and investing abroad minus the income that nonresidents earn from working and investing in the United States. From 2018 to 2028, net international

income is projected to fall from 0.9 percent of GDP to roughly 0.4 percent. As a result, in CBO's projections, GNP grows about 0.1 percentage point less per year than GDP grows over the 2018–2028 period.

Net international income is expected to fall over the next 11 years for two reasons. First, under current law, in CBO's projections, the amount of net borrowing from foreigners to finance domestic investment increases, as do federal budget deficits. For all but one of the past 35 years, the United States has been a net borrower on world capital markets and thus its net international lending (national saving minus domestic investment) has been *negative*, on average.¹⁰ In CBO's forecast, net international lending declines from –2.5 percent of GDP in the 2015–2017 period to an average of –3.5 percent from 2018 to 2028. The second reason is that U.S. borrowing from abroad becomes more expensive as interest rates rise in the United States.

9. Under the 2017 tax act, new limits on the amount of interest payments that can be deducted mean that corporate borrowing no longer receives more favorable treatment than equity issuance. As a result, corporate borrowing and interest payments are expected to rise by less than they otherwise would have, and domestic corporate profits are projected to be larger than they otherwise would have been.

10. A country is a net borrower if it saves less than it invests. The difference reflects a net inflow of foreign investment. In the U.S. national income and product accounts, the balance is known as net lending to the rest of the world. Since 1983, U.S. net international lending has averaged –2.7 percent of GDP.

Uncertainty Surrounding the Economic Outlook

Economic projections are inherently uncertain, but CBO's current projections are particularly so because they incorporate several estimates of the effects of recent changes to fiscal policy, which are themselves very uncertain. For instance, the agency's estimates of the effects of those changes depend on estimates of how incentives, crowding out, and changes to economic activity affect business investment. (See Appendix B for more detail.)

The agency attempts to construct its 11-year economic projections so that they fall in the middle of the distribution of possible outcomes, given the fiscal policy embodied in current law and the available economic data. Nevertheless, output, inflation, or interest rates could still turn out to be higher or lower than they are in CBO's projections. The fundamental factors and long-term trends that CBO uses to frame its economic projections become increasingly uncertain over the longer term, but temporary fluctuations in economic activity contribute more to the uncertainty of the projections in the near term.

Uncertainties in CBO's Long-Term Projections

Some of the uncertainty about future output is associated with the longer-run effects of recent policy changes, but uncertainty also arises in long-run projections of size of the labor force, productivity, and national saving, regardless of any changes in policy. Uncertainty about all those factors contributes to the uncertainty surrounding long-term interest rates.

The long-term economic effects of the 2017 tax act are particularly uncertain. CBO's estimates of the responses of households and businesses to changes in incentives to work and invest are based on the agency's assessment of the effects of similar policies in the past, but none of those previous episodes is a perfect guide to the future. For example, many of the recent tax provisions that affect individuals and businesses are scheduled to change during the projection period. As a result, CBO had to estimate how individuals and businesses might react to the scheduled shifts in policy on the basis of historical evidence. The forecast for output growth could be understated if capital investment and the labor supply increase more than CBO anticipates in response to changes in the tax code. Conversely, output growth could be overstated

if the incentive effects of the tax changes are smaller than the agency expects.

Another policy-related source of uncertainty in CBO's projections of output is the effect recent regulatory changes have on investment. For instance, deregulation could contribute to increases in total factor productivity by encouraging more entrepreneurial activity and innovation and by reducing the time that current workers spend on activities to document compliance with regulations. The regulatory changes could have more, or less, favorable implications for investment decisions, the labor supply, and productivity than CBO has built into its projections. Nevertheless, the effects are estimated to be modest relative to the size of the economy, and research on the relative importance of those factors or on the size of the changes is inconclusive.

Discrepancies between the actual values and CBO's projected values of a few key determinants of output could result in GDP growth that is faster or slower than the agency projected, for reasons unrelated to policy. If the labor force grew more quickly than anticipated—because, say, older workers chose to stay in the labor force longer than expected—the economy could grow more quickly than it does in CBO's projections. By contrast, if the growth rate of labor productivity does not rise above its average postrecession pace, as it does in CBO's projections, the growth of GDP might be weaker than the agency projected. That growth also could be weaker than projected if, for example, net flows of immigration were lower than expected, which would reduce the growth of the labor supply below the agency's current projections.

Real interest rates, which have a significant effect on government interest payments, are a major source of uncertainty over the longer term. Policy and nonpolicy factors contribute to that uncertainty. Global real interest rates have been unusually low, for reasons that are not fully understood, and the trajectories of those rates are equally uncertain. Many factors—population growth rates, global saving, the growth rate of productivity, and federal borrowing, to name a few—affect long-term interest rates, and CBO's projections of some or all of those factors could be too high or too low.

Uncertainties in CBO's Near-Term Projections

Over the near term, many developments—such as unforeseen changes in the labor market, the housing market, business confidence, or international conditions—could make economic growth and other variables differ from what CBO has projected. Unanticipated responses to the recent changes in fiscal policy are another significant source of uncertainty in CBO's projections over the next few years. Changes to trade agreements or tariff policies on the part of the United States and its trading partners that impede trade could have significant adverse effects on aggregate economic activity, whereas the removal of trade barriers between the United States and its trading partners could improve aggregate economic conditions.

The agency's current forecast for the near-term growth of output may be too pessimistic. For example, businesses might respond to the projected increase in aggregate demand for goods and services with more robust hiring and investment than CBO anticipates. If so, the unemployment rate could fall more sharply and inflationary pressures could rise more quickly than CBO projects. Or a greater-than-expected easing of mortgage-lending standards could support more rapid growth in household formation and in residential investment than CBO anticipates, accelerating the housing market's recovery and further boosting house prices. Households' increased wealth could then buttress consumer spending, raising GDP.

In contrast, CBO's forecast for the near-term growth of output may be too optimistic. For example, if the increased tightness of labor markets does not lead to increases in hourly wages and benefits, household income and consumer spending could grow more slowly than CBO anticipates. In addition, lower-than-expected growth among the United States' leading trading partners could lower export growth below CBO's forecast. Given such developments in aggregate demand, the unemployment rate could be higher and inflation weaker than CBO projects.

The inflation rate, which is important for budget estimates, also could be higher or lower than in CBO's projections because of factors other than the strength of demand in the economy. Inflationary pressures on consumer prices could be greater if import prices are higher than CBO projects. That could happen if, for example, synchronized growth around the world raised the prices

of commodities or if changes were made to tariffs or trade arrangements. But inflation also could remain subdued for longer than the agency expects if some of the temporary factors that have held down inflation in recent years end up being more permanent than CBO anticipates (reflecting deeper structural shifts in certain sectors, such as health care and retail).

CBO projects a soft landing for the economy—in which the output gap closes through slower, but still positive, economic growth—but there is nevertheless a risk of recession. That risk does not stem from the duration of the current economic expansion, even though it has lasted more than eight years—longer than the average (about five years) of the previous 11 expansions since 1945 (see Figure 1-15). Instead, it arises from the large output gap that CBO anticipates in 2019. Such a gap would indicate that growth in demand was so robust that it strained the economy's productive capacity, raising the likelihood that unexpected vulnerabilities, such as higher inflation or unsustainable debt burdens, would develop. Although CBO and many other forecasters do not anticipate such problems to arise, they could develop within a year or two, making the economy more vulnerable as it slows.

Quantifying the Uncertainty in CBO's Projections

To roughly quantify the degree of uncertainty in its projections for the next five years, CBO analyzed its past forecasts of the growth rate of real GDP and of inflation.¹¹ On the basis of that analysis, CBO estimates that there is approximately a two-thirds chance that the average annual growth rate of real GDP will be between 0.8 percent and 3.5 percent over the next five years. That is, there is a two-thirds chance that real GDP in 2022 will be within roughly \$1.3 trillion of the projected value of \$19 trillion (in 2009 dollars; see Figure 1-16). Similarly, errors in CBO's past forecasts of inflation (as measured by the CPI-U) suggest that there is a roughly two-thirds chance that the average annual rate of inflation will fall between 1.4 percent and 3.4 percent over the next five years.

Comparisons With CBO's June 2017 Projections

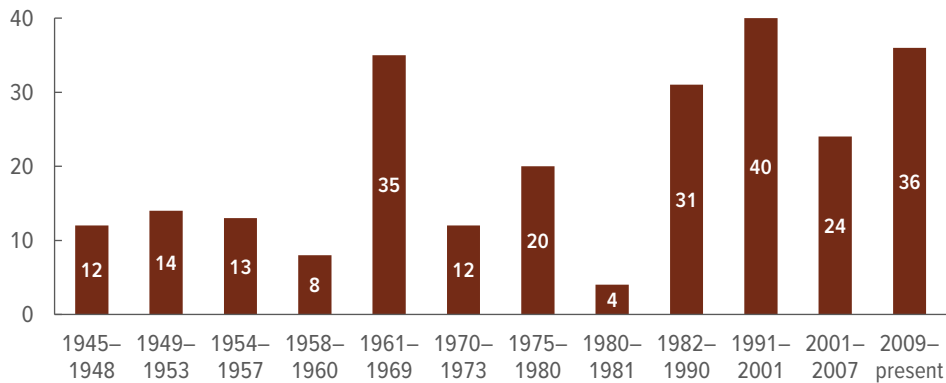
CBO's current economic projections differ in a number of ways from those that it issued in June 2017

11. See Congressional Budget Office, *CBO's Economic Forecasting Record: 2017 Update* (October 2017), www.cbo.gov/publication/53090.

Figure 1-15.

Duration of Economic Expansions Since 1945

Quarters



The current **economic expansion** has lasted nine years (36 quarters)—about four years longer than the average expansion since 1945.

Sources: Congressional Budget Office; National Bureau of Economic Research.

The duration of an economic expansion is the number of quarters from the trough of a business cycle to its peak. For each bar, the first year is the year of the trough and the second is the year of the peak. Not shown in this figure are periods of economic contraction—recessions—which extend from the peak of a business cycle to its trough.

GDP = gross domestic product.

(see Table 1-4 on page 36). The comparison is complicated by a variety of changes that have occurred since CBO issued its last projections—in policies, economic conditions, methodological approaches, and available economic data:

- On the policy side, reforms to the tax code that affect incentives to work and invest have changed the expected trajectory of the economy’s potential output, and changes in federal spending and revenue policies are expected to increase demand in the economy in the near term.
- Underlying economic conditions have improved in some unexpected ways since June. For example, asset prices (particularly the value of corporate equities) have substantially increased, and the global economy has strengthened more than the agency projected at that time.
- Changes in CBO’s methods, including an improved approach to projecting labor force participation rates, have resulted in somewhat larger projections of the potential labor supply.¹²

- New and revised data contributed to upward revisions to the current level and trajectory of GDP, but they also led the agency to significantly lower its estimates of labor’s share of income and of the rate of price inflation in the early years of the projection period.

Revisions to Projections of Potential Output

CBO’s projections of real potential output have been revised upward since last June as a consequence of data revisions and updates, improvements in analytical methods, and changes in policy. Updates to historical data resulted in upward revisions to estimated potential output in recent years and to the agency’s 11-year projections of that measure. The effects of those data revisions were reinforced by improvements in analytical methods. First, CBO lowered its estimate of the natural rate of unemployment by about 0.1 percentage point throughout the projection period, reflecting the agency’s reassessment of how demographic trends are affecting that rate. Second, the agency revised the data sources and methods that it uses to estimate potential employment and hours worked in different sectors of the economy. Both changes increased estimates of potential hours worked in recent years and thus raised CBO’s estimate of potential GDP.

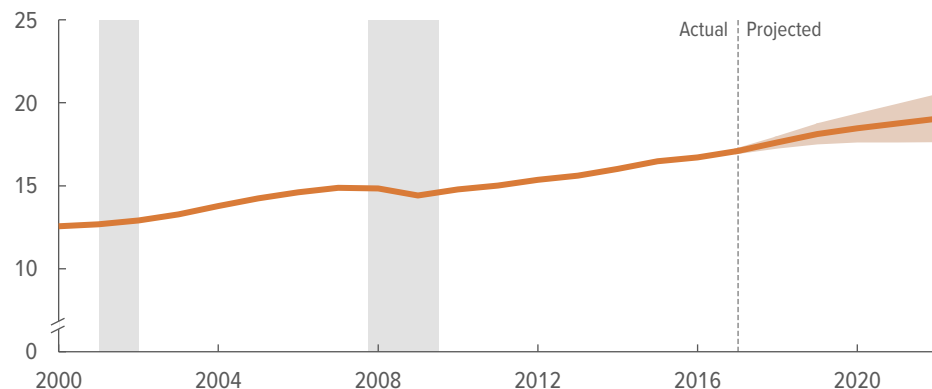
12. See Joshua Montes, *CBO’s Projection of Labor Force Participation Rates*, Working Paper 2018-04 (Congressional Budget Office, March 2018), www.cbo.gov/publication/53616.

In addition, the recent tax legislation included provisions that increased incentives to work and invest, which

Figure 1-16.

The Uncertainty of CBO's Projections of Real GDP

Trillions of 2009 Dollars



In CBO's baseline projections, **real GDP** grows at an average annual rate of 2.2 percent over the 2018–2022 period—but there is a roughly two-thirds chance that the growth would be between 0.8 percent and 3.5 percent.

Sources: Congressional Budget Office; Bureau of Economic Analysis.

Real values are nominal values that have been adjusted to remove the effects of inflation. The shaded area around CBO's baseline projection of real GDP is one way to illustrate the uncertainty of that projection. The area is based on the errors in CBO's one-, two-, three-, four-, and five-year projections of the average annual growth rate of real GDP for calendar years 1976 through 2017.

The vertical bars indicate recessions, which extend from the peak of a business cycle to its trough.

GDP = gross domestic product.

more than offset the negative effects on investment from greater projected federal borrowing. Because several of those provisions that would encourage a larger supply of labor and a larger capital stock are scheduled to expire later in the projection period, the legislation increases the growth of potential GDP in CBO's projections through 2024 but slows that growth thereafter. For example, CBO has raised its projections of the potential labor force participation rate for the 2019–2024 period by an average of 0.3 percentage points but has raised the projection for 2027 by only 0.1 percentage point.

Taken together, those changes led CBO to revise its June 2017 projections of potential GDP as follows: The agency increased its estimate for 2017 by more than 0.7 percent and its projection for 2027 by more than 1.6 percent. Changes to data and methods account for about 1.1 percentage points of the increase in projected potential GDP in 2027, and the effects of the recent tax legislation account for about 0.5 percentage points. As a consequence of those revisions to the level of potential GDP, CBO's projection of the average annual growth rate of potential GDP over the 11-year period increased by about 0.1 percentage point, from 1.8 percent to 1.9 percent (see Figure 1-17 on page 38).

Revisions to Projections of Actual Output

CBO significantly boosted its projections of the growth of real GDP in 2018 and 2019, mostly because of the recent changes in fiscal policy. Some of the difference in near-term growth also reflects growth in the U.S. economy in the second half of 2017 that was appreciably stronger than expected. New and revised data caused the Bureau of Economic Analysis (BEA) to estimate that real GDP grew by 2.6 percent from the fourth quarter of 2016 to the fourth quarter of 2017, whereas last June, CBO estimated that growth over the period would be 2.2 percent. The growth of real GDP in CBO's current projections now increases to 3.3 percent in 2018 before falling back to 2.4 percent in 2019. In the projections published last June, the growth rate of real GDP fell to 2.0 percent in 2018 and to 1.5 percent in 2019.

Because CBO made larger upward revisions to its projections of actual GDP growth than it did to its projections of potential GDP growth, the agency increased its projections of the output gap through 2023. In the agency's June 2017 projections, real GDP grew somewhat faster than potential output through 2018 and slowed for two years before rising at the same rate as potential output. By contrast, in CBO's current projections, that pattern is

Table 1-4.

Comparison of CBO's Current and Previous Economic Projections for Calendar Years 2017 to 2027

	2017 ^a	2018	2019	Annual Average		Total, 2017–2027
				2017–2021	2022–2027	
Percentage Change From Fourth Quarter to Fourth Quarter						
Real GDP ^b						
April 2018	2.6	3.3	2.4	2.3	1.7	2.0
June 2017	2.2	2.0	1.5	1.8	1.9	1.8
Nominal GDP						
April 2018	4.5	5.2	4.5	4.3	3.9	4.1
June 2017	4.0	4.0	3.4	3.8	4.0	3.9
PCE Price Index						
April 2018	1.7	1.8	2.0	2.0	2.0	2.0
June 2017	1.8	2.0	2.0	2.0	2.0	2.0
Core PCE Price Index ^c						
April 2018	1.5	1.9	2.1	2.0	2.0	2.0
June 2017	1.8	2.0	2.0	1.9	2.0	2.0
Consumer Price Index ^d						
April 2018	2.1	2.0	2.3	2.3	2.4	2.4
June 2017	2.1	2.3	2.4	2.3	2.4	2.4
Core Consumer Price Index ^c						
April 2018	1.7	2.3	2.5	2.4	2.4	2.4
June 2017	2.1	2.3	2.3	2.3	2.4	2.3
GDP Price Index						
April 2018	1.9	1.8	2.1	2.0	2.1	2.1
June 2017	1.8	2.0	1.9	1.9	2.1	2.0
Employment Cost Index ^e						
April 2018	2.8	3.1	3.6	3.3	3.2	3.2
June 2017	3.1	3.3	3.4	3.2	3.1	3.2
Real Potential GDP						
April 2018	1.7	2.0	2.1	2.0	1.8	1.9
June 2017	1.6	1.7	1.8	1.7	1.9	1.8

Continued

considerably more pronounced, and the output gap does not decline to CBO's estimate of the historical average until 2024, four years later than in the previous projection. All told, for 2027, CBO's projection of real GDP is now 1.6 percent greater than the June 2017 projection.

Revisions to Projections of the Labor Market

CBO's projections of important labor market variables have been substantially revised since June. In the current projections, the 2017 tax act boosts potential output by increasing the potential supply of labor through increases in the potential labor force participation rate and in hours worked per worker. The potential labor force participation rate is higher by an average of 0.2 percentage points during the 2018–2028 period. Total potential

hours worked, the result of increases in both the potential labor force participation rate and average weekly hours, are higher by an average of nearly 0.6 percent over that period.

With the strong growth of U.S. economic output in the second half of 2017, employment has been stronger and the unemployment rate lower than CBO projected in June. CBO projects that some of that additional momentum in the labor market will carry into the projection period and that the recent tax legislation will further boost employment, both by increasing the supply of labor and by raising overall aggregate demand. Over the next several years, the projected near-term stimulus to spending increases demand for workers, putting

Table 1-4.

Continued

Comparison of CBO's Current and Previous Economic Projections for Calendar Years 2017 to 2027

	2017 ^a	2018	2019	Annual Average		Total, 2017–2027
				2017–2021	2022–2027	
Annual Average						
Unemployment Rate (Percent)						
April 2018	4.4	3.8	3.3	3.8	4.8	4.3
June 2017	4.4	4.2	4.4	4.5	4.9	4.8
Interest Rates (Percent)						
Three-month Treasury bills						
April 2018	0.9	1.9	2.9	2.6	2.9	2.8
June 2017	0.9	1.5	2.2	2.0	2.8	2.4
Ten-year Treasury notes						
April 2018	2.3	3.0	3.7	3.5	3.8	3.6
June 2017	2.4	2.8	3.2	3.1	3.7	3.4
Tax Bases (Percentage of GDP)						
Wages and salaries						
April 2018	43.1	43.2	43.5	43.5	44.2	43.9
June 2017	44.4	44.5	44.6	44.5	44.5	44.5
Domestic Corporate Profits ^f						
April 2018	8.9	9.5	9.6	9.1	8.1	8.6
June 2017	8.6	8.4	8.2	8.2	7.5	7.8

Sources: Congressional Budget Office; Bureau of Labor Statistics; Federal Reserve.

GDP = gross domestic product; PCE = personal consumption expenditures.

a. Data in this column for the April 2018 projection are actual values.

b. Real values are nominal values that have been adjusted to remove the effects of inflation.

c. Excludes prices for food and energy.

d. The consumer price index for all urban consumers.

e. The employment cost index for wages and salaries of workers in private industry.

f. Consists of domestic profits, adjusted to remove distortions in depreciation allowances caused by tax rules and to exclude the effect of inflation on the value of inventories.

downward pressure on the unemployment rate and upward pressure on wages and salaries and on labor force participation.

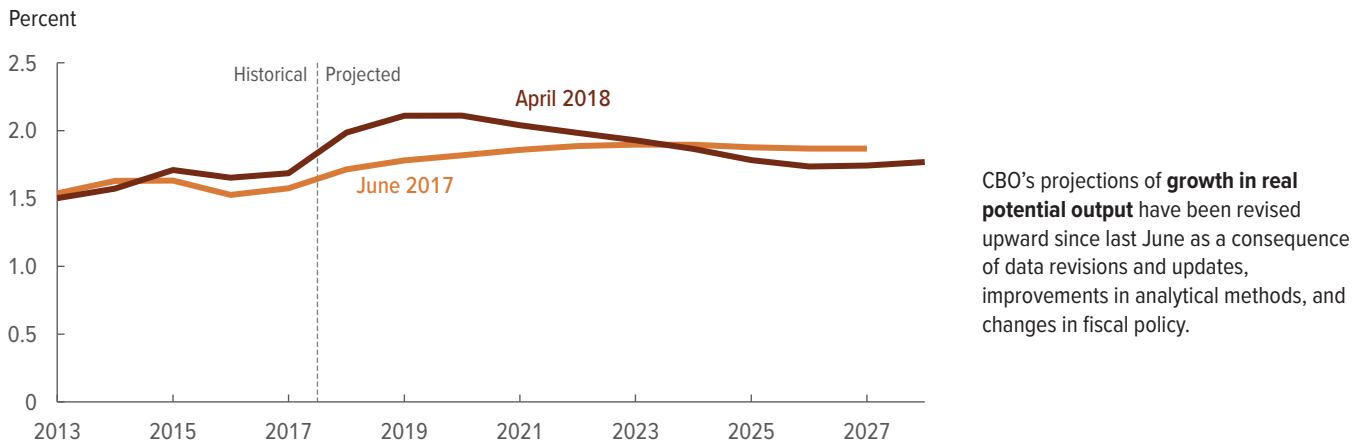
Because the factors that increase the demand for labor outweigh the factors that increase the supply of labor, CBO projects that labor markets will be tighter in the near term than it did in June. As a consequence, the agency revised downward the average unemployment rate in its projections for the 2017–2021 period by 0.7 percentage points. The average growth of wages and salaries has been revised upward by 0.1 percentage point. And the average labor force participation rate has been revised upward by 0.2 percentage points. In addition, projected increases in nonfarm payroll employment

have been boosted to about 210,000 jobs per month in 2018 and 180,000 jobs per month in 2019, up from 110,000 jobs and 30,000 jobs per month for those years, respectively, in the agency's June 2017 projections.

During the second half of the projection period, the revisions to labor market variables are smaller, as the slowing growth of economic activity restrains the demand for labor and eases the tightness of labor markets. In CBO's projections, the unemployment rate for 2022 to 2027 is about 0.2 percentage points lower, on average, than it was in June, in part because the natural rate of unemployment is lower. In addition, the rate of labor force participation is slightly higher, on average, as is the rate of growth of wages and salaries.

Figure 1-17.

Revisions to CBO's Projections of the Growth of Real Potential GDP



Source: Congressional Budget Office.

Real values are nominal values that have been adjusted to remove the effects of inflation. Potential GDP is CBO's estimate of the maximum sustainable output of the economy. Growth is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

GDP = gross domestic product.

Revisions to Projections of Inflation

CBO lowered its projection of inflation in 2018 because inflation was unexpectedly low last year. However, consistent with the larger output gap, CBO now expects greater inflationary pressure through 2024. In June, the agency projected that the rate of inflation would not rise above the Federal Reserve's target rate of 2 percent during the projection period. Inflation is now projected to exceed that target from 2019 to 2024.

Revisions to Projections of Interest Rates

CBO's upward revision to the output gap has also had implications for its projections of interest rates. With financial markets, demand for credit, and monetary policy all responding to stronger aggregate demand, CBO now expects short-term interest rates to be roughly three-quarters of a percentage point higher, on average, and long-term interest rates to be roughly a half percentage point higher, on average, from 2018 to 2021.

In later years, revisions to other factors have offsetting effects on interest rates. Interest rates have been revised upward for the later years of the projection period to reflect the projected increase in federal borrowing. Partially offsetting that effect on long-term interest rates is a revision to the agency's projection of the term premium, which CBO now expects to rise more gradually than previously anticipated, dampening long-term rates

over the decade, on average. The net result is a long-term interest rate at the end of the projection period that is largely unchanged from the June forecast. Also, CBO expects the Federal Reserve to lower the federal funds rate beginning in 2025, offsetting the upward pressure on short-term rates from increased federal borrowing. On net, short-term interest rates projected for 2027 are roughly unchanged from those in the June forecast.

Revisions to Projections of Income

Changes to CBO's projections of income made since June have affected the agency's projections of revenues and of the budget. Those changes stem primarily from two sources: revisions to historical data and changes to the economic outlook resulting largely from recent tax and spending legislation.

In July 2017, BEA released updated national income and product accounts data, which revealed that labor income, including wages and salaries and proprietors' income, was much lower in 2017 than had previously been estimated. Those revisions also revealed that corporate profits and domestic corporate profits were much higher than BEA had previously estimated. On balance, those revisions alone would suggest that taxable income would be slightly lower than it was in the June 2017 projections. However, the recent legislation raised GDP and

increased the growth of labor compensation in CBO's current projections, boosting projected labor income and domestic corporate profits above the amounts that CBO anticipated in June.

CBO has also revised its projections of equity prices since June, in part because of unexpectedly strong growth in those prices during the second half of 2017, but also because of upward revisions to projected growth in economic activity. Consequently, the agency projects higher revenues from various taxes. For example, expected revenues from taxes on realized capital gains are higher throughout the projection period than CBO projected in June 2017, particularly in the early years.

Since June, the agency has lowered its projections of labor's share of income. The estimate of labor's share of income in recent years was significantly revised downward in the national accounts released in July 2017. The anticipated acceleration of compensation had not begun by late 2017, according to those data. Nonetheless, CBO continues to project that labor's share of income will rise as labor markets tighten. Moreover, the rise in that share is now expected to be steeper than projected in June because of the upward revision to the demand for labor in CBO's projections. Despite that steeper rise, labor's share of income at the end of the 11-year period is now lower than it was in the June forecast.

Comparisons With Other Economic Projections

The agency's projections of the growth of real GDP, the unemployment rate, and interest rates in 2018 and 2019 suggest a stronger economic outlook than does the *Blue Chip* consensus forecast. CBO's projections of real GDP growth and interest rates are generally near the upper end of the range of *Blue Chip* forecasts this year and next year, and the agency's projections of the unemployment rate are near the lower end of the range in both years (see Figure 1-18). By contrast, CBO's projections of inflation (as measured by the CPI-U) are close to the middle of the range of forecasts for both years.

CBO's projections suggest a stronger economy in the near term than do the forecasts produced by Federal Reserve officials and presented at the March 2018 meeting of the Federal Open Market Committee (see Figure 1-19).¹³ The Federal Reserve reports three sets of forecasts: a median, a range, and a central tendency. The range reflects the highest and lowest forecasts of the members of the Board of Governors of the Federal Reserve System and the presidents of the Federal Reserve Banks. The central tendency reflects the range of estimates formed by removing the three highest and three lowest projections. CBO's projection of the growth of real GDP for 2018 is above both the central tendency and the range of Federal Reserve forecasts, whereas the forecast for 2019 is within both the range and the central tendency. CBO's projection of the unemployment rate for 2018 is below both the central tendency and the full range, and its projection of that rate for 2019 is at the bottom of the range. For consumer price inflation, CBO's projections are within the central tendency for both 2018 and 2019.

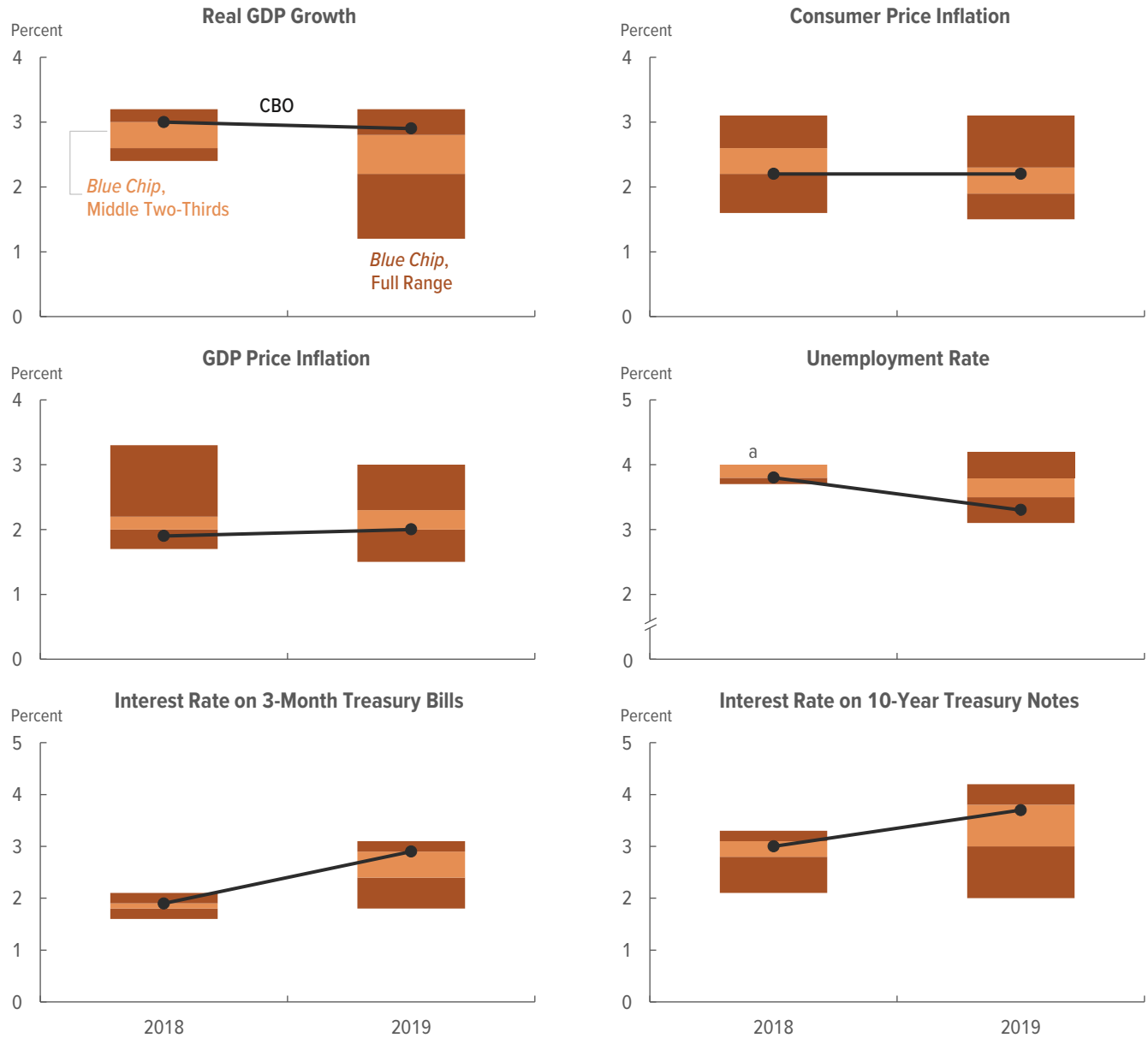
CBO's projections differ from those of other forecasters for a variety of reasons. For example, other forecasts may not yet include all of the economic effects of the federal tax and spending legislation enacted in late 2017 and early 2018, which boost economic growth and interest rates and lower the unemployment rate in CBO's projections. Also, other forecasts may incorporate expectations about future fiscal policies that differ from CBO's assumption that current law generally remains unchanged. Differences in the economic data available when the forecasts were prepared and differences in the economic and statistical models used also might account for the discrepancies. For example, outside forecasters may assume a stronger link between inflation and slack in the labor market than CBO does, which could explain why inflation is lower in CBO's forecasts than it is in other forecasts.

13. Board of Governors of the Federal Reserve System, "Economic Projections of Federal Reserve Board Members and Federal Reserve Bank Presidents Under Their Individual Assessments of Projected Appropriate Monetary Policy, March 2018" (March 21, 2018), <https://go.usa.gov/xQx5j> (PDF, 120 KB).

Figure 1-18.

Comparison of CBO’s Economic Projections With Those From the *Blue Chip* Survey

CBO’s projections suggest a stronger economy over the next two years than do many outside forecasts.



Sources: Congressional Budget Office; Wolters Kluwer, *Blue Chip Economic Indicators* (March 10, 2018).

The full range of forecasts from the *Blue Chip* survey is based on the highest and lowest of the roughly 50 forecasts. The middle two-thirds of that range omits the top one-sixth and the bottom one-sixth of the forecasts.

Real values are nominal values that have been adjusted to remove the effects of inflation. Consumer price inflation is calculated using the consumer price index for all urban consumers. Real GDP growth and inflation rates are measured from the average of one calendar year to the next.

The unemployment rate is the number of jobless people who are available for and seeking work, expressed as a percentage of the labor force. The unemployment rate and interest rates are calendar year averages.

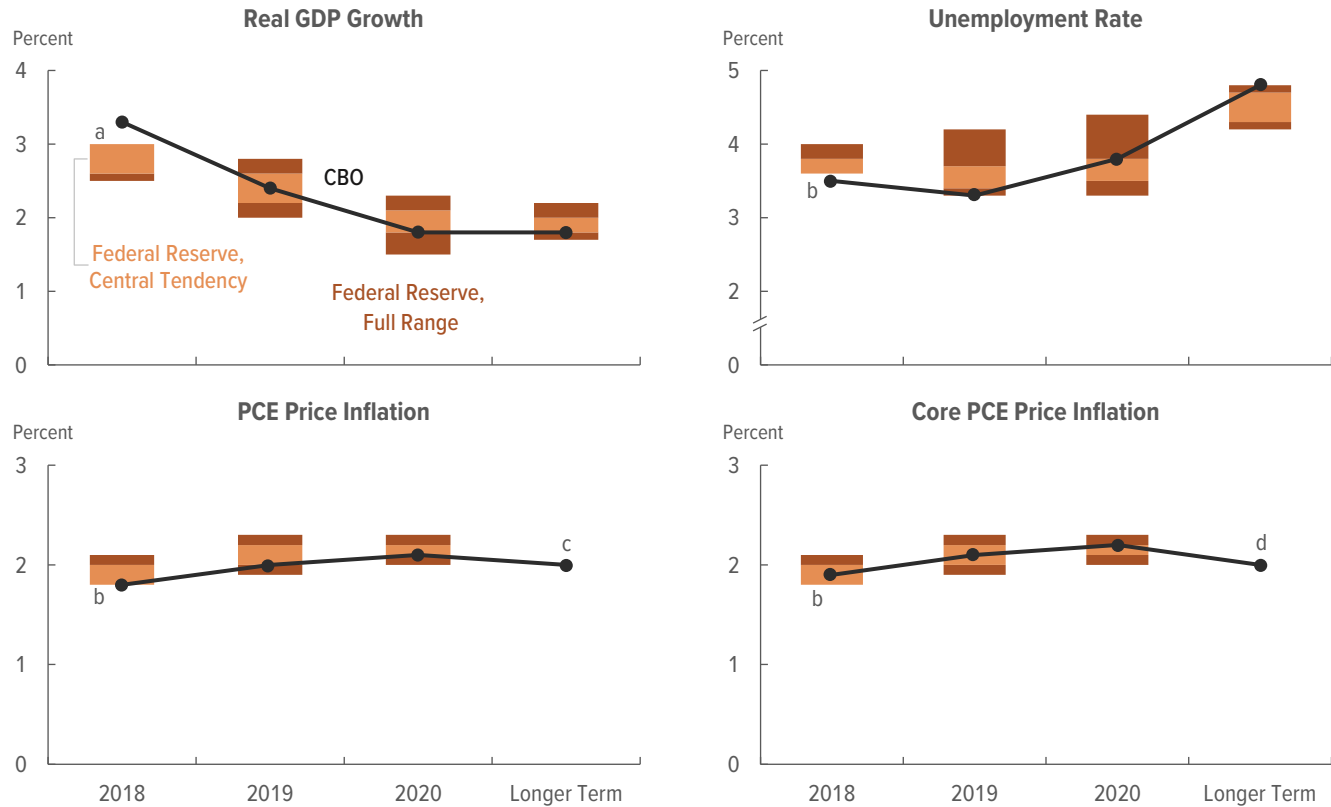
GDP = gross domestic product.

a. The upper ends of the full range and the middle two-thirds are equal.

Figure 1-19.

Comparison of CBO’s Economic Projections With Those by Federal Reserve Officials

CBO’s projections suggest a stronger economy this year than do the Federal Reserve’s recent forecasts.



Sources: Congressional Budget Office; Board of Governors of the Federal Reserve System, “Economic Projections of Federal Reserve Board Members and Federal Reserve Bank Presidents Under Their Individual Assessments of Projected Appropriate Monetary Policy, March 2018” (March 21, 2018), <https://go.usa.gov/xQx5j> (PDF, 120 KB).

The full range of forecasts from the Federal Reserve is based on the highest and lowest of the 15 projections by the Board of Governors and the president of each Federal Reserve Bank. The central tendency is the range formed by removing the 3 highest and 3 lowest projections—roughly speaking, the middle two-thirds of the full range.

For CBO, longer-term projections are values for 2028. For the Federal Reserve, longer-term projections are described as the value at which each variable would settle under appropriate monetary policy and in the absence of further shocks to the economy.

Real GDP is the output of the economy adjusted to remove the effects of inflation.

The unemployment rate is the number of jobless people who are available for and seeking work, expressed as a percentage of the labor force.

The core PCE price index excludes prices for food and energy.

Real GDP growth and inflation rates are measured from the fourth quarter of one calendar year to the fourth quarter of the next. The unemployment rate is a fourth-quarter value.

GDP = gross domestic product; PCE = personal consumption expenditures.

- a. The upper ends of the full range and central tendency are equal.
- b. The lower ends of the full range and central tendency are equal.
- c. For PCE price inflation in the longer term, the range and central tendency equal 2 percent.
- d. The Federal Reserve does not indicate a range or central tendency for core PCE price inflation in the longer term.