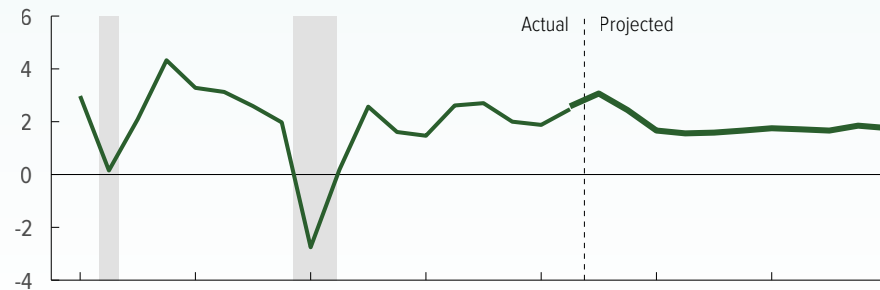


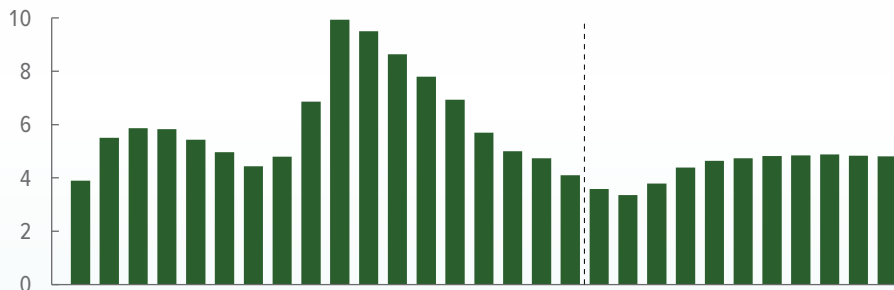
CBO

An Update to the Economic Outlook: 2018 to 2028

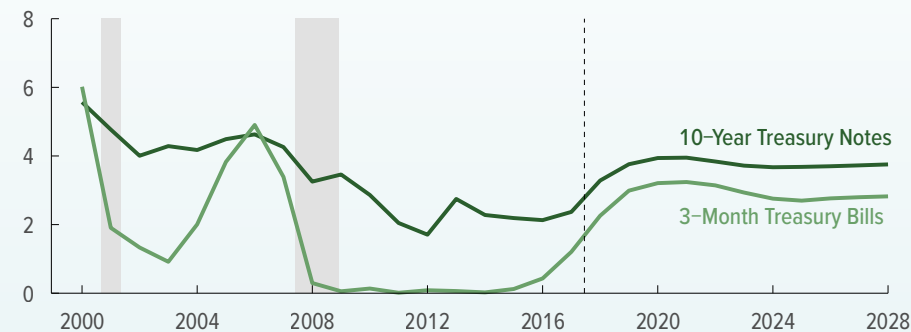
Percent



In CBO's forecast, **real GDP growth**, spurred by fiscal stimulus, is 3.1 percent this year and 2.4 percent next year.



That growth creates excess demand in the economy and lowers the **unemployment rate** through next year.



Interest rates rise over the next few years as the Federal Reserve raises the federal funds rate to reduce excess demand and the associated inflationary pressures.

Notes

Unless otherwise indicated, all years referred to in describing the economic outlook are calendar years.

Numbers in the text, tables, and figures may not add up to totals because of rounding. Also, some values are expressed as fractions to indicate numbers rounded to amounts greater than a tenth of a percentage point.

Some figures in this report have vertical bars that indicate the duration of recessions. (A recession extends from the peak of a business cycle to its trough.)

The Congressional Budget Office completed its current economic forecast in early July 2018. Unless otherwise indicated, projections of economic variables presented in this report are based on information that was available at that time. Thus, the projections do not reflect the comprehensive update to the national income and product accounts that the Bureau of Economic Analysis released on July 27. However, the actual and historical data shown in figures describing the economic forecast are based on that update, as are the discussions of recent economic events in the text.

This report does not include updates to CBO's baseline budget projections. The agency's most recent budget projections were released in May as part of *An Analysis of the President's 2019 Budget* (www.cbo.gov/publication/53884).

Supplemental data for this analysis are available on CBO's website (www.cbo.gov/publication/54318), as is a glossary of common budgetary and economic terms (www.cbo.gov/publication/42904).



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An Update to the Economic Outlook: 2018 to 2028

Summary

The Congressional Budget Office regularly updates its economic forecast to incorporate changes in the agency's methodology and to ensure that the projections reflect recent economic developments and current law. This report presents the agency's latest economic forecast, which includes the following key projections of real (inflation-adjusted) gross domestic product (GDP) and other factors:

- **In 2018, real GDP is projected to grow by 3.1 percent.** That is about 0.6 percentage points faster than the pace of its growth in 2017 (see Figure 1). The pickup in growth is largely the result of increases in government spending, reductions in taxes, and faster growth in private investment. For the second half of the year, CBO expects real GDP to grow at roughly the same average pace as it grew in the first half of the year, which would represent a moderation following the 4.1 percent annualized growth of GDP reported in the second quarter. Such moderation occurs because several factors that boosted second-quarter growth—including a rebound in the growth of consumer spending from a weak first quarter and a surge in agricultural exports—are expected to either fade or reverse. In 2019, the pace of GDP growth slows to 2.4 percent in the agency's forecast as growth in business investment and government purchases slows.
- **Growth of actual output is expected to outpace the growth of its maximum sustainable amount through the rest of 2018 and 2019, creating excess demand in the economy.** Although that growth in actual output leads to lower unemployment rates and higher income in CBO's forecast, it also creates demand for goods, services, and labor that exceeds the economy's long-run capacity to supply them.
- **Excess demand will put upward pressure on prices, wages, and interest rates over the next few years.** In CBO's forecast, the growth of actual output slows markedly after 2019 because higher interest rates,

along with the slower growth of federal outlays projected under current law, restrain demand. As the excess demand dissipates, the unemployment rate rises and inflation and interest rates fall. By 2022, the excess demand in the economy disappears.

- **From 2023 to 2028, real GDP is projected to grow by about 1.7 percent each year.** That is slightly slower than potential output grows, on average. (Potential output is CBO's estimate of the maximum sustainable output of the economy.) The difference between actual and potential output arises because of a slight, temporary slowdown in the growth of actual output from 2025 to 2026, when some of the major provisions of the 2017 tax act (Public Law 115-97, originally called the Tax Cuts and Jobs Act) are scheduled to expire.

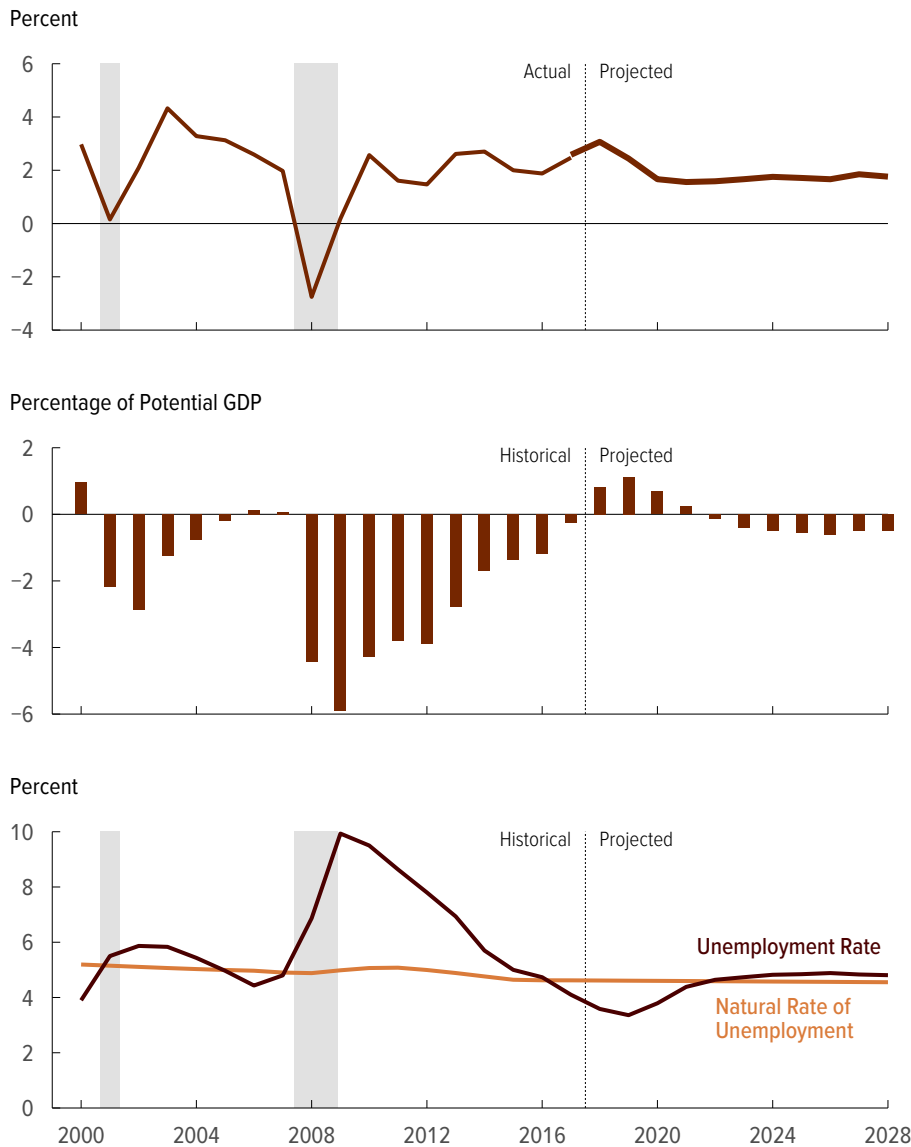
Although CBO's current economic forecast does not differ significantly from the forecast that the agency published in April 2018, it nevertheless incorporates several important changes. For example, the current forecast is based on the path for discretionary spending specified in CBO's most recent budget projections, which were released in May.¹ That path includes less fiscal stimulus over the next few years than did the path that the agency used when it previously projected economic growth. That revision slightly lowered the agency's projections of output growth and interest rates in the near term. Additionally, CBO has further revised downward its forecast of interest rates over much of the projection period on the basis of information about financial markets and the projections of other forecasters. It has also revised slightly upward its near-term inflation forecast on the basis of recent data on consumer prices.

The economic projections in this report do not differ significantly from those of other forecasters. They are slightly stronger in the near term than most of the

1. See Congressional Budget Office, *An Analysis of the President's 2019 Budget* (May 2018), Table 1, www.cbo.gov/publication/53884.

Figure 1.

CBO's Economic Forecast at a Glance



In CBO's forecast, **real GDP growth**, spurred by fiscal stimulus, is 3.1 percent this year and 2.4 percent next year.

That growth creates excess demand in the economy, which pushes GDP above potential GDP, resulting in a positive **output gap** and . . .

. . . lowering the **unemployment rate** below CBO's estimate of the **natural rate of unemployment**.

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 changes in prices. Real GDP growth is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

Excess demand exists when the demand for goods and services exceeds the amount that the economy can sustainably supply. Potential GDP is CBO's estimate of the maximum sustainable output of the economy. The output gap is the difference between 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.

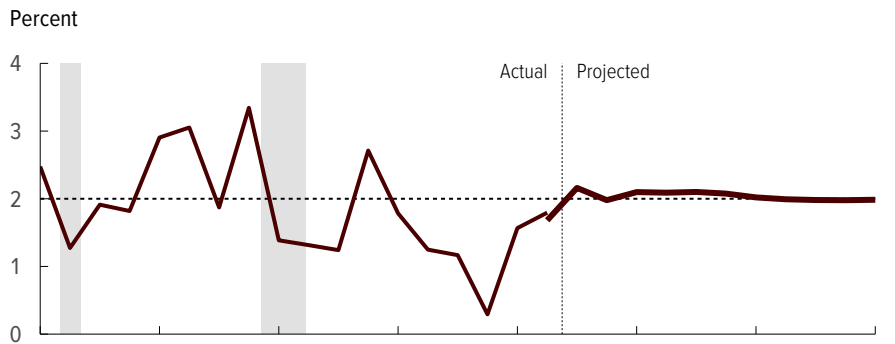
The unemployment rate is the number of jobless people who are available for and actively seeking work, expressed as a percentage of the labor force. The natural unemployment rate is the rate arising from all sources except fluctuations in the overall demand for goods and services. For the unemployment rate and the natural unemployment rate, data are fourth-quarter values.

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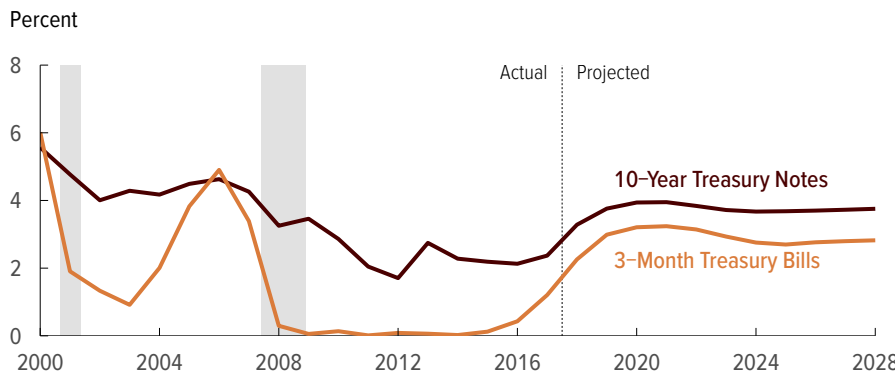
Figure 1.

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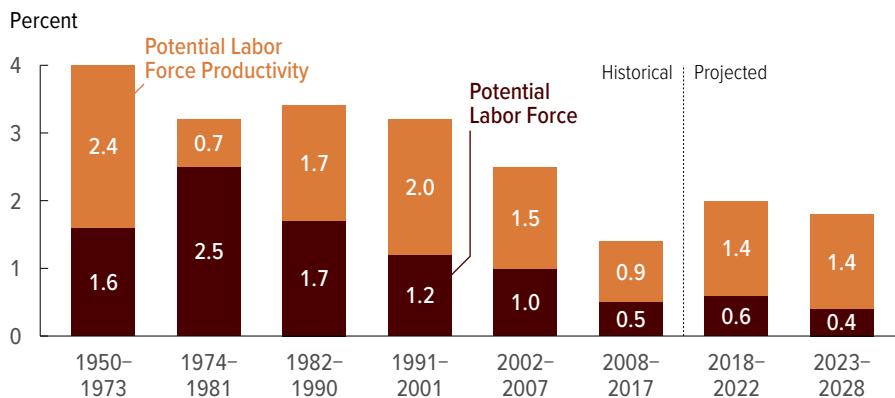
CBO’s Economic Forecast at a Glance



Excess demand also pushes the rate of **inflation in consumer prices** above the Federal Reserve’s target of 2 percent this year.



Interest rates rise over the next few years as the Federal Reserve raises the federal funds rate to reduce excess demand and the associated inflationary pressures.



The projected **growth of real potential GDP** (the sum of the growth of the potential labor force and the growth of potential labor force productivity) is faster than it has been since 2008 but slower than it was in previous periods.

Inflation in consumer prices is based on the price index for personal consumption expenditures and is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The federal funds rate is the interest rate that financial institutions charge each other for overnight loans of their monetary reserves. The data for interest rates are fourth-quarter values.

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.

Values for real GDP growth and inflation in consumer prices from 2000 to 2017 (the thin line in the top panel on each page) reflect revisions to the national income and product accounts that the Bureau of Economic Analysis released on July 27, 2018. Values from 2017 to 2028 (the thick lines) reflect the data available when the projections were made in early July.

GDP = gross domestic product.

forecasts by the private-sector economists who contributed to the July 2018 *Blue Chip Economic Indicators*. They are somewhat stronger in the near term and weaker in the long term than the latest forecasts by Federal Reserve officials.

The Economic Effects of Recent Changes in Fiscal Policy

Three pieces of legislation enacted in the past year significantly affected fiscal policy and CBO's economic outlook.² The first, the 2017 tax act, permanently lowered the top corporate income tax rate to 21 percent and changed the way that business's foreign income is taxed. The act also lowered individual income tax rates and broadened the base of income subject to tax through 2025. In addition, it included various provisions that affect how businesses and individuals calculate their taxable income. The two other pieces of legislation affected spending. The Bipartisan Budget Act of 2018 (P.L. 115-123) increased the caps on discretionary funding for 2018 and 2019 and provided substantial funding for emergency assistance. The Consolidated Appropriations Act, 2018 (P.L. 115-141), provided appropriations for all discretionary accounts for 2018.

As noted in its April 2018 report, CBO estimates that the 2017 tax act will have appreciable effects on the U.S. economy. 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 potential output over the entire projection period.³ In addition, higher disposable (after-tax) income for households will, in CBO's estimate, boost the demand for goods and services, raising actual GDP slightly above its potential and generating some inflationary pressure during the first half of the projection period. In the meantime, those effects will be partly offset by the larger deficits created by the tax act. In later years, as many

2. In the agency's previous economic forecast, published in April 2018, CBO presented its estimate of the effects of those fiscal policy changes on the U.S. economy over the next 11 years. See Congressional Budget Office, *The Budget and Economic Outlook: 2018 to 2028* (April 2018), www.cbo.gov/publication/53651.

3. A marginal tax rate is the percentage of an additional dollar of income that is paid in taxes. For details on how CBO projects potential output, 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.

temporary provisions of the 2017 tax act phase out or expire, growth of actual GDP falls below the growth of potential output in CBO's projections, but the law's total effect on the levels of investment, employment, and output remains positive through 2028. That occurs because the positive effect on incentives from the provisions that were still in place would more than offset the negative effect of greater federal borrowing.

The increases in federal outlays in the next few years that result from the Bipartisan Budget Act of 2018 and the Consolidated Appropriations Act, 2018, will boost aggregate demand and increase the federal budget deficit in the near term, CBO estimates. In CBO's projections, the additional federal spending adds to the existing excess demand and inflationary pressures. Higher interest rates and greater federal borrowing ultimately "crowd out" some private activities, particularly private investment, in later years.

CBO's economic projections incorporate the federal deficits in the agency's adjusted baseline budget projections that were published in May. Each year's federal budget deficit is linked to the flows of domestic saving and investment, as well as to the current-account balance (see Box 1).⁴ In CBO's current economic projections, federal deficits and current-account deficits rise for the next few years, reflecting increases in borrowing by the federal government and increases in lending to the United States by foreign investors.

The Economic Outlook for 2018 to 2022

CBO expects real GDP to grow by 3.1 percent this year, by 2.4 percent in 2019, and by an average of 1.6 percent each year from 2020 through 2022 (see Table 1).⁵ Most

4. The current-account balance is a summary measure of a country's current transactions with the rest of the world, including net exports, net unilateral transfers, and net income from abroad.

5. CBO completed its economic projections in early July, and therefore the projections do not reflect the benchmark revision of the national income and product accounts (NIPAs), which the Bureau of Economic Analysis (BEA) released on July 27. This year's comprehensive update included several important changes to NIPA definitions and methods that affected historical data from 1929 through the first quarter of 2018. In addition, BEA also released an early estimate for the second quarter of 2018. CBO's initial review of those recently released data suggested that they would not substantially change the projections of GDP growth and of other key economic variables that are presented in this report. That said, CBO's estimate of potential GDP also depends on the revised information on capital stock, which has not yet been released.

Table 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	3.1	2.4	1.7	1.6	1.7
Nominal	4.5	5.1	4.7	3.9	3.8	3.9
Inflation						
PCE price index	1.7	2.2	2.0	2.1	2.1	2.0
Core PCE price index ^b	1.5	2.1	2.1	2.2	2.1	2.0
Consumer price index ^c	2.1	2.5	2.3	2.5	2.5	2.4
Core consumer price index ^b	1.7	2.3	2.6	2.7	2.5	2.4
GDP price index	1.9	2.0	2.2	2.2	2.2	2.1
Employment Cost Index ^d	2.8	3.4	3.6	3.6	3.4	3.1
Fourth-Quarter Level (Percent)						
Unemployment Rate	4.1	3.6	3.4	3.8	4.6 ^e	4.8 ^f
Percentage Change From Year to Year						
Gross Domestic Product						
Real ^a	2.3	3.0	2.8	1.9	1.6	1.7
Nominal	4.1	5.1	4.9	4.1	3.8	3.9
Inflation						
PCE price index	1.7	2.1	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	2.5	2.2	2.5	2.5	2.4
Core consumer price index ^b	1.8	2.2	2.4	2.7	2.6	2.4
GDP price index	1.8	2.0	2.1	2.2	2.2	2.1
Employment Cost Index ^d	2.6	3.1	3.4	3.6	3.5	3.1
Annual Average						
Unemployment Rate (Percent)	4.4	3.8	3.4	3.6	4.4	4.8
Payroll Employment (Monthly change, in thousands) ^g	181	210	178	63	26	57
Interest Rates (Percent)						
Three-month Treasury bills	0.9	1.9	2.8	3.1	3.2	2.8
Ten-year Treasury notes	2.3	3.0	3.6	3.9	3.9	3.7
Tax Bases (Percentage of GDP)						
Wages and salaries	43.1	43.1	43.4	43.7	43.9	44.1
Domestic corporate profits ^h	8.9	9.5	9.6	9.1	8.6	8.3

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

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

a. Real values are nominal values that have been adjusted to remove the effects of changes in prices.

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. The average monthly change, calculated by dividing by 12 the change in payroll employment from the fourth quarter of one calendar year to the fourth quarter of the next.

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.

Box 1.

Federal Deficits, Domestic Saving and Investment, and the Current-Account Balance

Federal deficits reduce national saving (total saving by households, businesses, and governments) and the amount of funds available for private investment in productive capital.¹ The reduction in the amount of funds depends on the magnitude of the resulting increases in private saving and in net inflows of foreign capital (foreign purchases of U.S. assets minus U.S. purchases of foreign assets). Because federal deficits are linked to domestic and foreign saving and investment flows, the Congressional Budget Office considers the interactions among the following three saving-investment balances when it assesses current fiscal and financial conditions and prepares its economic forecast (see the figure):

- *The federal budget balance*—the difference between the federal government’s revenues and outlays. When the federal government runs a budget deficit (that is, when outlays exceed revenues), the Treasury borrows money by selling securities to the general public.² The funds for such borrowing come from two principal sources: nonfederal domestic entities (businesses, nonprofit organizations, households, and state and local governments) and foreign investors (government and private). For example, when federal borrowing rises, U.S. businesses may increase their lending to the U.S. government by reallocating their saving from private assets (and thus decreasing investment in capital) or by increasing their rate of saving. In addition, foreign governments and private investors may increase their investment in U.S. debt. The United States’ federal budget balance has been in deficit since the 1970s except for in fiscal years 1998 to 2001.
- *The current-account balance*—the difference between exports and imports (net exports, a measure often referred to as the trade balance), plus net international income (the difference between the income earned by U.S. residents from foreign sources and the income earned by foreign

individuals from U.S. sources) and net international transfers (the difference between the inflows and outflows of transfer payments, such as remittances and foreign aid). A country’s current-account balance reflects the amount of its domestic saving (by both private- and public-sector entities) compared with the amount of investment in that country. When a country runs a current-account deficit, it borrows from abroad to finance an excess of investment over saving. In other words, a country with a current-account deficit is a net borrower on international markets, whereas a country with a current-account surplus is a net lender. The U.S. current account has been in deficit since the early 1980s. Though current-account deficits are a sign of strong foreign demand for investments in the United States, large and sustained current-account deficits have often served as a prelude to disruptive economic and financial events.

- *The nonfederal domestic balance*—the difference between saving and investment of nonfederal domestic entities, which is calculated here by subtracting the federal budget balance from the current-account balance. In most years, this balance is positive, indicating that, taken together, nonfederal domestic entities are net lenders. When the balance is negative, as it was from 1997 through 2008, the current-account deficit exceeds the federal deficit and the nonfederal domestic entities are net borrowers.

The interactions among those balances reflect, and help to illustrate, underlying developments in the economy over time. For example, the unique pattern of the balances in the early years of this century reflected increased borrowing by households and businesses that later proved to be unsustainable. Starting with the recession of 2001 and continuing through the expansion of the early- to mid-2000s, both the federal government and the U.S. domestic private sector were net borrowers. That borrowing was funded by foreign investors, and current-account deficits climbed throughout the period, reaching an all-time high of 6.0 percent of gross domestic product (GDP) in fiscal year 2006. Following the onset of the 2007–2009 recession, the private sector drastically cut its borrowing while the federal government’s borrowing dramatically increased. On net, the current-account deficit fell to 3.0 percent of GDP at the trough of the recession in 2009. From 2009 through 2017, current-account deficits averaged 2.7 percent of GDP.

1. See Jonathan Huntley, *The Long-Run Effects of Federal Budget Deficits on National Saving and Private Domestic Investment*, Working Paper 2014-02 (Congressional Budget Office, February 2014), www.cbo.gov/publication/45140.

2. The federal government also borrows for other purposes, including to adjust cash balances and to manage the cash flows associated with federal credit programs such as student loans. This analysis is concerned only with borrowing used to fund the federal deficit.

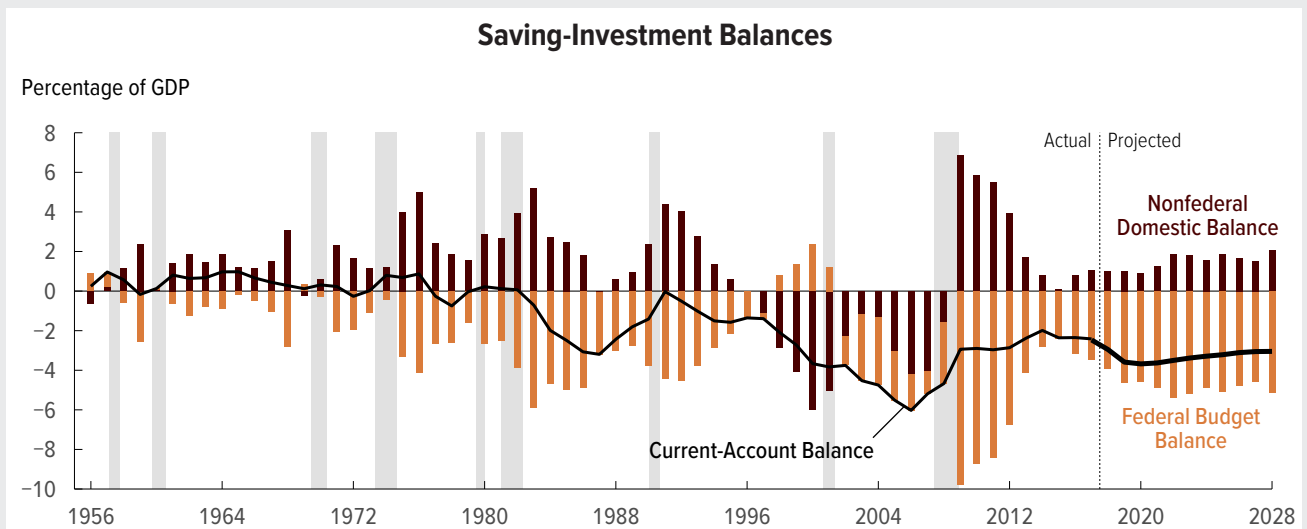
Box 1.

Continued

Federal Deficits, Domestic Saving and Investment, and the Current-Account Balance

The pattern of the three balances shifts somewhat over time in CBO’s projections. In the near term, the current-account deficit rises from 2.4 percent of GDP in 2017 to 3.6 percent in 2021, driven mainly by growing federal budget deficits. In the baseline budget projections that CBO published in May, federal deficits as a share of GDP rise by roughly 1.4 percentage points between 2017 and 2021, from 3.5 percent to 4.9 percent. The nonfederal domestic balance stays roughly stable over that same period, averaging 1.0 percent of GDP each year.

From 2022 to 2028 in CBO’s forecast, the current-account deficit shrinks steadily to 3.0 percent of GDP. That occurs despite the fact that federal budget deficits remain elevated, hovering around 5 percent of GDP. The current-account deficit shrinks primarily because of projected slower growth in domestic investment relative to saving, which is reflected in an increasing nonfederal domestic balance. In CBO’s projections, that balance rises from 1.3 percent of GDP in 2021 to 2.1 percent in 2028.



Sources: Congressional Budget Office; Bureau of Economic Analysis; Office of Management and Budget.

The federal budget balance is the difference between revenues and spending. The current-account balance is the difference between exports and imports (net exports), plus net international income (the difference between the income earned by U.S. residents from foreign sources and the income earned by foreign individuals from U.S. sources) and net international transfers (the difference between the inflows and outflows of transfer payments, such as remittances and foreign aid). The nonfederal domestic balance is the current-account balance minus the federal budget balance. It is primarily the difference between saving and investment in the private sector and the state and local government sector.

Values for 2000 to 2017 reflect revisions to the national income and product accounts that the Bureau of Economic Analysis released on July 27, 2018. Values for 2018 to 2028 (and for the current-account balance, those for 2017 to 2028 represented by the thick line) reflect the data available when the projections were made in early July.

All years are fiscal years.

GDP = gross domestic product.

of the growth of output in CBO's forecast over the next few years is driven by consumer spending and, to a lesser extent, business investment. In addition, in 2018 and 2019, demand from the federal, state, and local governments, on net, adds to the growth of output while net exports (exports minus imports) generally offset those contributions to GDP growth.

Output growth is expected to exceed the growth of potential output over the next two years and create excess demand for goods and services in the economy. Since the 2007–2009 recession ended, real GDP has grown faster than real potential GDP, on average, reducing the gap between the two. By early this year, output was about equal to potential output, and the output gap—the difference between actual and potential GDP, expressed as a percentage of potential GDP—was closed. As the growth of actual output continues to outpace the growth of potential output through most of next year, the output gap widens in CBO's forecast until late 2019 and remains positive until late 2022.

That excess demand for goods and services leads to a heightened demand for workers in CBO's forecast, which lowers the unemployment rate below the agency's estimate of the natural rate of unemployment. (The natural rate of unemployment is the rate arising from all sources other than fluctuations in the overall demand for goods and services, including normal job turnover and the structural mismatch between the skills that jobs require and those that job seekers possess.)

The excess demand also puts upward pressure on interest rates and price and wage inflation. Those higher interest rates, along with slower growth in federal spending, in turn restrain growth in later years.

Actual Output (Gross Domestic Product)

Economic growth was uneven but fairly robust, on average, in the first half of 2018. Real GDP growth started at an annual rate of just 2.2 percent in the first quarter of this year before accelerating to 4.1 percent in the second quarter. However, the strong second-quarter growth was boosted in large part by a rebound in the growth of consumer spending after recent weakness and a surge in agricultural exports, neither of which will, in CBO's view, persist in the second half of this year.

Despite the volatility in the rate of GDP growth in the first and second quarters of the year, CBO expects the

momentum underlying that growth to largely continue into the second half of the year before slowing gradually in subsequent years. CBO estimates that real GDP will grow by a total of 3.1 percent in 2018 (up from 2.5 percent in 2017) and by 2.4 percent in 2019. Growth of real GDP is expected to slow further after 2019, averaging 1.6 percent per year between 2020 and 2022.

In CBO's projections, the above-trend growth of real GDP in 2018 mainly reflects robust growth in business fixed investment (businesses' purchases of equipment, nonresidential structures, and intellectual property products) and purchases by the federal, state, and local governments. Consumer spending, which accounts for more than two-thirds of economic output, grows relatively modestly, on average, in 2018 before picking up momentum in 2019 and supporting real output growth when growth in investment and government purchases slows down. By contrast, net exports make a slightly negative contribution to GDP growth in both 2018 (despite a surge in the second quarter) and 2019. From 2020 to 2022, GDP growth in CBO's forecast reflects primarily continued moderate growth in consumer spending but also growth in business and residential investment; total government purchases and net exports have little impact on GDP growth after 2019.

Consumer Spending. CBO expects that consumer spending on goods and services will grow by 2.1 percent in 2018—less than the 2.7 percent that such spending grew in 2017—and by 2.9 percent in 2019; such growth is projected to account for less than half of the growth of real GDP in 2018 but more than three-quarters of output growth in 2019. In CBO's projections, growth in consumer spending stems mainly from growth in disposable income, which reflects a combination of rising labor and capital income in the strong economy and lower income tax rates under current law. However, the agency anticipates that many households will respond to the smaller personal tax liabilities gradually and that the effect of increases in after-tax income will therefore not fully translate into more consumer spending until 2019. (Consumer spending did grow robustly in the second quarter of 2018; however, in CBO's view, that growth mainly reflects a rebound from a very weak first quarter.) Rising gasoline prices, which dampen the gains in real income, also restrain the growth in real consumption in 2018. In the meantime, household financial conditions, which include continuing gains in household wealth and increasing access to credit, are expected to be broadly

supportive of consumer spending. Annual growth in consumer spending slows in the agency's projections to 2.2 percent in 2020 and to less than 2.0 percent in 2021 and 2022 as interest rates and prices rise and growth in income slows.

Business Investment. In CBO's projections, the pace of growth in real business investment accelerates significantly in 2018, reaching 8.9 percent (substantially faster than the 5.3 percent growth recorded in 2017) and accounting for nearly one-third of the growth of real GDP for the year. That robust growth in business investment reflects several factors: increased incentives for investment under the 2017 tax act, the accelerated growth of output that stems in part from the tax act and the legislated increases in federal outlays, a rebound from the unusually weak inventory investment in late 2017 and the most recent quarter, greater incentives for oil exploration and development created by higher oil prices, and the easing of existing regulations coupled with a slowdown in new regulatory activity.

Growth in business investment gradually slows between 2019 and 2022 in the agency's forecast, as most of the effect of those forces on growth wanes. In particular, although provisions in the tax act increase incentives in those years, they do so by less each year than they do in 2018 and thus lead to less growth in investment. In addition, GDP growth slows in those years as the fiscal stimulus provided by federal spending diminishes and as an increasing supply of oil puts downward pressure on oil prices and slows investment in oil drilling.

Residential Investment. CBO anticipates that growth in real residential investment will remain subdued in 2018 before picking up considerably in subsequent years. In the agency's projections, real residential investment grows by 2.5 percent in 2018 (down from 3.8 percent in 2017), by 5.0 percent in 2019, and by an average of 4.1 percent each year from 2020 to 2022. The slow growth in residential investment in 2018 is attributable in part to the 2017 tax act, which included provisions that reduced the incentives to own homes. The subsequent pickup in growth from 2019 through 2022, by contrast, mainly reflects the continued strength in household formation and the continued easing of mortgage lending standards.

Government Purchases. If current laws governing federal taxes and spending generally remained in place, total

real purchases of goods and services by the federal, state, and local governments would increase by 2.8 percent in 2018 and by only 0.5 percent in 2019, CBO estimates. From 2020 to 2022, the growth of total real government spending is projected to largely disappear because of a sharp decrease in federal purchases that is only partially offset by an increase in state and local purchases. Specifically, in CBO's projections, real purchases by the federal government fall by an average rate of roughly 1 percent per year from 2020 to 2022, reflecting the existing caps on discretionary funding in place through fiscal year 2021 and the assumption that funding will grow at the rate of inflation thereafter. By contrast, real purchases by state and local governments are projected to increase at an average annual rate of 0.9 percent in those years as both demand for their services and the tax revenue that funds those services rise.

Net Exports. After declining for several years, real net exports are projected to continue to decline through 2019 before stabilizing over the following three years. In CBO's current economic projections, real imports grow faster, on average, than real exports in both 2018 and 2019. (Although there was a surge in agricultural exports in the second quarter of 2018, it will, in the agency's view, be reversed over the second half of the year.) Over the next two years, strong growth in demand in the United States will, in CBO's estimate, boost the growth rate of real imports of goods and services. The growth of real exports, by contrast, is projected to slow in those years because the agency expects that the economies of the United States' trading partners will experience a moderate slowdown in GDP growth. The exchange value of the dollar is expected to remain relatively stable through 2019.⁶ As a result of those factors, in CBO's projections, real net exports decline and subtract 0.2 percentage points from GDP growth in both 2018 and 2019.⁷ After 2019, the effects of those factors diminish, slowing the decline in real net exports. From 2020

6. CBO's measure of the exchange value of the dollar is an export-weighted average of the exchange rates between the dollar and the currencies of the United States' leading trading partners.

7. Although a decline in net exports appears to make negative contributions to GDP growth in 2018 and 2019 in CBO's projections, that does not imply that an increase in imports will reduce GDP growth. Increases in imports reduce the contribution of net exports to GDP growth, but they also contribute positively to other components of GDP growth because imports are included in domestic demand as part of consumption, investment, and government spending.

through 2022, real net exports have little impact on GDP growth.

Recent changes to tariffs made by the United States and its trading partners are expected to reduce trade between them. Since the beginning of this year, the United States has raised tariffs on imported solar panels, washing machines, steel, and aluminum. In July, it imposed additional tariffs on about \$34 billion worth of Chinese goods, including semiconductors, plastics, and capital equipment.⁸ In response to higher U.S. import tariffs, Canada, the European Union, and China have raised tariffs on U.S. exports. By making imported goods more costly in the United States and U.S. exports more costly abroad, those changes in tariffs are expected to reduce the volume of both real imports and exports.

Because the new tariffs that were in place when CBO completed its forecast in early July affected goods that accounted for less than 1.5 percent of the total value of U.S. trade, they had a very limited effect on CBO's economic projections. However, trade policy has already changed since early July and may continue to evolve, so the effects of new tariffs on the economy—and thus on CBO's future projections—may become more substantial. (See the discussion of trade policy changes in the section “Some Uncertainties in the Economic Outlook” below.)

Potential Output and the Output Gap

CBO's near-term forecast reflects not only anticipated fluctuations in aggregate demand but also projected changes in aggregate supply. In the agency's projections, potential output—a measure of the economy's fundamental capacity to supply goods and services—grows by an average of 2.0 percent per year from 2018 to 2022, roughly 0.6 percentage points more than it has grown annually, on average, since 2008. Although the growth of potential output is determined primarily by long-run forces (such as trends in population growth, the labor force participation rate, and productivity), the acceleration of that growth over the next few years in CBO's forecast is also driven by the 2017 tax act, which according to the agency's estimates, boosts investment (and therefore labor productivity) and labor supply and thus increases the economy's underlying productive capacity.⁹

CBO's forecasts of the growth of actual and potential GDP imply that there will be excess demand for goods and services in the economy throughout most of the 2018–2022 period. In the agency's projections, the output gap widens from zero in the first half of 2018 to a cyclical peak of 1.1 percent of potential GDP by late 2019. At the same time, as a result of the 2017 tax act, potential output growth accelerates, slowing the increase in the output gap, mitigating the inflationary pressure associated with that gap, and facilitating growth in actual output. Still, starting in 2020, higher prices and interest rates, along with the decline in federal outlays projected under current law, slow actual GDP growth in relation to the growth of potential GDP, steadily narrowing and ultimately eliminating the output gap by 2022.

The Labor Market

The labor market continued to improve in the first half of 2018. The primary measure that CBO uses to assess the degree of slack in the labor market—the employment gap, or the difference between employment and potential employment—indicated that there was no slack remaining by early 2018.¹⁰ That elimination of slack in the labor market occurred because of a drop in the unemployment rate (which has been below its estimated natural rate since early 2017) and the continued stability of the labor force participation rate (which is approaching its potential level though it remains below it). The potential labor force participation rate is itself trending down in the long run because of demographic pressures.

In CBO's projections, the growth of aggregate demand increases demand for labor beyond its maximum sustainable level, leading to a positive employment gap for the rest of 2018 and through 2022. The employment gap peaks at roughly 2 million people in late 2019. (Employment as a percentage of the population also peaks in 2019, at about 60.7 percent.) In terms of monthly job growth, payroll employment in the non-farm business sector grows by roughly 210,000 jobs per month in 2018 (up from 181,000 jobs per month in 2017) and by approximately 180,000 jobs per month in 2019. From 2020 to 2022, slower economic growth slows employment growth sharply—to an average of

8. CBO's economic projections were completed before those tariffs on Chinese goods took effect.

9. The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are at least 16 years old and are either working or seeking work.

10. Potential employment is CBO's estimate of the number of people who would be employed if the unemployment rate equaled its natural rate and if the labor force participation rate equaled its potential rate.

38,000 jobs per month—reducing the employment gap to about half a million workers by the end of 2022.¹¹

CBO's projections of employment relative to its potential also reflect the agency's forecasts of changes in the rate of unemployment and the size of the labor force, which partly offset each other over the 2018–2022 period. In CBO's projections, the unemployment rate continues to drop, from about 4 percent in the first half of 2018 to about 3.3 percent by the end of 2019, and then rises gradually and approaches its natural rate of 4.6 percent over the 2020–2022 period as economic growth slows. The labor force, in contrast, approaches (but remains below) its estimated potential size in 2018 and 2019 and slightly exceeds its potential between 2020 and 2022. The labor force participation rate, which has hovered around 62.8 percent since 2014, remains relatively stable at that rate from 2018 through 2022 as excess demand for labor offsets demographic pressures, which continue to push down the rate's long-run trend.

The increased demand for labor and competition for workers boost the growth of hourly labor compensation (a measure that includes benefits as well as wages and salaries) in CBO's projections. The increase in labor compensation, in turn, dampens demand for labor, slowing employment growth and, by 2020, diminishing the positive employment gap. In particular, the annual growth rate of the employment cost index (ECI) for wages and salaries of workers in private industries rises from 2.8 percent in 2017 to 3.4 percent in 2018 and peaks at 3.6 percent in 2020 before slowing to 3.3 percent by 2022 and further to 3.0 percent in the long term.

Inflation

Inflation picked up considerably in late 2017 and the first half of 2018, after slowing markedly during much of 2017. The annual growth rate of the price index for personal consumption expenditures (PCE)—the measure that the Federal Reserve uses to set its long-run inflation target—reached and surpassed the target rate of 2.0 percent in the middle of 2018. Excluding food and energy prices, which tend to be volatile, the core PCE price index is also approaching 2.0 percent annual growth. Energy, health care, and shelter are among the categories with the greatest price increases. In addition,

newly imposed tariffs have led to higher prices for certain imported goods; however, the effect on the prices of consumer goods—and thus the effect of those tariffs on domestic inflation—has so far been very limited.

Over the next few years, excess demand is expected to put more upward pressure on inflation. The Federal Reserve is expected to tighten monetary policy and, aided by market participants' stable expectations of future inflation, prevent inflation from substantially exceeding its long-run target. In CBO's projections, growth in the core PCE price index is 2.1 percent (measured from the fourth quarter of one year to the fourth quarter of the next) in both 2018 and 2019 and peaks at 2.2 percent in 2020. The core consumer price index for urban households (CPI-U), which historically tends to grow faster than the PCE price index, rises by 2.3 percent in 2018, by 2.6 percent in 2019, and by 2.7 percent in 2020. As interest rates rise and the excess demand in the economy dissipates, inflation slows after 2020 in CBO's forecast. By 2022, the core PCE inflation falls back to 2.1 percent, and the core CPI-U inflation, to 2.5 percent.

Interest Rates

CBO expects the Federal Reserve to continue to raise the target range for the federal funds rate (the interest rate that financial institutions charge each other for overnight loans of their monetary reserves) over the next few years in response to excess demand and increased inflationary pressures in the economy. In CBO's projections, the federal funds rate rises from 1.6 percent in the first half of 2018 to 2.8 percent in 2019 before reaching 3.4 percent, where it remains from 2020 to 2022.

The interest rates on 3-month Treasury bills and 10-year Treasury notes are also expected to be substantially higher over the next few years. The interest rate on 3-month Treasury bills rises from 1.9 percent in the first half of 2018 to 2.8 percent in 2019 and to 3.2 percent by 2021; it falls slightly after 2021 as excess demand for goods and services diminishes and inflationary pressure dissipates. Similarly, the interest rate on 10-year Treasury notes rises from 2.8 percent in the first half of 2018 to a cyclical peak of nearly 4.0 percent in 2021 before falling slightly, back to 3.8 percent, by the end of 2022.

CBO's projections of long-term interest rates over the next few years reflect several factors. First, they incorporate the anticipated movements of short-term interest

11. In CBO's projections, payroll employment is slightly higher in 2020, reflecting an anticipated increase in the number of temporary workers hired by the Census Bureau to conduct the decennial census.

rates. Second, an increase in the term premium (the premium paid to bondholders for the extra risk associated with holding longer-term bonds), which has historically moved up and down with the business cycle, is projected to contribute to some of the rise in long-term rates. Finally, CBO expects the ongoing reduction in the Federal Reserve's portfolio of long-term assets to provide a slight boost to long-term interest rates. Despite that boost, however, CBO expects the difference between long-term and short-term rates (referred to as the yield curve slope) to flatten through 2022.

The Economic Outlook for 2023 to 2028

CBO's projections of GDP, unemployment, inflation, and interest rates for 2023 through 2028 are based mainly on the agency's projections of underlying trends in key variables, such as the size of the labor force, the number of hours worked, capital investment, and productivity. In addition, CBO considers the effects of current-law federal tax and spending policies on those variables. In some cases, policies might be projected not only to affect potential output but also to influence aggregate demand for goods and services, causing the gap between actual output and potential output to change. For example, the expiration of the temporary provisions in the 2017 tax act—including the expiration of most of the provisions affecting individual income taxes at the end of 2025 and the phaseout of bonus depreciation by the end of 2026—is projected to slow real GDP growth and to lower real GDP in relation to its potential in those years.

Potential Output and Actual Output

In CBO's projections, potential output grows at an average rate of 1.8 percent per year over the 2023–2028 period, driven by average annual growth of the potential labor force of about 0.4 percent and growth of potential labor force productivity of about 1.4 percent (see Table 2 and the bottom panel of Figure 1 on page 3). Compared with growth of potential output of about 2.0 percent per year from 2018 to 2022, the annual rate of 1.8 percent in later years represents a slowdown of about 0.2 percentage points, which results primarily from a projected slowdown in growth of the potential labor force.

The slowdown in growth is expected to be particularly marked in the nonfarm business sector, which produces roughly three-quarters of GDP. Annual growth of that sector's potential output slows by about a quarter of

a percentage point in CBO's projections, from over 2.3 percent in the 2018–2022 period to less than 2.1 percent in the 2023–2028 period. The contribution of potential hours worked falls from 0.4 percentage points per year, on average, in the first half of the 11-year projection period to 0.2 percentage points in the second half, while the contribution of capital services drops from an average of 0.9 percentage points per year to 0.7 percentage points. The slowdown in the growth of potential hours and in the growth of capital services reflects changes in underlying long-run trends—such as the aging of the population and other demographic shifts—as well as the expiration of temporary tax provisions under current law.

Also, the annual rate of growth of potential total factor productivity (the average real output per unit of combined labor and capital services) in the nonfarm business sector accelerates in CBO's forecast from 1.0 percent in the first half of the projection period to 1.2 percent in the second half, somewhat offsetting the slowdown in the growth of factor inputs. That acceleration plays a key role in keeping growth in potential aggregate output substantially faster than the 1.5 percent average annual growth that is estimated to have occurred since 2007, when the last recession began.

Typically in CBO's forecasts, the growth of actual output and growth of potential output converge in the second half of the 11-year period, and the level of actual output stays about 0.5 percent below that of potential output, which is consistent with the long-term relationship between the two measures. In the agency's current forecast, however, that convergence is interrupted because the expiration of the temporary provisions of the 2017 tax act is expected not only to affect the growth of potential output by reducing the supply of labor but also to result in a temporary slowdown in the growth of aggregate demand. As a consequence, in the current forecast, the gap between actual output and potential output widens temporarily before returning to its long-term average in the final years of the projection period. The average growth rate of actual output during the 2023–2028 period is 1.7 percent per year, slightly less than the 1.8 percent average annual growth projected for potential output in those years.

The Labor Market

In CBO's projections, the unemployment rate settles by 2024 near its anticipated long-term rate of 4.8 percent

Table 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	3.2	2.5	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	1.5	0.9	1.7	1.4	1.4	1.4
Nonfarm Business Sector										
Real Potential Output	4.1	3.5	3.6	3.6	2.7	1.7	3.4	2.3	2.1	2.2
Potential Hours Worked*	1.4	2.3	1.8	1.3	0.4	0.5	1.3	0.6	0.3	0.4
Capital Services	3.7	3.8	3.6	3.8	2.9	1.8	3.4	2.5	2.0	2.3
Potential Total Factor Productivity	1.9	0.9	1.2	1.4	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	0.8	0.2	0.3	0.9	0.4	0.2	0.3
Capital input	1.2	0.9	1.1	1.3	0.9	0.6	1.1	0.9	0.7	0.8
Potential total factor productivity	1.9	0.9	1.2	1.4	1.6	0.7	1.4	1.0	1.2	1.1
Total Contributions	4.0	3.5	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	1.7	1.8	1.8

Source: Congressional Budget Office.

Real values are nominal values that have been adjusted to remove the effects of changes in prices. 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.

(roughly one-quarter of a percentage point higher than the natural rate of 4.6 percent), though it rises again temporarily in 2026.¹² That temporary increase occurs because the slowdown in the growth of aggregate demand caused by the expiration of certain provisions of the 2017 tax act also slows the growth in the demand for labor. Meanwhile, the natural rate of unemployment declines very slowly (by a total of less than 0.1 percentage point) over the next decade. That slow decline reflects a shift in the composition of the workforce toward older workers, who tend to have lower rates of unemployment

(when they participate in the labor force), and away from less educated workers, who tend to have higher rates.

The labor force participation rate follows its long-term trend in CBO's projections and falls to about 61 percent by 2028, roughly 1¼ percentage points below the agency's projection for 2023. The agency attributes most of the decline from 2023 to 2028 to demographic changes—in particular, to the aging of the population (because older people tend to participate less in the labor force than younger people do).

12. The projected gap of 0.25 percentage points between the unemployment rate and the natural rate of unemployment corresponds to the projected output gap of -0.5 percent of potential output.

Growth in employment and wages is projected to moderate during the 2023–2028 period. In particular, nonfarm payroll employment increases by an average

of 57,000 jobs per month during those years in CBO's forecast. Measured as a percentage of the population, employment falls from 59.4 percent in 2023 to 58.1 percent in 2028, reflecting the decline in the potential labor force participation rate. Real compensation per hour in the nonfarm business sector, a measure of labor costs that is a useful gauge of longer-term trends, grows at an average annual rate of 1.8 percent from 2023 to 2028—the same rate at which labor force productivity in that sector grows in the agency's projections, reflecting the close historical relationship between the two measures.

Inflation

In the agency's forecast, the overall and the core PCE price indexes increase by an average of 2.0 percent per year between 2023 and 2028, which is the Federal Reserve's long-run target for inflation. The overall and core CPI-U average 2.4 percent growth annually in those years. Those projections reflect the historical difference between the growth rates of the PCE price indexes and the CPI-U.

Interest Rates

Over the 2023–2028 period, the interest rate on 3-month Treasury bills averages 2.8 percent in CBO's projections, and the rate on 10-year Treasury notes, 3.7 percent. The federal funds rate averages 3.1 percent. Throughout that period, federal debt rises in relation to GDP and exerts upward pressure on short- and long-term interest rates. Long-term interest rates rise gradually in relation to short-term rates as the term premium slowly increases over the latter half of the 11-year projection period. Various factors—continued growth in foreign economies and inflation that remains at or near the Federal Reserve's target rate—are expected to make holding Treasury securities as a hedge against adverse foreign and domestic economic outcomes less desirable for investors than it has been in recent years, thereby putting upward pressure on the term premium.

In general, CBO expects interest rates to rise slightly over the 2023–2028 period. However, short-term interest rates decline slightly from mid-2025 through 2026 in the agency's forecast because the Federal Reserve is expected to reduce the federal funds rate in response to the slower growth stemming from the expiration of the individual income tax cuts.

Projections of Income for 2018 to 2028

Projections of federal revenues depend to a large extent on the amount of the various types of income earned in the production of GDP. The most important types of income for projecting federal revenues are wages and salaries and domestic profits, which are taxed at higher rates than the other types. Together, those two types of income have averaged just over 52 percent of GDP since the early 1980s, though their combined share of GDP has fluctuated with the business cycle. As of early 2018, the sum of those two types of income amounted to just under 52 percent of GDP. In the near term, as the economy operates above its potential, that percentage rises in CBO's forecast, but it settles back to its post-1983 average in later years.

In CBO's projections, wages and salaries grow more quickly than other kinds of income throughout the 11-year projection period, increasing from 43.2 percent of GDP in 2018 to 44.1 percent in 2028. That rise in wages and salaries relative to other types of income contributes to a partial rebound in labor's share of GDP, which grows from 57.1 percent in 2018 to 58.7 percent in 2028. Despite that projected growth, CBO does not expect labor's share of GDP to reach its 1980–2000 average of more than 59.2 percent because some of the long-run factors that have depressed labor's share since the early 2000s are likely to persist in the coming decade. One such factor is globalization, which has increased businesses' incentives to move the production of labor-intensive goods and services to countries with labor costs that are lower than those in the United States. Another factor is technological change, which may have increased returns to capital more than it has increased returns to labor.

The share of domestic corporate profits falls from 9.5 percent of GDP in 2018 to an average of 8.3 percent over the 2023–2028 period in CBO's forecast. The decline in the share of domestic profits mostly reflects the rise in wages and salaries, but it also reflects an increase in corporate interest payments that results from rising interest rates.

Some Uncertainties in the Economic Outlook

Economic projections are inherently uncertain. But CBO's current economic projections are especially so because they incorporate several estimates of the effects of recent changes to fiscal policy, which are themselves very uncertain. In addition, recently implemented

changes to trade policies, and proposals calling for further changes, compound the uncertainty surrounding the current economic outlook.

Trade Policy Changes

A sizable uncertainty in the U.S. trade and inflation forecast stems from recent changes to U.S. import tariffs and the retaliation of the country's key trading partners. The renegotiation of the North American Free Trade Agreement (NAFTA) similarly presents the risk that trade and inflation may differ from CBO's projections.

When CBO completed its current economic forecast, the agency estimated that the macroeconomic consequences of the U.S. tariffs and foreign retaliatory tariffs that had been implemented at that time would be small. The prices of washing machines, solar panels, steel, and aluminum increased in the first half of 2018, but those products account for only a small share of consumer and business purchases. Higher tariffs on more imported products, however, could add to inflationary pressure, which in turn would not only reduce the purchasing power of domestic income but also increase the costs of domestic production, making the prices of U.S. exports less competitive in international markets. In addition, retaliatory tariffs on U.S. exports are likely to reduce the profitability of U.S. businesses whose products are targeted by those tariffs.

Furthermore, heightened uncertainty about trade policy could discourage businesses from making capital investments that they might otherwise have made, because changes to trade policy affect price competitiveness in foreign markets as well as the costs associated with global supply chains. Recent volatility in equity markets might indicate that such uncertainty is already taking a toll on the value of U.S. businesses.

Other Uncertainties

In addition to trade policy changes, many other developments could cause economic growth and other variables to differ from CBO's projections over the near term. For example, if energy prices continued to rise or stayed elevated longer than CBO has projected, inflation would be higher, and if the adverse effects on consumer spending outweighed increased investment in oil drilling, GDP would be lower. Moreover, the 2017 tax act significantly altered the incentives to work and invest, but it is very difficult to anticipate how households and businesses will respond to those changes in incentives. If consumer

spending and capital investment increased more (or less) than CBO projects, GDP growth and interest rates would be correspondingly higher (or lower).¹³

Over the long term, policy changes and other factors add to the uncertainty surrounding CBO's projections. The scheduled expiration of the provisions of the 2017 tax act is one source of uncertainty stemming from policy changes during the projection period. Individuals and businesses could respond more (or less) to those changes than CBO anticipates, resulting in lower (or higher) economic growth in the later years of the projection period than the agency forecasts. In addition to fiscal policy changes, recent shifts by the Administration and the Congress toward deregulation and a looser regulatory environment are expected to boost investment, and thus potential output, modestly in the long term. If the effects of deregulation are greater than CBO expects, however, then economic growth could be stronger than the agency projects.

Long-run economic growth could also be higher or lower than CBO projects for reasons unrelated to policy. If, for example, the labor force grew more quickly than expected—say, because older workers chose to stay in the labor force longer than anticipated—the economy could grow considerably more quickly than it does in CBO's projections. By contrast, if the growth of labor productivity did not rise above its average postrecession pace, as it does in CBO's projections, the growth of GDP might be weaker than the agency projects.

Over the next five or six years, CBO projects, the economy will experience a cycle in which the output gap widens and then narrows through slower (though still positive) economic growth—but there is nonetheless a risk of recession. Some analysts have noted with concern the recent narrowing of the spread between long-term and short-term interest rates. In the past, the economy has often entered a recession shortly after that spread has turned negative (a development referred to as an inversion of the yield curve). Consistent with the agency's forecast of slower economic growth in 2019 and 2020, that spread continues to close but does not invert in

13. For example, one provision of the 2017 tax act provided companies a greater incentive to fund their defined benefit pension plans in 2018. CBO estimates that the effect of that provision on interest rates will be small. If, however, the effect is larger than expected, interest rates will be higher than CBO projects in 2019 and beyond.

CBO's projections. There is some risk, however, that the yield curve could invert. Although an inversion would not by itself cause an economic downturn to occur, it could signal that market participants see an increased risk of recession.

Quantifying the Uncertainty in CBO's Projections

To quantify the degree of uncertainty in its projections for the next five years, CBO analyzed its past forecasts of the growth of real GDP and of inflation.¹⁴ 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). 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 1.8 percent and 3.0 percent over the next five years.

Changes in CBO's Economic Projections Since April

CBO's current economic projections differ in some important respects from those published in April 2018 (see Table 3).¹⁵ In particular, CBO's current economic forecast incorporates the path for discretionary spending that was specified in the agency's most recent baseline budget projections, which were published as part of *An Analysis of the President's 2019 Budget*.¹⁶ Federal spending in those projections is somewhat lower than the amounts used as the basis of CBO's previous economic projections, which were made before details of the Consolidated Appropriations Act, 2018, were finalized. Adjusting those economic projections to account for CBO's current spending projections resulted in reduced projections of real federal purchases and, in turn, lower projections of real GDP: By 2020, the level of real GDP in CBO's current forecast is about 0.3 percent lower than it was in the previous forecast because of that adjustment.

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

15. See Congressional Budget Office, *The Budget and Economic Outlook: 2018 to 2028* (April 2018), www.cbo.gov/publication/53651.

16. See Congressional Budget Office, *An Analysis of the President's 2019 Budget* (May 2018), www.cbo.gov/publication/53884.

CBO has also revised down its projections of interest rates over the 2018–2023 period since April. It has done so to incorporate the current path for discretionary spending as well as to account for new data on financial markets and information from other forecasters. Incorporating the baseline spending path resulted in slower output growth in the near term and a slightly smaller output gap. On the basis of that smaller output gap, CBO projects that the Federal Reserve would raise interest rates fewer times and that short-term interest rates would be lower. Projections of long-term rates, which are based in part on the expected path of short-term rates, were revised down as well. Aligning those projections with CBO's current discretionary spending path also resulted in smaller deficits than those incorporated in CBO's previous economic forecast. More national saving stemming from those smaller deficits also contributed to the downward revision in interest rates. In addition, data on financial markets and information from other forecasters point to a more muted increase in interest rates in the near term than CBO forecast in April. (The agency's projections of interest rates for 2025 to 2028 are the same as they were in April.)

Other changes made to CBO's forecast since April are relatively modest and arise primarily from recent developments. For example, CBO now expects inflation (as measured by both the overall PCE and the core PCE price indexes) to reach and surpass the Federal Reserve's target of 2.0 percent in 2018 rather than in 2019 as previously projected. That upward revision mainly reflects stronger than expected growth in energy prices and, to a lesser extent, health care prices.

Comparison With Other Economic Projections

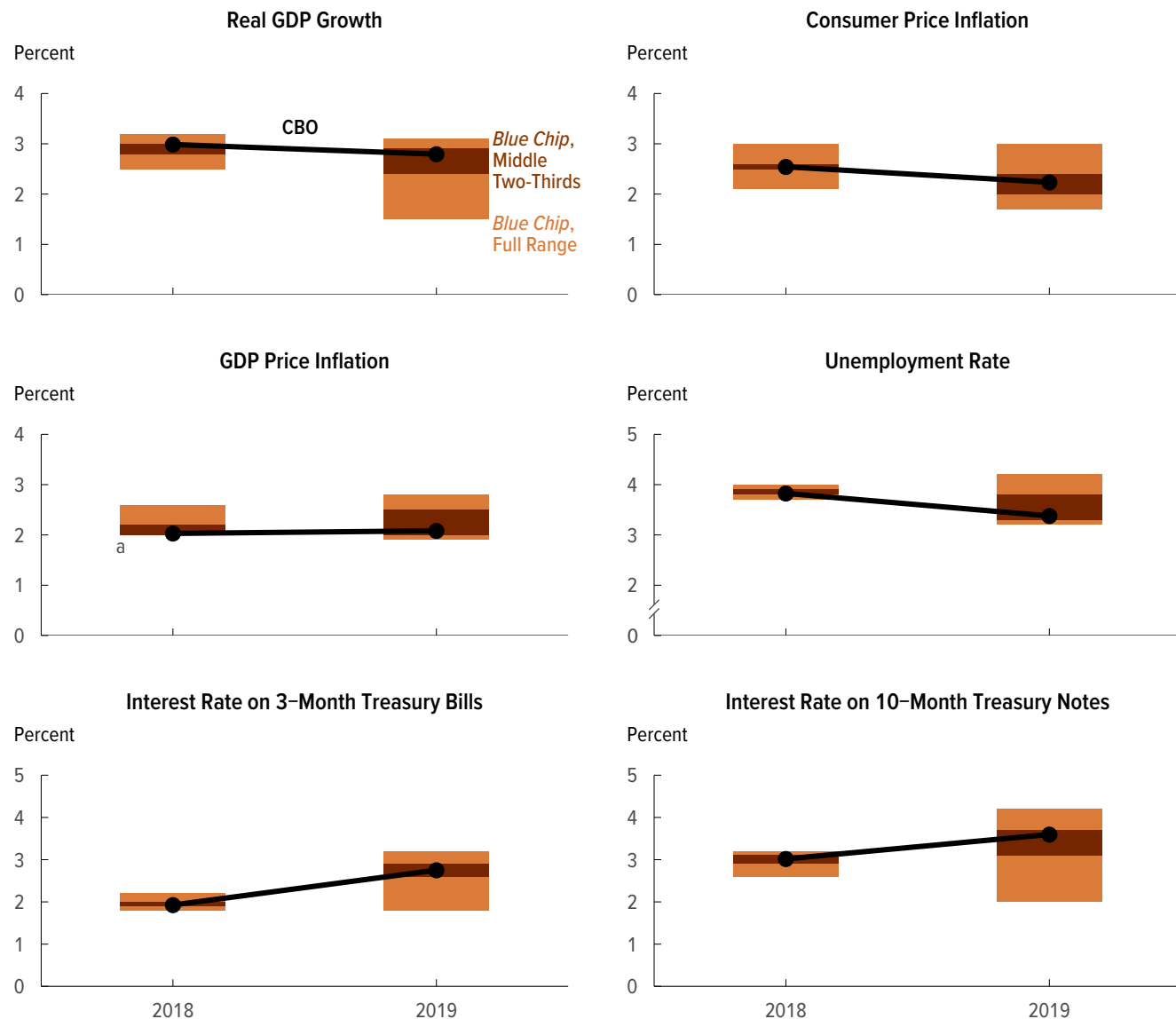
In the near term, CBO anticipates a slightly stronger economy than do most of the private-sector economists whose forecasts were published in the July 2018 *Blue Chip Economic Indicators*. In particular, CBO's projections for both 2018 and 2019 are near the top of the middle two-thirds of the ranges of *Blue Chip* forecasts of real GDP growth, interest rates, and consumer price inflation and near the bottom of the middle two-thirds of the range of forecasts of the unemployment rate (see Figure 2).

Compared with the forecasts made by Federal Reserve officials and reported at the June 2018 meeting of the Federal Open Market Committee, CBO's projections

Figure 2.

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

In the near term, CBO anticipates a somewhat stronger economy than do most of the private-sector economists whose forecasts are published in *Blue Chip Economic Indicators*.



Sources: Congressional Budget Office; Wolters Kluwer, *Blue Chip Economic Indicators* (July 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 changes in prices. 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 lower ends of the full range and the middle two-thirds are equal.

Table 3.

Comparison of CBO's Current and Previous Economic Projections for Calendar Years 2018 to 2028

	2018	2019	2020	Annual Average		Total, 2018–2028
				2018–2022	2023–2028	
Percentage Change From Fourth Quarter to Fourth Quarter						
Real GDP ^a						
August 2018	3.1	2.4	1.7	2.1	1.7	1.9
April 2018	3.3	2.4	1.8	2.1	1.7	1.9
Nominal GDP						
August 2018	5.1	4.7	3.9	4.2	3.9	4.0
April 2018	5.2	4.5	3.9	4.2	3.9	4.0
PCE Price Index						
August 2018	2.2	2.0	2.1	2.1	2.0	2.0
April 2018	1.8	2.0	2.1	2.0	2.0	2.0
Core PCE Price Index ^b						
August 2018	2.1	2.1	2.2	2.1	2.0	2.0
April 2018	1.9	2.1	2.2	2.1	2.0	2.0
Consumer Price Index ^c						
August 2018	2.5	2.3	2.5	2.5	2.4	2.4
April 2018	2.0	2.3	2.5	2.4	2.4	2.4
Core Consumer Price Index ^b						
August 2018	2.3	2.6	2.7	2.5	2.4	2.4
April 2018	2.3	2.5	2.6	2.5	2.4	2.4
GDP Price Index						
August 2018	2.0	2.2	2.2	2.1	2.1	2.1
April 2018	1.8	2.1	2.1	2.1	2.1	2.1
Employment Cost Index ^d						
August 2018	3.4	3.6	3.6	3.5	3.1	3.3
April 2018	3.1	3.6	3.6	3.4	3.2	3.3
Real Potential GDP ^a						
August 2018	2.0	2.1	2.1	2.0	1.8	1.9
April 2018	2.0	2.1	2.1	2.0	1.8	1.9

Continued

suggest a stronger economic outlook for 2018, a similar outlook for 2019, and a weaker outlook for 2020 and the longer term (see Figure 3).¹⁷ The Federal Reserve reports three sets of forecasts: a median, a range, and a central tendency. The range is based on the highest and lowest forecasts made by the members of the Board of Governors of the Federal Reserve System and the

presidents of the Federal Reserve Banks; the central tendency is the range formed by removing the three highest and three lowest projections. For 2018, CBO's projections of real GDP growth, interest rates, and inflation are either above or near the top of the full range of Federal Reserve forecasts, and its projection of the unemployment rate is near the bottom of the full range. For 2019, by contrast, the agency's projections of real GDP growth, interest rates, inflation, and unemployment are largely within the central tendency, whereas for 2020 and the longer term, CBO's projections are somewhat weaker than those of Federal Reserve officials.

17. 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, June 2018" (June 13, 2018), <https://go.usa.gov/xUNqg> (PDF, 119 KB).

Table 3.

Continued

Comparison of CBO's Current and Previous Economic Projections for Calendar Years 2018 to 2028

	2018	2019	2020	Annual Average		Total, 2018–2028
				2018–2022	2023–2028	
				Annual Average		
Unemployment Rate (Percent)						
August 2018	3.8	3.4	3.6	3.9	4.8	4.4
April 2018	3.8	3.3	3.6	3.9	4.8	4.4
Interest Rates (Percent)						
Three-month Treasury bills						
August 2018	1.9	2.8	3.1	2.9	2.8	2.8
April 2018	1.9	2.9	3.6	3.1	2.8	3.0
Ten-year Treasury notes						
August 2018	3.0	3.6	3.9	3.7	3.7	3.7
April 2018	3.0	3.7	4.1	3.8	3.7	3.8
Tax Bases (Percentage of GDP)						
Wages and salaries						
August 2018	43.1	43.4	43.7	43.6	44.1	43.9
April 2018	43.2	43.5	43.9	43.7	44.3	44.0
Domestic corporate profits ^e						
August 2018	9.5	9.6	9.1	9.1	8.3	8.7
April 2018	9.5	9.6	9.0	9.0	8.0	8.5

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

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

- a. Real values are nominal values that have been adjusted to remove the effects of changes in prices.
- 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. Consists of domestic profits, adjusted to remove distortions in depreciation allowances caused by tax rules and to exclude the effects of inflation on the value of inventories.

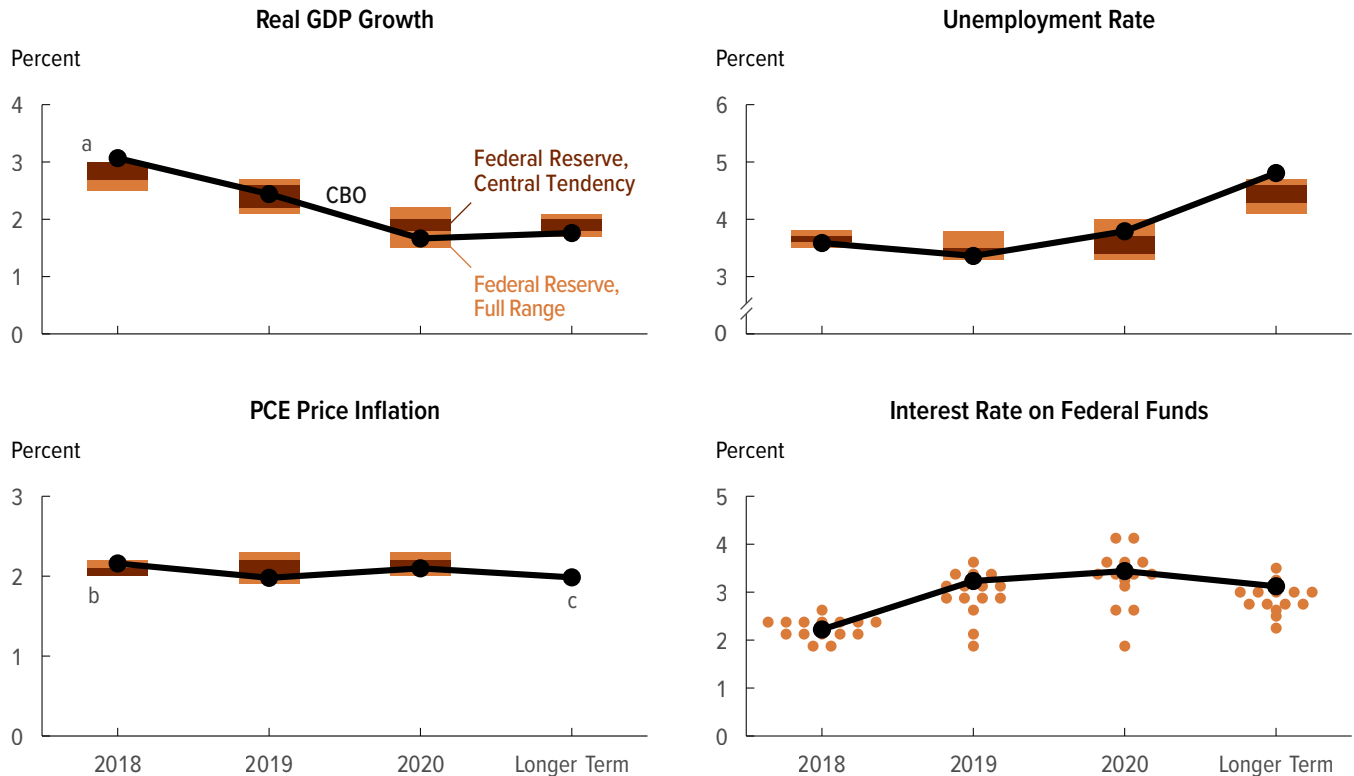
At least part of the discrepancies between CBO's projections and other forecasters' is probably attributable to differences in the economic data available when the forecasts were completed and to differences in the economic

and statistical models used to prepare them. In addition, other forecasters may be assuming certain changes in federal policies will occur, whereas CBO's projections are based on current law.

Figure 3.

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

Compared with forecasts made by Federal Reserve officials, CBO's projections suggest a stronger economic outlook for 2018, a similar outlook for 2019, and a somewhat weaker outlook for 2020 and the longer term.



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, June 2018” (June 13, 2018), <https://go.usa.gov/xUNqg> (PDF, 119 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 presidents of the Federal Reserve Banks. (One Federal Reserve official did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate.) 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.

Each of the data points for the federal funds rate represents a forecast made by one of the members of the Federal Reserve Board or one of the presidents of the Federal Reserve Banks in June 2018. The Federal Reserve officials' forecasts of the federal funds rate are for the rate at the end of the year, whereas CBO's forecasts are fourth-quarter values.

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 values are nominal values that have been adjusted to remove the effects of changes in prices.

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.

- The upper ends of the full range and central tendency are equal.
- The lower ends of the full range and central tendency are equal.
- For PCE price inflation in the longer term, the range and central tendency equal 2 percent.



Appendix: CBO's Economic Projections for 2018 to 2028

The tables in this appendix expand on the information in the main report by showing the Congressional Budget Office's economic projections for each year from 2018 to 2028 (by calendar year in Table A-1 and by fiscal year in Table A-2). CBO's projections for 2018 to 2022 reflect the economy's strong initial momentum as well as significant fiscal stimulus in those years. They also reflect a modest increase in the growth of potential output—the economy's maximum sustainable level of production.

The projections for 2023 to 2028 are primarily based on underlying trends for those years in key variables that determine the growth of potential output, such as the size of the labor force, the number of hours worked, capital investment, and productivity. For 2025 and 2026, however, CBO projects a modest temporary slowdown in the growth of actual output that results from fiscal policy under current law.

Table A-1.

CBO's Economic Projections, by Calendar Year

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Percentage Change From Year to Year										
Gross Domestic Product											
Real ^a	3.0	2.8	1.9	1.6	1.6	1.6	1.7	1.8	1.6	1.8	1.8
Nominal	5.1	4.9	4.1	3.8	3.8	3.8	3.9	3.9	3.8	3.9	3.9
Inflation											
PCE price index	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Core PCE price index ^b	1.9	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Consumer price index ^c	2.5	2.2	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Core consumer price index ^b	2.2	2.4	2.7	2.7	2.5	2.4	2.4	2.3	2.3	2.3	2.4
GDP price index	2.0	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1
Employment Cost Index ^d	3.1	3.4	3.6	3.6	3.4	3.2	3.1	3.1	3.0	3.0	3.0
	Calendar Year Average										
Unemployment Rate (Percent)	3.8	3.4	3.6	4.1	4.6	4.7	4.8	4.8	4.9	4.9	4.8
Payroll Employment (Monthly change, in thousands) ^e	210	178	63	23	28	41	53	62	56	66	67
Interest Rates (Percent)											
Three-month Treasury bills	1.9	2.8	3.1	3.2	3.2	3.0	2.8	2.7	2.7	2.8	2.8
Ten-year Treasury notes	3.0	3.6	3.9	4.0	3.9	3.8	3.7	3.7	3.7	3.7	3.7
Tax Bases (Percentage of GDP)											
Wages and salaries	43.1	43.4	43.7	43.9	44.0	44.0	44.0	44.1	44.1	44.1	44.1
Domestic economic profits	9.5	9.6	9.1	8.7	8.5	8.3	8.3	8.3	8.3	8.4	8.4
Tax Bases (Billions of dollars)											
Wages and salaries	8,785	9,288	9,740	10,145	10,548	10,962	11,391	11,842	12,303	12,789	13,295
Domestic economic profits ^f	1,928	2,055	2,026	2,013	2,027	2,066	2,146	2,240	2,318	2,426	2,534
Nominal GDP (Billions of dollars)	20,377	21,383	22,269	23,110	23,977	24,896	25,869	26,882	27,898	28,989	30,121

Source: Congressional Budget Office.

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

a. Real values are nominal values that have been adjusted to remove the effects of changes in prices.

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. The average monthly change, calculated by dividing by 12 the change in payroll employment from the fourth quarter of one calendar year to the fourth quarter of the next.

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

Table A-2.

CBO's Economic Projections, by Fiscal Year

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Percentage Change From Year to Year											
Gross Domestic Product											
Real ^a	2.9	3.0	2.1	1.6	1.6	1.6	1.7	1.8	1.7	1.7	1.8
Nominal	4.9	5.1	4.3	3.8	3.7	3.8	3.9	3.9	3.8	3.9	3.9
Inflation											
PCE price index	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0
Core PCE price index ^b	1.8	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Consumer price index ^c	2.4	2.3	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Core consumer price index ^b	2.0	2.3	2.7	2.7	2.6	2.4	2.4	2.3	2.3	2.3	2.4
GDP price index	2.0	2.0	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1
Employment Cost Index ^d	3.0	3.4	3.6	3.6	3.4	3.3	3.2	3.1	3.0	3.0	3.0
Fiscal Year Average											
Unemployment Rate (Percent)	4.0	3.4	3.5	4.0	4.5	4.7	4.8	4.8	4.9	4.9	4.8
Payroll Employment (Monthly change, in thousands) ^e	199	202	89	25	26	38	50	60	57	65	67
Interest Rates (Percent)											
Three-month Treasury bills	1.7	2.6	3.1	3.2	3.2	3.1	2.9	2.7	2.7	2.8	2.8
Ten-year Treasury notes	2.8	3.5	3.8	4.0	3.9	3.8	3.7	3.7	3.7	3.7	3.7
Tax Bases (Percentage of GDP)											
Wages and salaries	43.1	43.4	43.7	43.9	44.0	44.0	44.0	44.0	44.1	44.1	44.1
Domestic economic profits	9.3	9.7	9.2	8.8	8.5	8.3	8.3	8.3	8.3	8.3	8.4
Tax Bases (Billions of dollars)											
Wages and salaries	8,665	9,165	9,634	10,045	10,447	10,857	11,282	11,728	12,187	12,665	13,167
Domestic economic profits ^f	1,866	2,045	2,037	2,013	2,022	2,052	2,123	2,220	2,296	2,396	2,508
Nominal GDP (Billions of dollars)	20,122	21,141	22,059	22,899	23,756	24,660	25,621	26,629	27,639	28,709	29,837

Source: Congressional Budget Office.

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

a. Real values are nominal values that have been adjusted to remove the effects of changes in prices.

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. The average monthly change, calculated by dividing by 12 the change in payroll employment from the fourth quarter of one calendar year to the fourth quarter of the next.

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



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About This Document

This document is one of a series of reports on the state of the economy that the Congressional Budget Office issues each year. In keeping with CBO's mandate to provide objective, impartial analysis, this report makes no recommendations.

CBO's Panel of Economic Advisers commented on an early version of the economic forecast underlying this report. Members of the panel are Katharine Abraham, Alan Auerbach, David Autor, Olivier Blanchard, Markus Brunnermeier, Mary Daly, Steven Davis, Kathryn Dominguez, Robert Hall, Jan Hatzius, Donald Kohn, Nellie Liang, Gregory Mankiw, Emi Nakamura, Jonathan Parker, Adam Posen, James Poterba, Valerie Ramey, Brian Sack, Robert Shimer, James Stock, Kevin Warsh, and Mark Zandi. Seth Carpenter, Peter Henry, and Melissa Kearney attended the panel's meeting as guests. Although CBO's outside advisers provided considerable assistance, they are not responsible for the contents of this report.

Y. Gloria Chen wrote this report with guidance from Robert Arnold, John Kitchen, Kim Kowalewski, and Jeffrey Werling. The economic forecast was prepared by David Burk, Y. Gloria Chen, Michael Falkenheim, Daniel Fried, Edward Gamber, Ronald Gecan, Mark Lasky, Jeffrey Perry, John Seliski, Robert Shackleton, Claire Sleight, Jazmine Smith, Adam Staveski, and Christopher Williams.

Wendy Edelberg, Mark Hadley, Jeffrey Kling, and Robert Sunshine reviewed the report, Bo Peery edited it, and Casey Labrack prepared it for publication. The report is available on CBO's website (www.cbo.gov/publication/54318).

Keith Hall
Director
August 2018