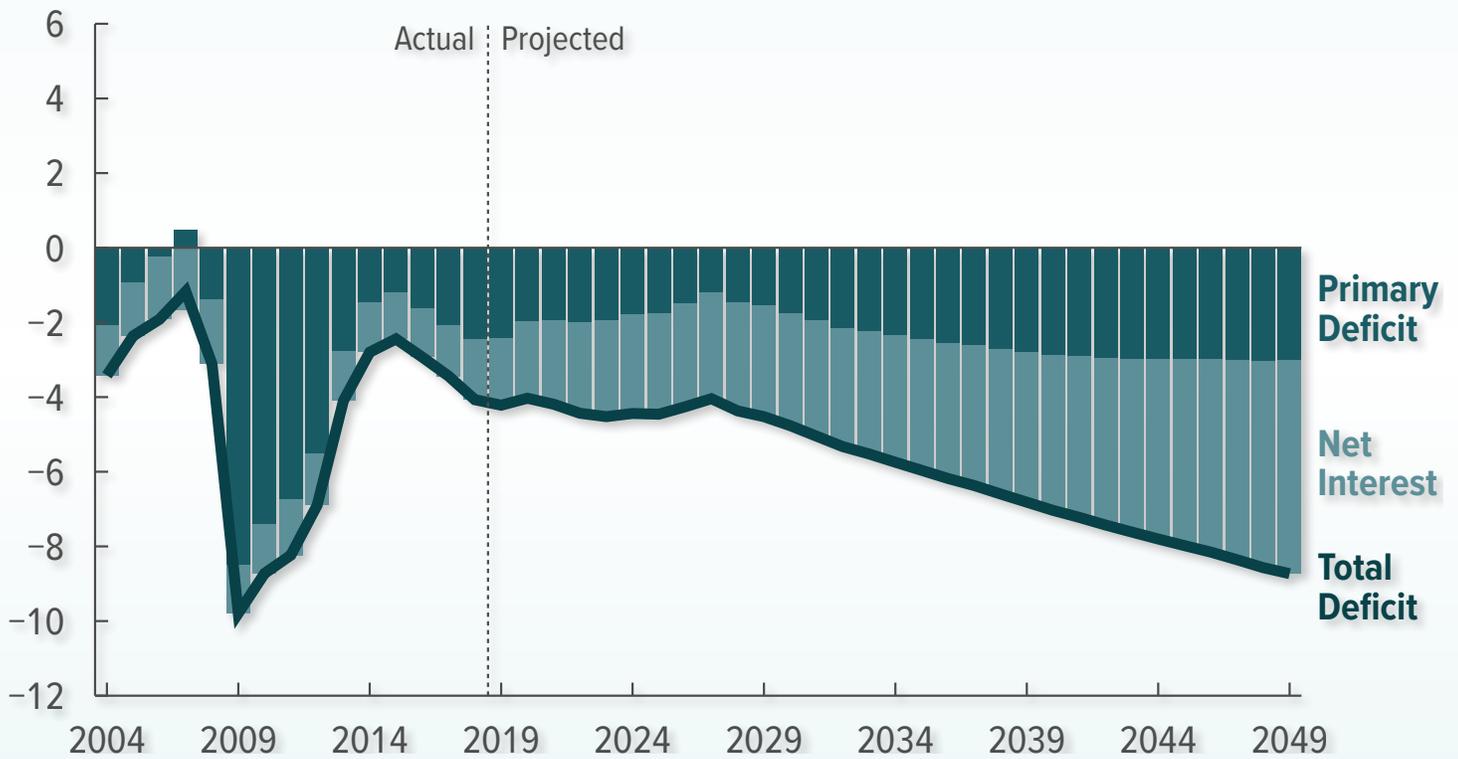


# CBO

## The 2019 Long-Term Budget Outlook

Percentage of Gross Domestic Product



JUNE 2019

## At a Glance

Each year, the Congressional Budget Office publishes a report presenting its budget projections for the next 30 years. Those *extended baseline* projections generally reflect current law. This report is the latest in the series.

- **Debt in CBO's Extended Baseline Projections.** Large budget deficits over the next 30 years are projected to drive federal debt held by the public to unprecedented levels—from 78 percent of gross domestic product (GDP) in 2019 to 144 percent by 2049. That projection incorporates CBO's central estimates of various factors, such as productivity growth and interest rates on federal debt. CBO's analysis indicates that even if values for those factors differed from the agency's projections, debt several decades from now would probably be much higher than it is today.
- **Other Possible Outcomes.** The agency's projections of debt are highly sensitive to changes in the factors underlying them. For example, if the growth of total factor productivity in the nonfarm business sector was one-half of one percentage point lower each year than CBO projects, all else being equal, debt in 2049 would be 185 percent of GDP; if such growth was one-half of one percentage point higher, debt that year would be 106 percent of GDP. If interest rates were one percentage point higher each year than CBO projects, debt in 2049 would be 199 percent of GDP; if they were one percentage point lower, debt that year would be 107 percent of GDP.
- **Debt Under Alternative Scenarios.** If lawmakers changed current laws to maintain certain major policies now in place—most significantly, if they prevented a cut in discretionary spending in 2020 and an increase in individual income taxes in 2026—then debt held by the public would increase even more, reaching 219 percent of GDP by 2049. By contrast, if Social Security benefits were limited to the amounts payable from revenues received by the Social Security trust funds, debt in 2049 would reach 106 percent of GDP, still well above its current level.
- **Interest Costs.** The projected increase in federal borrowing would lead to significantly higher interest costs. In CBO's extended baseline projections, net outlays for interest more than triple in relation to the size of the economy over the next three decades, exceeding all discretionary spending by 2046.
- **Noninterest Spending.** Mainly owing to the aging of the population, spending for Social Security and the major health care programs (primarily Medicare) is projected to rise as a percentage of GDP over the coming decades. The growth of spending for Medicare and the other major health care programs is also driven by rising health care costs per person.
- **Revenues.** Measured as a percentage of GDP, revenues are projected to be roughly flat over the next few years, rise slowly, and then jump in 2026 because of the scheduled expiration of certain provisions of the 2017 tax act. Thereafter, they continue to rise—but they do not keep pace with growth in spending. The factor contributing most to the long-term growth in revenues is the increasing share of income that is pushed into higher tax brackets.
- **Comparison With Last Year's Projections.** Debt as a percentage of GDP in 2048 is 11 percentage points lower in this year's extended baseline projections than it was in last year's. That difference is largely driven by spending projections that are lower than they were last year.



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## Notes

The Congressional Budget Office's extended baseline projections show the budget's long-term path under most of the same assumptions that the agency uses, in accordance with statutory requirements, in constructing its 10-year baseline projections. Both sets of projections incorporate the assumptions that current law generally remains unchanged, that some mandatory programs are nevertheless extended after their authorizations lapse, and that spending for Medicare and Social Security continues as scheduled even if their trust funds are exhausted.

Unless this report indicates otherwise, all projections shown in the figures are extended baseline projections.

Unless the report indicates otherwise, the years that it refers to are federal fiscal years, which run from October 1 to September 30 and are designated by the calendar year in which they end. Budgetary values, such as the ratio of debt or deficits to gross domestic product, are calculated on a fiscal year basis; economic variables, such as gross national product or interest rates, are calculated on a calendar year basis.

When October 1 (the first day of the fiscal year) falls on a weekend, certain payments that would have ordinarily been made on that day are instead made at the end of September and thus are shifted into the previous fiscal year. All budget projections in this report have been adjusted to exclude the effects of those timing shifts. For the dollar amounts of payments that are shifted in CBO's 10-year baseline budget projections, see Congressional Budget Office, *Updated Budget Projections: 2019 to 2029* (May 2019), Table 2, [www.cbo.gov/publication/55151](http://www.cbo.gov/publication/55151).

Numbers in the text, tables, and figures may not add up to totals because of rounding.

Unless the report specifies otherwise, Medicare outlays are presented net of offsetting receipts, which reduce outlays for the program.

As referred to in this report, the Affordable Care Act comprises the Patient Protection and Affordable Care Act; the health care provisions of the Health Care and Education Reconciliation Act of 2010; and the effects of subsequent judicial decisions, statutory changes, and administrative actions.

Data and supplemental information files—the data underlying the figures in this report, supplemental budget projections, and the demographic and economic variables underlying those projections—are posted along with the report on CBO's website ([www.cbo.gov/publication/55331](http://www.cbo.gov/publication/55331)). Previous editions of this report are also available on the website (<https://go.usa.gov/xmezZ>).

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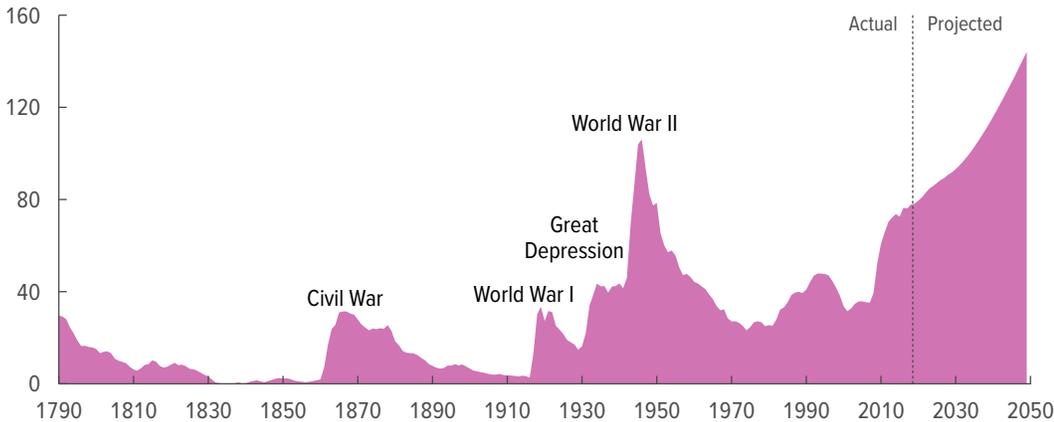


# Visual Summary

Each year, the Congressional Budget Office issues a set of long-term budget projections—that is, projections of what federal spending, revenues, deficits, and debt would be for the next 30 years if current laws generally did not change. CBO calls them extended baseline projections. This year’s projections of federal debt are slightly lower than last year’s, mainly because CBO has reduced its projections of discretionary and net interest spending. Those reductions are partially offset by a small reduction in projected revenues.

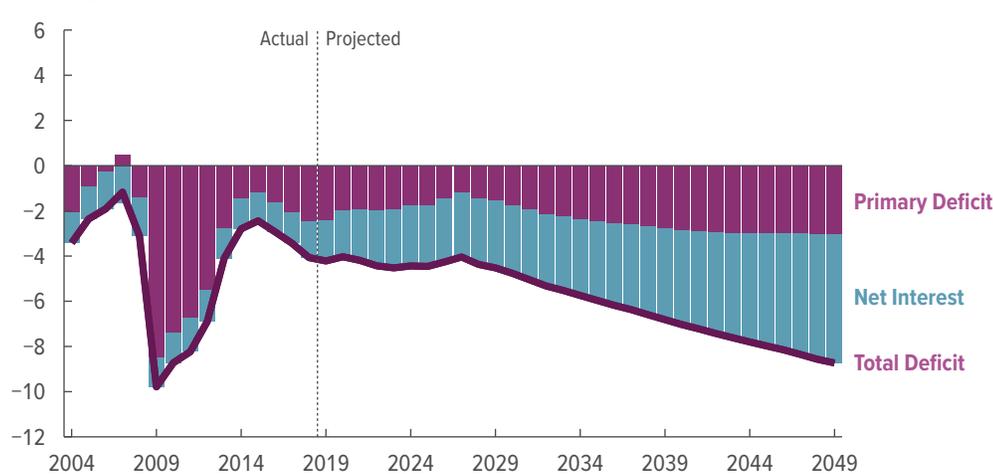
## Debt and Deficits

Percentage of Gross Domestic Product



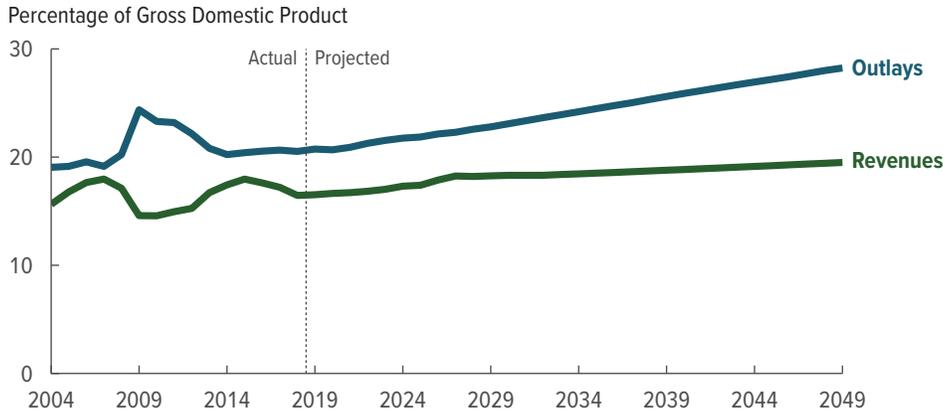
See Figure 1-1

Percentage of Gross Domestic Product



See Figure 1-4

**Debt and Deficits (Continued)**

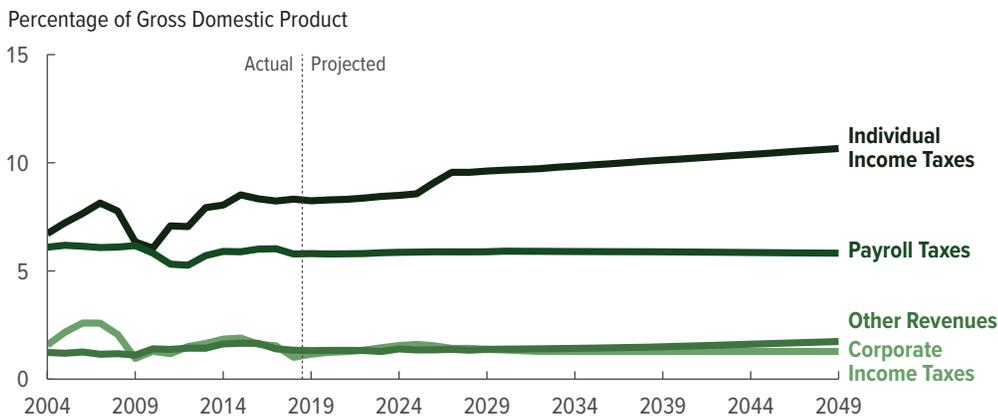


See Figure 1-3

Deficits grow because growth in spending outpaces growth in revenues.

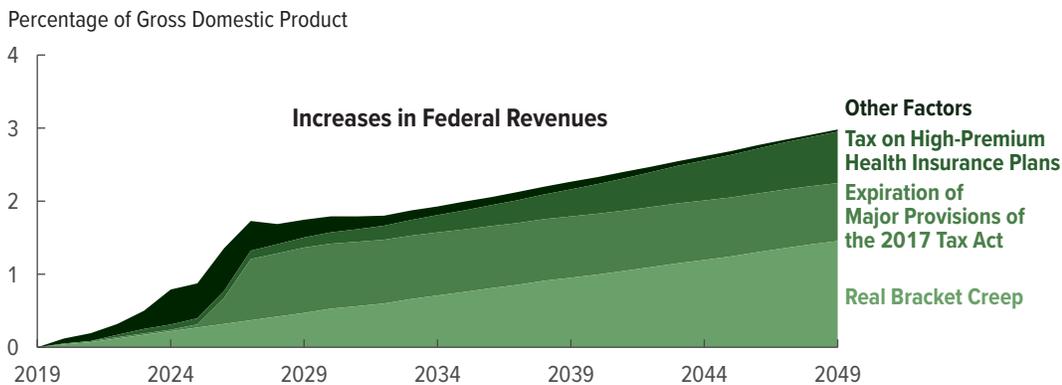
**Revenues**

In CBO’s projections, federal revenues increase as a percentage of GDP—from 16.5 percent in 2019 to 19.5 percent in 2049.



See Figure 1-3

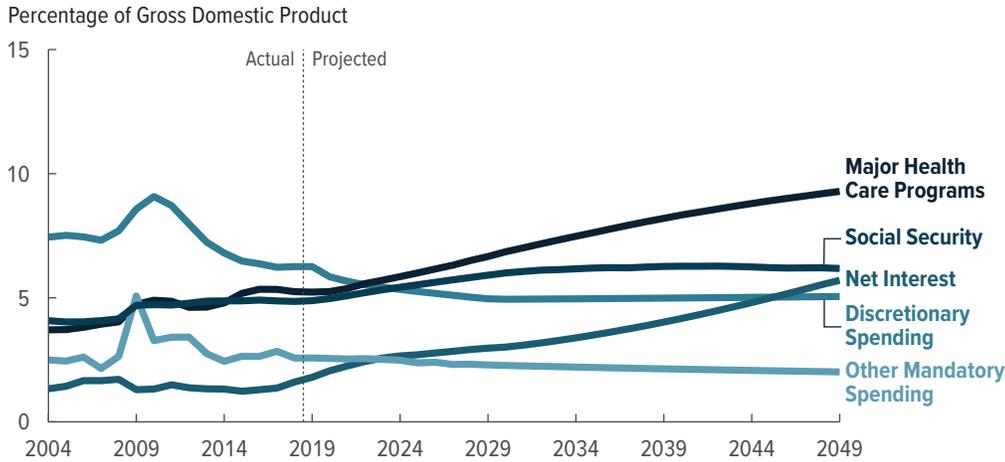
Increases in receipts from individual income taxes account for most of the rise in total revenues.



See Figure 1-13

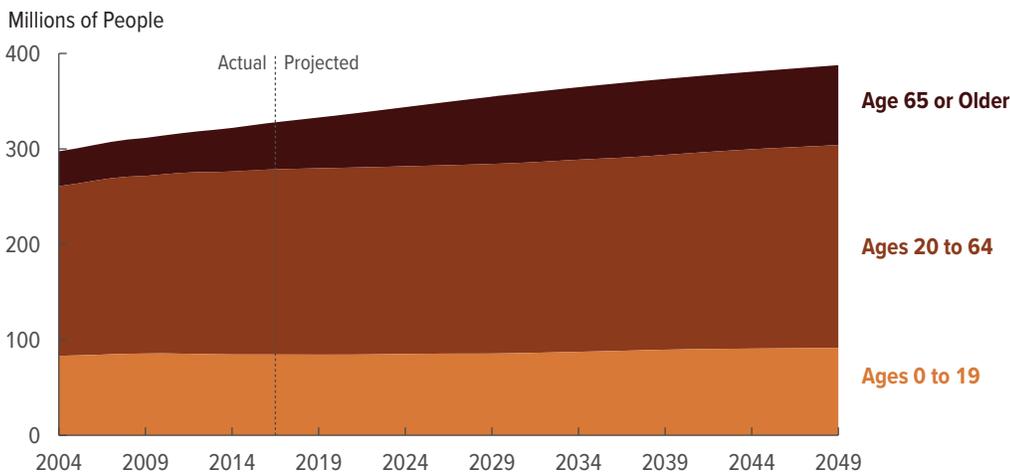
The largest source of growth in tax revenues is real bracket creep—the process in which, as income rises faster than inflation, a larger proportion of income becomes subject to higher tax rates.

**Spending** Federal spending grows from 20.7 percent of GDP today to 28.2 percent in 2049.



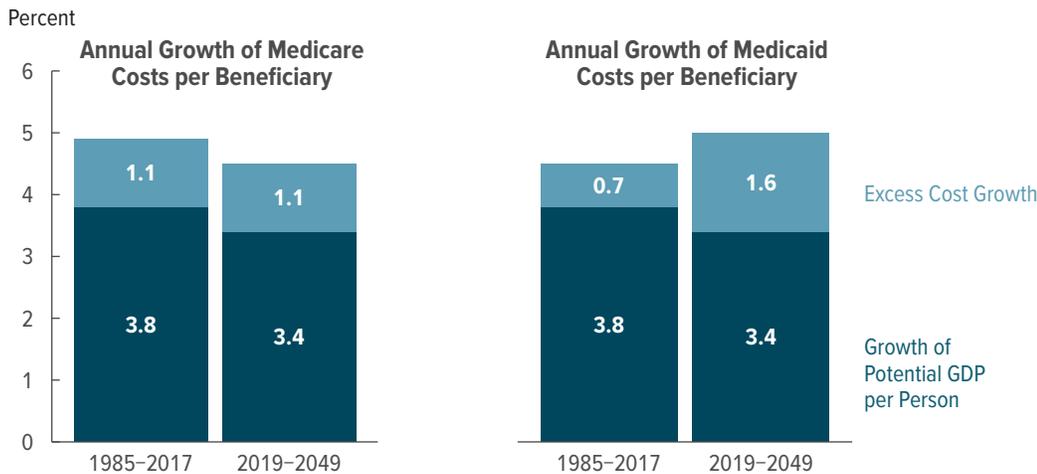
See Figure 1-3

Spending increases, as a percentage of GDP, for net interest, the major health care programs, and Social Security. That spending growth is partially offset by declining spending for other programs.



See Figure 1-5

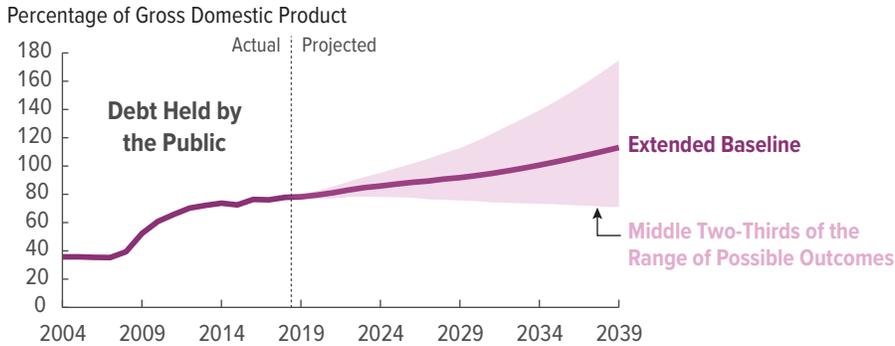
Much of the spending growth for Social Security and Medicare results from the aging of the population. As baby boomers age and as life expectancy continues to increase, the percentage of the population age 65 or older will grow significantly, boosting the number of beneficiaries of those programs.



See Figure 1-11

Growth in spending on Medicare and the other major health care programs is also driven by rising health care costs per beneficiary, as it has been in the past. Excess cost growth is the extent to which growth in health care costs per person, adjusted to remove the effects of aging, exceeds growth in potential GDP (the economy's maximum sustainable output) per person.

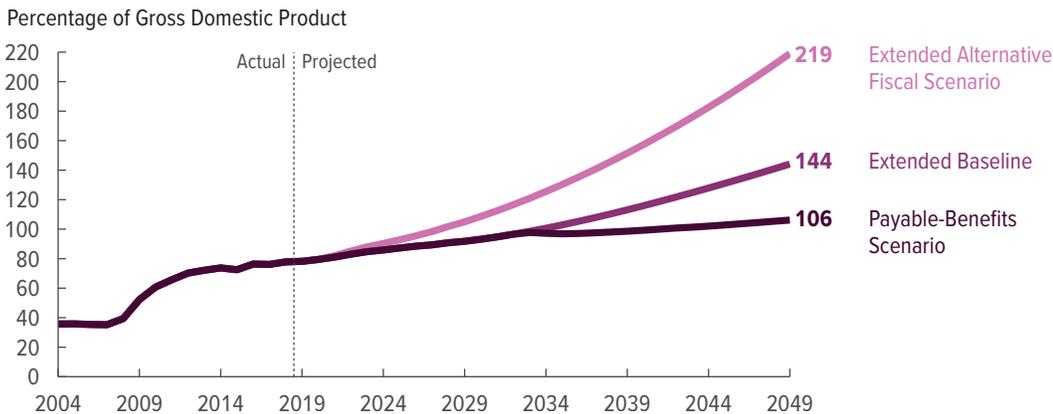
### Uncertainty



See Figure 1-15

The economic and demographic variables used to construct CBO's projections are uncertain. But even if their values differed from those underlying the extended baseline projections, in 20 years, federal debt would probably be much higher than it is today, if current laws generally remained unchanged.

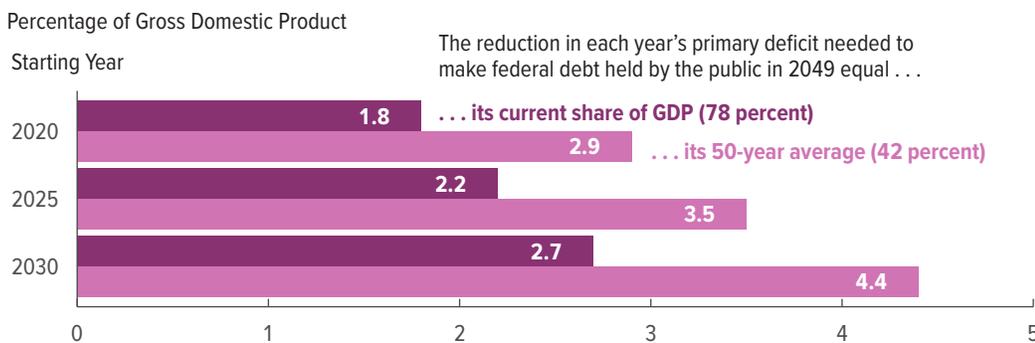
### Alternative Scenarios



See Figure 2-1

In relation to the extended baseline projections, debt would be greater under an extended alternative fiscal scenario (in which certain major policies now in place would be maintained) and less under a payable-benefits scenario (in which Social Security benefits would be limited to the program's total annual revenues after 2032).

### Various Goals for Deficit Reduction



See Figure 2-3

The reduction in each year's primary deficit needed to make federal debt held by the public in 2049 equal . . .

. . . its current share of GDP (78 percent)  
 . . . its 50-year average (42 percent)

The longer policymakers waited to reduce primary deficits, the larger those reductions would have to be.

# The Budget Outlook for the Next 30 Years

## Overview

By the end of this year, federal debt held by the public is projected to equal 78 percent of gross domestic product (GDP)—its highest level since shortly after World War II. If current laws generally remained unchanged, growing budget deficits would boost federal debt drastically over the next 30 years, the Congressional Budget Office projects. Debt would reach 92 percent of GDP by the end of the next decade and 144 percent by 2049 (see Table 1-1). That level of debt would be the highest in the nation's history by far, and it would be on track to increase even more. Although long-term projections are very uncertain, in CBO's assessment, even if a key set of factors, including productivity growth and interest rates, were favorable for the fiscal situation over the next three decades, debt as a share of GDP would most likely rise if current laws remained unchanged. If lawmakers changed current laws to maintain certain policies now in place—most significantly, if they prevented a cut in discretionary spending in 2020 and an increase in individual income taxes in 2026—the result would be even larger increases in debt (see Chapter 2). The prospect of such high and rising debt poses substantial risks for the nation and presents policymakers with significant challenges.

## What CBO's Projections Represent

The long-term projections of federal spending, revenues, deficits, and debt in this report are consistent with the 10-year baseline budget projections that CBO published in May 2019 and the economic forecast that the agency published in January 2019.<sup>1</sup> They extend most of the concepts underlying those 10-year budget projections for an additional 20 years, and they reflect the macroeconomic effects of projected fiscal policy over that 30-year period. Together, those long-term projections constitute the agency's *extended baseline* projections.

CBO's 10-year and extended baseline projections are not predictions of budgetary outcomes. Rather, they

represent the agency's best assessment of future spending, revenues, deficits, and debt under the assumption that current laws generally remain unchanged. In doing so, they give lawmakers a point of comparison from which to measure the effects of proposed legislation.

## How Federal Debt Has Grown in Recent Years

Debt held by the public is the amount that the federal government has borrowed in financial markets by issuing Treasury securities to pay for its operations and activities.<sup>2</sup> Debt as a percentage of GDP is a useful measure for comparing amounts of debt in different years because it removes the effects of changes in prices, population, output, and income—all of which affect the nation's ability to finance the debt. That measure places the effects of potential adjustments to the budget within the context of the nation's resources. Examining whether debt as a percentage of GDP is increasing is therefore a simple and meaningful way to assess the budget's sustainability.

Federal debt held by the public has ballooned over the past decade. At the end of 2007, federal debt stood at 35 percent of GDP, but deficits arising from the 2007–2009 recession and subsequent policies caused debt to grow sizably in relation to the economy over the next five years. By the end of 2012, debt as a share of GDP had doubled, reaching 70 percent. The upward trajectory has generally continued since then, and debt is projected to be 78 percent of GDP by the end of this year—a very high level by historical standards. (Over the past

1. See Congressional Budget Office, *Updated Budget Projections: 2019 to 2029* (May 2019), [www.cbo.gov/publication/55151](http://www.cbo.gov/publication/55151), and *The Budget and Economic Outlook: 2019 to 2029* (January 2019), [www.cbo.gov/publication/54918](http://www.cbo.gov/publication/54918).

2. When the federal government borrows in financial markets, it competes with other participants for financial resources and, in the long term, crowds out private investment, thus reducing economic output and income. By contrast, federal debt held by trust funds and other government accounts represents internal transactions of the government and does not directly affect financial markets. (Together, that debt and debt held by the public make up gross federal debt.) For more discussion, see Congressional Budget Office, *Federal Debt and Interest Costs* (December 2010), [www.cbo.gov/publication/21960](http://www.cbo.gov/publication/21960). Several factors not directly included in the budget totals also affect the government's need to borrow from the public. They include fluctuations in the government's cash balance as well as the cash flows of the financing accounts used for federal credit programs.

Table 1-1.

**CBO's Extended Baseline Projections**

Percentage of Gross Domestic Product

	2019	Projected Annual Average		
		2020–2029	2030–2039	2040–2049
<b>Revenues</b>				
Individual income taxes	8.2	8.9	9.9	10.4
Payroll taxes	5.8	5.9	5.9	5.9
Corporate income taxes	1.2	1.4	1.3	1.3
Other <sup>a</sup>	1.3	1.3	1.4	1.6
<b>Total Revenues</b>	<b>16.5</b>	<b>17.5</b>	<b>18.5</b>	<b>19.2</b>
<b>Outlays</b>				
<b>Mandatory</b>				
Social Security	4.9	5.5	6.2	6.2
Major health care programs <sup>b</sup>	5.2	6.0	7.5	8.8
Other	2.6	2.4	2.2	2.1
Subtotal	12.7	13.9	15.9	17.1
Discretionary	6.3	5.3	5.0	5.0
Net interest	1.8	2.6	3.5	4.9
<b>Total Outlays</b>	<b>20.7</b>	<b>21.9</b>	<b>24.3</b>	<b>27.1</b>
<b>Deficit</b>	<b>-4.2</b>	<b>-4.3</b>	<b>-5.8</b>	<b>-7.9</b>
<b>Debt Held by the Public at the End of the Period</b>	<b>78</b>	<b>92</b>	<b>113</b>	<b>144</b>
<b>Memorandum:</b>				
<b>Social Security</b>				
Revenues <sup>c</sup>	4.4	4.5	4.5	4.4
Outlays <sup>d</sup>	4.9	5.5	6.2	6.2
Contribution to the Federal Deficit <sup>e</sup>	-0.6	-1.1	-1.7	-1.8
<b>Medicare</b>				
Revenues <sup>c</sup>	1.4	1.5	1.6	1.7
Outlays <sup>d</sup>	3.6	4.4	5.8	7.0
Offsetting receipts	-0.6	-0.8	-1.0	-1.3
Contribution to the Federal Deficit <sup>e</sup>	-1.5	-2.1	-3.2	-4.1
Gross Domestic Product at the End of the Period (Trillions of dollars)	21.3	31.0	45.2	66.5

Source: Congressional Budget Office.

This table satisfies a requirement specified in section 3111 of S. Con. Res. 11, the Concurrent Resolution on the Budget for Fiscal Year 2016.

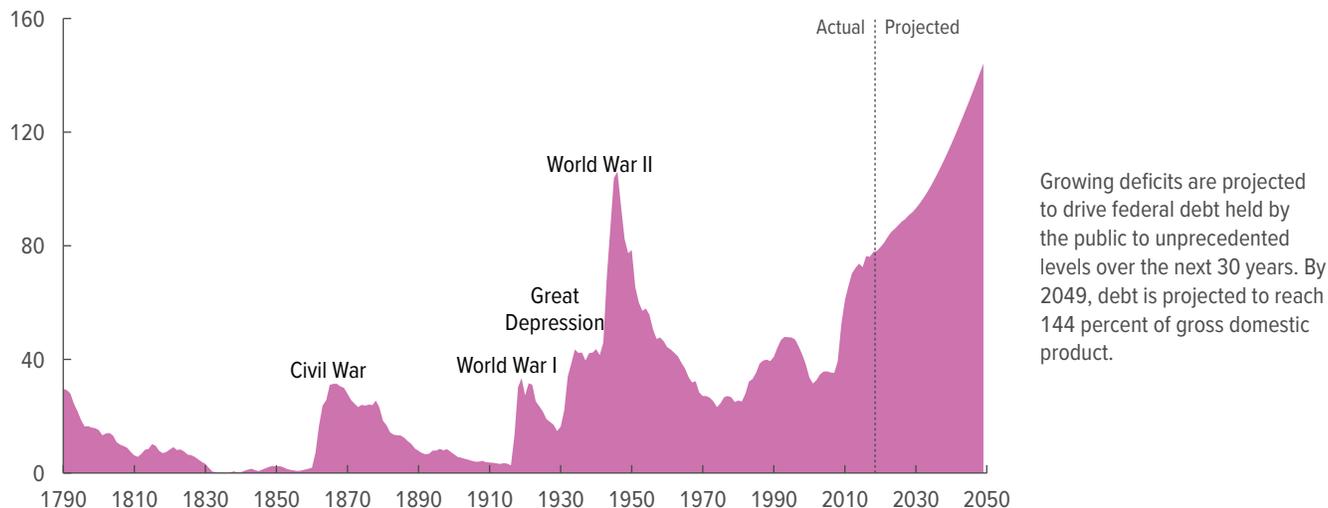
The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

- Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.
- Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.
- Includes all payroll taxes for the program other than those paid by the federal government on behalf of its employees (which are intragovernmental transactions). Also includes income taxes paid on Social Security benefits, which are credited to the trust funds. Excludes interest credited to the trust funds.
- Excludes discretionary outlays related to administration of the program.
- The contribution to the deficit shown here differs from the change in the trust fund balance for the program because it excludes intragovernmental transactions, interest earned on balances, and outlays related to administration of the program.

Figure 1-1.

**Federal Debt Held by the Public Since 1790**

Percentage of Gross Domestic Product



Growing deficits are projected to drive federal debt held by the public to unprecedented levels over the next 30 years. By 2049, debt is projected to reach 144 percent of gross domestic product.

Source: Congressional Budget Office.

50 years, such debt has averaged 42 percent of GDP.) It has exceeded 70 percent of GDP during only one other period in U.S. history—from 1944 to 1950 following the surge in federal spending that occurred during World War II (see Figure 1-1).

**Why Debt Is Projected to Grow**

The total amount of debt is projected to increase each year as the government runs budget deficits. If current laws generally remained unchanged, federal budget deficits would grow substantially over the next 30 years (see Figure 1-2). In CBO's projections, that increase occurs because mandatory spending—in particular, outlays for Social Security and the major health care programs—and interest payments on federal debt grow faster than revenues (see Figure 1-3 on page 10).

**2019 to 2029.** Deficits (adjusted to exclude the effects of shifts in the timing of certain payments) are projected to increase from 4.2 percent of GDP in 2019 to 4.5 percent of GDP by 2029—a level that has been exceeded in only eight years since 1946.<sup>3</sup> (Four of those years followed

the 2007–2009 recession, and the other four followed a double-dip recession in the early 1980s.) From 2019 to 2029, projected deficits average 4.3 percent of GDP—nearly one-and-a-half times the average over the past 50 years.

In CBO's projections, mandatory spending increases from 12.7 percent of GDP in 2019 to 14.9 percent in 2029. In contrast, discretionary spending decreases in relation to the size of the economy over that period—from 6.3 percent of GDP in 2019 to 5.0 percent in 2029. Revenues increase from 16.5 percent of GDP in 2019 to 18.3 percent in 2029. (A large portion of that increase is attributable to the expiration of nearly all of the individual income tax provisions of the 2017 tax act, Public Law 115-97.)

As a result of those changes in spending and revenues, primary deficits (deficits excluding net spending for interest) shrink in CBO's projections, falling from 2.4 percent of GDP in 2019 to 1.6 percent in 2029. But growing debt and rising average interest rates on federal

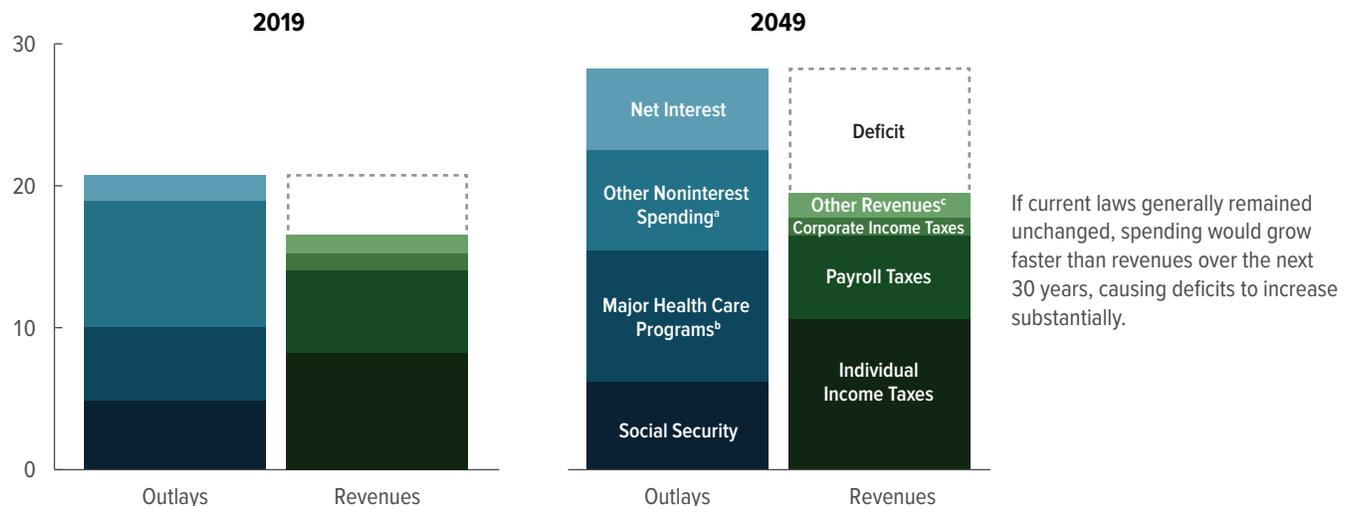
3. When October 1 (the first day of the fiscal year) falls on a weekend, certain payments that would have ordinarily been made on that day are instead made at the end of September and thus are shifted into the previous fiscal year. Over the next decade, certain payments will be shifted from fiscal years 2023, 2024,

and 2029 to fiscal years 2022, 2023, and 2028. Those shifts will noticeably boost spending and the deficit in fiscal years 2022 and 2028 and reduce spending and deficits in fiscal years 2024 and 2029. No adjustments were made for timing shifts after the first decade of the projection period.

Figure 1-2.

**The Federal Budget in 2019 and 2049**

Percentage of Gross Domestic Product



If current laws generally remained unchanged, spending would grow faster than revenues over the next 30 years, causing deficits to increase substantially.

Source: Congressional Budget Office.

- a. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.
- b. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.
- c. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

debt increase net interest costs from 1.8 percent of GDP in 2019 to 3.0 percent in 2029. The resulting increase in net outlays for interest more than offsets the decrease in primary deficits.

**2029 to 2049.** Deficits continue to grow beyond the first 10 years in CBO's extended baseline projections, rising from 4.5 percent of GDP in 2029 to 6.8 percent by 2039 and 8.7 percent by 2049 (an amount exceeded only in 2009, following the last recession). In the last two decades of the projection period, deficits average 6.9 percent of GDP.

After 2029, mandatory spending continues to increase faster than economic output, reaching 16.6 percent of GDP in 2039 and 17.5 percent in 2049, whereas discretionary spending increases only slightly, to 5.1 percent in 2049. Revenues also rise, although not as quickly as spending. They increase because of real bracket creep (the process in which an ever-larger proportion of income becomes subject to higher tax rates as income rises faster than inflation) and because of collections from the tax

on high-premium health plans that is scheduled to take effect in 2022.

As a result of those developments, primary deficits increase over the last two decades of the projection period, reaching 2.8 percent of GDP in 2039 and 3.0 percent by 2049 (see Figure 1-4 on page 12). And because in CBO's projections federal debt is already high at the end of the next decade and interest rates continue to rise, net outlays for interest increase from 3.0 percent of GDP in 2029 to 5.7 percent in 2049, adding substantially to projected deficits.

**How CBO Analyzes the Uncertainty of Its Projections**

Long-term projections are very uncertain. CBO therefore examined the extent to which federal debt would differ from the extended baseline projections if a set of key factors—several demographic and economic factors as well as the growth of health care costs—deviated from the paths underlying those projections. In CBO's assessment, there is about a two-thirds chance that federal debt would be between 71 percent and 175 percent of GDP in 2039. That range indicates that if current

laws generally remained unchanged, in 20 years federal debt—which is already high by historical standards—would probably be much higher than it is today.<sup>4</sup>

In addition to estimating that likely range by simulating budgetary outcomes when the values for all of the key factors varied simultaneously, the agency examined the sensitivity of its projections to higher or lower values for some of those factors individually. For example, if growth of total factor productivity in the nonfarm business sector was 0.5 percentage points faster than CBO’s central estimate, in 2049 federal debt held by the public would be 106 percent of GDP; if such growth was 0.5 percentage points slower, debt would be 185 percent of GDP. Or if federal borrowing rates were 1.0 percentage point lower than CBO’s central estimate, in 2049 debt would be 107 percent of GDP; if they were 1.0 percentage point higher, debt would be 199 percent of GDP.

### Consequences of High and Rising Federal Debt

If federal debt as a percentage of GDP continues to rise at the pace that CBO projects it would under current law, the economy would be affected in two significant ways:

- That debt path would dampen economic output over time, and
- Rising interest costs associated with that debt would increase interest payments to foreign debt holders and thus reduce the income of U.S. households by increasing amounts.

That debt path would also pose significant risks to the fiscal and economic outlook, although those risks are not currently apparent in financial markets. In particular, that path would have the following effects:

- Increase the risk of a fiscal crisis—that is, a situation in which the interest rate on federal debt rises abruptly because investors have lost confidence in the U.S. government’s fiscal position—and

- Increase the likelihood of less abrupt, but still significant, negative economic and financial effects, such as expectations of higher rates of inflation and more difficulty financing public and private activity in international markets.

In addition, high debt might cause policymakers to feel restrained from implementing deficit-financed fiscal policy to respond to unforeseen events or for other purposes, such as to promote economic activity or strengthen national defense.

Not all effects of the projected path of debt are negative. In addition to allowing policymakers to achieve goals for spending and revenue policies under current law, that path would cause interest rates to be higher than they otherwise would be, giving the Federal Reserve more flexibility in implementing monetary policy. (Higher interest rates would also have adverse economic effects, as described below.)

If policymakers understand the potential effects of high and rising debt, they may be better equipped to weigh the consequences of fiscal policy under current law against those of proposed changes to law. In all likelihood, if policymakers postponed fiscal tightening and debt as a share of GDP continued to rise, the changes necessary to stabilize debt would place an even greater burden on future generations.

### Effects Incorporated in CBO’s Extended Baseline Projections

The path of federal borrowing in CBO’s extended baseline projections would have negative economic consequences over the longer term. CBO projects that rising debt would crowd out the resources available for private investment, reducing the growth of economic output and income. In addition, rising interest payments would result in increasingly large payments to foreign investors and thus further dampen domestic income.

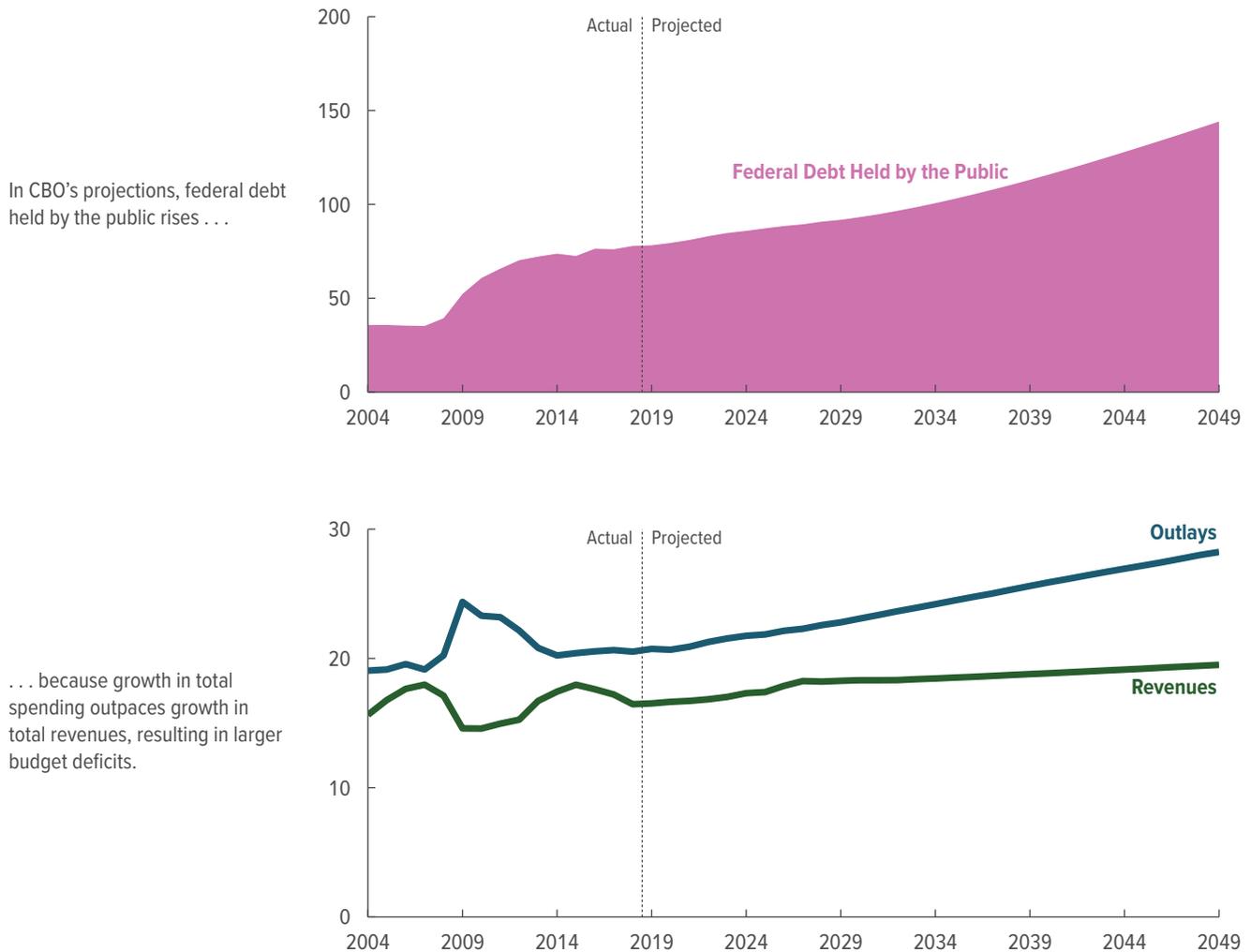
**Crowding Out of Private Investment.** The projected path of federal borrowing would reduce output in the long run. When the government borrows, it borrows from people and businesses whose saving would otherwise finance private investment in productive capital, such as factories and computers. Although an increase in government borrowing strengthens the incentive to save—in part by increasing interest rates—the resulting rise in private saving is not as large as the increase in

4. The range of likely outcomes that CBO’s models produce is less informative after 20 years because the key parameters governing the economic effects of fiscal policy in the agency’s models are based on the nation’s historical experience with federal borrowing. At the high end of such a range for 30 years in the future, projections of debt as a percentage of GDP would grow to amounts well outside historical experience.

Figure 1-3.

**CBO's Budget Projections in Brief**

Percentage of GDP



Continued

government borrowing; national saving, or the amount of domestic resources available for private investment, therefore declines.<sup>5</sup> Private investment falls less than

national saving does in response to government deficits, however, because the higher interest rates that are likely to result from increased federal borrowing tend to attract more foreign capital to the United States.

5. In CBO's assessment, another reason that an increase in government borrowing strengthens the incentive to save is that some people expect that policymakers will raise taxes or cut spending in the future to cover the cost of paying interest on the additional federal debt. As a result, some of those people increase their saving to prepare for paying higher taxes or receiving less in benefits. For further discussion of that effect and the estimated effect of federal borrowing on private investment, see Jonathan Huntley, *The Long-Run Effects of Federal Budget Deficits*

If investment in capital goods declined, workers would, on average, have less capital to use in their jobs. As a result, they would be less productive, their compensation

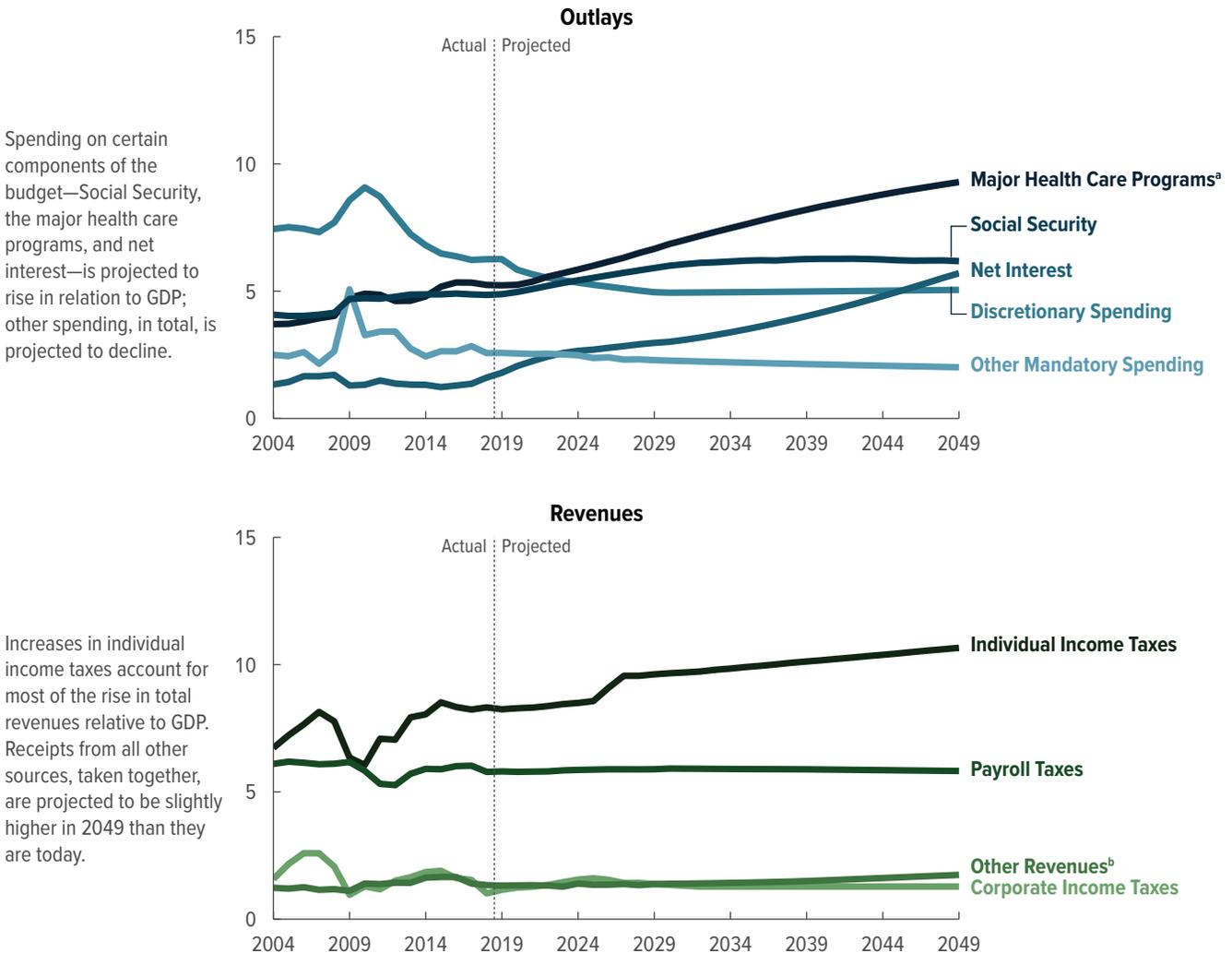
on *National Saving and Private Domestic Investment*, Working Paper 2014-02 (Congressional Budget Office, February 2014), [www.cbo.gov/publication/45140](http://www.cbo.gov/publication/45140).

Figure 1-3.

Continued

**CBO’s Budget Projections in Brief**

Percentage of GDP



Source: Congressional Budget Office.

GDP = gross domestic product.

- a. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children’s Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.
- b. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

would be lower, and they would thus be less inclined to work. Those effects would increase over time as federal borrowing grew. As an example of the benefits of lower debt, in CBO’s estimate, budgetary changes that entailed steadily reducing debt over 30 years to 42 percent of GDP (its average over the past 50 years) would, all else being equal, boost economic growth each year by about 0.1 percentage point in relation to growth in the agency’s

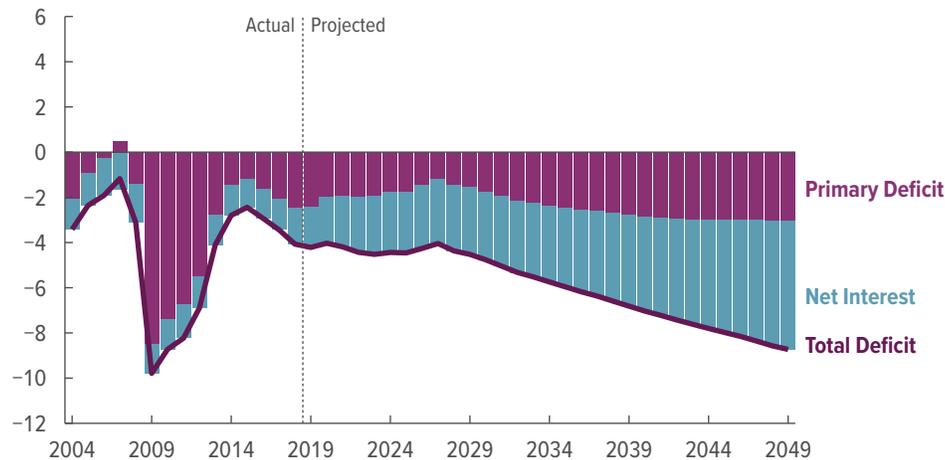
extended baseline projections. As a result, GDP would be 4.3 percent higher in 2049 than it is in the extended baseline projections, and GDP per person in 2049 would be about \$4,200 higher (in 2019 dollars).

**Rising Interest Payments.** The projected increase in federal borrowing would also drive up interest costs, increasing the burden of interest outlays in the federal budget.

Figure 1-4.

### Total Deficit, Primary Deficit, and Net Interest

Percentage of Gross Domestic Product



Although rising revenues and shrinking discretionary spending are projected to decrease primary deficits as a percentage of gross domestic product from 2019 to 2029, total deficits remain large because of rising net spending for interest.

Source: Congressional Budget Office.

Primary deficits or surpluses exclude net spending for interest.

In CBO's extended baseline projections, net interest outlays grow from 1.8 percent of GDP in 2019 to 3.0 percent in 2029 and then continue to increase over the next two decades to 5.7 percent by 2049. Moreover, because foreign investors hold a significant portion of Treasury securities, the increase in outlays represents an increase in payments to foreign investors and thus a reduction in domestic income relative to total U.S. economic output. If, for example, debt was reduced to 42 percent of GDP by 2049, gross national product—which, unlike GDP, includes income that U.S. residents earn abroad and excludes income payments to nonresidents—would be 5.8 percent higher than it is in CBO's extended baseline projections. (That increase is 1.5 percentage points greater than the percentage increase in GDP that would result from that path for debt.) GNP per person in 2049 would be about \$5,500 higher (in 2019 dollars) than it is in the extended baseline projections.

CBO projects a substantial increase in interest costs in part because of a projected increase in interest rates. Although the agency does not expect interest rates to rise as much as it previously anticipated, the projected increase in debt from an already high level means that even moderate increases in interest rates would lead to significantly higher interest costs. CBO now projects the average interest rate on federal debt to increase

from 2.4 percent in 2019 to 4.2 percent by 2049. The additional interest costs resulting from that increase in interest rates accounts for roughly one-quarter of the increase in debt as a share of GDP over the next three decades in CBO's extended baseline projections; the cost of financing the primary deficits projected over that period at current interest rates accounts for the remainder of that increase.

That interest rate projection reflects the relatively muted rise in interest rates over the past decade, which has generally surprised CBO, other government agencies, and many private-sector forecasters. CBO's projections of interest rates also reflect the trajectory of federal debt in the agency's baseline, prices in financial markets that indicate expectations of future interest rates, and other factors. Although factors such as slower labor force growth are projected to put downward pressure on interest rates, CBO expects rates to rise because of such factors as an increase in inflation, faster growth of productivity, increased demand for investment in emerging economies, and increases in federal borrowing (see Appendix A).

Still, even as the outlook for federal borrowing has worsened over the past decade, financial markets have shown few signs of adverse effects, and interest rates on Treasury

securities have remained relatively low. CBO has revised its projections of interest rates downward several times in response. For example, from 2030 to 2035, the average rate on federal debt is now projected to be 3.5 percent, 1.7 percentage points lower than the agency projected for that period in June 2010. Similarly, the average real (inflation-adjusted) interest rate on federal debt is now projected to be 1.1 percent, 1.6 percentage points lower than the 2010 projection. Those downward revisions have reduced the projected costs of federal borrowing under current law and reduced the estimated changes in fiscal policy that would be necessary to stabilize debt as a share of GDP.

Although the government has benefited from persistently low interest rates, which have dampened the costs of federal borrowing, those low rates can also have negative implications, including their potential to constrain the implementation of monetary policy. Persistently low and declining interest rates could affect the Federal Reserve's ability to use monetary policy to respond sufficiently to a negative shock—such as a sudden worsening in international conditions or abrupt and unexpected fiscal tightening—because monetary policy would be less able to support economic growth once short-term interest rates were lowered to zero. In the long run, less effective monetary policy would reduce national income, on average. The current path of debt helps mitigate those potential negative effects by keeping rates from being even lower.

### **Risk of a Fiscal Crisis**

High and rising federal debt increases the likelihood of a fiscal crisis because it erodes investors' confidence in the government's fiscal position and could result in a sharp reduction in their valuation of Treasury securities, which would drive up interest rates on federal debt because investors would demand higher yields to purchase Treasury securities. For example, concerns about the U.S. government's fiscal position could lead to a sudden increase in inflation expectations, fear of a large decrease in the value of the U.S. dollar, or a loss of confidence in the federal government's ability or commitment to repay its debt in full.

In a fiscal crisis, dramatic increases in Treasury rates would reduce the market value of outstanding government securities, and the resulting losses incurred by holders of those securities—including mutual funds, pension funds, insurance companies, and banks—could be large

enough to cause some financial institutions to fail. A fiscal crisis could thus lead to a financial crisis. Because the United States plays a central role in the international financial system, such a crisis could spread globally.

Policymakers' options for responding to a fiscal crisis would each have negative economic consequences, and choosing among them would involve difficult trade-offs. Such options include using monetary policy to raise inflation, thereby reducing the burden of financing outstanding securities; restructuring the debt (that is, modifying the contractual terms of existing obligations); or dramatically cutting spending or increasing taxes.

The risk of a fiscal crisis depends on many factors beyond the level of federal debt. Among those factors are investors' expectations about the budget and economic outlook, which can shift over time, and domestic and international financial conditions, including global interest rates. Furthermore, the relationships between those many factors and the risk of a crisis are uncertain and can shift over time depending, in part, on the state of the economy. In CBO's assessment, the debt-to-GDP ratio has no set tipping point at which a crisis becomes likely or imminent. Indeed, CBO cannot reliably quantify the probability that a fiscal crisis will occur. Thus, the distribution of possible outcomes that the agency considered in preparing its baseline projections does not include the potential budgetary and economic outcomes of a fiscal crisis.

At this time, financial markets show little indication of the risk of a fiscal crisis in the near future. Yet, markets do not always fully reflect risks on the horizon, and more important, the risk of a fiscal crisis is subject to sudden change in the wake of unexpected events. Moreover, all else being equal, the risk increases as the debt level rises, which it is projected to do under current law; if certain tax increases and discretionary spending cuts do not take place as scheduled during the next few years, the debt level would rise even more than it does in CBO's extended baseline projections.

An economic downturn could heighten the risk of a fiscal crisis. In a downturn, the economy shrinks and automatic stabilizers boost federal spending and reduce tax liabilities (and thus revenues). As a result of those developments, deficits and debt (measured as a share of GDP) would be larger than they are in CBO's extended baseline projections. Moreover, policymakers would

face heightened risk that a fiscal crisis would result from elevated debt during circumstances that in the past have led them to enact new policies that increased deficits and in situations in which the Federal Reserve has less flexibility in implementing monetary policy. The effect of the increase in federal borrowing on interest costs would be mitigated to some degree if interest rates fell during the downturn, as they have in the past. But deficits and debt that were larger than CBO projects could make investors more likely to drastically reduce their valuations of Treasury securities, which would lead to significantly higher interest rates on those securities. Those factors suggest lawmakers could avoid certain risks to the economy by reducing deficits in times of relatively strong economic growth.

### Risks of Other Disruptions

Even in the absence of an abrupt fiscal crisis, high and rising debt could generate persistent negative effects on the economy beyond those incorporated in CBO's extended baseline projections, including a gradual decline in the value of Treasury securities and other domestic assets. High and rising debt could lead to moderate but ongoing increases in inflation expectations. Increases in federal borrowing could also lead to an erosion of confidence in the U.S. dollar as an international reserve currency. Among other effects, such developments would make it more difficult to finance public and private activity. Moreover, the increased dependence on foreign investors that would accompany high and rising debt could pose other challenges, such as making U.S. financial markets more vulnerable to a change in valuation of U.S. assets by participants in global markets.

The projected level of debt creates the risk that interest costs would be substantially greater than projected—even without a fiscal crisis—if interest rates were higher than those underlying CBO's extended baseline projections. For example, if unexpected changes in financial factors caused the average borrowing rate to be 1 percentage point higher every year than the rate underlying the agency's extended baseline projections but all other aspects of the economy were unaffected, then the government's net interest costs would amount to about 10 percent of GDP 30 years from now, CBO projects. That amount is equal to about half of federal revenues projected for that year. Moreover, under those circumstances, federal debt would equal almost 200 percent of GDP, CBO estimates. If interest rates jumped, investors could become concerned about the government's fiscal

position over the long term as they worked to determine whether the uptick in rates was temporary or signaled a long-run trend. Alternatively, a lower borrowing rate would result in smaller interest costs than those in CBO's extended baseline projections.

High debt and large deficits might also create constraints for policymakers as they contemplate making changes to fiscal policy. As the federal government increases its borrowing, ever larger cuts in primary deficits would be required to achieve particular deficit or debt targets. In addition, as a result of the outlook for federal borrowing, policymakers could feel restrained from using deficit-financed fiscal policy to respond to unforeseen events or for other purposes, including to promote economic activity or to further other goals. High debt could also undermine national security if policymakers felt constrained from increasing national security spending to resolve an international crisis or to prepare for such a crisis before it began.

### Demographic and Economic Trends Underlying CBO's Long-Term Projections

Demographic and economic projections are key determinants of the long-term budget outlook. Through 2029, the projections in this report are the same as those that underlie CBO's 10-year baseline budget projections; for later years, the agency projects conditions on the basis of its assessment of long-term trends. The agency uses a model with four components to integrate demographic and economic changes into its long-term budget projections.<sup>6</sup>

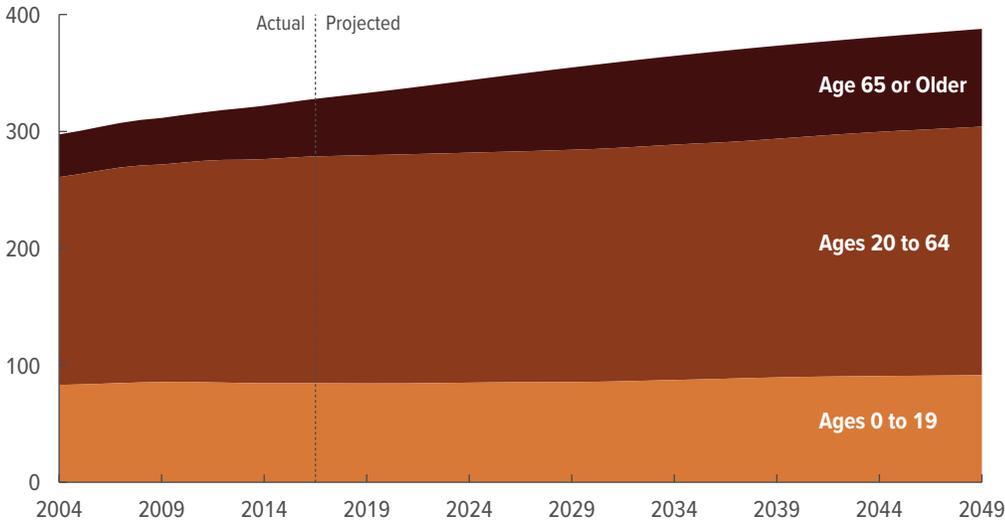
- A demographic model is used to project the size of the population by age and sex.
- A microsimulation model is used to project year-to-year changes in demographic characteristics and economic outcomes for individuals in a representative sample of the population.
- A long-term budget model is used to project federal outlays, revenues, deficits, and debt beyond CBO's standard 10-year budget period.

6. See Congressional Budget Office, *An Overview of CBOLT: The Congressional Budget Office Long-Term Model* (April 2018), [www.cbo.gov/publication/53667](http://www.cbo.gov/publication/53667).

Figure 1-5.

**Population, by Age Group**

Millions of People



The percentage of the population age 65 or older is projected to rise over the coming decades, maintaining a long-standing historical trend.

Source: Congressional Budget Office.

Actual data are shown through calendar year 2016, the most recent year for which such data are available.

- A model of economic growth is used to simulate how demographics, fiscal policy, and economic factors affect the U.S. economy and, in turn, the federal budget.

Those four components interact in a variety of ways. For example, the economic projections reflect the effects that increases in spending and revenues in the extended baseline projections—in particular, increased federal borrowing and rising effective marginal tax rates—would have on the economy. Such effects would result in a smaller labor supply, a smaller stock of capital, and less output than would otherwise be the case. (Appendix A describes CBO’s demographic and economic projections.) In turn, the budgetary outcomes in the extended baseline projections reflect those economic effects.

**Demographic Projections**

The size and age profile of the U.S. population affect the federal budget and the nation’s economy. For example, the composition of the population influences the size of the labor force and the number of beneficiaries of Social Security and other federal programs. In CBO’s projections, the U.S. population increases from 333 million at the beginning of 2019 to 388 million in 2049, expanding by 0.5 percent each year, on average. That

rate is slower than the average annual growth rate of the past 50 years (0.9 percent). The share of the population that is 65 or older also rises over the coming decades, continuing a long-standing historical trend. By 2049, 22 percent of the population would be age 65 or older, whereas today that share is 16 percent (see Figure 1-5). To estimate the growth of the U.S. population, CBO projects rates of fertility, immigration, and mortality.

**Fertility.** The total fertility rate is calculated as the sum of fertility rates for women between 15 and 49 in a given year and represents the average number of children that a woman would have in her lifetime.<sup>7</sup> In general, that rate tends to decline during recessions and rebound during recoveries. Instead of rebounding after the 2007–2009 recession, however, the fertility rate fell. In 2007, the rate was 2.1 births per woman, but it has steadily declined since then, falling to 1.9 children per woman in 2010 and to 1.8 children per woman in 2017 (the most

7. The total fertility rate can also be defined as the average number of children that a woman would have if, in each year of her life, she experienced the birth rates observed or assumed for that year and if she survived her entire childbearing period.

recent year for which data are available).<sup>8</sup> CBO expects the total fertility rate to gradually increase to 1.9 children per woman by 2022 and to remain at that level for the rest of the projection period. The lower fertility rates over the past decade result in slower growth of the population age 16 or older in the future. That slow future growth has noticeable effects on CBO's projections of economic growth in the second decade of the projection period.

**Immigration.** With birth rates projected to remain low, net immigration flows become an increasingly important part of overall U.S. population growth; in 2019, projected net inflows account for approximately 45 percent of overall population growth, but by 2049 that share is nearly 87 percent. CBO projects three broad categories of immigration: legal permanent residents (LPRs), legal temporary residents, and foreign-born people without legal status.<sup>9</sup> In the agency's projections, the rate of net annual immigration averages 3.1 immigrants per thousand people over the next 30 years, rising from 2.8 in 2019 to 3.1 in 2029 and staying at that level through 2049. That rate, which accounts for all people who enter or leave the United States in a given year, is slightly higher than the average net annual immigration rate since the end of the 2007–2009 recession.

Of those three categories, annual net flows of LPRs are largest, averaging approximately 860,000 people per year in the first decade and approximately 890,000 annually

over the second decade. Net flows of foreign-born people without legal status increase over the next five years in CBO's projections, from zero net flows in 2019 (meaning that immigration is offset by emigration in this category) to about 170,000 in 2024; thereafter, annual net flows remain about the same through 2039. The annual net increase of legal temporary residents is projected to remain relatively steady, at approximately 80,000 per year, over the next 20 years.

In its projections for years after 2039, CBO uses the same annual rate of growth for all categories of immigrants. Specifically, CBO projects that the net number of new immigrants would grow at a rate equal to the growth of the overall population in the previous year; that rate averages 0.4 percent annually through 2049. The share of the population that is foreign born is thus projected to grow from approximately 14 percent today to approximately 16 percent in 2049.

**Mortality.** Life expectancy is projected to improve (that is, mortality rates are projected to decline) over the next 30 years, on average. In CBO's projections, mortality rates, which measure the number of deaths per thousand people in the population, decline at the same pace as the rates for each age and sex group declined from 1950 to 2015. Average life expectancy at birth increases from 79.1 years in 2019 to 82.5 years in 2049 in CBO's projections. Similarly, life expectancy at age 65 increases by 2.1 years over that period, from 19.4 years in 2019 to 21.5 years in 2049.<sup>10</sup>

### Economic Projections

The performance of the U.S. economy in coming decades will affect the federal government's spending, revenues, and debt accumulation. CBO makes its economic projections by assessing trends in key economic variables, such as the size and composition of the labor force, capital accumulation, productivity, inflation, and interest rates. The agency also considers ways in which fiscal policy influences economic activity.

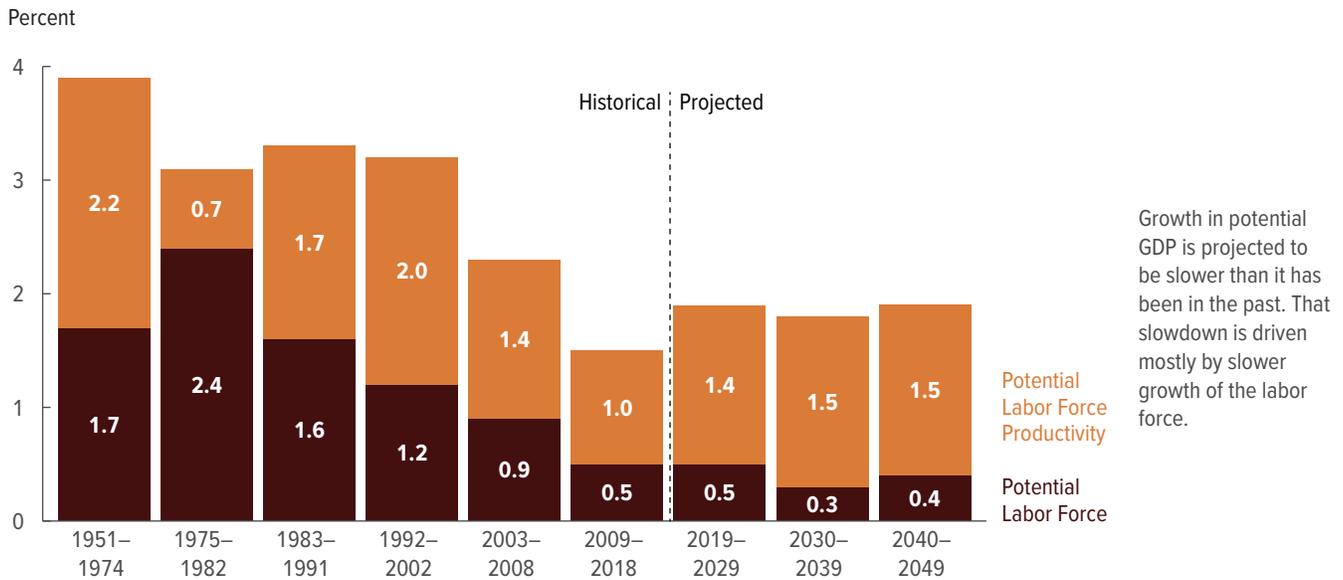
**Economic Growth and the Size of the Labor Force.** In CBO's extended baseline projections, growth in potential (maximum sustainable) GDP in the future is slower

8. See Brady E. Hamilton and others, *Births: Provisional Data for 2017*, Vital Statistics Rapid Release Report 4 (National Center for Health Statistics, May 2018), [www.cdc.gov/nchs/nvss/vsrr/reports.htm](http://www.cdc.gov/nchs/nvss/vsrr/reports.htm).

9. CBO uses the term "foreign-born people without legal status" to refer to foreign-born people other than LPRs, refugees, asylees, and temporary residents and visitors. Most foreign-born people without legal status either unlawfully entered the United States without inspection or lawfully entered the United States in a temporary status and then unlawfully remained in the country after that temporary status expired. Some foreign-born people without legal status are beneficiaries under Temporary Protected Status or under policies whereby the executive branch does not seek their immediate removal from the United States (Deferred Action for Childhood Arrivals, for example); others are allowed to remain in the United States while they await their removal proceedings in immigration courts. Many foreign-born people are authorized to work in the United States and can therefore apply for a Social Security number, which would also make them eligible for certain refundable tax credits. People are more likely to report employment income and pay the applicable income and payroll taxes when they have a Social Security number.

10. Life expectancy as used here is period life expectancy, which is the amount of time that a person in a given year would expect to survive beyond his or her current age on the basis of that year's mortality rates for various ages.

Figure 1-6.

**Average Annual Growth of Real Potential GDP**

Source: Congressional Budget Office.

Real potential GDP is the maximum sustainable output of the economy, adjusted to remove the effects of inflation. The two contributing factors are the potential labor force and potential labor force productivity. The potential labor force is the labor force (that is, the number of people in the civilian noninstitutionalized population who are age 16 or older and who are either working or actively seeking work) adjusted to remove the effects of fluctuations in the business cycle. Potential labor force productivity is the ratio of potential GDP to the potential labor force.

GDP = gross domestic product.

than it has been over the past 50 years. Over the next 30 years, real potential GDP increases at an average rate of 1.9 percent per year, whereas from 1969 to 2018, it grew at an average annual rate of 2.8 percent. That slower growth is attributable to several factors—most notably, slower growth of the potential labor force (the labor force adjusted for fluctuations in the business cycle). In CBO’s projections, the potential labor force grows by 0.4 percent per year, on average, through 2049 (see Figure 1-6); the average annual growth rate over the past 50 years was 1.5 percent. That slower projected growth of the potential labor force results mainly from slowing population growth and the aging of the population.

**Productivity.** Total factor productivity in the nonfarm business sector grows more slowly than its historical average in CBO’s projections, increasing by 1.1 percent per year, on average, from 2019 to 2049. That rate, which measures the growth of the average real output per unit of combined labor and capital services in the nonfarm business sector (which accounts for approximately 75 percent of economic activity), is slower than the

1.4 percent that such growth has averaged annually since 1950. Factors influencing that projection include slower productivity growth over the past several decades (except during a period of rapid growth in the late 1990s and early 2000s), relatively modest growth in labor quality (a measure of workers’ skills), and a projected reduction in federal investment as a share of GDP.

Potential labor productivity in the entire economy—defined as real potential GDP per potential hour of work—is likewise projected to grow more slowly than it has in the past, reflecting the slower growth of total factor productivity and less private investment in capital goods. Since 1950, labor productivity has risen by 1.7 percent per year, on average; through 2049, it is projected to increase by an average of 1.5 percent per year.

**Interest Rates.** As the economy continues to expand, interest rates rise in CBO’s latest economic projections but remain lower than they have been historically. The interest rate on 10-year Treasury notes rises from 2.9 percent at the end of 2018 to 3.8 percent in 2029. That rate

is projected to increase to 4.6 percent in 2049—1.2 percentage points below the 5.8 percent average recorded over the 1990–2007 period. In CBO’s projections, slower growth of the labor force and lower inflation than in the past push interest rates down from their historical levels; the effects on interest rates of those two factors and others are projected to outweigh the effects of rising federal debt and other factors that tend to push interest rates up above their historical levels.

The average interest rate on all federal debt held by the public tends to be lower than the rate on 10-year Treasury notes. (Interest rates are generally lower on shorter-term debt than on longer-term debt, and the average term to maturity of federal debt has been less than 10 years since the 1950s.) On the basis of projections of interest rate spreads, the average interest rate on federal debt is projected to be about 0.4 percentage points lower than the interest rate on 10-year Treasury notes after 2029. As a result, in CBO’s projections, the average interest rate on federal debt rises to 4.2 percent by 2049.

**Effects of Fiscal Policy.** CBO’s economic projections incorporate the macroeconomic effects of projected changes in federal tax and spending policies under current law. In particular, the agency projects that increased borrowing by the federal government under current law would crowd out some private investment in capital in the long term. Less private investment in capital goods would, in turn, make workers less productive, leading to lower wages. Lower wages would reduce people’s incentive to work and thus lead to a smaller supply of labor.

The agency also incorporates the economic effects of higher marginal tax rates in its extended baseline projections. As more income is pushed into higher tax brackets over time, labor and capital income face higher effective tax rates. Higher marginal tax rates on labor income would reduce after-tax wages and thus people’s incentive to work, and the increase in the marginal tax rate on capital income would reduce their incentive to save and invest. All told, less private investment and a smaller labor supply would lower economic output and income.

### Projected Spending Through 2049

Spending for all of the government’s programs and activities and for its net interest costs is projected to account for a larger percentage of GDP in coming years than it has, on average, over the past 50 years.

Excluding net spending on interest, federal outlays averaged 18.3 percent of GDP from 1969 to 2018. Under current law, noninterest outlays are projected to rise from 18.9 percent of GDP in 2019 to 19.8 percent in 2029: Mandatory spending (which includes spending on Social Security and the major health care programs as well as outlays for many smaller programs) is generally projected to increase as a share of the economy, and discretionary spending is generally projected to decrease.

After 2029, under the assumptions that govern the extended baseline, noninterest spending relative to the size of the economy would continue to rise, reaching 22.5 percent of GDP by 2049. (For a summary of the assumptions about spending and revenues that underlie CBO’s extended baseline, see Table 1-2.) That increase would mostly result from larger outlays for the two biggest mandatory programs: Social Security and Medicare (see Figure 1-7).

Under current law, net interest costs would, CBO projects, rise from 1.8 percent of GDP in 2019 to 3.0 percent in 2029 as debt accumulates and interest rates increase from their currently low levels. By 2049, net interest costs would equal 5.7 percent of GDP, boosting total federal spending to 28.2 percent of GDP. Spending has exceeded that level only once, for a three-year period during World War II. In those years, when defense spending increased sharply, total federal spending topped 40 percent of GDP.

CBO projects that growth in spending for Social Security, the major health care programs, and interest would reshape the spending patterns of the U.S. government (see Figure 1-8 on page 21). Net spending for interest would account for a much greater portion of total federal spending in 2049 than it does today, and spending on Social Security and the major health care programs would account for a much larger share of all federal noninterest spending. Discretionary spending, however, would account for a much smaller share of all federal noninterest spending in 2049 than it does today.

### Spending for Social Security and the Major Health Care Programs

Mandatory programs have accounted for a growing share of the federal government’s noninterest spending over the past few decades. Most of that growth has occurred because Social Security and Medicare provide benefits mainly to people age 65 or older, a group that has been

Table 1-2.

### Assumptions About Outlays and Revenues Underlying CBO's Extended Baseline Projections

<b>Assumptions About Outlays</b>	
Social Security	As scheduled under current law <sup>a</sup>
Medicare	As scheduled under current law through 2029; thereafter, projected spending depends on the estimated number of beneficiaries and health care costs per beneficiary (for which excess cost growth is projected to move smoothly to a rate of 1.0 between 2030 and 2049) <sup>a</sup>
Medicaid	As scheduled under current law through 2029; thereafter, projected spending depends on the estimated number of beneficiaries and health care costs per beneficiary (for which excess cost growth is projected to move smoothly to a rate of 1.0 between 2030 and 2049)
Children's Health Insurance Program	As projected in CBO's baseline through 2029; thereafter, projected spending remains constant as a percentage of GDP
Subsidies for Health Insurance Purchased Through the Marketplaces	As scheduled under current law through 2029; thereafter, projected spending depends on the estimated number of beneficiaries, an additional indexing factor for subsidies, and excess cost growth for private health insurance premiums (which is projected to move smoothly to a rate of 1.0 between 2030 and 2049)
Other Mandatory Spending	As scheduled under current law through 2029; thereafter, refundable tax credits are estimated as part of revenue projections, and the rest of other mandatory spending is assumed to decline as a percentage of GDP at roughly the same annual rate at which it is projected to decline between 2024 and 2029 <sup>b</sup>
Discretionary Spending	As projected in CBO's baseline through 2029; thereafter, projected spending remains roughly constant as a percentage of GDP <sup>c</sup>
<b>Assumptions About Revenues</b>	
Individual Income Taxes	As scheduled under current law
Payroll Taxes	As scheduled under current law
Corporate Income Taxes	As scheduled under current law
Excise Taxes	As scheduled under current law <sup>d</sup>
Estate and Gift Taxes	As scheduled under current law
Other Sources of Revenues	As scheduled under current law (remain constant as a percentage of GDP after 2029)

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

For CBO's most recent 10-year baseline projections, see Congressional Budget Office, *Updated Budget Projections: 2019 to 2029* (May 2019), [www.cbo.gov/publication/55151](http://www.cbo.gov/publication/55151).

Excess cost growth is the extent to which the growth rate of nominal health care spending per person (adjusted to remove the effects of aging) exceeds the growth rate of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.)

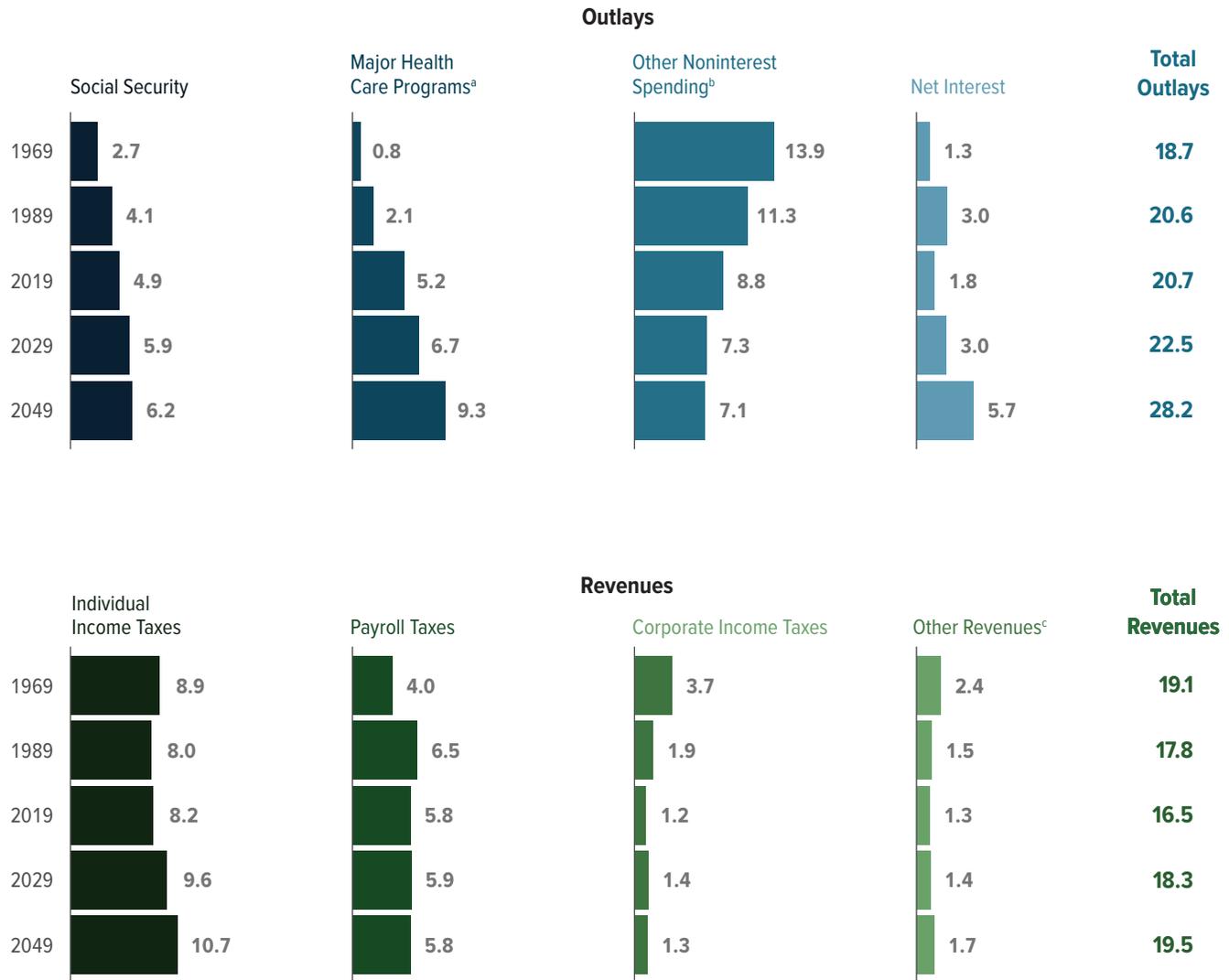
GDP = gross domestic product.

- a. The payment of full benefits as calculated under current law is assumed to continue regardless of the amounts available in the program's trust funds.
- b. In that projection, GDP includes the macroeconomic effects of the policies underlying the extended baseline projections. If it did not, the rest of other mandatory spending after 2029 would decline at the same rate at which it is projected to decline between 2024 and 2029 (excluding the decline in spending for the Supplemental Nutrition Assistance Program).
- c. In that projection, GDP includes the macroeconomic effects of the policies underlying the extended baseline projections. If it did not, discretionary spending after 2029 would remain the same (measured as a percentage of GDP) as the amount projected for 2029.
- d. The current-law assumption does not apply to expiring excise taxes dedicated to trust funds. The Balanced Budget and Emergency Deficit Control Act of 1985 requires CBO's baseline to reflect the assumption that those taxes would be extended at their current rates. That law does not stipulate that the baseline include the extension of other expiring tax provisions, even if they have been routinely extended in the past.

Figure 1-7.

**Outlays and Revenues in Selected Years**

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

- a. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children’s Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.
- b. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.
- c. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

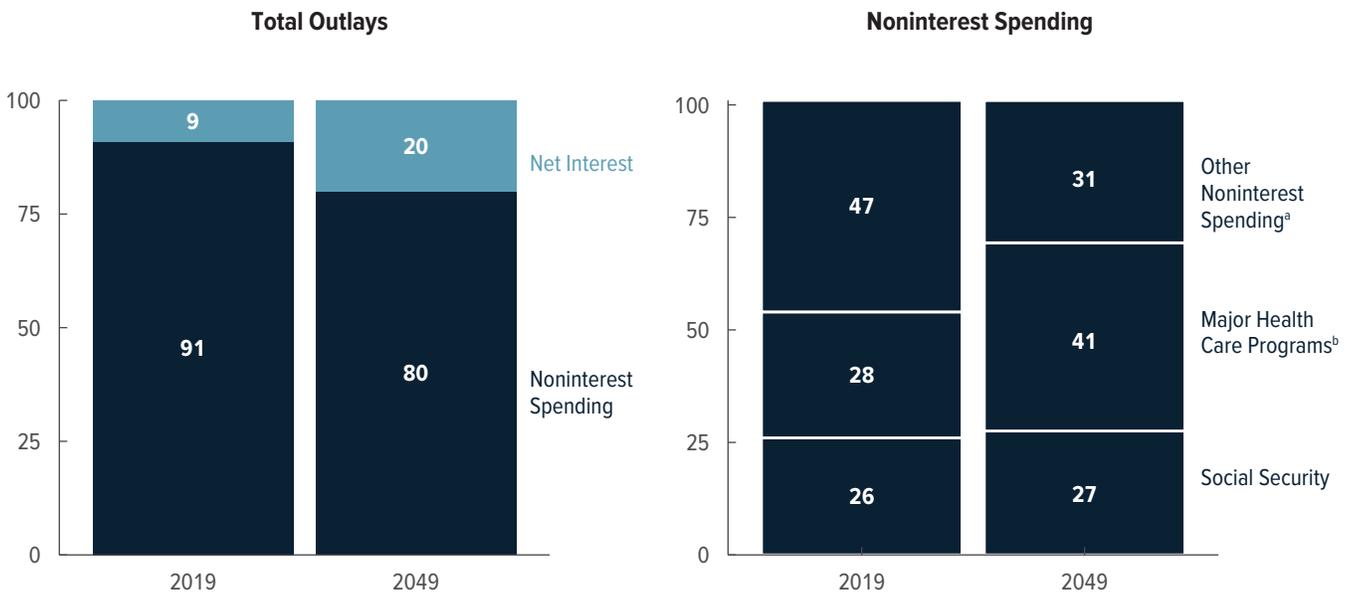
growing significantly. In CBO’s extended baseline, the aging of the U.S. population continues to drive up outlays for Social Security and Medicare. Moreover, Medicare outlays also climb because, in CBO’s estimation, health care costs per person will continue to rise. By 2049, CBO projects, federal spending for people

age 65 or older (including spending for Social Security, Medicare, and Medicaid—the federal health care program for people with limited income and resources) would account for about half of all federal noninterest spending; today, that share is about two-fifths.

Figure 1-8.

**Composition of Federal Outlays**

Percent



Source: Congressional Budget Office.

- a. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.
- b. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

**Social Security.** Created in 1935, Social Security is the largest single program in the federal budget. Its two components pay benefits to 64 million people in all. The larger of the two, Old-Age and Survivors Insurance (OASI), pays benefits to retired workers, their eligible dependents, and some survivors of deceased workers. The smaller program, Disability Insurance (DI), makes payments to disabled workers and their dependents until those workers are old enough to claim full retirement benefits under OASI.

Under current law, CBO projects, spending for Social Security would increase noticeably as a share of the economy, continuing the trend of the past five decades. CBO projects that the number of Social Security beneficiaries would rise from 64 million in 2019 to 97 million in 2049 and that spending for the program would increase from 4.9 percent of GDP to 6.2 percent over that period (see Figure 1-7 on page 20). Those projections reflect the assumption that Social Security will continue to pay benefits as scheduled under current law, regardless of

the status of the program's trust funds.<sup>11</sup> That approach is consistent with a statutory requirement that CBO's 10-year baseline projections incorporate the assumption that funding for such programs is adequate to make all payments required by law.<sup>12</sup> (For analysis of a scenario in which benefit payments would be limited to the amounts in the trust funds, see Chapter 2.)

The Social Security program is funded by dedicated tax revenues from two sources. Currently, 96 percent comes from a payroll tax; the rest is collected from income taxes on Social Security benefits. Revenues from the payroll

11. The balances of the trust funds represent the total amount that the government is legally authorized to spend for those purposes. For more details about the legal issues related to exhaustion of a trust fund, see William R. Morton and Barry F. Huston, *Social Security: What Would Happen If the Trust Funds Ran Out?* Report for Congress RL33514 (Congressional Research Service, June 11, 2018), <https://go.usa.gov/xEtw>.

12. Sec. 257(b)(1) of the Balanced Budget and Emergency Deficit Control Act of 1985 (Deficit Control Act), P.L. 99-177 (codified at 2 U.S.C. §907(b)(1) (2016)).

Table 1-3.

### Summary Financial Measures for the Social Security System

Projection Period (Calendar years)	Income Rate	Cost Rate	Actuarial Balance
<b>As a Percentage of Gross Domestic Product</b>			
25 Years (2019 to 2043)	5.1	6.1	-1.1
50 Years (2019 to 2068)	4.8	6.1	-1.4
75 Years (2019 to 2093)	4.6	6.2	-1.5
<b>As a Percentage of Taxable Payroll</b>			
25 Years (2019 to 2043)	14.6	17.6	-3.1
50 Years (2019 to 2068)	14.0	18.0	-4.0
75 Years (2019 to 2093)	13.9	18.4	-4.6

Source: Congressional Budget Office.

These projections incorporate the assumption that spending for Social Security continues as scheduled even if its trust funds are exhausted. Through 2049, the projections incorporate macroeconomic feedback caused by rising federal debt and marginal tax rates. After 2049, they do not account for such feedback.

For programs such as Social Security that have both a trust fund and a dedicated source of revenue, a common measure of sustainability is the actuarial balance, which is the income rate over a given period minus the cost rate over that period. The income rate is the present value of annual tax revenues plus the initial trust fund balance, divided by the present value of gross domestic product (GDP) or taxable payroll. The cost rate is the present value of annual outlays plus the present value of a reserve equal to a year's worth of benefits at the end of the period, divided by the present value of GDP or taxable payroll. (The present value of a flow of revenues or outlays over time expresses that flow as a single amount received or paid at a given time. The present value depends on the rate of interest, known as the discount rate, that is used to translate the cash flow into current dollars.)

tax and the tax on benefits are credited to the Old-Age and Survivors Insurance Trust Fund and the Disability Insurance Trust Fund, which finance the program's benefits. In CBO's extended baseline projections, dedicated tax revenues for the combined trust funds remain roughly constant through 2049 at about 4.4 percent of GDP.

A common measure of the sustainability of a program that has a trust fund and a dedicated revenue source is its estimated actuarial balance over a given period—that is, the sum of the present value of projected tax revenues and the current trust fund balance minus the sum of the present value of projected outlays and a year's worth of

benefits at the end of the period.<sup>13</sup> For Social Security, that difference is traditionally expressed as a percentage of the present value of taxable payroll over 75 years.<sup>14</sup>

With the trust funds' revenues projected to grow more slowly than their expenditures, the program would have a long-term actuarial deficit. Over the next 75 years, if current laws remained in place, the program's actuarial deficit would be 1.5 percent of GDP, or 4.6 percent of taxable payroll, CBO projects (see Table 1-3).<sup>15</sup> According to CBO's projections, it would therefore be possible to pay the benefits prescribed by current law and maintain the necessary trust fund balances through 2093 if payroll taxes were raised immediately and permanently by about 4.6 percent of taxable payroll, if scheduled benefits were reduced by an equivalent amount, or if some combination of tax increases and spending reductions of equal present value was adopted.<sup>16</sup>

13. A present value expresses a flow of past and future income or payments as a single amount received or paid at a specific time. The value depends on the interest rate, known as the discount rate, used to translate past and future cash flows into current dollars at that time. To account for the difference between a trust fund's current balance and the desired balance at the end of the period, the balance at the beginning is added to the projected tax revenues, and an additional year of costs at the end of the period is added to projected outlays.
14. Taxable payroll is the total amount of earnings (wages and self-employment income) from employment covered by Social Security that is below the applicable annual taxable maximum (\$132,900 in 2019).
15. The 75-year projection period used here begins in calendar year 2019 and ends in calendar year 2093. The Social Security trustees have estimated that the program's 75-year actuarial shortfall would be 2.8 percent of taxable payroll, which is about 1.8 percentage points less than CBO's projection. For details on the trustees' projections, see Social Security Administration, *The 2018 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds* (June 2018), [www.ssa.gov/oact/trf/2018](http://www.ssa.gov/oact/trf/2018).
16. A policy that either increased revenues or reduced outlays by the same percentage of taxable payroll each year to eliminate the 75-year shortfall would not necessarily place Social Security on a permanently stable financial path. Estimates of the actuarial deficit do not account for revenues or outlays after the 75-year projection period. Because shortfalls are smaller earlier in the 75-year projection period than they are later, such a policy would create surpluses in the next several decades but result in deficits later and leave the system financially unbalanced after calendar year 2093. Additionally, the calculation of the actuarial balance does not include the effects of any macroeconomic feedback that would result from an increase in taxes or a reduction in benefits.

Another commonly used measure of Social Security's sustainability is the trust funds' dates of exhaustion. CBO projects that under current law, the DI trust fund would be exhausted in fiscal year 2028 and the OASI trust fund would be exhausted in calendar year 2032. If their balances were combined, the OASDI trust funds would be exhausted in calendar year 2032, CBO estimates.

**The Major Health Care Programs.** Outlays for the major health care programs consist of spending for Medicare, Medicaid, and the Children's Health Insurance Program (CHIP), as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act (ACA) and related spending.<sup>17</sup> Medicare, which provides health insurance to about 61 million people (most of whom are at least 65 years old), accounts for more than 60 percent of that spending.

CBO projects federal spending for the government's major health care programs for 2019 through 2029 under the assumption that the laws governing those programs will, in general, remain unchanged. As with Social Security, CBO assumes that Medicare will pay benefits as scheduled under current law, regardless of the amounts in the program's trust funds. For longer-term projections, considerable uncertainty surrounds the evolution of health care delivery and financing systems. That uncertainty led CBO to use a formulaic approach to prepare projections beyond 2029: It combines estimates of the number of expected beneficiaries of the government's health care programs with mechanical estimates of the growth in spending per beneficiary.

Over the past five decades, spending for the major health care programs has steadily grown faster than the economy, and that trend continues in CBO's extended baseline. In 2019, net federal spending for the major health care programs is estimated to equal 5.2 percent of GDP. If current laws generally remained in place, net outlays for those programs would increase to 9.3 percent in 2049: Medicare spending, net of offsetting receipts (mostly premiums paid by enrollees), would grow by 3.0 percent of GDP, and spending on Medicaid and

CHIP, combined with outlays for marketplace subsidies and related spending, would grow by 1.0 percent of GDP (see Figure 1-9).<sup>18</sup>

### **Causes of Growth in Spending for Social Security and the Major Health Care Programs**

The aging of the population and rising health care costs per person are the primary reasons for the sharp rise in projected spending for Social Security and the major federal health care programs over the next 30 years. The extent to which health care costs per person (adjusted to remove the effects of aging) grow faster than potential GDP per person is known as excess cost growth. In CBO's extended baseline projections, spending for Social Security and the major federal health care programs grows from 10.7 percent of GDP in 2019 to 16.8 percent in 2049 (see Figure 1-10).<sup>19</sup> Spending for Social Security grows from 4.9 percent of GDP in 2019 to 6.2 percent in 2049, and spending for the major federal health care programs grows from 5.9 percent of GDP to 10.7 percent.

If CBO had set the shares of the population by age at today's proportions and had set excess cost growth at zero when developing its projections, spending on those programs as a share of GDP in 2049 would have been projected to be 10.7 percent—the same share as estimated for 2019.<sup>20</sup> Aging accounts for an increase of 3.0 percentage points, or roughly half of the difference between 10.7 percent and 16.8 percent. Excess cost growth accounts for the other half, an increase of 3.1 percentage points. For Social Security, aging accounts for more than the full increase in spending. For the major health care programs, aging accounts for 1.5 percentage points of the growth, and excess cost growth accounts for the remainder.

**The Aging of the Population.** In CBO's projections, the aging of the baby-boom generation and continued gains

17. Spending related to subsidies for insurance purchased through the marketplaces includes spending for subsidies for insurance provided through the Basic Health Program and spending for the risk-adjustment and reinsurance programs that were established by the ACA to stabilize premiums for health insurance purchased by individuals and small employers.

18. In CBO's projections, the outlays for subsidies for insurance purchased through the marketplaces and related spending are combined with outlays for Medicaid and CHIP. Federal subsidies for health insurance for low- and moderate-income households account for most of those outlays.

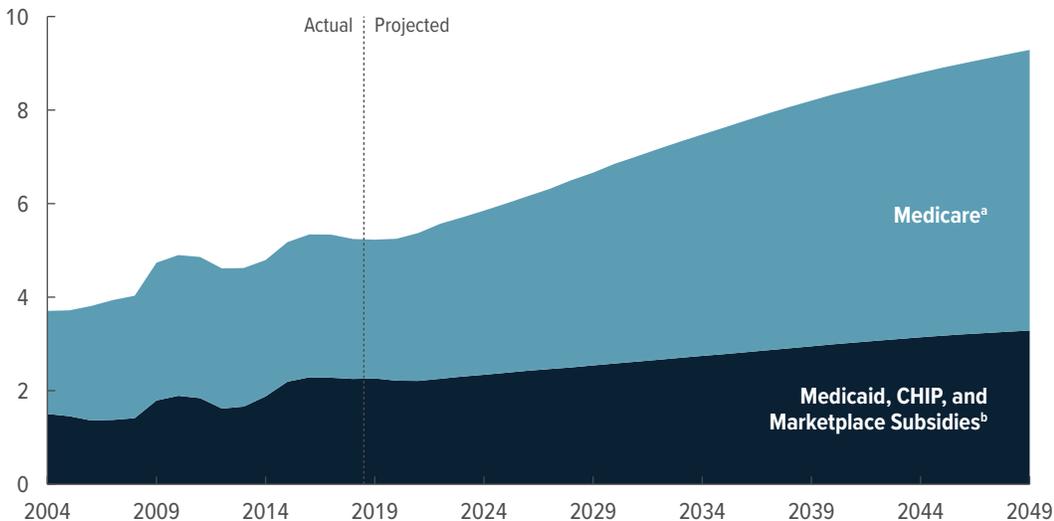
19. This analysis of causes of spending growth includes gross spending on Medicare.

20. If the effects of aging and excess cost growth were removed, spending on those programs as a percentage of GDP would be slightly lower in 30 years than it is today, mainly because of the scheduled increase in the full retirement age for Social Security.

Figure 1-9.

**Federal Outlays for the Major Health Care Programs, by Category**

Percentage of Gross Domestic Product



Medicare spending, net of offsetting receipts, is projected to account for about three-quarters of the increase in spending for the major health care programs over the next 30 years.

Source: Congressional Budget Office.

CHIP = Children's Health Insurance Program.

- a. Refers to net spending for Medicare, which accounts for offsetting receipts that are credited to the program. Those offsetting receipts are mostly premiums paid by beneficiaries to the government.
- b. "Marketplace Subsidies" refers to spending to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and insurance provided through the Basic Health Program, as well as spending to stabilize premiums for health insurance purchased by individuals and small employers.

in life expectancy increase the share of the population that is age 65 or older from 16 percent to 22 percent between 2019 and 2049.

Aging accounts for all of the projected long-term increase in Social Security spending as a percentage of GDP. Because the share of the population that is 65 or older is growing, a larger segment of the population will receive Social Security benefits, increasing federal spending for the program.

Aging also contributes to the projected increase in spending, relative to GDP, for the major health care programs, particularly Medicare, which is the largest such program. Most beneficiaries qualify for Medicare at age 65. As that group becomes larger and older, on average, Medicare spending will increase, not only because the number of beneficiaries will rise but also because people tend to require more health care as they age. Aging explains about one-third of the increase in spending for the major

health care programs as a share of GDP over the 2019–2049 period in CBO's projections.

**Rising Health Care Costs per Person.** Even though growth in health care costs per person has slowed recently, over the next 30 years such costs are projected to continue to grow faster than potential GDP per person (see Figure 1-11). In CBO's extended baseline projections, excess cost growth accounts for about two-thirds of the increase in spending, measured as a share of GDP, for the major health care programs between 2019 and 2049.

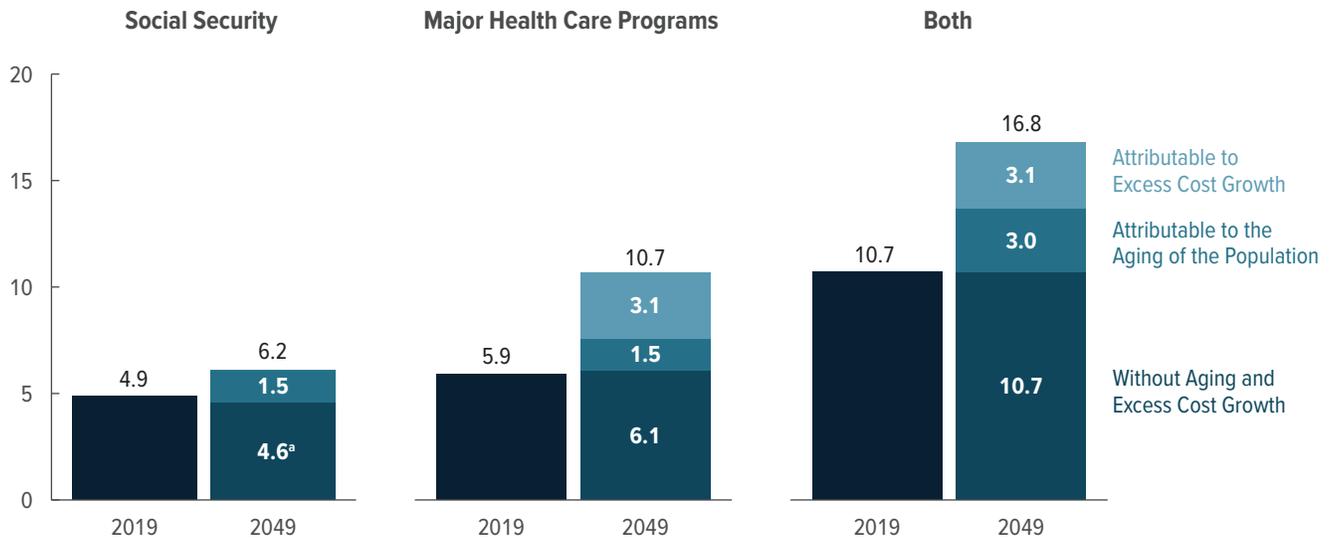
**Other Noninterest Spending**

In CBO's extended baseline projections, total federal spending for everything other than Social Security, the major health care programs, and interest declines as a share of GDP to its lowest level in more than 70 years. Over the past 50 years, such spending has averaged 11 percent of GDP, but it has been as high as 14 percent (in the late 1960s and early 1970s) and as low as

Figure 1-10.

**Spending for Social Security and the Major Health Care Programs in 2019 and 2049**

Percentage of GDP



Source: Congressional Budget Office.

Spending for the major health care programs consists of gross spending for Medicare (which does not account for the offsetting receipts that are credited to the program), Medicaid, and the Children’s Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending. Those outlays have been adjusted to exclude the effects of shifting payments from one fiscal year into another so that those payments are not made on a weekend.

Excess cost growth is the extent to which the growth rate of nominal health care spending per person (adjusted to remove the effects of aging) exceeds the growth rate of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.)

GDP = gross domestic product.

a. If aging and excess cost growth did not occur after 2019, spending on Social Security as a share of GDP would be lower in 30 years, mainly because of the scheduled increase in the full retirement age for Social Security.

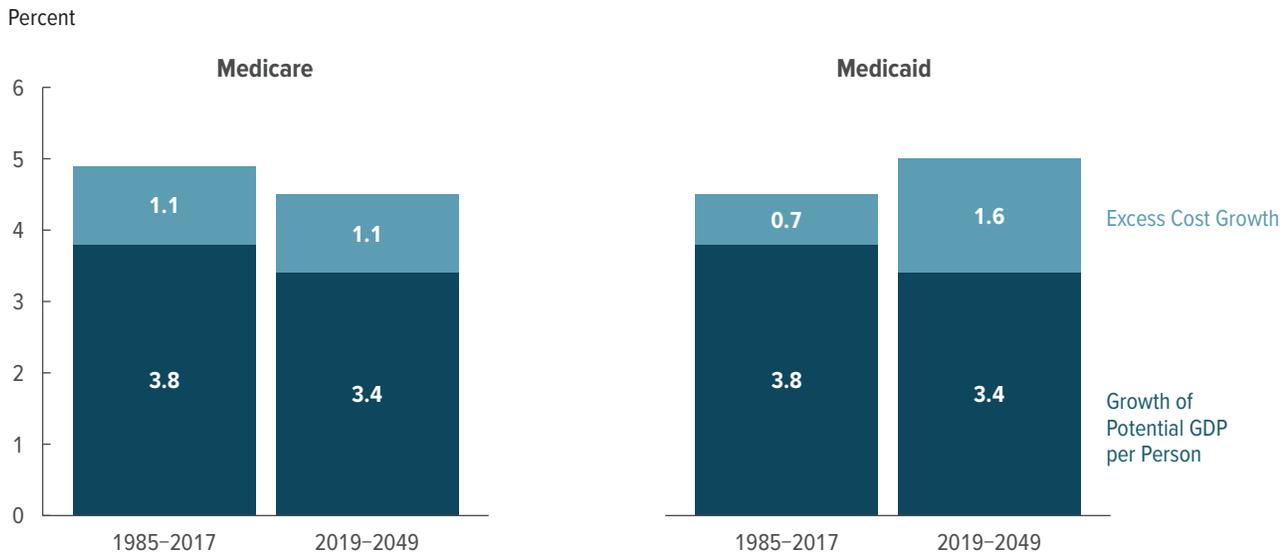
8 percent (in the late 1990s and early 2000s). Other noninterest spending is estimated to equal 8.8 percent of GDP in 2019. In CBO’s extended baseline projections, such spending falls to 7.3 percent of GDP in 2029 and to 7.1 percent of GDP in 2049. Both discretionary spending and other mandatory spending are projected to decline in relation to GDP.

**Discretionary Spending.** About half of all discretionary spending is dedicated to national defense, and the rest is for an array of federally funded investments and activities, including education, transportation, housing assistance, veterans’ health care, health-related research and public health programs, the administration of justice, and international affairs.

Over the past half-century, discretionary spending has diminished markedly as a percentage of GDP: Between 1969 and 2018, it declined from 12.0 percent of GDP to 6.3 percent. In CBO’s baseline projections, discretionary outlays equal 6.3 percent of GDP in 2019 and then decrease steadily over the coming decade, falling to 5.0 percent of GDP in 2029.

Through 2021, most discretionary funding is limited by caps on annual discretionary appropriations that were originally specified in the Budget Control Act of 2011 (P.L. 112-25, as amended). The decline in discretionary outlays relative to GDP over the next eight years in CBO’s projections reflects lower statutory limits on discretionary funding in 2020 and 2021 and CBO’s assumption (required by law) that discretionary funding will grow at the rate of inflation—which is slower

Figure 1-11.

**Average Annual Growth of Health Care Costs per Beneficiary**

Source: Congressional Budget Office, using data from the Centers for Medicare & Medicaid Services.

Excess cost growth is the extent to which the growth rate of nominal health care spending per person (adjusted to remove the effects of aging) exceeds the growth rate of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.)

The averages of the components (excess cost growth and growth in potential GDP per person) are estimated separately using weighted regression, with twice as much weight placed on the last year of the period as on the first year. As a result, the components do not add up exactly to the average growth in health care costs per person (adjusted to remove the effects of aging), particularly over history, when growth rates varied substantially from year to year.

GDP = gross domestic product.

than the projected growth of GDP—beginning in 2022. CBO’s extended baseline projections reflect the assumption that after 2029, discretionary spending will remain roughly constant as a percentage of GDP (see Figure 1-12).<sup>21</sup>

**Other Mandatory Spending.** Since the mid-1960s, mandatory spending excluding that for Social Security and the major health care programs has generally remained between 2 percent and 4 percent of GDP.

21. CBO assumed that discretionary spending after 2029 would remain constant as a percentage of GDP before the agency accounted for the effect on the economy of the fiscal policies projected under the extended baseline. Because CBO estimates that those policies would dampen economic growth, projected discretionary spending would not grow at precisely the same rate as GDP. Although discretionary spending declines in relation to GDP from 2019 to 2029 in CBO’s projections, historical evidence suggests that such a decline is unlikely to persist: Discretionary spending has historically been a larger share of economic output than it is projected to be in 2029. For that reason, CBO did not assume that the share would decline further.

(One exception occurred in 2009, when such spending, referred to as other mandatory spending, spiked to 5.1 percent because of policies enacted in response to the severe recession.) Other mandatory spending includes retirement programs for federal civilian and military employees, certain veterans’ programs, the Supplemental Nutrition Assistance Program (SNAP), Supplemental Security Income, unemployment compensation, and refundable tax credits.<sup>22</sup>

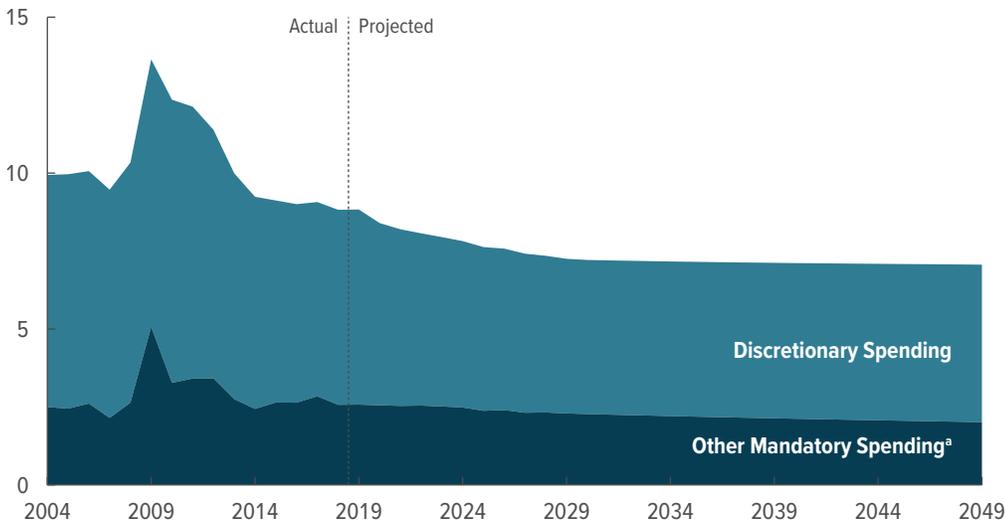
Other mandatory spending declines slightly as a share of the economy over the next 10 years in CBO’s projections. Such spending accounts for 2.6 percent of GDP today and, if current laws generally remained unchanged,

22. Refundable tax credits reduce a filer’s overall income tax liability; if the credit exceeds the rest of the filer’s income tax liability, the government pays all or some portion of that excess to the taxpayer (and the payment is treated as an outlay in the budget). See Congressional Budget Office, *Refundable Tax Credits* (January 2013), [www.cbo.gov/publication/43767](http://www.cbo.gov/publication/43767).

Figure 1-12.

## Other Federal Noninterest Spending

Percentage of Gross Domestic Product



Measured as a percentage of economic output, other federal noninterest spending declines between 2019 and 2049 in CBO's projections, mainly because of a projected decrease in discretionary spending over the next decade.

Source: Congressional Budget Office.

a. Consists of all mandatory spending other than that for Social Security and the major health care programs. It includes the refundable portions of the earned income and child tax credits and of the American Opportunity Tax Credit.

would decline to 2.3 percent of GDP in 2029.<sup>23</sup> That decrease stems primarily from average benefits' increasing more slowly than income (because benefit growth is generally indexed to inflation measures that do not account for real income growth).

In CBO's extended baseline projections, other mandatory spending falls to 2.0 percent of GDP by 2049. In part, that reduction is attributable to growth in income, which would reduce the number of people eligible for refundable tax credits. It also reflects the assumption that after 2029 other mandatory spending, excluding outlays for such tax credits, would decline at roughly the same rate as such spending is projected to fall between 2024 and 2029.<sup>24</sup>

23. Sec. 257(b)(2) of the Deficit Control Act, which governs CBO's baseline projections, makes exceptions regarding current law for some programs, such as SNAP, that have expiring authorizations but that are assumed to continue as currently authorized.

24. For the years after 2029, other mandatory spending was not projected in detail because of the number of programs involved and the variety of factors that influence spending on them. Instead, CBO used an approximate method to project spending for those programs as a group. Except for the outlays for refundable tax credits, after 2029 such spending is assumed to decline in relation to GDP (before any possible effects of fiscal policy on the economy are accounted for) at the same rate at

## Net Interest Costs

Over the past 50 years, the government's net interest costs have averaged 2.0 percent of GDP, although they have been as high as 3.2 percent and as low as 1.2 percent. In CBO's extended baseline projections, net interest costs increase steadily as a share of the economy over the next decade—from 1.8 percent of GDP in 2019 to 3.0 percent by 2029—as greater federal borrowing boosts debt-service costs and as interest rates rise. Those costs reach 5.7 percent of GDP by 2049—higher than they have ever been before (see Figure 1-7 on page 20). If net interest costs followed that projected path, they would exceed other mandatory spending by 2023, exceed all discretionary spending by 2046, and approach spending for Social Security by 2049.

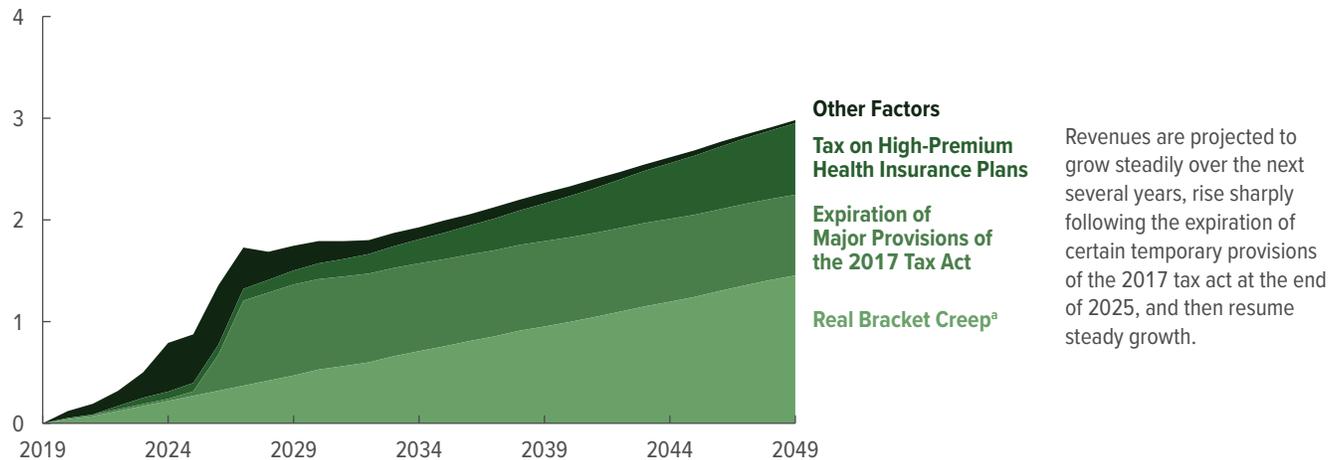
Deficits and debt rise in CBO's projections because of the growing gap between spending and revenues, and higher interest costs are a major contributor to the growth of that gap. More than half of the increase in spending as a percentage of GDP from 2019 to 2049 results from higher net interest costs. Moreover, of the 4.5 percentage-point increase in the federal budget deficit over that period, only 0.6 percentage points

which it is projected to fall between 2024 and 2029 (excluding the decrease in spending for SNAP).

Figure 1-13.

## Increases in Federal Revenues

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

a. Real bracket creep is the process in which, as income rises faster than inflation, a larger proportion of income becomes subject to higher tax rates.

are attributable to the primary deficit—the rest of the increase is due to rising net interest costs. In large part, those rising interest costs stem from increases in interest rates that reflect long-term economic trends, which CBO projects would occur even if debt did not rise beyond its current level. But greater federal borrowing places additional upward pressure on interest rates and thus on interest costs. Moreover, growth in net interest costs and growth in debt reinforce one another: Rising interest costs boost deficits and debt, and rising debt pushes up interest costs.

### Projected Revenues Through 2049

In CBO's extended baseline projections, revenues measured as a share of GDP are generally higher than they have been, on average, in recent decades. As a share of GDP, revenues have averaged 17.4 percent over the past 50 years, but they have fluctuated between 15 percent and 20 percent of GDP because of changes in tax laws and interactions between those laws and economic conditions.

If current laws generally remained unchanged, revenues would increase in relation to GDP over the coming decade, CBO projects. Revenues are projected to rise steadily from 16.5 percent of GDP in 2019 to 17.4 percent by 2025 and then to grow more rapidly, reaching 18.3 percent by 2029. The projected growth in revenues after 2025 is largely attributable to the expiration of

nearly all of the individual income tax provisions of the 2017 tax act.

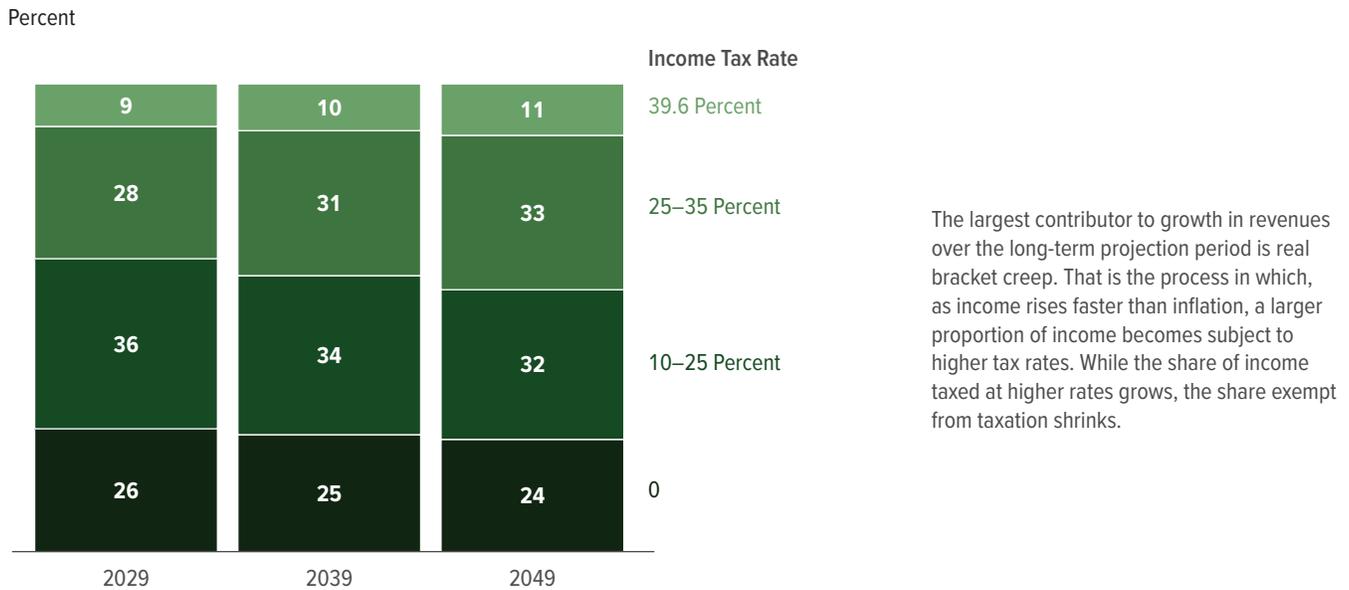
For years after 2029, revenues are projected following the assumption that the rules for all tax sources will change only as scheduled under current law.<sup>25</sup> Thus, in CBO's extended baseline projections, revenues continue to grow faster than GDP after 2029 and total 19.5 percent of GDP in 2049. Increases in receipts from individual income taxes account for most of the projected 3.0 percentage-point rise in total revenues as a share of GDP over the next three decades. Receipts from all other sources combined are projected to increase slightly as a share of GDP (see Figure 1-7 on page 20).

Over the entire 30-year period, the underlying causes of the projected increase in total revenues as a share of GDP are real bracket creep in the individual income tax system, expiring tax provisions and the tax on high-premium health insurance plans, and other factors.

25. The sole exception to the current-law assumption during the 30-year projection period applies to expiring excise taxes dedicated to trust funds. The Deficit Control Act requires CBO's baseline to reflect the assumption that those taxes would be extended at their current rates. That law does not stipulate that the baseline include the extension of other expiring tax provisions, even if lawmakers have routinely extended them before.

Figure 1-14.

**Shares of Income Taxed at Different Rates Under the Individual Income Tax System**



Source: Congressional Budget Office.

Income here refers to adjusted gross income—that is, income from all sources not specifically excluded by the tax code, minus certain deductions. The income tax rate is the statutory rate specified under the individual income tax system.

The lowest statutory rate is zero because of deductions and exemptions.

**Real Bracket Creep in the Individual Income Tax System**

The largest contributor to the increase in total revenues is real bracket creep (see Figure 1-13 on page 28). If current laws generally remained unchanged, real bracket creep would continue to gradually push up taxes in relation to income over the next three decades, CBO projects. That occurs because most income tax brackets, exemptions, credits, and other tax thresholds are indexed to inflation.<sup>26</sup> When income grows faster than inflation, as generally happens during economic expansions, more income is pushed into higher tax brackets and credits phase out, thereby increasing tax receipts. Between 2029 and 2049, the share of income taxed at the top rate rises by 2 percentage points—and the share of income exempted from taxation falls by 2 percentage points—because of real bracket creep (see Figure 1-14).

**Expiring Tax Provisions and the Tax on High-Premium Health Insurance Plans**

The second largest contributor to the increase in revenues is the expiration, after calendar year 2025, of nearly all provisions of the 2017 tax act that affect individual income taxes. The expiration of those provisions would boost individual income tax receipts as a share of GDP by 0.8 percentage points by 2029, CBO projects.

The third major source of the increase in revenues is a tax on certain employment-based health insurance plans with high premiums that was originally enacted in 2010 and is scheduled to take effect in 2022.<sup>27</sup> Although the revenues raised by that tax would initially be small, rapid growth in health care costs is projected to drive up revenues from that tax over subsequent decades. CBO projects that the tax would bring in revenues equal to 0.7 percent of GDP by 2049.

26. Some parameters of the tax system, including the amount of the child tax credit, are fixed in nominal dollars and are not adjusted for inflation.

27. Under the Affordable Care Act, employer-sponsored health benefits will be subject to an excise tax equal to 40 percent of the value of those benefits exceeding certain thresholds. That tax was originally scheduled to take effect in 2018 but has been delayed twice by legislation, most recently by the Extension of Continuing Appropriations Act, 2018.

Table 1-4.

### Effective Marginal Federal Tax Rates Underlying CBO's Extended Baseline Projections

Percent	2019	2029	2049
Marginal Tax Rate on Labor Income	26.8	30.3	32.0
Marginal Tax Rate on Capital Income	15.7	15.7	15.9

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

The effective marginal tax rate on labor income is a weighted average of the percentage of an additional dollar of a taxpayer's labor income that is paid in federal individual income taxes and payroll taxes. Weights are assigned to taxpayers on the basis of their labor income. The effective marginal tax rate on capital income is the percentage of the return on an additional dollar of investment made in a particular year that will be paid in taxes over the life of that investment. The before- and after-tax rates of return used to calculate that effective tax rate are weighted averages of the rates for every combination of asset type, industry, form of organization, and source of financing; the weights used are the values of the assets for each combination.

### Other Factors

Many other factors affect revenues in the extended baseline projections. For example, earnings are projected to grow faster for higher-income people than for other people over the next 30 years. That trend would cause a larger share of individual income to be taxed at higher rates. The resulting increase in individual income tax revenues would be largely offset by a decrease of nearly the same amount in payroll tax receipts, CBO projects, because a greater share of earnings would be above the maximum amount subject to Social Security payroll taxes. In addition, several other tax provisions are scheduled to expire over the coming decade, which generally pushes up revenues in CBO's projections.

Those factors would, under current law, cause the effects of the tax system in 2049 to differ substantially from the system's effects today. Taxpayers across the income distribution would, on average, pay more of their income in taxes in 2049 than similar taxpayers do now if current laws generally remained unchanged. In addition, a larger share of each additional dollar of income that households earned would go to pay taxes because under current law, the effective marginal federal tax rates for labor would

rise (see Table 1-4). The effective marginal tax rate on capital would also rise by a small amount. Higher marginal rates can dampen economic activity: Increases in the marginal tax rate on labor income reduce people's incentive to work, and increases in the marginal tax rate on capital income reduce their incentive to save.<sup>28</sup>

### Uncertainty of CBO's Long-Term Projections

Budget projections are inherently uncertain. Even if future tax and spending policies do not vary from those specified in current law, budgetary outcomes will undoubtedly differ from those in CBO's extended baseline projections because of unexpected changes in demographics, the economy, and other factors. To quantify the uncertainty of budgetary outcomes over the long term, CBO examined the extent to which federal debt as a percentage of GDP would differ from its extended baseline projections if a set of key factors—several demographic and economic factors and the growth of health care costs—deviated from the paths underlying those projections.

CBO projects that there is a two-thirds chance that federal debt held by the public would be between 71 percent and 175 percent of GDP in 2039 if current laws generally remained unchanged (see Figure 1-15). That range of outcomes indicates that federal debt held by the public after 20 years could be as much as 42 percentage points lower or as much as 62 percentage points higher than the agency's extended baseline projection of 113 percent of GDP.

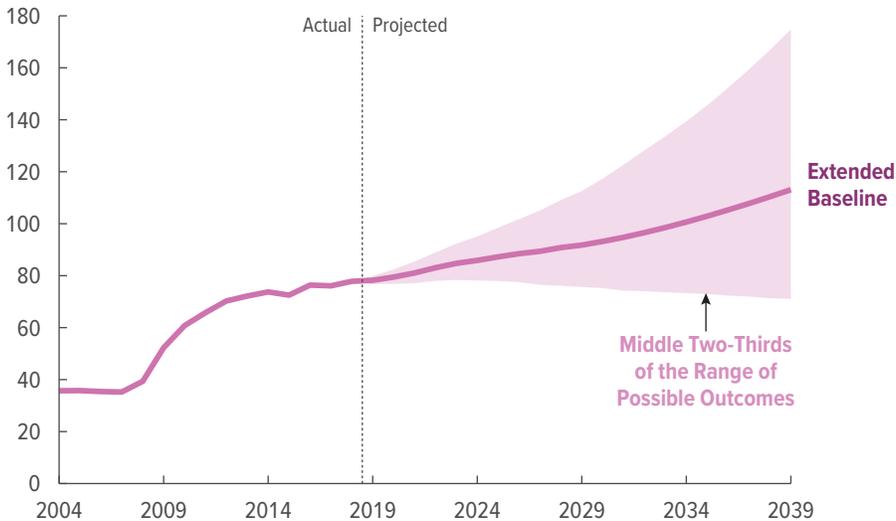
To estimate that likely range, CBO simulated budgetary outcomes 30 years from now by varying all of the key factors at once, but the agency also examined the sensitivity of its projections to higher or lower values for some of those factors, including productivity growth or interest rates, in isolation (see Box 1-1). CBO's analysis does not address certain sources of uncertainty in the budget projections, such as the risk of an economic depression or a major war or catastrophe. Also, although the factors considered here are some of the more important ones, they are not the only ones. Nonetheless, the results show that the main implications of this report apply under a wide range of possible values for key factors that influence federal spending and revenues. If current

28. Although the marginal tax rate on capital income is projected to rise under current law, it would still be lower than it has been in recent years.

Figure 1-15.

**Uncertainty in CBO's Projections of Federal Debt Held by the Public**

Percentage of GDP



There is a two-thirds chance that federal debt held by the public will be between 71 percent and 175 percent of GDP by 2039.

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

To quantify the uncertainty of long-term budgetary outcomes, CBO estimated a distribution of outcomes using simulations of its long-term model, each with a unique set of values for key economic and demographic factors. Specifically, CBO assessed the consequences of alternative paths for the following factors: the growth rate of total factor productivity, interest rates on federal debt held by the public, the civilian unemployment rate, the rates of excess cost growth for Medicare and Medicaid spending, the fertility rate, the rate of mortality improvement, and the rate of immigration.

The civilian unemployment rate is the percentage of people in the labor force who are unemployed. (The labor force is the number of people in the civilian noninstitutionalized population who are age 16 or older and who are either working or actively seeking work.) Excess cost growth is the extent to which the growth rate of nominal health care spending per person (adjusted to remove the effects of aging) exceeds the growth rate of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.)

GDP = gross domestic product.

laws generally remained unchanged, in 20 years federal debt—which is already high by historical standards—would probably be much higher than it is today.

**The Basis of CBO's Uncertainty Analysis**

If the size of the population, productivity growth, interest rates, unemployment rates, and excess cost growth for Medicare and Medicaid diverged from the paths underlying CBO's extended baseline budget projections, budgetary outcomes could differ markedly from those projections.<sup>29</sup> To quantify the uncertainty of its budget projections arising from the uncertainty of those key factors, CBO assessed past trends of those factors. The

agency also evaluated the extent to which some factors—productivity growth, interest rates, and unemployment rates—have moved together over long periods of time.

Using simulations that incorporated historical data, the agency projected potential future outcomes for each key factor.<sup>30</sup> On the basis of those simulations, the agency constructed ranges that capture two-thirds of possible outcomes over the next two decades for each of those factors as well as for the budgetary outcomes resulting from them. There is a two-thirds chance that an outcome will fall within the range estimated for it. The ranges reflect the uncertainty of the long-term trend of each

29. The civilian unemployment rate is the percentage of people in the labor force who are unemployed.

30. Details about the methods used in this analysis of uncertainty will be provided in a forthcoming publication.

Box 1-1.

**Sensitivity of Budget Projections to Changes in Underlying Economic Factors**

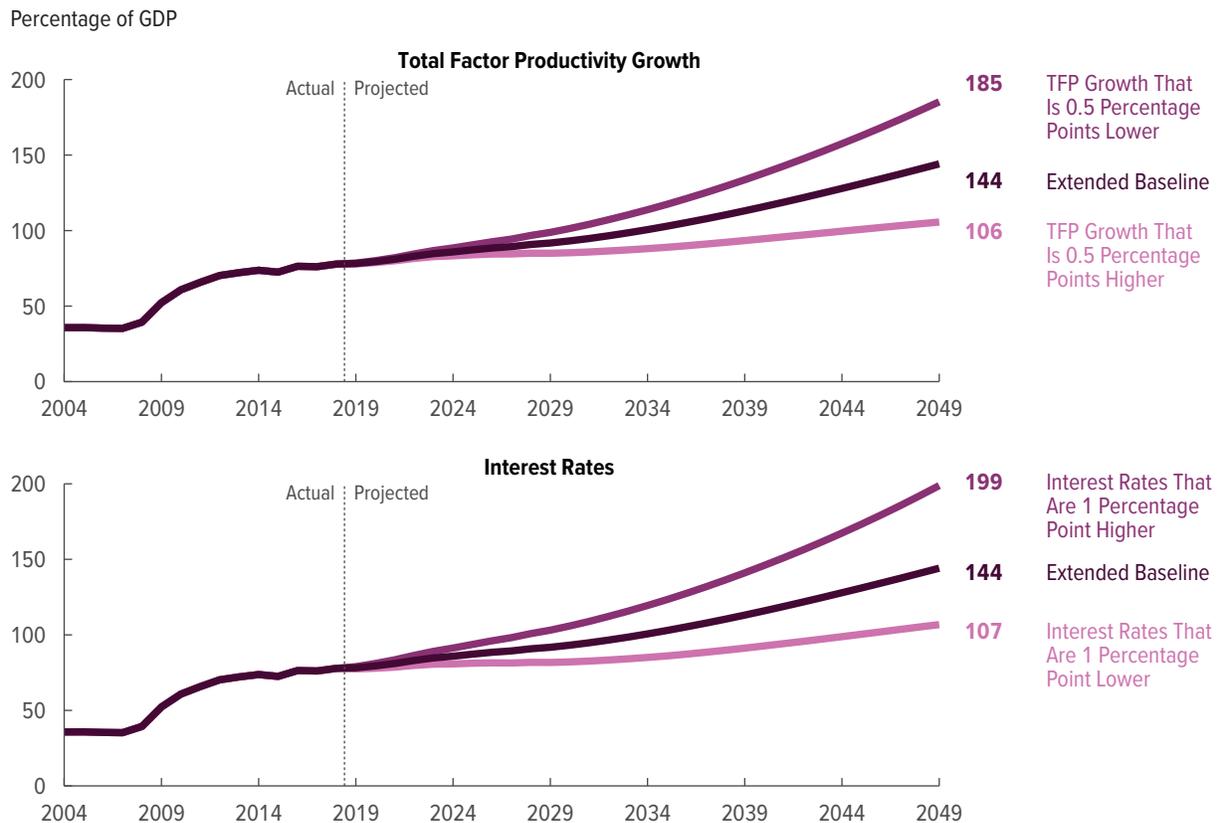
How would the budget be affected if the economy ended up growing more quickly than it does in the Congressional Budget Office’s projections? For example, what if productivity grew more quickly than CBO expects? Or what if interest rates turned out to be higher than CBO’s central estimates? For instance, what if investors were willing to take on more risk than projected and interest rates on federal debt rose in relation to interest rates on private securities more than CBO expects? How would such a development affect the budget? To help answer those questions and others, the agency examined the sensitivity of its budget projections to values for productivity growth and for interest rates on federal debt that differed from its central estimates for those key factors.

**Growth of Nonfarm Business Productivity**

CBO assessed average nonfarm business total factor productivity (TFP) growth over 30-year periods between 1950 and the present.<sup>1</sup> Over those periods, the 30-year average of productivity growth varied by about 1 percentage point, indicating that future outcomes would most likely fall within a 1 percentage-point range around the agency’s central estimates.<sup>2</sup> The agency therefore projected economic and budgetary outcomes

1. Total factor productivity is the growth of real (inflation-adjusted) output per unit of combined labor and capital services.
2. See Congressional Budget Office, *The 2016 Long-Term Budget Outlook* (July 2016), Chapter 7, [www.cbo.gov/publication/51580](http://www.cbo.gov/publication/51580).

**Federal Debt If Total Factor Productivity Growth or Interest Rates Differed From the Values Underlying CBO’s Projections**



Source: Congressional Budget Office.

GDP = gross domestic product; TFP = total factor productivity.

Continued

Box 1-1.

Continued

### Sensitivity of Budget Projections to Changes in Underlying Economic Factors

using rates of growth of nonfarm business TFP that were 0.5 percentage points higher and 0.5 percentage points lower than the rate underlying the extended baseline projections.<sup>3</sup>

- If nonfarm business productivity grew 0.5 percentage points faster each year than CBO projects, federal debt held by the public would be 106 percent of gross domestic product (GDP) in 2049 rather than 144 percent, as it is in the extended baseline projections (see the figure).
- If, instead, nonfarm business productivity grew 0.5 percentage points more slowly each year than projected, federal debt held by the public would be 185 percent of GDP in 2049.

#### Interest on Federal Debt Held by the Public

CBO also examined the variation in interest rates on federal debt held by the public over 30-year periods since 1949 to assess the extent to which unexpected changes in financial factors contribute to changes in those rates. (The agency estimated how much of that variation could be explained directly or indirectly by economic or budgetary factors; the remaining, unexplained variation was the contribution of unexpected changes in financial factors.) On the basis of that analysis, CBO determined that future outcomes are likely to fall within a range of 2 percentage points around the agency's central estimate. Thus, CBO projected economic and budgetary outcomes using interest rates on federal debt that were 1.0 percentage point higher (before accounting for macroeconomic effects) and 1.0 percentage point lower than the agency's central estimates.

- If federal borrowing rates were 1.0 percentage point higher each year than CBO projects, federal debt held by the

3. CBO's extended baseline projections generally reflect current law, following the agency's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

public would be 199 percent of GDP in 2049 rather than the 144 percent in the extended baseline projection (see the figure).

- If, instead, federal borrowing rates were 1.0 percentage point lower each year than they are in CBO's extended baseline projections, federal debt held by the public would be 107 percent of GDP in 2049.

#### Other Factors

CBO has also examined the sensitivity of its budget projections to other factors, as it has done in the past. Last year, for example, CBO examined the extent to which federal debt as a percentage of GDP would differ from amounts in the extended baseline projections if four key factors underlying its analysis varied by fixed amounts: the labor force participation rate, the growth rate of total factor productivity in the nonfarm business sector, interest rates on federal debt held by the public, and excess cost growth for Medicare and Medicaid spending.<sup>4</sup> The degree of variation in each of those factors was based on historical movements and considered the effects of possible future developments. Estimates of the budgetary outcomes of alternative paths for each of the four factors (including the two discussed here), as well as estimates of the effects when all four factors vary simultaneously, are presented in the supplemental data posted along with this report on CBO's website ([www.cbo.gov/publication/55331](http://www.cbo.gov/publication/55331)).

4. See Congressional Budget Office, *The 2018 Long-Term Budget Outlook* (June 2018), pp. 23–35, [www.cbo.gov/publication/53919](http://www.cbo.gov/publication/53919). The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are age 16 or older and either working or actively seeking work. Excess cost growth is the extent to which the growth rate of nominal health care spending per person (adjusted to remove the effects of aging) exceeds the growth rate of potential gross domestic product per person. Potential GDP per person is the maximum sustainable output of the economy.

factor as well as the uncertainty associated with the long-term correlation among some factors.

#### Uncertainty of Demographic Factors

CBO projected a range of outcomes for the total fertility rate, the rate of mortality improvement, and the rate of net immigration, all of which affect the size of the population (see Table 1-5). On the basis of historical data and

current trends, CBO estimates that there is roughly a two-thirds chance that those factors would fall within the following ranges:

- The total fertility rate would be between 1.8 and 2.0 births per woman, or between 5 percent lower and 5 percent higher than the rate underlying the extended baseline projections.

Table 1-5.

### Middle Two-Thirds of the Ranges of Possible Outcomes for Key Factors Used to Quantify the Uncertainty in CBO's Projections of Federal Debt Held by the Public

	Average Annual Value, 2019 to 2039		
	Low	Extended Baseline	High
<b>Demographic Factors</b>			
Total fertility rate (Children per woman)	1.8	1.9	2.0
Rate of mortality improvement (Percent) <sup>a</sup>	0.6	0.9	1.2
Net immigration rate (Per 1,000 people in the U.S. population)	2.9	3.1	3.3
<b>Economic Factors (Percent)</b>			
Growth in total factor productivity in the nonfarm business sector <sup>b</sup>	0.6	1.1	1.6
Interest rate on 10-year Treasury securities	2.4	3.8	5.1
Civilian unemployment rate <sup>c</sup>	3.7	4.6	5.5
<b>Excess Cost Growth (Percent)<sup>d</sup></b>			
Medicare	0.5	1.1	1.7
Medicaid	1.2	1.8	2.4

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

GDP = gross domestic product.

- a. The rate of mortality improvement is the average annual percentage improvement in mortality rates. A mortality rate is the number of deaths per thousand people; improved (that is, lower) mortality rates result in longer life expectancy.
- b. Total factor productivity in the nonfarm business sector measures the growth of the average real (inflation-adjusted) output per unit of combined labor and capital services.
- c. The civilian unemployment rate is the percentage of people in the labor force who are unemployed. Labor force data are restricted to the civilian noninstitutionalized population who are age 16 or older and are either working or actively seeking work.
- d. Excess cost growth is the extent to which the growth rate of nominal health care spending per person (adjusted to remove the effects of aging) exceeds the growth rate of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.)

- The rate of mortality improvement would be between 0.6 percent and 1.2 percent, or as much as one-third lower or higher than the rate underlying the extended baseline projections. If rates of mortality improvement fell within that range, life expectancy at birth would be between 80.5 and 82.2 years by 2039, or between 1 percent shorter and 1 percent longer than the value underlying the extended baseline projections. (Life expectancy at age 65 would be between 20.3 and 21.4 years, or 2½ percent shorter to 2½ percent longer than CBO's baseline value.)
- The average net immigration rate over the 20-year projection period would be between 2.9 and 3.3 per thousand people in the U.S. population, or between

6½ percent less than and 6½ percent greater than the rate underlying the extended baseline projections.<sup>31</sup>

As a result of varying those key demographic factors, in two-thirds of CBO's simulations the civilian noninstitutionalized population grew by an average of between 0.6 percent and 0.7 percent from 2019 to 2039. If the growth of that population was within that range, by 2039 that population would be between 293 million and 297 million, or between 2 million (or 0.7 percent) smaller than and 2 million (or 0.7 percent) larger than the population underlying CBO's extended baseline projections.

31. For some categories of immigrants, the number of people admitted in any year is restricted by caps. For this analysis, the net number of immigrants in those categories does not vary. Net inflows of foreign-born people without legal status are highly uncertain, and those net flows are varied for this analysis.

### Uncertainty of Economic Factors and the Growth of Health Care Costs

CBO examined three economic factors and the growth of health care costs in its uncertainty analysis. In the agency's assessment, there is roughly a two-thirds chance that the following outcomes would occur over the next two decades (see Table 1-5 on page 34):

- The average growth rate of total factor productivity in the nonfarm business sector would be between 0.6 percent and 1.6 percent, or as much as 0.5 percentage points less than or greater than the rate underlying CBO's extended baseline projections.
- The average interest rate on 10-year U.S. Treasury securities would be between 2.4 percent and 5.1 percent, or as much as 1.4 percentage points lower or higher than the rate underlying the extended baseline projections.
- The average civilian unemployment rate would be between 3.7 percent and 5.5 percent, or as much as 0.9 percentage points less than or greater than the rate underlying the extended baseline projections.
- The rates of excess cost growth for Medicare and Medicaid spending would be as much as 0.6 percentage points higher or lower than the rates underlying the extended baseline projections.

Changes in those factors would affect the budget in important ways. For example, if the unemployment rate was higher than projected, the economy's output and tax revenues would be less than they are in CBO's extended baseline projections, and consequently, federal deficits and debt would be greater than the agency projects. By contrast, if the rates of cost growth for Medicare and Medicaid were lower than projected, deficits and debt would be less than they are in the extended baseline projections, primarily because outlays would be smaller.

### Changes From Last Year's Long-Term Budget Outlook

As a share of GDP, federal debt and deficits are now projected to be lower over the next three decades than CBO projected last year. In the agency's current extended baseline projections, debt is equal to 141 percent of GDP in 2048, which is 11 percentage points lower than the amount the agency projected last year. Projected deficits (both primary and total) as a share of GDP in this year's report are smaller throughout the entire projection period than those in last year's report. (See Appendix B for more information on changes in the long-term budget projections since last year.)

The revised projections of debt and deficits resulted primarily from a reduction in projected outlays, specifically in discretionary spending and in net spending for interest, which was partially offset by a small reduction in projected revenues. This year's projections of discretionary spending are lower than last year's projections because appropriations for relief and recovery efforts related to hurricanes and wildfires were smaller in 2019 than they were in 2018. (Projections for future years are based on the 2019 appropriations.) This year's projections of net spending for interest are lower because less debt is projected to be accumulated and because CBO has revised downward its projections of the average interest rate on that debt. Revenues are projected to be slightly lower than they were in last year's projections because of new administrative and tax data.

The 75-year actuarial deficit currently projected for Social Security is 1.5 percent of GDP (the same amount that CBO estimated last year) or 4.6 percent of taxable payroll (which is slightly larger than last year's estimate of 4.4 percent). Those projections reflect several developments since last year. The actuarial deficit increased partly because CBO lowered its projections of payroll taxes. Also, the agency incorporated another year with a relatively large deficit into the analysis. Largely offsetting those increases, however, was a downward revision that CBO made to its projections of outlays for Social Security.



# The Long-Term Budget Outlook Under Alternative Scenarios

## Overview

This chapter expands on the analysis in Chapter 1 in various ways. First, it shows how the federal budget and the nation's economy would evolve under an *extended alternative fiscal scenario* in which substantial tax increases and discretionary spending cuts would not take place as scheduled; instead, current law would change to maintain certain major policies that are now in place. Compared with outcomes in the Congressional Budget Office's extended baseline projections, which generally reflect current law, outcomes under the extended alternative fiscal scenario would differ in the following ways:

- Federal deficits and debt would be far larger.
- Real gross domestic product (GDP) would be lower in the long run. (Real GDP is nominal GDP that has been adjusted to remove the effects of inflation.)
- Federal spending would be higher, and most taxpayers would pay less in taxes.
- The risk of a fiscal crisis occurring would be greater over the longer run. In addition, the risk of negative economic and financial effects that were less abrupt but still significant would be greater.

Second, this chapter presents an analysis under which Social Security benefits are limited to the amounts payable from revenues received by the Social Security trust funds. Under that *payable-benefits scenario*, spending for Social Security would be significantly lower than it is in the extended baseline projections. Other outcomes relative to CBO's extended baseline projections are the following:

- Federal deficits and debt as a percentage of GDP would be lower.

- Spending on Social Security benefits for older people would be greatly curtailed, leading to increases in the overall labor supply and private saving.
- That drop in benefits would induce beneficiaries to reduce their spending, causing real GDP to be lower in the short term; but real GDP would be higher in the longer term, when the reduction in federal deficits would boost the funds available for private investment.
- The risk of a fiscal crisis occurring would be lower over the longer run. In addition, the risk of negative economic and financial effects that were less abrupt but still significant would be lower.

Third, the chapter examines the size and timing of policy changes needed to meet various goals for deficit reduction. (The policy changes examined here are illustrative, and the results do not reflect any particular assumptions about specific changes.) If lawmakers aimed for debt as a share of GDP in 2049 to fall to its 50-year average through across-the-board fiscal adjustments of equal size (as a percentage of GDP) each year, for example, they could reach that goal by increasing revenues or by decreasing spending by \$1,900 per person in 2020, CBO projects.

Additionally, the timing of deficit reduction has implications for its effects, in terms of costs and benefits, on different generations of the U.S. population. CBO estimates that delaying policy action would require larger changes in revenues and outlays to reach a given level of debt as a percentage of GDP by 2049. That is, making policy changes in 2025 or 2030 that aimed to achieve a target ratio of debt to GDP would require a greater percentage reduction in noninterest spending or a larger percentage increase in revenues than making such changes in 2020.

Furthermore, delaying policy action would reduce the well-being of younger and future generations while improving the well-being of older generations. Even though the burden of delaying policy action would be borne by future generations, income among those generations is projected to be higher, on average, owing to the growth of the U.S. economy.

### **Budgetary and Economic Effects of an Alternative Fiscal Scenario**

CBO examined budgetary and economic outcomes under an extended alternative fiscal scenario. Under that scenario, current law would be changed to maintain certain policies that are now in place. As a result, deficits would be larger than they are in CBO's extended baseline projections. For example, the deficit would be \$774 billion larger in 2029—about 60 percent larger than the deficit in CBO's baseline projections. Federal debt would equal 219 percent of GDP in 2049 and continue to rise in later years.

In the extended alternative fiscal scenario, spending and tax policies for the first 10 years are identical to those in CBO's alternative fiscal scenario.<sup>1</sup> The budgetary outcomes differ, however, because in addition to the conventional estimates, this report incorporates estimated effects of the changes in fiscal policy on the economy and the effects of those economic changes on the budget. Over the next 10 years, the extended alternative fiscal scenario incorporates the following features:

- The caps on discretionary appropriations currently in effect through 2021 cease after 2019, and appropriations instead grow at the same rate as inflation in each year.
- The expiring revenue provisions of the 2017 tax act—including provisions that specify tax rates and brackets, the number of allowable deductions, the size of the child tax credit and the portion that is refundable, and the reach of the alternative minimum tax—are extended.
- The expansion of bonus depreciation for businesses deducting certain investments is held at 100 percent.

- Certain temporary tax provisions that have recently expired or are scheduled to expire in coming years, including several trade preference programs, are permanently extended.
- Certain postponed taxes established by the Affordable Care Act are repealed.

As a result, in 2029, discretionary outlays are projected to total 5.7 percent of GDP, 0.7 percentage points greater than they are in the extended baseline projections. Revenues are projected to total 17.0 percent of GDP, 1.3 percentage points lower than they are in the extended baseline projections.

After 2029, projections of discretionary spending reflect the assumption that such spending would remain roughly constant as a percentage of GDP.<sup>2</sup> By 2049, that amount would exceed outlays in the extended baseline projections by 0.9 percentage points.

Extending the expiring tax provisions is projected to lower revenues (relative to amounts in the extended baseline projections) by an average of 1.5 percent of GDP each year between 2030 and 2049.

Nevertheless, revenues as a share of GDP trend upward under this scenario, mostly because of structural features of the tax code; they reach 17.6 percent of GDP in 2049. That upward trend differs from historical experience, however. Over the past 50 years, federal revenues as a percentage of GDP have fluctuated around their 50-year average of 17.4 percent with no evident long-term trend.

### **How CBO Analyzed Outcomes Under the Extended Alternative Fiscal Scenario**

Relative to the fiscal policy in place under current law, fiscal policy under this scenario would reflect significant changes. Those changes are projected to have effects on the economy that would feed back to budgetary outcomes. CBO has not analyzed every way in which those changes would affect the economy in the long term. Instead, for the simplified analysis presented in this report, CBO has analyzed three of those effects.<sup>3</sup>

1. See Congressional Budget Office, *Updated Budget Projections: 2019 to 2029* (May 2019), [www.cbo.gov/publication/55151](http://www.cbo.gov/publication/55151).

2. That assumption also underlies the extended baseline projections. See Table 1-2 on page 19.

3. For a general explanation of how CBO analyzes the effects of fiscal policies, see Congressional Budget Office, *How CBO Analyzes the Effects of Changes in Federal Fiscal Policies on the Economy* (November 2014), [www.cbo.gov/publication/49494](http://www.cbo.gov/publication/49494).

- Effective marginal tax rates on labor income would be lower under the extended alternative fiscal scenario than they are in the extended baseline projections, encouraging people to work and save more and thereby increasing output.<sup>4</sup>
- Effective marginal tax rates on income from most types of capital would also be lower, which would encourage saving and investment and again increase output.<sup>5</sup>
- Federal debt would be greater under the extended alternative fiscal scenario than it is in the extended baseline projections—drawing money away from (or “crowding out”) investment in capital goods and services, reducing the stock of private capital, and making output smaller than it would be otherwise.

In addition to those three effects, any changes to fiscal policy could alter people’s incentives in other ways, possibly resulting in significant long-term changes to the economy. For example, changes to tax policy might alter businesses’ choices about how they were structured, and those choices might then alter the effective marginal tax rate on capital income. Similarly, changes in the tax treatment of mortgage debt would affect households’ decisions about how much to save. Because this analysis is simplified, it does not incorporate those effects.

CBO also analyzed short-term outcomes under the extended alternative fiscal scenario. Policies that increased spending or reduced revenues would boost overall demand for goods and services over the next few years, thereby making output and employment in the short term higher than they would be otherwise.

CBO estimated the effects of this scenario on both GDP and GNP (gross national product). Each of those measures is important for different reasons. GDP is important because by accounting for effects on domestic economic and income growth, it helps assess the productive capacity—and therefore the tax base—of the economy

4. The effective marginal tax rate on labor income is the share of an additional dollar of such income that is paid in federal individual income taxes and payroll taxes—averaged among taxpayers, with weights proportional to their labor income.
5. The effective marginal tax rate on capital income is the share of the return on an additional dollar of investment made in a particular year that will be paid in taxes over the life of that investment.

within U.S. borders (including the contributions of foreign-owned capital and labor). GNP is important because it is a more complete measure of the income available to U.S. residents. (GNP differs from GDP by including the income that U.S. residents earn abroad and excluding the income that nonresidents earn from domestic sources.) Under the extended alternative fiscal scenario, the amount of federal debt owned by foreigners and the inflows of foreign capital are larger than they are in CBO’s extended baseline projections. As a result, the long-term negative effects of that debt on GNP are larger than the negative effects on GDP.

### **Budgetary and Economic Outcomes Under the Extended Alternative Fiscal Scenario**

Under the extended alternative fiscal scenario, CBO projects, the primary deficit (which excludes interest costs) in 2049 would be 6.1 percent of GDP. (In the extended baseline projections, it is 3.0 percent of GDP.) Once the rising costs of debt service are added, the total deficit in 2049 would equal 15.5 percent, not the 8.7 percent of GDP it equals in CBO’s extended baseline projections (see Table 2-1).

CBO projects the following outcomes in 2049. (Amounts in the extended baseline projections are shown in parentheses.)

- Net interest costs would be 9.4 percent of GDP (rather than 5.7 percent).
- Total spending excluding interest payments would be 23.7 percent of GDP (rather than 22.5 percent).
- Revenues would be 17.6 percent of GDP (rather than 19.5 percent).
- Debt held by the public would be 219 percent of GDP (rather than 144 percent).

The crowding out of private investment, the smaller capital stock, and the larger supply of labor would, on balance, cause output to be lower and interest rates to be higher in the long term under the extended alternative fiscal scenario than they are in the extended baseline projections. In 2049, for instance, real GDP would be 2.5 percent lower (see Table 2-2). In addition, real GNP in 2049 would be 3.6 percent lower, and real GNP per person would be about \$3,400 lower (see Figure 2-1 on page 42). Also, the interest rate on 10-year Treasury

Table 2-1.

**Budget Projections Under Three Scenarios**

Percentage of Gross Domestic Product

	2029	2049
<b>Revenues</b>		
Extended Baseline	18.3	19.5
Extended Alternative Fiscal Scenario	17.0	17.6
Payable-Benefits Scenario	18.3	19.6
<b>Spending Excluding Interest Payments</b>		
Extended Baseline	19.8	22.5
Extended Alternative Fiscal Scenario	20.6	23.7
Payable-Benefits Scenario	19.8	20.5
<b>Deficit (-) or Surplus, Excluding Interest Payments</b>		
Extended Baseline	-1.6	-3.0
Extended Alternative Fiscal Scenario	-3.6	-6.1
Payable-Benefits Scenario	-1.6	-0.9
<b>Total Deficit (-) or Surplus</b>		
Extended Baseline	-4.5	-8.7
Extended Alternative Fiscal Scenario	-7.0	-15.5
Payable-Benefits Scenario	-4.5	-4.9
<b>Federal Debt Held by the Public</b>		
Extended Baseline	92	144
Extended Alternative Fiscal Scenario	105	219
Payable-Benefits Scenario	92	106

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

Under the extended alternative fiscal scenario, substantial tax increases and discretionary spending cuts would not take place as scheduled; instead, current law would be changed to maintain certain major policies that are now in place. Under the payable-benefits scenario, spending for Social Security would be significantly lower than it is in the extended baseline projections.

The estimates of deficits, surpluses, and debt include macroeconomic feedback.

securities in 2049 would be 0.4 percentage points higher than the rate in CBO's extended baseline projections.

In addition to the effects on output and interest rates reported here, other effects would occur under the extended alternative fiscal scenario. In particular, the significant increase in federal borrowing would elevate

the risk of a fiscal crisis and would limit lawmakers' ability to respond to unforeseen events. Negative economic and financial effects that were less abrupt but still significant—such as higher inflation expectations or an increased burden of financing public and private activity in international markets—would also have a greater chance of occurring under this scenario. Those effects would worsen the consequences associated with high and rising federal debt.

The policies underlying the extended alternative fiscal scenario would have short-term effects as well. Over the next few years, greater federal spending would boost the overall demand for goods and services, causing output to be higher than it otherwise would be. In CBO's estimation, real GDP would be 0.7 percent higher in 2020 and 0.4 percent higher in 2021 than it is in the extended baseline projections. In addition, the Federal Reserve would respond, in CBO's view, by raising interest rates to restrain the boost in overall demand and prevent inflation from rising above the central bank's goal. As a result, the interest rate on 10-year Treasury securities would be 0.2 percentage points higher in 2020 and 2021 than it is in the extended baseline projections, CBO estimates (see Table 2-3 on page 43).

The economic and budgetary effects of the policies underlying the extended alternative fiscal scenario are highly uncertain, as are the effects of the extended baseline. That uncertainty arises mainly from two sources: uncertainty about future economic conditions and demographic trends, and uncertainty about the macroeconomic effects of policy changes. If future economic and demographic conditions and their responses to policy changes differed from CBO's projections, budgetary and economic outcomes would differ from those the agency estimates under the extended alternative fiscal scenario.

For example, if federal borrowing rates were 0.1 percentage point higher (or lower) than they are in the extended baseline projections, debt in the extended alternative fiscal scenario would be 225 percent of GDP (or 212 percent of GDP) rather than 219 percent in 2049. If total factor productivity growth was 0.1 percentage point higher (or lower), debt would be 209 percent of GDP (or 228 percent of GDP). Those estimated effects are roughly scalable for moderate changes in the economic variables. In particular, if interest rates were more than 0.5 percentage points higher than they are in the extended baseline projections or total factor productivity growth was more

Table 2-2.

**Long-Term Economic Effects Under Two Scenarios Relative to CBO's Extended Baseline Projections**

	2029	2049
<b>Real GDP (Percent)</b>		
Extended Alternative Fiscal Scenario	-0.1	-2.5
Payable-Benefits Scenario	n.a.	1.7
<b>Interest Rates on 10-Year Treasury Securities (Percentage points)</b>		
Extended Alternative Fiscal Scenario	0.1	0.4
Payable-Benefits Scenario	n.a.	-0.2

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

Under the extended alternative fiscal scenario, substantial tax increases and discretionary spending cuts would not take place as scheduled; instead, current law would be changed to maintain certain major policies that are now in place. Under the payable-benefits scenario, spending for Social Security would be significantly lower than it is in the extended baseline projections.

n.a. = not applicable.

than 0.3 percentage points lower, projected debt as a percentage of GDP under the extended alternative fiscal scenario would grow to levels well outside of U.S. historical experience, which provides the empirical basis for CBO's models.

**Budgetary and Economic Effects of a Payable-Benefits Scenario**

Without legislative action, the combined trust funds for Social Security (known as Old-Age, Survivors, and Disability Insurance, or OASDI) are projected to be exhausted in calendar year 2032. Beyond that point, trust fund balances would no longer be available to make up the gap between benefits specified in current law and annual trust fund receipts. CBO's extended baseline projections reflect the assumption that the Social Security Administration will pay benefits as scheduled under current law regardless of the status of the program's trust funds.<sup>6</sup> However, if the trust funds' combined balance

6. That approach is consistent with the requirement that CBO's 10-year baseline projections incorporate the assumption that funding for such programs is adequate to make all payments required by law.

declined to zero and current revenues were insufficient to pay benefits specified in law, the Social Security Administration would no longer be permitted to pay beneficiaries the full amounts to which they were entitled.<sup>7</sup> CBO analyzed a payable-benefits scenario in which Social Security benefits would be limited to the amounts payable from dedicated funding sources beginning in 2033.

Although it is unclear how much payments for specific beneficiaries would be reduced if total benefits were limited to the amounts payable from dedicated funding, CBO estimated the amount of the total reduction in annual benefits that would be necessary for the trust funds' outlays to match revenues in each year after the funds were exhausted. The required reduction would amount to 24 percent in 2033 and rise gradually to 29 percent in 2049 (relative to the amounts in CBO's extended baseline projections).

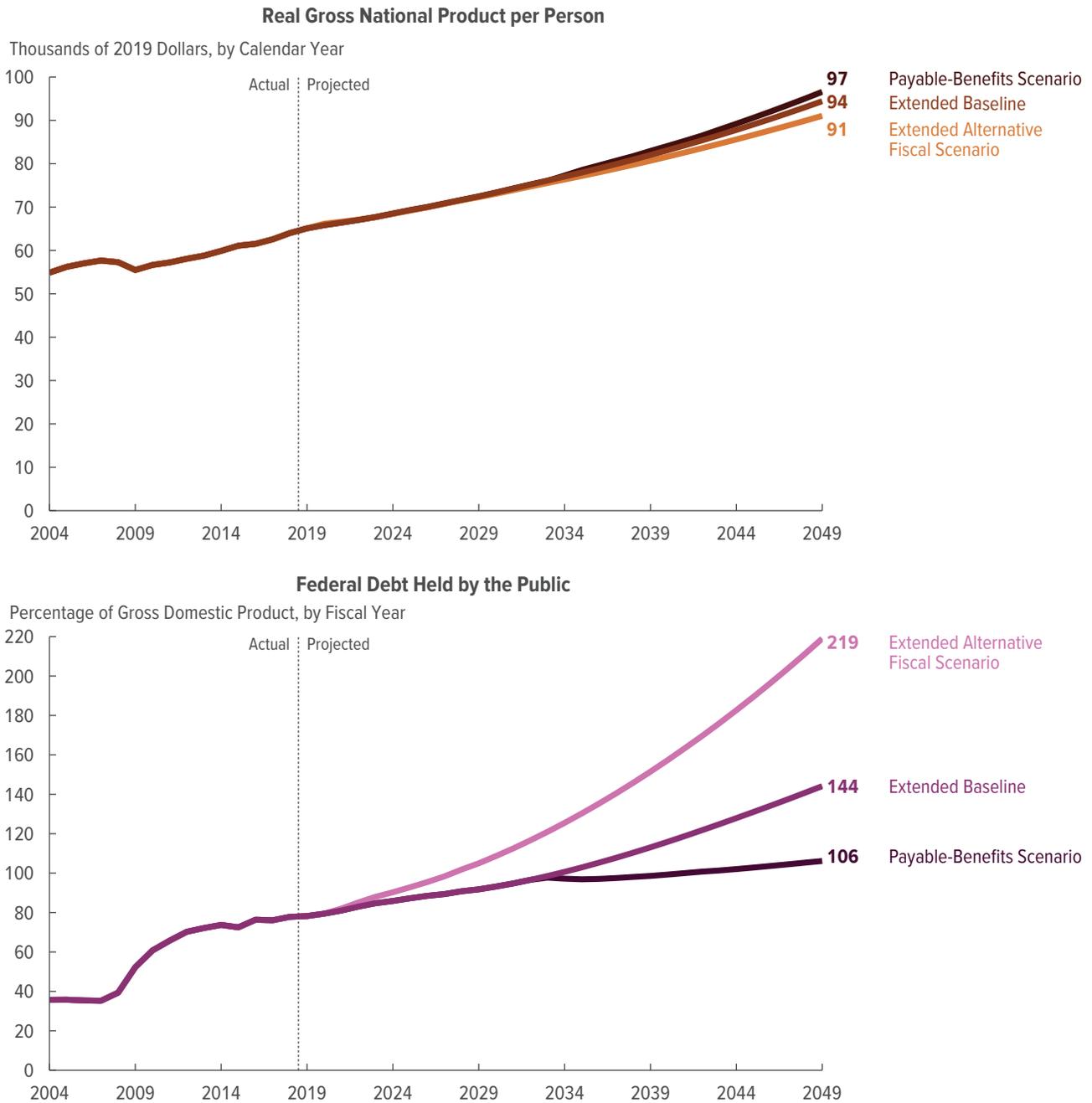
In CBO's assessment, if benefits paid out were limited to revenues received by the Social Security trust funds, federal deficits would decrease by 1.5 percent of GDP in 2033 and by 3.8 percent in 2049 (relative to the amounts in CBO's extended baseline projections). The cut in benefits would not be announced until 2033 and would therefore be unexpected (which matters for the projection of macroeconomic effects). That abrupt cut in benefits in 2033 would cause a substantial drop in consumer spending and a corresponding increase in saving. It would also probably induce some older workers to work more hours or to delay retirement and save more. In addition, some Social Security beneficiaries might return to work to supplement their income.

Under the payable-benefits scenario, changes in overall demand would lower GDP in the first few years following the reduction in benefits. In the long run, however, increases in the labor supply and investment stemming from smaller budget deficits would boost output and reduce interest rates. Those changes, which are measured relative to amounts in CBO's extended baseline projections, would generally decrease income and wealth for older generations and increase them for

7. The balances of the trust funds represent the total amount that the government is legally authorized to spend. For more details about the legal issues related to exhaustion of a trust fund, see William R. Morton and Barry F. Huston, *Social Security: What Would Happen If the Trust Funds Ran Out?* Report for Congress RL33514 (Congressional Research Service, June 11, 2018), <https://go.usa.gov/xEtaw>.

Figure 2-1.

**Output per Person and Debt Under Three Scenarios**



Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO’s 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

Under the extended alternative fiscal scenario, substantial tax increases and discretionary spending cuts would not take place as scheduled; instead, current law would be changed to maintain certain major policies that are now in place. Under the payable-benefits scenario, spending for Social Security would be significantly lower than it is in the extended baseline projections.

Gross national product differs from gross domestic product, the more common measure of the output of the economy, by including the income that U.S. residents earn abroad and excluding the income that nonresidents earn in this country.

The estimates of deficits, surpluses, and debt include macroeconomic feedback.

Table 2-3.

**Short-Term Economic Effects Under Two Scenarios Relative to the Extended Baseline Projections**

	2020	2021	2033	2034
	<b>Real GDP (Percent)</b>			
Extended Alternative Fiscal Scenario	0.7	0.4	n.a.	n.a.
Payable-Benefits Scenario	n.a.	n.a.	-0.8	-0.1
	<b>Interest Rates on 10-Year Treasury Securities (Percentage points)</b>			
Extended Alternative Fiscal Scenario	0.2	0.2	n.a.	n.a.
Payable-Benefits Scenario	n.a.	n.a.	-0.7	-0.4

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

Under the extended alternative fiscal scenario, substantial tax increases and discretionary spending cuts would not take place as scheduled; instead, current law would be changed to maintain certain major policies that are now in place. Under the payable-benefits scenario, spending for Social Security would be significantly lower than it is in the extended baseline projections.

n.a. = not applicable.

younger ones. That shift would stem not only from the direct effects of a drop in benefits, but also from macroeconomic effects that would raise wages in the long run. Incorporating those macroeconomic effects into its analysis, CBO projects that the debt-to-GDP ratio would stand at 106 percent in 2049, 38 percentage points below the extended baseline projection—but still well above the current level.

### How CBO Analyzed Outcomes Under the Payable-Benefits Scenario

As with the extended alternative fiscal scenario, this scenario represents significant changes to the fiscal policy projected under current law. Because benefit cuts would be unexpected, workers would not adjust their saving and hours worked beforehand. Hence, projections under this scenario do not differ from those in the extended baseline until 2033, when those cuts would begin. Thereafter, people would expect benefits to be reduced permanently. As a result, changes in investment and the labor supply would lead in the long term to greater output and lower interest rates than in CBO's extended baseline projections. Although CBO has not analyzed every way in which those changes would affect the economy in the long term, the agency analyzed four of those effects for this report.

- The reduction in benefits would decrease retirees' income, pushing down the overall demand for goods and services and causing output to be lower than it

is in the extended baseline projections in 2033 and 2034.

- The benefit cuts would cause some people to work more and some to remain in the labor force longer than they would have otherwise. Both of those factors would expand the supply of labor and thus the economy's output in the long term.
- In CBO's assessment, some workers who have not yet retired would respond to the prospect of smaller benefit payments by boosting their saving and reducing their spending.<sup>8</sup> Those changes would lessen the effect that smaller future benefit payments would have on households' future income and spending. The resulting increases in saving and the labor supply would boost the capital stock and GDP.
- Federal debt would be lower than it is in the extended baseline projections—increasing the amount of money available for (or “crowding in”) private investment in capital goods and services, boosting the stock of private capital, and making output greater than it would be otherwise.

8. In this analysis, CBO did not address the potential effects of moving households' savings into or out of tax-deferred or taxable savings accounts.

### **Budgetary and Economic Outcomes Under the Payable-Benefits Scenario**

In 2049, primary deficits under the payable-benefits scenario would be smaller than they are in CBO's extended baseline projections—0.9 percent of GDP instead of 3.0 percent of GDP. Adding debt-service costs raises those amounts to 4.9 percent of GDP under the payable-benefits scenario and to 8.7 percent of GDP in the extended baseline projections (see Table 2-1 on page 40).

For the payable-benefits scenario, CBO projects the following outcomes in 2049 (compared with outcomes in the extended baseline):

- Net interest costs would be 4.0 percent of GDP (rather than 5.7 percent).
- Total spending excluding net interest costs would be 20.5 percent of GDP (rather than 22.5 percent).
- Revenues would be 19.6 percent of GDP (rather than 19.5 percent).
- Debt would be 106 percent of GDP (rather than 144 percent).

In CBO's assessment, the crowding in of private investment and the increase in the supply of labor and the capital stock would cause output to be higher and interest rates to be lower in the long term under the payable-benefits scenario than they are in the extended baseline projections. Specifically, real GDP would be 1.7 percent higher in 2049, CBO estimates (see Table 2-2 on page 41). In addition, real GNP would be 2.3 percent higher in 2049, and real GNP per person would be about \$2,200 higher in that year (see Figure 2-1 on page 42). In contrast, the interest rate on 10-year Treasury securities would be 0.2 percentage points lower under this scenario than it is in CBO's extended baseline projections.

The policies underlying the payable-benefits scenario would have short-term effects as well. In CBO's assessment, people would respond to smaller benefit payments by reducing their spending, which would decrease the overall demand for goods and services. As a result, real GDP would be 0.8 percent lower in 2033 and 0.1 percent lower in 2034 than it is in the extended baseline projections, CBO estimates. In CBO's view, the Federal Reserve would respond by lowering interest rates to boost overall demand and prevent inflation from falling below

the central bank's longer-term goal. In addition, the increase in the saving rate—and other factors—would further reduce interest rates. Taken together, those effects would cause the interest rate on 10-year Treasury securities to be 0.7 percentage points lower in 2033 and 0.4 percentage points lower in 2034 than it is in the extended baseline projections, in CBO's estimation (see Table 2-3 on page 43).

The economic and budgetary effects of the policies underlying the payable-benefits scenario are highly uncertain, as are the effects of the extended baseline. That uncertainty arises mainly from two sources: uncertainty about future economic conditions and demographic trends, and uncertainty about how reductions in Social Security benefits would affect the economy and the budget. If future economic and demographic conditions and the macroeconomic effects of reduced Social Security benefits differed from CBO's projections, budgetary and economic outcomes would differ from those the agency estimates under the payable-benefits scenario. For example, if interest rates on federal debt were 0.1 percentage point higher (or lower) than they are in the extended baseline projections, debt in the payable-benefits scenario would be 109 percent of GDP (or 102 percent of GDP) rather than 106 percent in 2049. If total factor productivity growth was 0.1 percentage point higher (or lower), debt would be 100 percent of GDP (or 111 percent of GDP). Those estimated effects are roughly scalable for moderate changes in the economic variables.

### **The Size and Timing of Policy Changes Needed to Meet Various Goals for Deficit Reduction**

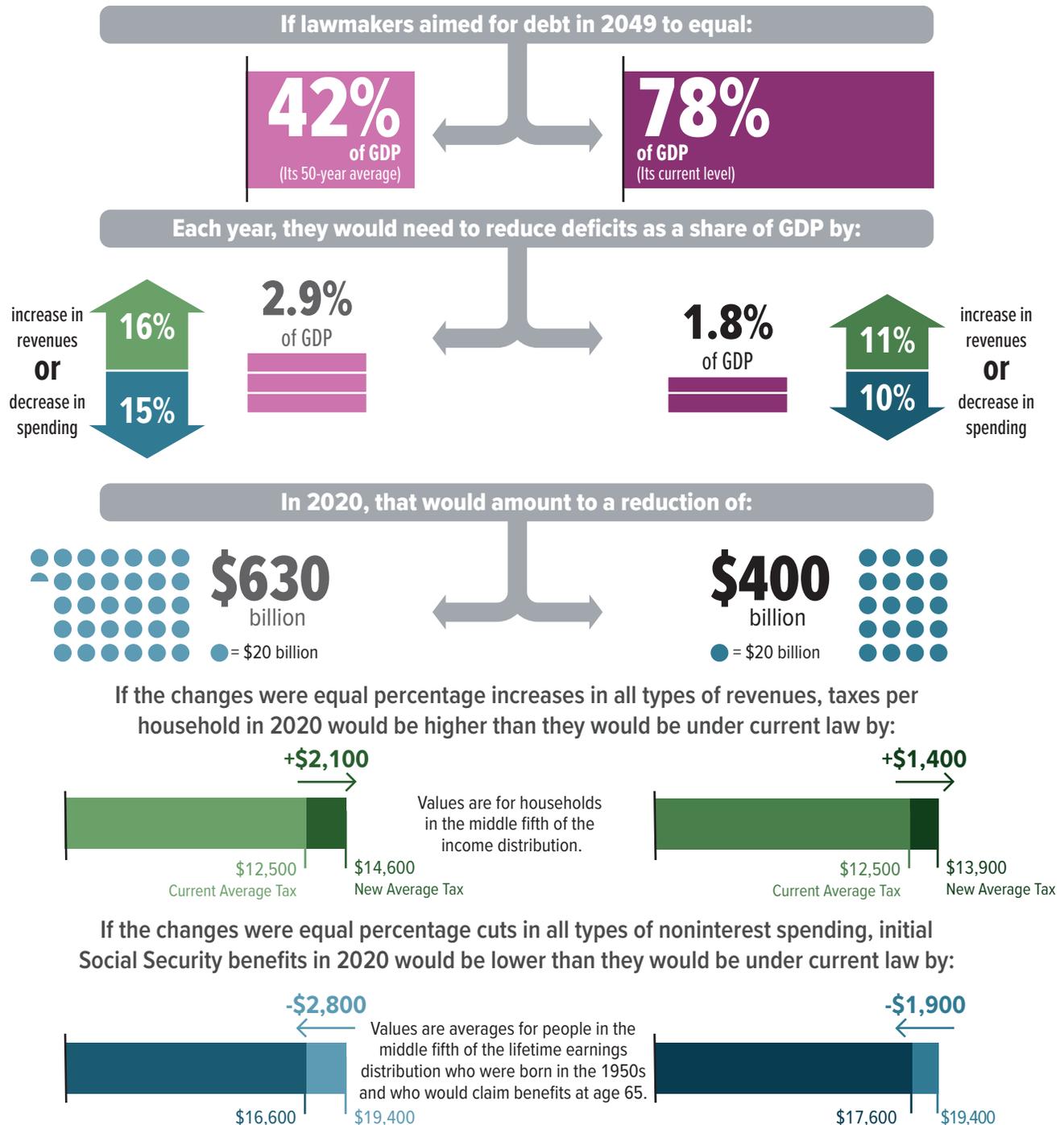
CBO estimated the size of changes in spending or revenues that would be needed if lawmakers wanted to achieve some specific targets for federal debt held by the public. The agency also assessed the extent to which the size of policy adjustments would change if such deficit reduction occurred later, and it examined how waiting to resolve the long-term fiscal imbalance would affect different generations of the U.S. population.

#### **The Size of Policy Changes Needed to Meet Various Goals for Deficit Reduction**

If lawmakers wanted debt in 2049 to match its current level of 78 percent of GDP, they could cut noninterest spending or raise revenues (or do both) in each year beginning in 2020 by amounts totaling 1.8 percent of GDP (see Figure 2-2). In 2020, 1.8 percent of GDP would be about \$400 billion, or \$1,200 per person. If

Figure 2-2.

**The Size of Policy Changes Needed to Make Federal Debt Meet Two Possible Goals in 2049**



Source: Congressional Budget Office

In this figure, the indicated sizes of policy changes are relative to CBO’s extended baseline projections, which generally reflect current law, following CBO’s 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period. The projected effects of the policy changes on debt include the direct effects of the policy changes and the feedback to the federal budget from faster economic growth. The effects on growth and the feedback to the federal budget reflect the positive economic effects of lowering the debt but do not reflect any assumptions about the specific details of the policy changes.

GDP = gross domestic product.

such an adjustment was made in each year, the budget would show a primary surplus of 0.2 percent of GDP in 2030 and a primary deficit of 0.7 percent of GDP by 2049. If the changes came entirely from revenues or spending, they would amount to an 11 percent increase in revenues or a 10 percent cut in noninterest spending (relative to amounts in CBO's extended baseline projections).

Increases in revenues or cuts in noninterest spending would need to be larger than 1.8 percent of GDP to reduce debt to levels recorded in recent decades. If lawmakers wanted to decrease debt to 42 percent of GDP (its average over the past 50 years) by 2049, they could increase revenues or cut noninterest spending (in relation to amounts under current law) or adopt some combination of those two actions beginning in 2020 by amounts totaling 2.9 percent of GDP each year. In 2020, 2.9 percent of GDP would be about \$630 billion, or \$1,900 per person.

To lower debt to its average over the past 50 years solely by increasing revenues or cutting noninterest spending, lawmakers could make the following changes:

- If collections of the various types of revenues were increased proportionally, total revenues would need to be about 16 percent higher each year over the 2020–2049 period. On average, that adjustment would result in federal taxes that were about \$2,100 higher than they are under current law for households in the middle fifth of the income distribution in 2020.
- If all types of noninterest spending were cut by an equal percentage, spending overall would need to be about 15 percent lower in each of the next 30 years. For example, such cuts would lower initial annual Social Security benefits by about \$2,800, on average, for people in the middle fifth of the lifetime earnings distribution who were born in the 1950s and who first claimed benefits at age 65.

In those examples, the projected effects on debt include both the direct effects of the policy changes and the feedback to the federal budget that would result from faster economic growth. In general, reducing the federal debt increases the amount of money available for (or crowds in) private investment in capital goods and services, which increases the stock of private capital and economic output. The policy changes examined here are illustrative,

however, and the results do not reflect any particular assumptions about specific changes. Any policy change could alter productivity growth and people's incentives to work and save, which would in turn affect overall economic output and feed back to the federal budget.

### **The Timing of Policy Changes Needed to Meet Various Goals for Deficit Reduction**

The size of the policy changes needed to achieve a particular goal for federal debt would depend, in part, on how quickly that goal was expected to be reached. Regardless of the chosen goal for federal debt, lawmakers would face trade-offs in deciding how quickly to implement policies designed to reduce or stabilize debt as a percentage of GDP. The benefits of reducing the deficit sooner would include a smaller accumulated debt, smaller policy changes required to achieve long-term outcomes, and less uncertainty about the policies lawmakers would adopt. If lawmakers cut spending or increased taxes abruptly, people might have insufficient time to plan for or to adjust to the new system.

Over the first several years following their adoption, such policy changes would dampen overall demand for goods and services, thus decreasing output and employment below amounts projected under current law. That dampening effect is expected to be temporary, however, because of how prices and interest rates would respond to the reductions in demand and to the resulting actions by the Federal Reserve.

By contrast, if policymakers waited longer to reduce federal spending or increase taxes, more debt would accumulate, which would slow the growth of output and income. Delaying implementation would thus mean that reaching any chosen target for debt would require larger changes. Nonetheless, if policymakers waited longer to enact deficit-reduction policies, the economy probably would be affected less over the short term than it would be if changes were made immediately.

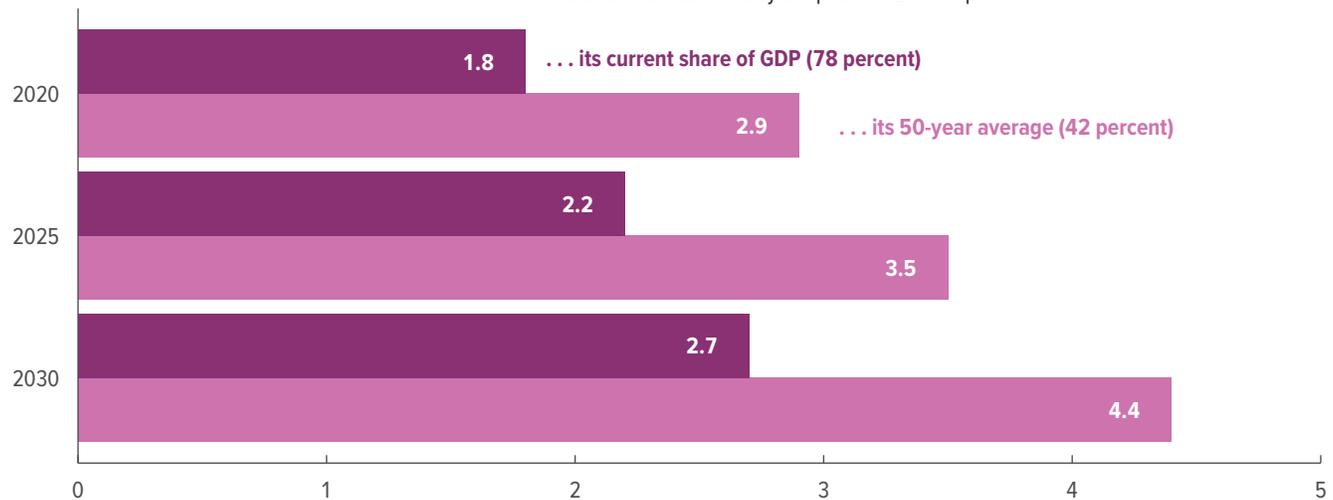
Faster or slower implementation of policies to reduce budget deficits would tend to impose different burdens on different generations. Reducing deficits sooner would probably require older workers and retirees to sacrifice more but would benefit younger workers and future generations. Reducing deficits later would require smaller sacrifices from older people but greater ones from younger workers and future generations.

Figure 2-3.

### How Timing Affects the Size of Policy Changes Needed to Make Federal Debt Meet Two Possible Goals in 2049

Percentage of GDP

Starting Year



Source: Congressional Budget Office.

GDP = gross domestic product.

CBO has analyzed those trade-offs in two ways. First, it estimated the extent to which the size of policy adjustments would change if deficit reduction was delayed by five or 10 years. (CBO did not make any assumptions about the specific policy changes that might be used to reduce the deficit.) For example, if lawmakers sought to reduce debt as a share of GDP to its historical 50-year average of 42 percent in 2049 and if the necessary policy changes did not take effect until 2025, the annual reduction in the primary deficit would need to amount to 3.5 percent of GDP rather than the 2.9 percent that would accomplish the same goal if the changes were made starting in 2020 (see Figure 2-3). If lawmakers chose to wait another five years to implement the policies (having them take effect in 2030), even larger changes would be necessary; in that case, the required annual reduction in the primary deficit would amount to 4.4 percent of GDP.

Second, CBO studied the effects on the average per capita income of various generations from waiting to resolve the long-term fiscal imbalance. CBO compared economic outcomes under two types of policies. One would stabilize the debt-to-GDP ratio starting in a particular year, and the other would wait 10 years to do so. For policies

such as across-the-board benefit cuts or tax rate increases for all adults, that analysis suggests that the average income of generations born after the earlier implementation date would be lower under the policy with a 10-year delay.<sup>9</sup> In contrast, people born more than 25 years before the earlier implementation date would have a higher average income if action was delayed—mainly because they would partly or entirely avoid the policy changes needed to stabilize the debt. Generations born between those

9. Those results are preliminary conclusions from an update of work that CBO published in 2010. See Congressional Budget Office, *Economic Impacts of Waiting to Resolve the Long-Term Budget Imbalance* (December 2010), [www.cbo.gov/publication/21959](http://www.cbo.gov/publication/21959). That analysis was based on a projection of slower growth in debt than CBO now projects, so the estimated effects of a similar policy today would be close, but not identical, to the effects estimated in that analysis. For a different approach to analyzing the costs of debt reduction for different generations, see Shinichi Nishiyama and Felix Reichling, *The Costs to Different Generations of Policies That Close the Fiscal Gap*, Working Paper 2015-10 (Congressional Budget Office, December 2015), [www.cbo.gov/publication/51097](http://www.cbo.gov/publication/51097).

two groups could either gain or lose from delayed action, depending on the specific details of the policy changes.<sup>10</sup>

CBO's analysis indicates that delaying policy changes would reduce the well-being of younger generations compared with a situation in which policy changes occurred earlier. Moreover, the further in the future that a policy change occurred, the more the well-being of older generations would be improved and that of younger generations would be worsened. However, the additional burden on younger generations resulting from delaying policy

changes would be relatively small compared with their lifetime earnings potential because, on average, future generations are expected to have much higher income than current generations.

Even if lawmakers waited to implement policy changes to reduce deficits in the long term, deciding about those changes sooner would offer two main advantages. First, people would have more time to prepare by changing the number of hours they work, the age at which they plan to retire, and the amount they choose to save. Second, policy changes that would reduce the debt over the long term would hold down longer-term interest rates and could lessen uncertainty—thus enhancing businesses' and consumers' confidence. Those factors would boost output and employment in the near term.

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10. Those conclusions do not incorporate the negative effects that would arise from a fiscal crisis if one occurred or effects that might arise from the government's reduced flexibility to respond to unexpected challenges.

# CBO's Projections of Demographic and Economic Trends

The Congressional Budget Office develops its assessment of the long-term outlook for the federal budget on the basis of its projections of demographic and economic trends over the next three decades. Through 2029, the economic and demographic projections presented in this report are the same as those that CBO published in January.<sup>1</sup> For 2030 through 2049—the remaining years of CBO's extended baseline—the agency's projections generally reflect historical trends and anticipated demographic changes.<sup>2</sup> (A set of annual projections is included in this report's supplemental data, available online at [www.cbo.gov/publication/55331](http://www.cbo.gov/publication/55331).)

## Demographic Factors

Both the size and composition of the U.S. population influence the overall growth of the economy and affect federal tax revenues and spending. Rates of fertility, net immigration, and mortality determine the population and thus the size of the labor force and the number of people receiving benefits from federal programs such as Social Security and Medicare. Because of changes to those rates, CBO projects the population to be smaller and to grow at a slower pace in the future than it projected last year.

## Population

In CBO's projections, the total population increases from 333 million at the beginning of 2019 to 388 million in 2049, and population growth slows from a rate of 0.6 percent per year to 0.4 percent per year by the end of the projection period (see Table A-1). The slowdown in growth is particularly pronounced for the population age 16 or older, which grows on average by 0.8 percent per

year in the first decade of the projection, 0.5 percent in the second decade, and 0.4 percent in the third. Over the entire 30-year period, the U.S. population is projected to grow at an average annualized rate of 0.5 percent (compared with a rate of 0.9 percent over the past 30 years): Births account for an average annual increase of 1.2 percentage points, immigration adds 0.3 percentage points, and mortality subtracts 1.0 percentage point.

The population is projected not only to grow more slowly but also to become older, on average, than in the past. In the agency's projections, over the 30-year period, the share of the population that is 65 or older grows, whereas the share that is of working age (defined as people ages 20 to 64) shrinks. As a result, CBO projects, a growing portion of the population will receive benefits from the Social Security and Medicare programs while a shrinking portion will be working and paying into the trust funds that support those programs.

## Fertility

CBO projects a gradual rise in the total fertility rate over the next few years, increasing from a rate of 1.8 children per woman in 2018 to a rate of 1.9 children per woman from 2022 through 2049.<sup>3</sup> Fertility rates tend to be procyclical, meaning they often decline during recessions and rebound during recoveries. However, the U.S. fertility rate did not recover after the 2007–2009 recession; the rate (which averaged 2.0 children per woman in the 20 years prior to the recession) peaked at 2.1 in 2007.

1. See Congressional Budget Office, *The Budget and Economic Outlook: 2019 to 2029* (January 2019), [www.cbo.gov/publication/54918](http://www.cbo.gov/publication/54918).

2. The extended baseline generally reflects current law, following CBO's 10-year baseline projections through 2029 and then extending most of the concepts underlying those projections through the rest of the long-term projection period.

3. The total fertility rate represents the average number of children that a woman would have in her lifetime and is calculated as the sum of fertility rates for all ages between 15 and 49 in a given year. The total fertility rate can also be defined as the average number of children that a woman would have if, in each year of her life, she experienced the birth rates observed or assumed for that year and if she survived her entire childbearing period. In CBO's long-term model, the likelihood that a particular woman will have a child depends on such factors as that woman's education, marital status, immigration status, and childbearing history.

Table A-1.

**Average Annual Values for Demographic Variables That Underlie CBO's Extended Baseline Projections**

	1989–2018	2019–2029	2030–2039	2040–2049	Overall, 2019–2049
Growth of Population (Percent)	0.9	0.6	0.5	0.4	0.5
Contribution to Population Growth (Percentage points):					
Births	1.4	1.2	1.2	1.2	1.2
Net immigration	0.4	0.3	0.3	0.3	0.3
Deaths	-0.9	-0.9	-1.0	-1.1	-1.0
Growth of Civilian Noninstitutionalized Population (Percent) <sup>a</sup>	1.1	0.8	0.5	0.4	0.6
<b>Memorandum:</b>					
Fertility Rate (Children per woman)	2.0	1.9	1.9	1.9	1.9
Life Expectancy at Birth, End of Period (Years) <sup>b</sup>	78.9	80.3	81.4	82.5	82.5
Life Expectancy at Age 65, End of Period (Years) <sup>b</sup>	19.4	20.1	20.8	21.5	21.5
Immigration Rate (Per 1,000 people in the U.S. population)	3.7	3.1	3.1	3.1	3.1

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

- a. The civilian noninstitutionalized population includes individuals age 16 or older who are not inmates of institutions or on active duty in the armed forces.
- b. Life expectancy as used here is period life expectancy, which is the amount of time that a person in a given year would expect to survive beyond his or her current age on the basis of that year's mortality rates for various ages.

Since then, the fertility rate has steadily declined, reaching 1.9 children per woman in 2010 and 1.8 children per woman in 2017 (the most recent year for which data are available).

CBO projects that total fertility rates will remain below the replacement rate—the fertility rate required for a generation to exactly replace itself—of 2.1 children per woman for the next three decades.<sup>4</sup> Over the next 30 years, that relatively low rate of fertility will contribute to slower population growth. CBO's projection is consistent with the recommendation made to the Social Security Advisory Board by its 2015 Technical Panel on Assumptions and Methods.<sup>5</sup>

4. See Joyce A. Martin and others, *Births: Final Data for 2017*, National Vital Statistics Reports, vol. 67, no. 8 (National Center for Health Statistics, November 2018), [www.cdc.gov/nchs/data/nvsr/nvsr67/nvsr67\\_08-508.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr67/nvsr67_08-508.pdf) (988 KB).

5. See 2015 Technical Panel on Assumptions and Methods, *Report to the Social Security Advisory Board* (September 2015), p. 9, <https://go.usa.gov/cJYR5> (PDF, 3.4 MB).

## Immigration

Under current law, CBO projects, annual net immigration to the United States (a measure that accounts for all people who either enter or leave the United States in any year) would rise from 0.9 million people in 2019 to 1.2 million people in 2049. In an environment of relatively low birth rates, net immigration flows become a more important part of overall U.S. population growth. Between 2019 and 2029, projected net inflows account for approximately half of overall population growth, but by the last decade of the projection period that share is about four-fifths of all growth.

The new immigrants would largely consist of legal permanent residents (LPRs). Over the next two decades, average annual net flows of LPRs are projected to increase from approximately 860,000 LPRs per year in the first decade to approximately 890,000 over the second decade. In addition, the number of legal temporary residents is projected to increase steadily by approximately 80,000 per year over the next 20 years.

CBO's projections of annual net flows of foreign-born people without legal status, which are informed by the agency's economic projections and by recent demographic

trends, increase over that period.<sup>6</sup> Growth in the U.S. economy is an important factor because, in CBO's estimation, periods of faster growth over the past two decades have been associated with higher net flows of foreign-born people without legal status. CBO expects that relationship to boost such immigration. However, estimates indicate that the number of foreign-born people without legal status in 2016 was the lowest since 2004 despite relatively strong economic conditions in the United States, which implies that other factors have constrained such immigration in recent years. CBO expects those other factors to continue to hold down such immigration in the near term.<sup>7</sup> Nevertheless, over time, the agency expects economic growth to again become an important factor for immigration.

On the basis of recent data, CBO anticipates that net flows of foreign-born people without legal status will be smaller in the near term than the long-term relationship between immigration and economic growth would suggest; the agency projects zero net flows in 2019 (meaning that immigration is offset by emigration in this category). The agency expects annual net flows of foreign-born people without legal status to increase significantly between 2020 and 2024, reaching approximately 170,000 by 2024, and then remain roughly unchanged through 2039, reflecting both economic growth and those other constraining factors.

For projections beyond the next 20 years, CBO employs a simplified approach: After 2039, under current law, the

agency projects that net immigration for all categories would grow at a rate equal to overall population growth in the prior year; that rate averages 0.4 percent annually through 2049.

### Mortality

The mortality rate, which is the number of deaths per thousand people, has generally declined in the United States since the early 20th century, although the rate of those improvements has slowed over time. For the most part, the mortality rate has decreased more quickly for younger people than for older people during that period. However, mortality rates rose in 2015 and 2016, the most recent years for which data were available at the time this analysis was completed. The result was that life expectancy at birth declined in both years, marking the first decreases in this metric since 1993. Those declines are primarily driven by increases in mortality from Alzheimer's disease, suicide, chronic liver disease, septicemia, and unintentional drug overdoses (in particular, opioids).<sup>8</sup>

CBO projects mortality rates for every five-year age group to decline at the same average pace each group experienced from 1950 through 2015. After projecting average mortality rates for men and women in each age group, CBO incorporates differences in those rates for people 30 years of age and older on the basis of marital status, education, disability insurance status, and lifetime household earnings (for people under 30, the mortality projections account for age and sex only). CBO projects lower mortality rates and thus longer life expectancies for people who are married, have more education, do not receive benefits through the Social Security Disability Insurance (DI) program, or are in higher-income groups.<sup>9</sup>

6. CBO uses this term to refer to foreign-born people other than LPRs, refugees, asylees, temporary residents, and visitors. Most foreign-born people without legal status either unlawfully entered the United States without inspection or lawfully entered the United States in a temporary status and then unlawfully remained in the country after that temporary status expired. Some foreign-born people without legal status are beneficiaries under Temporary Protected Status or under policies whereby the executive branch does not seek their immediate removal from the United States (for example, Deferred Action for Childhood Arrivals); others are allowed into the United States while they await their removal proceedings in immigration courts. Many of those foreign-born people without legal status are authorized to work in the United States, in which case they may apply for a Social Security number and must pay applicable federal taxes.

7. For the most recent estimates, see Jeffrey S. Passel and D'Vera Cohn, *U.S. Unauthorized Immigrant Total Dips to Lowest Level in a Decade* (Pew Research Center, November 2018), <https://tinyurl.com/y9tmol2g>. Official data on foreign-born people without legal status are limited, so historical estimates are very uncertain.

8. For an account of how factors affecting mortality and mortality improvement rates have changed over time, see National Center for Health Statistics, *Health, United States, 2017: With Special Feature on Mortality*, [www.cdc.gov/nchs/data/hus/17.pdf](http://www.cdc.gov/nchs/data/hus/17.pdf) (10.5 MB).

9. For more information about mortality differences among groups with different earnings, see Tiffany Bosley, Michael Morris, and Karen Glenn, *Mortality by Career-Average Earnings Level*, Actuarial Study 124 (Social Security Administration, April 2018), <https://tinyurl.com/yct5qdew> (PDF, 301KB); Congressional Budget Office, *Growing Disparities in Life Expectancy* (April 2008), [www.cbo.gov/publication/41681](http://www.cbo.gov/publication/41681); and Julian P. Cristia, *The Empirical Relationship Between Lifetime Earnings and Mortality*, Working Paper 2007–11 (Congressional Budget Office, August 2007), [www.cbo.gov/publication/19096](http://www.cbo.gov/publication/19096).

CBO's projections result in an average life expectancy at birth of 82.5 years in 2049, compared with 79.1 years in 2019.<sup>10</sup> Similarly, life expectancy at age 65 is projected to be 21.5 years in 2049, or 2.1 years longer than life expectancy at age 65 in 2019.<sup>11</sup>

### Changes in Demographic Projections Since Last Year

CBO's estimates of the U.S. population change as the result of changes in rates of fertility, immigration, and mortality.

**Population.** In CBO's projections, the population increases from approximately 333 million in 2019 to 355 million in 2029—an average annualized growth rate of about 0.6 percent. Last year, CBO projected the population would grow slightly faster, increasing from 335 million to 358 million over that same period, an average annualized rate of 0.7 percent. Those revisions reflect changes to underlying data—specifically, unexpectedly high mortality rates for 2015 and 2016 and unexpectedly low fertility rates for 2016 and 2017—as well as changes to the way the agency projects fertility rates and net immigration.

In the two decades following 2029, the population is projected to grow at an average annual rate of 0.4 percent (revised down from 0.5 percent in last year's report) to 388 million by 2049 (5 million, or 1.4 percent, fewer people than projected last year).

**Fertility.** The total fertility rate is projected to be lower through 2021 than CBO projected last year. Total fertility rates have been persistently low since the 2007–2009 recession. In recognition of that trend, CBO expects total fertility rates to remain low for the next few years, gradually rising from a rate of 1.8 children per woman in 2019 to 1.9 children per woman by 2022, and then remaining at that rate. By contrast, CBO last year

projected a total fertility rate of 1.9 children per woman in each year for 2018 through 2048.

The lower fertility rate in the first three years of the projection period eventually results in fewer births and a smaller working-age population throughout the entire period than CBO projected last year. There are approximately 547,000 fewer births over the first half of the projection period, but the effects of fewer births become most evident in the second half of the projection period, as the 2019–2021 birth cohort ages into its working and childbearing years. Between 2035 and 2049, the population age 16 and older contains about 3.7 million fewer people per year, on average, than CBO projected last year. Moreover, the combination of lower fertility rates and a smaller population of childbearing adults results in roughly 60,000 fewer births per year, on average, than the agency projected last year.

**Net Immigration.** CBO's projection of net immigration is also lower than its projection last year. Between 2019 and 2049, the agency projects the average net immigration rate to be 3.1 immigrants per thousand people, compared with an average rate of 3.2 over the same period in last year's report. Those revisions are attributable to more recent data and adjustments to the way CBO projects net immigration in the extended baseline.

In total, over the next decade, CBO projects approximately 352,000 (or 2.9 percent) fewer immigrants, on net, than the agency projected last year. That change is driven primarily by smaller projected net flows of LPRs and foreign-born people without legal status. In particular, CBO has revised its near-term projection of net flows of foreign-born people without legal status to be lower on the basis of recent data that suggest net flows for this category are likely to be smaller over the next few years than previously projected. Indeed, the agency's projection of zero net flows for 2019 reflects a downward revision of 171,000. Nevertheless, in CBO's assessment, domestic economic conditions will return as an important driver of immigration flows by the middle of the coming decade and, under current law, net flows of foreign-born people without legal status will again be positive.

Last year, for the final 20 years of the extended baseline projection, CBO based its projections of net immigration flows for all categories on the average growth in net immigration published by the Census Bureau—a

10. Life expectancy as used here is period life expectancy, which is the amount of time that a person in a given year would expect to survive beyond his or her current age on the basis of that year's mortality rates for various ages.

11. CBO projects life expectancy in 2090 to be 86.4 years at birth and 24.1 years at age 65. CBO's projections of life expectancies are longer than those of the Social Security trustees (85.7 and 23.5 years, respectively) but shorter than the projections (88.3 and 25.3 years, respectively) recommended in 2015 Technical Panel on Assumptions and Methods, *Report to the Social Security Advisory Board* (September 2015), pp. 13–20, <https://go.usa.gov/cJYR5> (PDF, 3.4 MB).

constant rate of 0.6 percent. After reassessing that approach, the agency now projects that the same economic forces driving immigration trends in the first decade of its projection will persist through the second decade. Because of that change, net immigration is projected to grow at an average annual rate of 0.3 percent—half the rate of growth projected last year—resulting in a total of 400,000 (or 3.4 percent) fewer immigrants, on net, between 2030 and 2039.

Beyond 2039, because of the significant uncertainty surrounding the mix of immigrants in the long run, CBO projects net immigration flows based on overall population growth in the prior year. As a result of that change, net immigration is projected to grow at an average annual rate of 0.4 percent between 2040 and 2049, compared with the annual rate of 0.6 percent CBO projected last year. In total, CBO projects approximately 740,000 (or 6.0 percent) fewer net immigrants over that period than the agency projected last year.

**Mortality.** Recent data show higher mortality rates than CBO expected last year for all age groups, but particularly for people under 45 years of age. Those data led CBO to increase its projection of mortality rates for all age groups in the near term and to reduce their rates of mortality improvement over the next three decades. As a result, CBO now projects approximately 970,000 (or 0.9 percent) more deaths over the next three decades than the agency projected last year.

CBO's new projections of mortality rates and mortality improvement also affect the agency's projections of life expectancies, which it now expects to be lower than it reported last year. Life expectancy at birth is projected to be 82.4 years in 2048, 0.4 years shorter than CBO projected last year, and life expectancy at age 65 is projected to be 21.5 years, 0.2 years shorter than in last year's projection.

## Economic Factors

The federal government's revenues, spending, and debt depend on key economic factors such as the growth of gross domestic product (GDP), the size and composition of the labor force, the number of hours worked, the distribution of earnings among workers, capital accumulation, productivity, inflation, and interest rates. CBO's projections of those factors reflect the agency's assessment of various economic and demographic developments as well as the effects of fiscal policy on economic activity.

## Gross Domestic Product

CBO expects total output, or GDP, in the economy to grow by an average of 3.9 percent per year over the 2019–2049 period (see Table A-2). In the agency's projections, real (inflation-adjusted) GDP growth over that period averages 1.9 percent per year, about what CBO projected last year for the 2018–2048 period. That rate is less than the average growth of 2.5 percent for the past three decades. CBO expects that growth in real GDP per person will average 1.3 percent over the next three decades, less than the 1.6 percent growth of the past three decades.

**Projections of GDP.** CBO projects that over the next five years, GDP and employment will initially exceed and then return to their long-run relationships with their maximum sustainable levels. After five years, real GDP is then projected to grow at a pace that reflects the increases in the supply of labor, capital services, and productivity described below. That projected pace also takes into consideration the influences of the marginal tax rates and increases in federal debt that CBO projects in its extended baseline.<sup>12</sup>

Over the long term, total GDP is projected to be one-half of one percent below its potential (maximum sustainable) amount, as it has roughly been, on average, over past decades. Those projected outcomes reflect CBO's assessment that, during and after economic downturns, actual output has fallen short of potential output to a greater extent and for longer periods than actual output has exceeded potential output during economic booms.<sup>13</sup>

Projected real GDP growth over the next three decades is slower than the average annual rate of 2.5 percent recorded over the past three decades because the labor force is projected to grow more slowly. On average, CBO projects that real GDP will grow at an annual rate of 1.8 percent from 2019 to 2029. In the decade after 2029, average growth is projected to remain at 1.8 percent before rising to 1.9 percent over the 2040–2049 period. The pattern of projected GDP growth

12. The marginal tax rate is the percentage of an additional dollar of income from labor or capital that is paid in taxes.

13. See Congressional Budget Office, *Why CBO Projects That Actual Output Will Be Below Potential Output on Average* (February 2015), [www.cbo.gov/publication/49890](http://www.cbo.gov/publication/49890).

Table A-2.

**Average Annual Values for Economic Variables That Underlie CBO's Extended Baseline Projections**

Percent

	1989–2018	2019–2029	2030–2039	2040–2049	Overall, 2019–2049
<b>Growth of GDP</b>					
Real GDP <sup>a</sup>	2.5	1.8	1.8	1.9	1.9
Nominal GDP (Fiscal year)	4.7	4.0	3.8	3.9	3.9
Real GDP per Person	1.6	1.2	1.3	1.5	1.3
<b>Growth of the Labor Force</b>					
Labor Force Participation Rate	65.5	62.0	60.3	59.7	60.7
<b>Unemployment</b>					
Unemployment rate	5.9	4.5	4.6	4.5	4.5
Natural rate of unemployment	5.1	4.5	4.4	4.2	4.4
<b>Growth of Average Hours Worked</b>					
	-0.1	*	*	*	*
<b>Growth of Total Hours Worked</b>					
	0.9	0.4	0.3	0.4	0.4
<b>Earnings as a Share of Compensation</b>					
	81	81	81	81	81
<b>Growth of Real Earnings per Worker</b>					
	0.9	1.2	1.1	1.0	1.1
<b>Share of Earnings Below the Taxable Maximum</b>					
	85	82	81	80	81
<b>Growth of Productivity</b>					
Total factor productivity in the nonfarm business sector	1.2	1.1	1.1	1.1	1.1
Real GDP per hour worked <sup>a</sup>	1.6	1.4	1.5	1.5	1.5
Labor force productivity <sup>b</sup>	1.5	1.3	1.5	1.5	1.4
<b>Inflation</b>					
Growth of the CPI-U	2.5	2.4	2.4	2.4	2.4
Growth of the GDP price index	2.1	2.1	2.0	2.0	2.0
<b>Interest Rates</b>					
<b>Real rates</b>					
On 10-year Treasury notes and the OASDI trust funds	2.2	1.3	1.6	2.0	1.6
<b>Nominal rates</b>					
On 10-year Treasury notes and the OASDI trust funds	4.7	3.7	4.0	4.4	4.0
On all federal debt held by the public <sup>c</sup>	4.8	3.1	3.6	4.0	3.6

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections through 2029 and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

CPI-U = consumer price index for all urban consumers; GDP = gross domestic product; OASDI = Old-Age, Survivors, and Disability Insurance;

\* = between -0.05 and 0.05.

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

b. The ratio of real GDP to the labor force. Elsewhere, CBO reports other measures of labor productivity, such as the ratio of real potential GDP to the potential labor force.

c. The interest rate on all federal debt held by the public equals net interest payments in the current fiscal year divided by debt held by the public at the end of the previous fiscal year.

follows the pattern of labor force growth over the next three decades.

Real GDP per person is expected to increase at a slower pace than it has in the past—at an average annual rate of 1.3 percent over the 2019–2049 period, compared with 1.6 percent over the past 30 years. That occurs mainly because the labor force is projected to grow more slowly than the overall population.

**Changes in Projections of GDP Since Last Year.** In CBO's current projections, the level of real GDP is slightly higher in 2028 than the agency projected last year. Over the subsequent two decades, the agency's current projection of real GDP grows slightly more slowly than it did last year; by 2048, real GDP is 1.6 percent less than it was last year. GDP growth is projected to grow more slowly in the second decade (2030 to 2039), mainly because growth in the labor force is slower in this year's projection than it was in last year's projection. In the third decade, GDP growth is similar to last year's projection.

### **The Rate of Labor Force Participation and Labor Force Growth**

The size of the labor force depends on the rates at which people of different demographic groups participate in the labor market. Since the mid-2000s, the overall labor force participation rate in the United States has declined substantially, driven predominantly by the aging of the population.<sup>14</sup> CBO expects that downward trend to continue over the coming decades before slowing down and eventually leveling off toward the end of the 30-year projection period. As a result, the labor force is projected to grow more slowly than the population. CBO's projections of the overall participation rate and labor force growth are broadly similar to its previous projections. However, the agency has made larger revisions to the participation rates of specific demographic groups.

**Projections of the Labor Force Participation Rate.** In CBO's projections, the rate of labor force participation declines from 62.8 percent in 2019 to 61.0 percent in 2029 and to 59.8 percent in 2040, where it remains roughly constant for the rest of the projection period. In CBO's assessment, the aging of the population accounts

for nearly the entire decline, while the effects of other factors largely offset one another.

People over age 65 tend to participate in the labor force at lower rates than younger people—as of 2018, the average participation rate for prime-age people (those ages 25 to 54) was 82 percent, whereas that for people over age 65 was about 20 percent. Therefore, the ongoing aging of the population is expected to dampen the overall rate of participation in the labor force over the next 30 years. Among the civilian noninstitutionalized population age 16 or older, the share of people over age 65 has increased from 16 percent to 20 percent over the past decade and is projected to rise to 27 percent by 2049. In the meantime, the share of the prime-age population is expected to decline from 49 percent in 2018 to 45 percent by 2049. Without the effects of further aging of the population—that is, if the age composition of the population remained the same as it was in 2018—the overall labor force participation rate over the next 30 years would be roughly constant (and slightly higher than its 2018 level), in CBO's assessment.

Aside from the aging of the population, CBO expects the effects on labor force participation of other demographic trends, economic trends, and fiscal policies under current law to largely offset one another over the coming decades. In particular, two long-term trends are expected to put downward pressure on the participation rate:

- Members (particularly men) of each generation that followed the baby boomers tend to participate in the labor force at lower rates than their predecessors did at the same age.<sup>15</sup> (One notable exception in later generations is that women younger than 35 generally participate at higher rates than female baby boomers did at the same ages. However, as those later generations of women have aged, their participation rates have also fallen below those of their predecessors.)
- The marriage rate is projected to continue to fall, especially among men, and unmarried men tend to participate in the labor force at lower rates than married men do.

CBO expects those forces to be mostly offset by two trends that are expected to increase participation:

14. The labor force participation rate is the share of the civilian noninstitutionalized population age 16 or older that participates in the labor force.

15. Baby boomers are people born between 1946 and 1964.

- The population is becoming more educated, and people with more education tend to participate in the labor force at higher rates than do people with less education.
- Increasing longevity is expected to lead people to continue working to increasingly older ages.

In addition to the effects of those demographic trends, budgetary effects and incentives under current tax law, combined with economic trends, would also affect the labor force. For example, rising federal deficits are projected to slow growth in the stock of private capital and to limit the growth of after-tax wages, thereby reducing the supply of labor. Meanwhile, under current law, tax rates on individual income are set to rise in 2026 when some provisions of the 2017 tax act expire. In addition, as people's income rises faster than inflation, more of their income is pushed into higher tax brackets through a process known as real bracket creep, raising their effective tax rates. After 2025, those higher tax rates and real bracket creep are projected to decrease participation in the labor force because people would see a lower return on their labor.

**Changes in Projections of the Labor Force Participation Rate Since Last Year.** CBO's current projection of the overall labor force participation rate is slightly lower than previously projected for 2019 to 2024 and slightly higher than previously projected for 2025 to 2048. The new projection incorporates the agency's reassessment of recent trends in the participation rates of different demographic groups.

Compared with its previous projections, CBO has lowered its projection of the participation rate of the youngest group of workers (ages 16 to 24) throughout the 30-year projection period. The agency now expects that group's rate of participation in the labor force to fall, from about 55 percent in 2018 to 54 percent in 2048, instead of rising to 57 percent as previously projected. CBO's revision mainly reflects the observation that the participation rate of the youngest workers has declined substantially since the 2007–2009 recession and has failed to recover meaningfully in recent years despite the growth of the economy.<sup>16</sup> That development suggests that the factors that have pushed down younger

Americans' participation rates since the last recession are more structural and less cyclical than previously estimated.

Conversely, the agency has raised its projection of the participation rate of prime-age people throughout the 30-year projection period. CBO now expects the participation rate of that group to be higher, on average, over the next three decades than its current rate. That contrasts with CBO's previous projection that the rate would decline slightly over the next three decades. The agency revised its projection primarily because the participation rate of prime-age people has rebounded more strongly in the past year than expected, which suggests that the rate's decline after the last recession was driven more by cyclical factors and less by structural factors than previously estimated.

**Projections of Labor Force Growth.** Because a falling participation rate means that less of the growth in population translates into labor force growth, the labor force is expected to increase even more slowly than the population from 2019 to 2049. Although the population age 16 or older is expected to grow by 0.6 percent per year, on average, the labor force is projected to grow at an average rate of 0.4 percent per year. That represents a significant slowdown in labor force growth from earlier periods: For example, the average annual growth rate was 1.2 percent during the 1990–2006 period.

In CBO's projections, growth in the labor force declines from an average of 0.5 percent during the 2019–2029 period to 0.3 percent during the 2030–2039 period, driven by a decline in population growth over the next two decades as well as a decline in the participation rate. Labor force growth rebounds slightly, to an average of 0.4 percent per year, in the third decade of the 30-year projection period; the labor force participation rate is expected to have stabilized by then and therefore would no longer subtract from labor force growth.

**Changes in Projections of Labor Force Growth Since Last Year.** CBO's current projection of labor force growth is similar to last year's projection through 2029 but lower in the second decade because of the downward revision in population growth discussed in previous sections. In the third decade, projected labor force growth

16. For a discussion of CBO's methods for projecting labor force participation, 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](http://www.cbo.gov/publication/53616).

is similar to last year's projection because higher participation rates offset the downward revisions to population growth.

### Other Labor Market Outcomes

In addition to the rate of labor force participation and the size of the labor force, CBO's long-term labor market outlook also includes its projections for the unemployment rate, the average and total number of hours that people work, and various measures of workers' earnings over the next 30 years. The agency regularly updates those projections to incorporate updates to historical data, reassessments of trends, and changes to its analytic methods.

**Unemployment.** In CBO's projections, the unemployment rate falls from 3.9 percent at the end of 2018 to 3.5 percent in 2019, about 1.1 percentage points below the agency's estimate of the natural rate of unemployment (the rate that results from all sources other than fluctuations in overall demand related to the business cycle). As economic growth slows after 2019, the unemployment rate rises, surpassing the natural rate by 2022. (The natural rate of unemployment is projected to fall from 4.6 percent in 2019 to 4.5 percent in 2029.) From 2023 onward, the unemployment rate is expected to remain roughly one-quarter of one percentage point above the natural rate, a difference that is consistent both with the historical average relationship between the two measures and with the projected gap of one-half of one percent between actual and potential GDP.

After 2029, both the actual and the natural rates of unemployment are projected to decline gradually as the labor force ages and becomes increasingly educated. (Older and more educated workers tend to have lower actual and natural rates of unemployment.) By 2049, the natural rate of unemployment is projected to be about 4.2 percent, and the actual rate is projected to be about 4.4 percent.

**Average Hours Worked.** Different subgroups of the labor force work different numbers of hours, on average. Men tend to work more hours than women do, for example, and people between the ages of 30 and 40 tend to work more hours than people between the ages of 50 and 60 do. In CBO's estimation, those differences among groups will remain stable. However, over the long term, the composition of the labor force is projected to shift toward groups that tend to work less (such as older workers). As a result, the average number of hours worked by

the labor force as a whole is expected to decline slightly. By 2049, the average number of hours that people work is expected to be about 0.9 percent less than it is today.

**Total Hours Worked.** Based on projections of the size of the labor force, average hours worked, and unemployment, total hours worked are estimated to increase at an average annual rate of 0.4 percent between 2019 and 2049. This is slower than the average annual rate of 0.9 percent over the past three decades. The drop in the growth of total hours is mainly because the population is expected to grow more slowly in the future than it has over the past 30 years.

Average growth in total hours worked falls from 0.4 percent in the first decade of CBO's projections (2019 to 2029) to 0.3 percent in the second decade, rising to 0.4 percent in the third decade. A drop in population growth between the first and second decades is the main cause of the projected decline in growth of total hours worked. Growth in total hours worked increases in the third decade because the decline in the rate of labor force participation ends.

**Earnings as a Share of Compensation.** Workers' total compensation consists of taxable earnings and non-taxable benefits such as employers' contributions to health insurance and pensions. Over the years, the share of total compensation paid in the form of earnings has declined—from about 90 percent in 1960 to about 81 percent in 2018—mainly because the cost of health insurance has risen more quickly than total compensation.<sup>17</sup>

CBO expects that trend in health care costs to continue, which would further decrease the proportion of compensation that workers receive as earnings. However, under current law, an excise tax on certain employment-based health insurance plans that have premiums above specified amounts is scheduled to take effect in 2022. Some employers and workers are expected to respond by shifting to less expensive plans, thereby reducing the share of compensation consisting of health insurance premiums and increasing the share that consists of earnings. In CBO's projections, the effects of the tax on the mix of compensation roughly offset the effects of rising costs for health care until the effects of rising costs outweigh those of the excise tax late in the projection period. As a result,

17. For more details, see Congressional Budget Office, *How CBO Projects Income* (July 2013), [www.cbo.gov/publication/44433](http://www.cbo.gov/publication/44433).

the share of compensation that workers receive as earnings is projected to remain close to 81 percent through most of the 2019–2049 period.

**Growth of Real Earnings per Worker.** Projections of wages and salaries, nonwage compensation (such as employment-based health insurance), average hours worked, labor productivity (discussed below), and prices imply that real earnings per worker would grow by an average of 1.1 percent annually over the 2019–2049 period. That rate is higher than the average annual growth of 0.9 percent over the past 30 years.

**Distribution of Earnings.** Over the past several decades, earnings have grown faster for higher earners than for lower earners. In CBO’s projections, the unequal growth in earnings continues for the next three decades, although that disparity falls over time. The distribution of earnings affects revenues from income taxes and payroll taxes, among other things. Income taxes are affected by the earnings distribution because of the progressive rate structure of the individual income tax; people with lower income pay a smaller share of their earnings than people with higher income do.

Social Security payroll taxes are also affected by the earnings distribution. Those taxes are levied only on earnings up to a certain annual amount (\$132,900 in 2019). Below that amount, earnings are taxed at a combined rate of 12.4 percent, split between the employer and employee (self-employed workers pay the full amount); no tax is paid on earnings above the cap. The taxable maximum has remained a nearly constant proportion of the average wage since the mid-1980s, but because earnings have grown more for higher earners than for others, the portion of covered earnings on which Social Security payroll taxes are paid has fallen from 90 percent in 1983 to 84 percent in 2017.<sup>18</sup> The portion of earnings subject to Social Security taxes is projected to fall to an average of 82 percent between 2019 and 2029, 81 percent in the following decade, and 80 percent between 2040 and 2049.

**Changes in Projections of Other Labor Market Outcomes Since Last Year.** Projections of most other labor market outcomes are generally similar to what

CBO projected last year. CBO’s current projections of wages and salaries are slightly lower than last year’s, mainly because updates to historical wage and salary data indicate that their share of GDP was, on average, lower over the past decade than previously reported. As a result, CBO revised down its projection of wages and salaries over the next three decades.

Also, CBO’s current projection of the unemployment rate is higher during the 2019–2023 period but slightly lower from 2024 onward. The upward revision in the near term largely reflects the agency’s assessment that recent trends in hiring, layoffs, and retirement that had put downward pressure on the unemployment rate will not last as long as CBO estimated earlier. For the 2024–2048 period, in contrast, the downward revision occurred because the agency lowered its estimate of the natural rate of unemployment after reassessing the effects of the composition of the potential labor force. In particular, because younger workers tend to have higher natural rates of unemployment (on average, more than 10 percent, compared with prime-age workers’ 4 percent from 1990 to 2018), revising down their share in the potential labor force, as CBO did, leads to a reduction in the estimate of the economywide natural rate of unemployment.

### Capital Accumulation and Productivity

In addition to growth in the labor force and the number of hours worked, two other important factors affect the growth in output. One is the accumulation of capital, including physical structures, equipment, land, and inventories used in production, along with intangible capital such as computer software. The accumulated stock contributes a stream of services to production. The second is the growth of total factor productivity (TFP), which is the growth of real output per unit of combined labor and capital services—that is, the growth of output that is not explained by the growth of labor and capital. Combined, the growth rates projected for the labor supply, the capital stock, and TFP result in a projection of the average growth of labor force productivity.

**Capital Services.** Over the longer term, growth in the nation’s stock of capital will be driven by private saving, federal borrowing, total factor productivity, the after-tax rate of return, and international flows of financial capital. Private saving and international capital flows tend to move with the after-tax rate of return on investment, which measures the extent to which investment in the stock of capital results in a flow of income. CBO’s

18. Covered earnings are those received by workers in jobs subject to Social Security payroll taxes. Most workers pay payroll taxes on their earnings, although a small number—mostly in state and local government jobs or in the clergy—are exempt.

projection of that rate is consistent with the agency's projection that the real interest rate on 10-year Treasury notes will be 1.4 percent in 2029 and 2.2 percent in 2049 (see "Interest Rates" on page 60).

**Total Factor Productivity.** The annual growth of TFP in the nonfarm business sector is projected to increase from about 0.7 percent in 2019 to about 1.1 percent in 2022 and then to remain at that rate through 2049, yielding an average annual growth rate of roughly 1.1 percent from 2019 to 2049. That projected growth rate is about 0.3 percentage points slower than the average annual rate of 1.4 percent since 1950 and slightly slower than the average rate recorded since 1989.

The projected path for nonfarm business TFP reflects several considerations that, in CBO's assessment, suggest slower growth in coming decades than the long-term historical average. For example, with the exception of a period of rapid growth in the late 1990s and early 2000s, productivity has tended to grow more slowly in recent decades than it did during the 1950s and 1960s. That long-term trend suggests that projections for the next few decades should place greater weight on more recent, slower growth than on the relatively rapid growth of the more distant past. Thus, although CBO projects an acceleration of nonfarm business TFP growth from its unusually slow recent rate, the agency anticipates that growth will return to a rate that is slower than its long-term historical average.

A number of developments support projections of slower growth in nonfarm business TFP. One is the anticipated slowing of growth in labor quality, a measure of workers' skills that accounts for educational attainment and work experience that, in CBO's analysis, is implicitly a part of TFP. Following a relatively rapid rise during the 1980s and 1990s, growth in labor quality slowed after 2000. In CBO's assessment, that change results both from a gradual slowdown in the increase in average educational attainment and from the burgeoning retirement of a relatively large and skilled portion of the workforce—the baby-boom generation. In coming decades, however, the slowdown in the growth of labor quality is expected to be partly offset by the aging of those remaining in the labor force, especially as better health and longer life expectancy lead people to stay in the workforce longer than did members of previous generations. (An older workforce generally has a larger proportion of more highly educated workers because they tend to remain in the labor force longer than do workers with less education.)

Nevertheless, CBO anticipates slower growth in labor quality than in the past.

Another factor that is projected to slow the growth of nonfarm business TFP is the projected reduction in spending for federal investment. Under the assumptions used for CBO's baseline, the government's nondefense discretionary spending is projected to decline over the next decade to a much smaller percentage of GDP than it has averaged in the past. About half of nondefense discretionary spending from the 1980s onward has consisted of federal investment in physical capital (such as roads and other infrastructure), education and training, and research and development—all of which, in CBO's judgment, contributed to TFP growth. Consequently, lower nondefense discretionary spending as a percentage of GDP would mean less federal investment, causing TFP to grow more slowly.

**Labor Productivity.** Taken together, the projections of the labor force, capital services, and TFP result in labor force productivity that is expected to grow on average by 1.4 percent annually over the 2019–2049 period. When projections of total hours worked are used instead, real GDP per hour worked is expected to grow by an annual average of 1.5 percent over the 2019–2049 period.

**Changes in Projections of Capital Accumulation and Productivity Since Last Year.** CBO has revised its analytic methods to account more fully for economic growth outside the nonfarm business sector—that is, in the farm, household, nonprofit, and government sectors. That revision, which affects only the projection beyond the 10-year budget window, yields a more comprehensive accounting of the growth of private-sector capital services. For example, capital services from more sectors outside the nonfarm business sector are now explicitly included in CBO's measure of capital services, in order to assess their contributions to GDP, whereas last year, those services only implicitly contributed to GDP. As a result, CBO's measure of capital services accounts for a greater share of overall production than was the case last year, and TFP accounts for less.

In addition, changes in historical data regarding the national income and product accounts that the Bureau of Economic Analysis reported in July 2018 led CBO to increase its projection of the growth in capital services and to lower its projection of the growth in TFP in the nonfarm business sector. (As a result, TFP growth in that sector is expected to be slightly slower than it was in last

year's projections.) Those revisions offset each other and have little net effect on projected labor productivity.

The updated data and CBO's revised analytic methods are reflected in its projection of labor force productivity over the 30-year projection period, which is lower than last year's projection. This year, CBO projects that the average annual rate of growth in labor force productivity would be roughly 1.4 percent from 2019 to 2048; last year, CBO projected that rate would be roughly 1.5 percent from 2019 to 2048.

### Inflation

CBO projects rates of inflation for two categories: prices of consumer goods and services and prices of final goods and services.<sup>19</sup> Those rates influence nominal levels of interest rates and income (that is, the levels without adjustments to remove the effects of inflation) and thereby influence tax revenues, various types of federal expenditures that are indexed for inflation, and interest payments on federal debt.

**Prices of Consumer Goods and Services.** One measure of consumer price inflation is the annual rate of change in the consumer price index for all urban consumers (CPI-U). Over the 2019–2049 period, inflation in that measure averages 2.4 percent in CBO's projections. That long-term rate is slightly less than the average rate of inflation of 2.5 percent per year since 1990. CBO projects that, under a chained measure of CPI-U inflation, prices will grow at a rate 0.25 percentage points less than the annual increase in the consumer price index.<sup>20</sup>

**Prices of Final Goods and Services.** After 2019, the annual inflation rate for all final goods and services produced in the economy, as measured by the rate of increase in the GDP price index, is projected to average

0.4 percentage points less than the annual increase in the consumer price index. The GDP price index grows more slowly than the consumer price index because it is based on the prices of a different set of goods and services and a different method of calculation.

### Changes in Projections of Inflation Since Last Year.

Inflation in both measures of consumer prices is projected to be the same as the rates CBO projected last year for the 2018–2048 period.

### Interest Rates

CBO projects the interest rates, both real and nominal, that apply to federal borrowing, including the rate on 10-year Treasury notes and special-issue Social Security bonds. It also projects the average nominal interest rates on federal debt held by the public and on the bonds held in the Social Security trust funds. Those rates influence the cost of the government's debt burden and the evolution of the trust funds.

After considering a number of factors, including slower growth in the labor force, slower growth in TFP, and higher government debt, CBO expects real interest rates on federal borrowing to be lower in the future than they have been, on average, over the past few decades. The real interest rate on 10-year Treasury notes (calculated by subtracting the rate of increase in the consumer price index from the nominal yield on those notes) averaged roughly 2.9 percent between 1990 and 2007.<sup>21</sup> That rate has averaged 0.8 percent since 2009 and is projected to be 1.4 percent in 2029. In CBO's projections, the rate continues to rise thereafter, reaching 2.2 percent in 2049. That rate is 0.7 percentage points below the average real interest rate on 10-year Treasuries over the 1990–2007 period. CBO's current projections of interest rates are lower than last year's.

**Factors Affecting Interest Rates.** Interest rates are determined by a number of factors. CBO projects the rates by comparing how the values of those factors are expected to differ in the long term relative to their average values in the past. However, conclusions from such analyses

19. Final goods and services include not only those purchased directly by consumers, but also by businesses (for investment) and governments, as well as net exports.

20. The chained CPI-U tends to grow more slowly than the standard CPI-U for two reasons. First, it uses a formula that better accounts for households' tendency to substitute similar goods and services for each other when relative prices change. Second, unlike the CPI-U, the chained CPI-U 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.

21. Between 1970 and 2007, the real interest rate on 10-year Treasury notes averaged 2.8 percent; the average from 1954 to 2007 was 2.6 percent. Historical inflation rates are taken from the consumer price index, adjusted to account for changes over time in the way that the index measures inflation. See Bureau of Labor Statistics, "CPI Research Series Using Current Methods (CPI-U-RS)" (accessed on March 28, 2018), [www.bls.gov/cpi/research-series/home.htm](http://www.bls.gov/cpi/research-series/home.htm).

depend greatly on the period being considered, as some recent decades show: Real interest rates were low in the 1970s because of an unexpected surge in inflation. In the 1980s, when inflation declined at an unexpectedly rapid pace, real rates were high.<sup>22</sup> Interest rates fell sharply during the financial crisis and recession that began in 2007.

To avoid using any of those possibly less representative periods, CBO considered average interest rates and their determinants over the 1990–2007 period and then judged how different those determinants might be over the long term.<sup>23</sup> That period was chosen for comparison because it featured fairly stable expectations of inflation and no severe economic downturns or significant financial crises.

Some factors reduce interest rates; others increase them. In CBO's estimates for the 2019–2049 period, several factors tend to reduce interest rates on government securities relative to their 1990–2007 average:

- The labor force is projected to grow much more slowly than it did from 1990 to 2007. That slower growth in the number of workers would tend to increase the amount of capital per worker in the long term, reducing the return on capital and therefore

also reducing the return on government bonds and other investments.<sup>24</sup>

- The share of total income received by higher-income households is expected to be larger in the future than during the 1990–2007 period. Higher-income households tend to save a greater proportion of their income, so the difference in the distribution of income is projected to increase the total amount of saving available for investment, other things being equal. As a consequence, the amount of capital per worker is projected to rise and interest rates are expected to be lower.
- TFP is projected to grow more slowly in the future than it did from 1990 to 2007. For a given rate of investment, lower productivity growth reduces the return on capital and results in lower interest rates, all else being equal.
- CBO expects investors' preferences for Treasury securities relative to riskier assets to remain elevated compared with inclinations over the 1990–2007 period. Investors began to have less appetite for risk in the early 2000s, and the demand for low-risk assets was strengthened by the economic fallout from the financial crisis, the slow subsequent recovery, and financial institutions' response to increased regulatory oversight. The rise in demand for Treasury securities from those factors contributed to lower returns (that is, to lower interest rates). CBO expects preferences for Treasury securities relative to riskier assets to gradually decline over the next three decades but to remain above their average levels from 1990 to 2007.

At the same time, in CBO's estimates, several factors tend to boost interest rates on government securities relative to their average over the 1990–2007 period:

- Under CBO's extended baseline, federal debt is projected to be much larger as a percentage of GDP than it was before 2007—reaching 93 percent by 2029 and 144 percent by 2049. The latter figure is more than three and a half times the average over the 1990–2007 period. Greater federal borrowing

22. CBO calculates real interest rates by subtracting expected rates of inflation from nominal interest rates. In general, borrowers and lenders agree to nominal interest rates after accounting for their expectations of what inflation will be. However, if inflation ends up being higher than was expected when the rates were agreed to, real interest rates will turn out to be lower than anticipated. If inflation ends up lower than expected, the opposite will occur. CBO uses the actual consumer price index, adjusted to account for changes over time in the way that the index measures inflation, as a proxy for both what expectations of inflation have been in the past and what they will be in the future. One drawback is that if inflation fluctuates rapidly over time, changes in expectations may lag behind changes in actual inflation. Although CBO's approach could mismeasure expectations of inflation and real interest rates in some years, the way inflation has varied over time suggests that CBO's approach is a useful proxy over long periods, on average.

23. A Bank of England study identified a similar set of determinants that account for the decline in real interest rates over the past 30 years. See Rachel Lukasz and Thomas D. Smith, *Secular Drivers of the Global Real Interest Rate*, Staff Working Paper 571 (Bank of England, December 2015), <https://tinyurl.com/y3mrtoyv> (PDF, 1.8 MB).

24. For more information about the relationship between the growth of the labor force and interest rates, see Congressional Budget Office, *How Slower Growth in the Labor Force Could Affect the Return on Capital* (October 2009), [www.cbo.gov/publication/41325](http://www.cbo.gov/publication/41325).

tends to crowd out private investment in the long term, reducing the amount of capital per worker and increasing both interest rates and the return on capital over time.

- The capital share of income—the percentage of total income that is paid to owners of capital—has been on an upward trend for the past few decades. That share is projected to decline over the next decade from its current, elevated level but remain higher than its average has been over recent decades. The factors that appear to have contributed to the rise in income for owners of capital (such as technological change and globalization) are likely to persist, keeping it above the historical average. In CBO’s estimation, a larger share of income accruing to owners of capital would directly boost the return on capital and, thus, interest rates.
- The retirement of members of the baby-boom generation and slower growth of the labor force will reduce the number of workers in their prime saving years relative to the number of older people who are drawing down their savings, CBO projects. As a result, in CBO’s estimates, the total amount of saving available for investment is less than it otherwise would be (all else being equal), which tends to reduce the amount of capital per worker and thereby push up interest rates. (CBO estimates that this effect will only partially offset the positive effect of increased income inequality on saving, leaving a net increase in savings available for investment.)
- CBO anticipates that emerging-market economies will attract a greater share of foreign investment in coming decades than they did in the 1990–2007 period. As economic and financial conditions in those economies continue to improve, they will become increasingly attractive destinations for foreign investment. CBO projects that development would put upward pressure on interest rates in the United States.

Some factors mentioned above are easier than others to quantify. For instance, the effect of labor force growth and rising federal debt can be estimated from available data, theoretical models, and estimates in the literature. The extent to which other factors will affect interest rates is more difficult to estimate. A shift in preferences for low- rather than high-risk assets is not directly

observable, for example. And, although the distribution of income is observable, neither models nor empirical estimates offer much guidance for quantifying its effect on interest rates.

In light of those sources of uncertainty, CBO relies not only on economic models and findings from the research literature but also on information from financial markets to guide its assessments of the effects of various factors on interest rates over the long term. The current rate on 30-year Treasury bonds, for example, reflects market participants’ judgments about the path that interest rates on short-term securities will take 30 years into the future. That market forecast informs CBO’s assessment of market expectations for the risk premium—the premium paid to investors for the extra risk associated with holding longer-term bonds—and for investment opportunities in the United States and abroad, and it points to considerably lower interest rates well into the future than those of recent decades.

**Projections of Interest Rates.** The nominal interest rate on 10-year Treasury notes is projected to average 4.0 percent over the 2019–2049 period and to reach 4.6 percent in 2049. The real interest rate on 10-year Treasury notes is projected to average about 1.6 percent and, at the end of the period, to be 2.2 percent.

The average interest rate on all federal debt held by the public tends to be lower than the rates on 10-year Treasury notes because interest rates are generally lower on shorter-term debt than on longer-term debt and because Treasury securities are expected to mature, on average, over periods of less than 10 years.<sup>25</sup> CBO projects a 0.4 percentage-point difference between the rate on 10-year Treasury notes and the effective rate on federal debt over the 2030–2049 period. That difference is projected to average 0.6 percentage points over the next decade. The difference is larger over the coming decade than for later years because a significant portion of federal debt that will be outstanding during the next 10 years was issued at the very low interest rates prevailing in the aftermath of the 2007–2009 recession. (The average interest rate on all federal debt changes more slowly than the 10-year rate because only a portion of federal debt matures each year.) Thus, in CBO’s

25. In particular, over the next decade, CBO expects the difference between the rate on 3-month Treasury bills and the rate on 10-year Treasury notes to average 0.8 percentage points.

projections, the average nominal interest rate on all federal debt held by the public is about 3.6 percent for the 2019–2049 period and reaches 4.2 percent in 2049.

The Social Security trust funds hold special-issue bonds that generally earn interest at rates that are higher than the average rate on federal debt. In CBO's projections, the nominal interest rate on bonds newly issued to the trust funds is equal to the rate on 10-year Treasury notes and averages 4.0 percent over the 2019–2049 period and reaches 4.6 percent in 2049. The corresponding real rates are 1.6 percent, on average, over the full period and 2.2 percent in 2049.

Because interest rates have been low for much of the past decade, CBO projects that the average interest rate earned by all bonds held by the Social Security trust funds (both new and previously issued) would be slightly lower than the interest rate on newly issued bonds over the next decade. The average interest rate on all bonds, which CBO uses to calculate the present value of future streams of revenues and outlays for those funds, is projected to average 3.8 percent over the 2019–2049 period.<sup>26</sup>

**Changes in Projections of Interest Rates Since Last Year.** CBO's current projections of interest rates are lower than last year's. The real rates on 10-year Treasury notes and the Social Security bonds are projected to average 1.6 percent over the 2019–2049 period and to be 2.2 percent in 2048. Last year, CBO projected that both rates would average 1.7 percent over the 2018–2048 period and would be 2.4 percent in 2048.

26. A present value is a single number that expresses a flow of past and future income or payments in terms of an equivalent lump sum received or paid at a specific time. The value depends on the rate of interest, known as the discount rate, that is used to translate past and future cash flows into current dollars at that time.

CBO's projections of interest rates are different from last year's mainly because they are now based on a more comprehensive assessment of how changes in private investment affect the capital stock and thus the return on capital. Changes in the return on capital are estimated to drive changes in interest rates across the economy. Previously, changes in CBO's measure of capital services owing to changes in investment in essence incorporated effects only on nonfarm business capital. Now, changes in capital services from changes in investment incorporate effects on a broader range of capital, including owner-occupied residential housing.

That modeling improvement results in a smaller estimated effect on capital services from a change in investment (because of larger deficits and more crowding out, for example). Because CBO now incorporates the effect of changes in a capital stock measure that is more comprehensive this year than it was last year, any given change in private investment results in a smaller percentage change in the agency's capital stock measure than it did last year. In addition, residential housing depreciates more slowly than most other forms of capital, so the immediate effect of residential investment on residential capital is relatively small. The smaller percentage effect on capital results in a smaller change in the return on capital and ultimately a smaller change in interest rates resulting from a change in investment.

Because of that modeling improvement, changes in deficits have a smaller effect on interest rates in this year's extended baseline projection. That occurs even though CBO has not changed its assessment of how changes in deficits affect private investment. In addition, slower growth in both the labor force and TFP imply slightly lower returns on capital and, in turn, lower interest rates. All told, the average projected interest rate on 10-year Treasury notes over the 2019–2048 period is 0.1 percentage point lower than CBO projected a year ago.



## Changes in Long-Term Budget Projections Since June 2018

The 30-year extended baseline projections for federal spending and revenues presented in this report differ from the projections that the Congressional Budget Office published in 2018 because of certain changes in law, the availability of more recent data, changes to the agency's projections of demographic and economic factors, and other changes in assumptions and methods.<sup>1</sup> CBO has also revised its methods of analyzing uncertainty and fiscal scenarios that are alternatives to the extended baseline projections. This appendix compares CBO's current projections with the previous ones. Because most of last year's projections ended in 2048, the appendix generally makes comparisons only through that year.

Measured as a percentage of gross domestic product (GDP), budget deficits and federal debt held by the public are now projected to be smaller over the next three decades than CBO projected last year.

- In CBO's extended baseline projections, deficits are projected to grow from 4.2 percent of GDP this year to 8.6 percent in 2048, which are 0.4 percentage points and 1.0 percentage point lower, respectively, than projected last year (see Figure B-1).
- Primary deficits—deficits excluding net spending for interest—are projected to grow from 2.4 percent of GDP this year to 3.0 percent of GDP in 2048, which

are 0.3 percentage points and 0.2 percentage points lower, respectively, than projected last year.

- Debt held by the public is projected to grow more slowly than projected last year, rising from 78 percent of GDP this year to 141 percent in 2048; last year, CBO projected that it would rise from 79 percent of GDP in 2019 to 152 percent in 2048.

The revised projections of deficits and debt resulted primarily from lower projected spending, which was partially offset by a small reduction in projected revenues.

- Projected discretionary spending throughout the 30-year projection period is lower than CBO anticipated last year because appropriations for relief and recovery efforts related to hurricanes and wildfires were smaller in 2019 than in 2018.<sup>2</sup>
- Net spending for interest on debt over the 30-year period is lower in this year's projections than it was in last year's because less debt is projected to be accumulated and because CBO has revised downward its projections of the average interest rate on that debt (see Appendix A).
- Projected outlays for Social Security (throughout the 30-year period) and major health care programs (over the first 10 years) are slightly smaller than they were last year because the most recent data show reductions in the number of beneficiaries and in spending, respectively.
- Revenues are projected to be slightly lower because of new administrative and tax data.

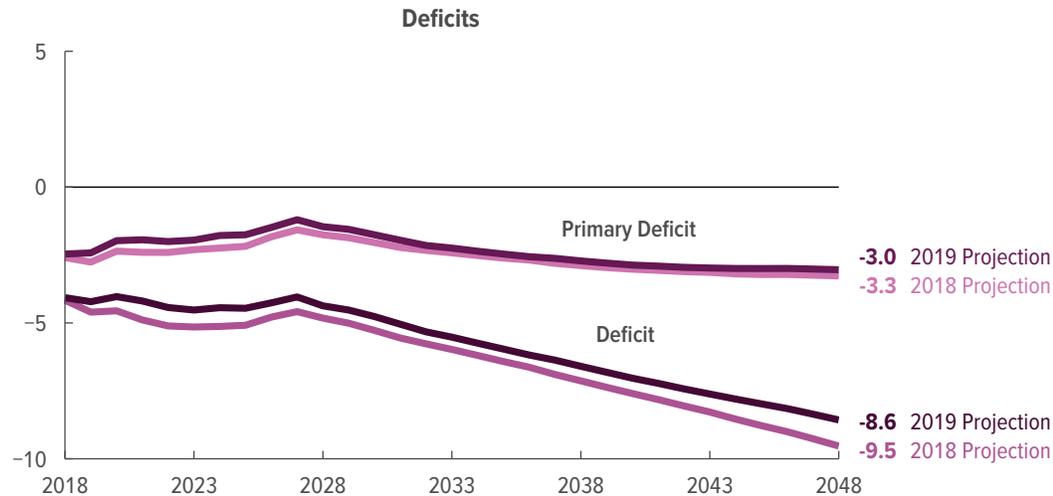
1. The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections and then extending most of the concepts underlying those projections for the rest of the long-term projection period. For the 2018 extended baseline projections, see Congressional Budget Office, *The 2018 Long-Term Budget Outlook* (June 2018), [www.cbo.gov/publication/53919](http://www.cbo.gov/publication/53919). For the 10-year projections underlying the extended baseline projections in this report, see *Updated Budget Projections: 2019 to 2029* (May 2019), [www.cbo.gov/publication/55151](http://www.cbo.gov/publication/55151). For the changes in projections of demographic and economic factors since 2018, see Appendix A of this report.

2. Projections of discretionary spending are based on the most recent appropriations for each discretionary program and are increased over time to account for inflation. (In addition, total discretionary spending is subject to caps that are specified in law and that limit discretionary outlays through 2021.)

Figure B-1.

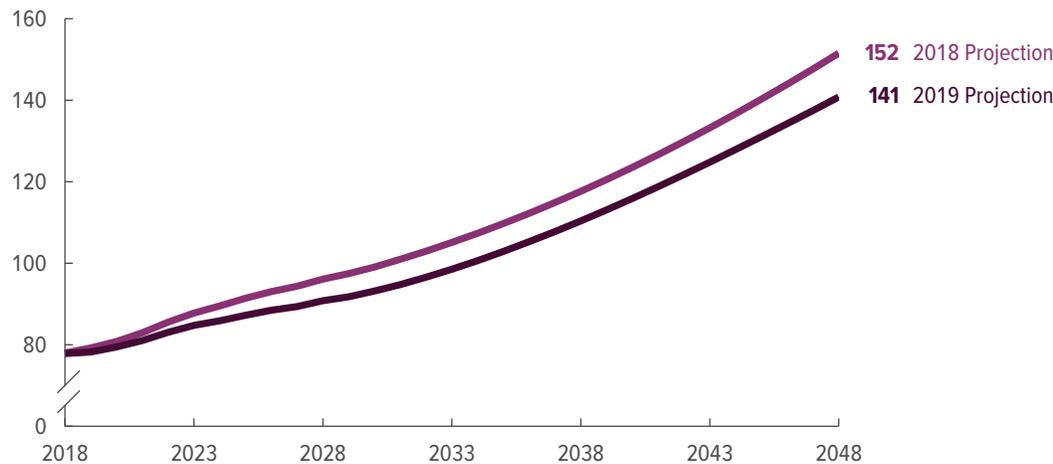
**CBO's 2018 and 2019 Extended Baseline Projections of Deficits and Federal Debt Held by the Public**

Percentage of GDP



Annual deficits over the next three decades are smaller in this year's projections than they were in last year's. The differences are larger for total deficits than for primary deficits because projected net spending for interest has fallen.

**Federal Debt Held by the Public**



Projected debt is also lower now. The difference between the two sets of projections grows over time, reaching about 11 percent of GDP.

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

The primary deficit is the deficit excluding net spending for interest.

GDP = gross domestic product.

**Changes in Projected Spending**

In CBO's extended baseline projections, spending as a percentage of GDP is lower than projected last year because of reductions in both noninterest spending and net spending for interest.

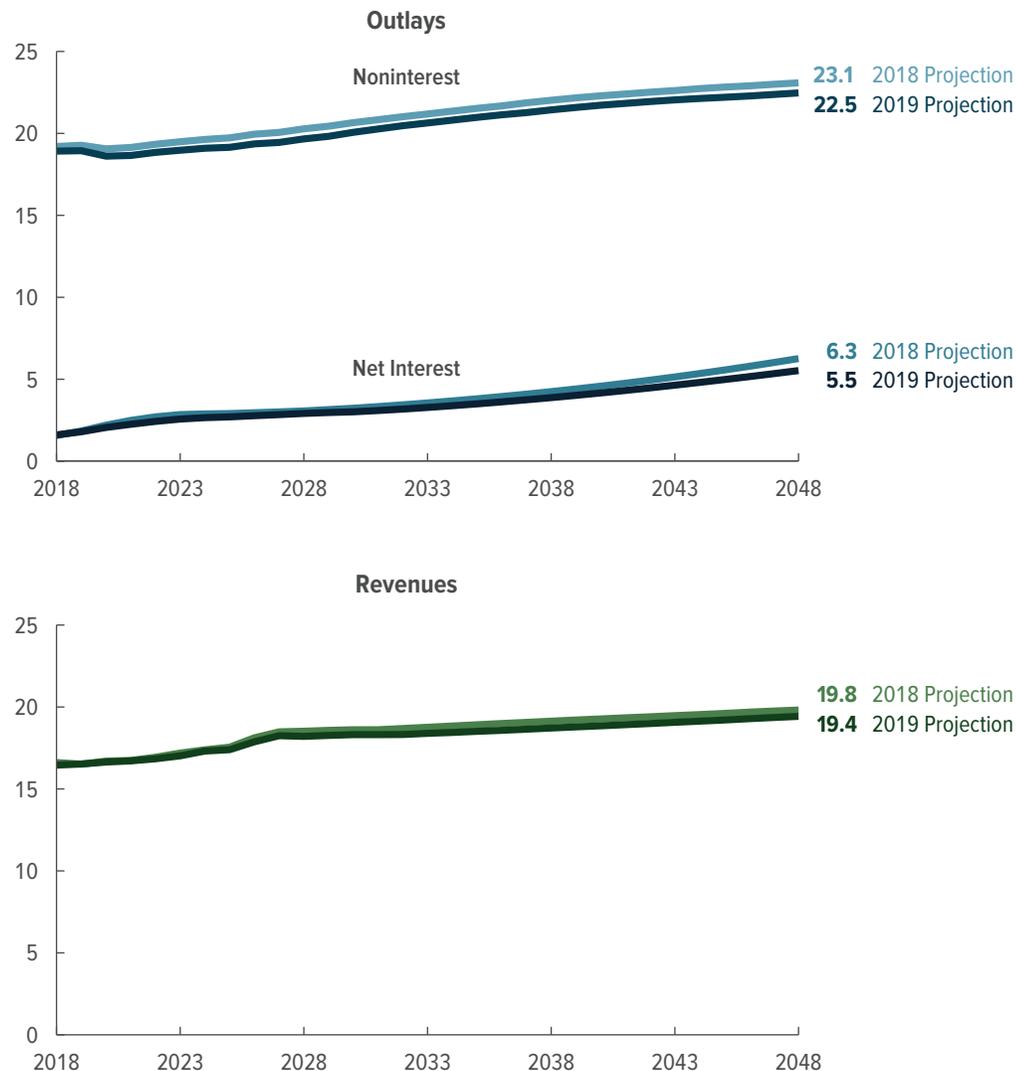
**Noninterest Spending**

As a percentage of GDP, noninterest spending—that is, spending for Social Security, spending for the major federal health care programs, other mandatory spending, and discretionary spending—is projected to be lower throughout the 30-year period than projected last year

Figure B-2.

**CBO's 2018 and 2019 Extended Baseline Projections of Outlays and Revenues**

Percentage of GDP



Noninterest spending and net spending for interest are both lower in this year's projections than they were in last year's.

Noninterest spending is now projected to be 0.3 percent of GDP lower in 2019, and 0.6 percent of GDP lower in 2048, than projected last year. Although this year's projection of net spending for interest is about the same as last year's for 2019, it is about 0.7 percent of GDP lower for 2048.

Projected revenues over the next three decades are also slightly lower in this year's projections than they were in last year's—0.4 percent of GDP lower by 2048.

Source: Congressional Budget Office.

The extended baseline projections generally reflect current law, following CBO's 10-year baseline budget projections and then extending most of the concepts underlying those projections for the rest of the long-term projection period.

GDP = gross domestic product.

(see Figure B-2). Most of that change stems from lower projections of discretionary spending.

**Discretionary Spending.** In CBO's current projections, outlays for discretionary spending as a percentage of GDP equal 6.3 percent of GDP in 2019, rather than the 6.4 percent projected last year; 5.0 percent of GDP in 2029, rather than the 5.4 percent projected last

year; and 5.0 percent of GDP in 2048, rather than the 5.5 percent projected last year. The reduction throughout the 30-year period occurred primarily because appropriations for 2019 that are designated as emergency requirements (generally to respond to wildfires and other major disasters) are substantially lower in 2019 than they were in 2018. So far, appropriations for 2019 amount to \$2 billion—a sharp reduction from the \$108 billion that

was appropriated in 2018, mostly for relief and recovery efforts related to Hurricanes Harvey, Irma, and Maria and wildfires in western states. In accordance with the statutes that govern its projections, CBO develops its projections for discretionary spending by starting with appropriations for the most recent year available and adjusting those amounts for inflation over time. CBO's projections last year were based on the amounts appropriated for 2018; the current projections are based on the much smaller amounts appropriated for 2019.<sup>3</sup>

**Spending for Social Security.** In CBO's current projections, outlays for Social Security as a percentage of GDP are slightly lower than the agency anticipated last year. Although projected spending for Social Security in 2019 is about the same as projected last year (4.9 percent of GDP), it is slightly lower throughout the next 10 years and thereafter. In 2048, that spending is projected to equal 6.2 percent of GDP, rather than the 6.3 percent of GDP projected last year.

Over the next decade, the revisions to outlays are due to slight reductions in projected spending for both of Social Security's components—Old-Age and Survivors Insurance (OASI) and Disability Insurance (DI). CBO's current projections of the number of OASI beneficiaries and DI beneficiaries over the next 10 years are lower than the previous projections by about 1 percent and 5 percent, respectively. Those revisions reflect recent data showing that people claimed OASI benefits later than expected and that fewer people were awarded DI benefits than expected. In addition, CBO has reduced its projections of population growth. The effect of fewer beneficiaries is slightly offset by a higher-than-anticipated cost-of-living adjustment that beneficiaries received in January 2019.

After 2028, the slight reduction in OASI outlays is driven by downward revisions to CBO's projections of the population and to projections of wages and salaries (see Appendix A for a discussion of changes in CBO's

demographic and economic projections). For DI outlays, the projected reduction after the first decade is also driven by a reduction in the projected share of the population that would receive disability benefits. CBO now projects a long-run age- and sex-adjusted rate of disability incidence—the share of workers who are awarded disability benefits in each year out of all workers who are insured under DI but not receiving benefits at the start of the year—of 5.2 per 1,000.<sup>4</sup> Last year, the projected rate was 5.4 per 1,000. CBO revised it because there have consistently been fewer new DI beneficiaries than the agency expected in recent years. The revised rate is also closer to current longer-term historical averages. Specifically, the average rate from 1990 through 2018, a time during which DI policy has remained fairly steady—and also from 1990 through 2007, the period covering the last two full business cycles—was about 5.2 per 1,000. The downward revision reduces the total projected number of DI beneficiaries in 2048 by about 3 percent.

**Spending for Major Health Care Programs.** CBO's current projection of federal spending for the major health care programs, measured as a percentage of GDP, is slightly lower over the next 10 years than it was in last year's projections and about the same thereafter. The change consists mainly of small revisions in projected outlays for Medicare and for subsidizing health insurance purchased through marketplaces and related spending.

*Medicare.* Spending for Medicare net of offsetting receipts (which are mostly premiums paid by beneficiaries) is projected to be about 0.1 percent of GDP lower in 2019 than anticipated last year and less than 0.1 percent of GDP lower, on average, over the first decade of the projection period. That revision was made mainly because the most recent data indicate that spending for Medicare's Part D (which covers prescription drugs) and Part A (Hospital Insurance) has been lower than expected. After the first decade, net spending for Medicare is projected to be about the same as projected last year.

*Medicaid, CHIP, and Marketplace Subsidies.* Throughout the first decade, outlays for Medicaid and the Children's

3. To project discretionary spending, CBO assumes that such spending would generally adhere to the caps that are specified in current law through 2021 and then increase gradually, to account for inflation, through 2029. Afterward, discretionary spending remains roughly constant as a percentage of GDP in CBO's projections. (It is not precisely constant as a percentage of GDP because CBO's projection of GDP includes the macroeconomic effects of the policies underlying the extended baseline projections.)

4. The adjustment accounts for changes since 2000 in the age and sex makeup of the population that has worked long enough and recently enough to satisfy work requirements for disability benefits but is not yet receiving those benefits.

Health Insurance Program (CHIP), together with spending to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending, are projected to be, on average, less than 0.1 percent of GDP lower than projected last year. That reduction is driven by lower projections of premiums for insurance purchased through marketplaces, reflecting updated data and technical revisions. After the first decade, projected spending is also less than 0.1 percent of GDP lower than projected last year, reaching 3.3 percent of GDP in 2048.

*Methods Underlying Projections of Health Care Spending.*

To project long-term spending for the major health care programs, CBO used the same method that it used last year. Namely, it combined estimates of the number of people who are projected to receive benefits from those programs with fairly mechanical estimates of the growth of spending per beneficiary (adjusted to account for demographic changes to the beneficiaries in each program). CBO has estimated the growth of spending per beneficiary by combining projected growth in potential nominal GDP per person with projected excess cost growth for each program. (Potential GDP is the maximum sustainable output of the economy; excess cost growth is the extent to which health care costs per person, after being adjusted for demographic changes, grow faster than potential GDP per person.) For both the 10-year and the 30-year periods, potential GDP per person is projected to grow at an average rate of about 3.4 percent per year, about the same rate that CBO projected last year.

Through 2029, CBO used the rate of excess cost growth for Medicare, Medicaid, and private health insurance premiums that is implicit in the agency's 10-year baseline projections for each of those categories. For 2030, the rate equals the average rate from the last 5 years of those projections (2025 to 2029), which is different for each category. After 2030, the rate for each category moves linearly, by the same fraction of a percentage point each year, from that category-specific rate to a rate of 1.0 percent in 2049.<sup>5</sup>

For Medicare, the average annual rate of excess cost growth implicit in CBO's baseline projections is about 1.2 percent from 2020 through 2029, a slightly higher rate than last year's projection of 1.0 percent from 2019 through 2028. (The increase reflects slightly higher projected spending per beneficiary because CBO revised its methods to incorporate updated data from the Centers for Medicare & Medicaid Services.) The projected rate of excess cost growth for 2030 is 1.2 percent, the same as last year's estimate for 2029. Excess cost growth is projected to average 1.1 percent over the full projection period, a slightly higher rate than last year's estimate for the 2018–2048 period (1.0 percent) but the same as the historical average of 1.1 percent from 1985 to 2017.

For Medicaid, the average annual rate of excess cost growth implicit in CBO's baseline projections for the federal share of such spending is 1.8 percent from 2020 through 2029, up by about 0.2 percentage points from last year's estimate for 2019 through 2028. The rate for 2030 is 1.8 percent, up by about 0.2 percentage points from last year's estimate for 2029. Those changes were the cumulative result of many updates that CBO made to its baseline projections for legislative, economic, and technical reasons. The rate of excess cost growth is projected to average 1.6 percent over the full projection period, which is about 0.3 percentage points higher than last year's estimate for the 2018–2048 period and 0.9 percentage points higher than the 1985–2017 average.

For private health insurance premiums, which CBO uses as an input to its calculation of marketplace subsidies, the average annual rate of excess cost growth implicit in CBO's baseline projections is 1.8 percent from 2020 through 2029 (which is slightly lower than last year's estimate of 2.0 percent for the 2019–2028 period). The rate for 2030 is 1.5 percent, which again is slightly lower than last year's estimate of 1.6 percent for 2029. The rate of excess cost growth is projected to average 1.4 percent over the full projection period, which is about 0.1 percentage point lower than last year's estimate for the 2018–2048 period and 0.7 percentage points lower than the 1988–2017 average.

**Other Mandatory Spending.** CBO's projections for other mandatory spending are slightly lower than they were last year. (Other mandatory spending includes outlays for retirement programs for federal civilian and military employees, certain programs for veterans, refundable

5. For more information, see Congressional Budget Office, *The 2016 Long-Term Budget Outlook* (July 2016), Chapter 3, [www.cbo.gov/publication/51580](http://www.cbo.gov/publication/51580). In contrast to outlays for the larger health care programs, outlays for CHIP are projected to be a constant percentage of GDP after 2029.

tax credits, the Supplemental Nutrition Assistance Program, and all other mandatory programs aside from Social Security and the health care programs described above.) On average over the 30-year projection period, outlays for other mandatory spending as a percentage of GDP in CBO's projections are less than 0.1 percent of GDP lower than projected last year. That small change was the cumulative result of several updates that CBO made for legislative, economic, and technical reasons.

### Net Spending for Interest

In CBO's current projections, net spending for interest—that is, the government's interest payments on debt held by the public, offset by interest income that the government receives—is lower throughout the 30-year projection period than it was in last year's projections (see Figure B-2 on page 67). That spending is lower because the agency's projections of interest rates, deficits, and federal debt held by the public are likewise lower. (For a discussion of changes to CBO's projections of interest rates, see Appendix A.)

For the 2019–2028 period, net spending for interest is projected to average 2.5 percent of GDP; last year, the projected average was 2.7 percent. It is projected to equal 3.0 percent of GDP in 2029 (down 0.2 percentage points from last year's projections) and 5.5 percent of GDP in 2048 (down 0.7 percentage points from last year's projections).

### Changes in Projected Revenues

In CBO's extended baseline projections, revenues as a percentage of GDP are slightly lower throughout the 30-year period than they were in last year's projections. Although in 2019 they are projected to be about the same, by 2048 they are projected to be about 0.4 percent of GDP lower than CBO projected last year. Most of the revisions occur in the first decade of the projection period.

The downward revisions to total revenues as a share of GDP result from CBO's slightly lower projections of individual income taxes, payroll taxes, and corporate income taxes. Receipts from individual income taxes and from payroll taxes are now each projected to be 0.1 percent of GDP lower over the 2019–2028 period than CBO projected last year. Those changes are mainly driven by new administrative and tax data that suggest lower tax receipts than CBO had projected. Also, the Bureau of Economic Analysis has revised upward its estimates of some of the sources of income that those taxes

have been levied on—particularly proprietors' income and monetary interest income, which is the share of personal interest income that does not come from marketed goods and services. Average tax rates on those types of income have therefore been lower than CBO previously estimated. As a result, CBO has lowered its projections of average tax rates in the future. Additional factors contributing to the downward revisions include lower taxable distributions from pension plans than projected previously, changes in the relationship between earnings and payroll tax receipts that have taken place in recent years and that are projected to persist, and a downward revision to CBO's forecast of wages and salaries. Receipts from corporate income taxes are also projected to be 0.1 percent of GDP lower over the 2019–2028 period; that change results from new data from corporate income tax returns for 2016 and improvements in CBO's modeling of the income of multinational corporations.

Those effects are partially offset by an increase in projected revenues from customs duties that reflects new tariffs imposed by the Administration during 2018. In 2019 and over the 2019–2028 period, those revenues are now projected to be 0.2 percent of GDP higher than CBO projected last year.<sup>6</sup>

### Changes in Social Security's Projected Finances

Social Security's 75-year actuarial deficit—a measure of the program's budgetary shortfall over a 75-year period—is currently projected to be 1.5 percent of GDP (which is about the same as estimated last year) or 4.6 percent of taxable payroll (which is slightly higher than last year's estimate of 4.4 percent).<sup>7</sup>

6. The projections of revenues from customs duties over the next decade were most recently published in May 2019; see Congressional Budget Office, *Updated Budget Projections: 2019 to 2029* (May 2019), [www.cbo.gov/publication/55151](http://www.cbo.gov/publication/55151). CBO's extended baseline projections incorporate the assumption that the new tariffs would continue throughout the projection period at the rates in effect at the beginning of May. For more information about CBO's approach to projecting revenues from customs duties, see Congressional Budget Office, *The Budget and Economic Outlook: 2019 to 2029* (January 2019), [www.cbo.gov/publication/54918](http://www.cbo.gov/publication/54918).

7. The actuarial deficit is computed as the sum of the present value of projected tax revenues and the trust funds' current balance minus the sum of the present value of projected outlays and a year's worth of benefits at the end of the period. The result is negative, indicating that the program's long-term cost is greater than its income. A present value is a single number that expresses a flow of current and future income (or payments) in terms of an equivalent lump sum received (or paid) at a specific time.

Those projections result from several factors. On the one hand, CBO has lowered its projection of payroll taxes, making the actuarial deficit larger. That reduction was a result of new administrative and tax data, reduced projections of the labor force, and downward revisions to wages and salaries throughout the projection period. Incorporating into the analysis another year (2093) with a relatively large difference between Social Security revenues and outlays also increased the actuarial deficit. On the other hand, CBO has lowered projected outlays for Social Security—making the actuarial deficit smaller—because the agency has reduced its projections of the number of beneficiaries in the OASI and DI programs and its projections of wages and salaries. (The reduction to projections of the number of beneficiaries was made partly because of downward revisions to the long-run rate of disability incidence and population growth.) The small increase in the actuarial deficit when measured as a percentage of taxable payroll also reflects a slightly lower projection of the share of earnings that is subject to Social Security payroll taxes over the next 30 years.<sup>8</sup>

CBO projects that if current law governing the program's taxes and benefits did not change, the DI trust fund would be exhausted in fiscal year 2028, the OASI trust fund would be exhausted in calendar year 2032, and the combined trust funds would also be exhausted in calendar year 2032. Last year, those exhaustion dates were three years earlier for the DI trust fund, the same year for the OASI trust fund, and one year earlier for the combined trust funds. The change in the date of exhaustion of the DI trust fund is due to lower projections of the number of DI beneficiaries over the next 10 years.

### Changes in Analyzing Uncertainty

CBO has changed the methods that it uses to analyze the uncertainty of its projections. To illustrate that uncertainty last year, the agency created two projections of federal debt—one in which key factors were varied in ways that would raise projected deficits in relation to CBO's extended baseline projections and another in which those factors lowered projected deficits. The ranges of variation that the agency used for the economic factors were based on historical movements and potential future developments of each individual factor. This year, CBO instead analyzed the long-term uncertainty surrounding the key

economic factors by using simulations from a multivariate statistical model.<sup>9</sup> That approach accounts not only for the uncertainty of long-term trends of individual factors but also for the uncertainty of those factors' long-term movement in relation to one another.

CBO has also significantly increased the number of factors that it varies when analyzing uncertainty. Last year, CBO varied four key factors—the labor force participation rate, the growth rate of total factor productivity (TFP) in the nonfarm business sector, interest rates on federal debt held by the public, and excess cost growth for Medicare and Medicaid spending.<sup>10</sup> This year, CBO varied seven key factors, the first three of which are demographic, the next three of which are economic, and the last of which relates to health care:

- The total fertility rate,
- The rate of mortality improvement,
- The net immigration rate,
- The growth rate of TFP in the nonfarm business sector,
- Interest rates on federal debt held by the public,
- The civilian unemployment rate, and
- Excess cost growth for Medicare and Medicaid spending.

Introducing demographic factors into this year's analysis—specifically, varying the civilian unemployment rate together with the demographic factors, which affect

8. Beyond the 30-year projection period, the share of earnings subject to Social Security payroll taxes is held constant in CBO's projections.

9. A multivariate statistical model is one that describes the statistical properties (such as mean, standard deviation, and correlations) of multiple variables. CBO's simulations for the growth rate of total factor productivity in the nonfarm business sector, the interest rates on federal debt held by the public, and the civilian unemployment rate are based on a vector autoregressive (VAR) multivariate model. CBO's VAR model incorporates parameters that vary with time, allowing the variables to have time-varying statistical properties. In particular, the model allows the variables to exhibit highly persistent (but not necessarily permanent) deviations from their historical averages. CBO estimated the parameters of the VAR model using annual data from 1953 to 2018.

10. Total factor productivity is the average real output per unit of combined labor and capital services.

the size of the working-age population—has allowed CBO to make a more comprehensive assessment of the uncertainty of the economy's future amount of labor. In last year's analysis, by contrast, CBO varied one economic factor, the labor force participation rate, to quantify that uncertainty.

CBO's new method of quantifying uncertainty in its projections and the additional uncertainty stemming from the demographic factors included in this year's analysis result in noticeable differences from last year's ranges of budgetary outcomes. Last year, CBO estimated that in 2039, federal debt under current law could be as much as 43 percent of GDP higher or 35 percent of GDP lower than it was in the agency's extended baseline projections. Also, CBO noted that those estimates did not cover the full range of possibilities. And the agency did not quantify the degree of its certainty that actual debt would equal a value between those estimates. Under the new method, CBO now estimates that if future tax and spending policies did not vary from those specified in current law, there is a two-thirds chance that federal debt held by the public in 2039 could be as much as 62 percent of GDP higher or 42 percent of GDP lower than it is in the agency's extended baseline projections.

CBO's current analysis of uncertainty extends 20 years into the future; last year, the analysis extended 30 years into the future. The likely range of uncertainty that CBO's models produce for projections of debt is less informative after 20 years because the key parameters governing the economic effects of fiscal policy in the agency's models are based on the nation's historical experience with federal borrowing. At the high end of a range 30 years in the future, projections of debt as a percentage of GDP would grow to amounts well outside that historical experience.

### Changes in Alternative Scenarios for Fiscal Policy

Last year, CBO published a report that described three fiscal scenarios that were alternatives to the extended baseline projections.<sup>11</sup> The first of the three scenarios, called the extended alternative fiscal scenario, incorporated the assumption that current law was changed to maintain certain major policies that are now in

place—including the individual income tax provisions of Public Law 115-97 (often called the 2017 tax act in CBO's publications), which are scheduled to expire in 2026 under current law. In that scenario, projected deficits were larger than in the extended baseline projections. In the second and third scenarios, projected deficits were larger still.

In this report, CBO has described two scenarios in addition to the extended baseline projections: an extended alternative fiscal scenario and another scenario, called the payable-benefits scenario, which incorporates the assumption that outlays for Social Security would be reduced to equal the program's total annual revenues once the combined Social Security trust funds were exhausted.

### The Extended Alternative Fiscal Scenario

Last year, CBO projected that debt held by the public in the extended alternative fiscal scenario would equal about 210 percent of GDP in 2048, which was about 60 percentage points more than in that year's extended baseline projections. This year, CBO projects that it would equal 211 percent in 2048, which is 70 percentage points more than in this year's extended baseline projections. The larger difference this year results from several modeling changes.

Two of the changes make the difference larger. First, in this year's extended alternative fiscal scenario, revenues are lower than in the extended baseline projections by a larger amount than they were last year because CBO has modeled the long-term effects of the policy changes in the extended alternative fiscal scenario in more detail than it did last year. Second, economic output is lower in the extended alternative fiscal scenario than it is in the extended baseline projections, pushing down some kinds of noninterest spending—and in CBO's long-term projections, such spending is now less sensitive to changes in economic output over the next decade than it was previously. As a result, the reduction in economic output in relation to the extended baseline projections pushes down noninterest spending by a smaller amount in this year's extended alternative fiscal scenario than in last year's.

Those changes are partially offset by a modeling improvement that reduces the effects of deficits on the return on capital and interest rates. Those effects are now based on a more comprehensive assessment of how changes in

11. Congressional Budget Office, *The Long-Term Budget Outlook Under Alternative Scenarios for Fiscal Policy* (August 2018), [www.cbo.gov/publication/54325](http://www.cbo.gov/publication/54325).

private investment affect the capital stock and thus the return on capital—which is a key factor driving changes in interest rates throughout the economy, in CBO’s view. This year, CBO has expanded its measure of the capital stock that is affected by changes in private investment to include owner-occupied residential housing. Last year, that measure mainly included nonfarm business capital stock. Because the measure is now more comprehensive, any given change in private investment (for example, a change resulting from larger deficits, which crowd out private investment) now results in a smaller percentage change in the measure. That smaller percentage effect on the capital stock results in a smaller change in the return on capital and ultimately in a smaller change in interest rates. Because of that modeling improvement, changes in deficits have a smaller effect on interest rates, and ultimately on federal debt held by the public, in this year’s extended alternative fiscal scenario.

### **The Payable-Benefits Scenario**

In CBO’s current payable-benefits scenario, debt equals 106 percent of GDP in 2049, which is 38 percentage points below its level in the extended baseline projections. CBO last examined a payable-benefits scenario in 2017 and projected that debt would equal 111 percent of GDP in 2047, the last year of the extended baseline projections at the time, which was 39 percentage points below its level in those extended baseline projections.

Also, CBO now projects that limiting Social Security benefits to amounts payable from revenues would result

in reducing benefits by 24 percent in calendar year 2033 (the year after the program’s combined trust funds are projected to be exhausted) and by 29 percent in calendar year 2049. In 2017, CBO estimated that the reduction in benefits would amount to 28 percent in calendar year 2031 (the year after the projected exhaustion of the combined trust funds in that analysis) and greater percentages in later years.<sup>12</sup>

This year, CBO analyzed the payable-benefits scenario with the same suite of dynamic macroeconomic models that the agency used in analyzing the extended alternative fiscal scenario. In the 2017 analysis, CBO used a simpler set of models; assumed that people would not change their decisions about consumption, saving, or work in anticipation of receiving lower Social Security benefits; and assumed that they would not change their decisions about saving or work *after* receiving those lower benefits.

Furthermore, the current analysis incorporates the ways in which those changed decisions about work and saving would affect the economy and feed back into the federal budget. It also incorporates the ways in which those decisions would affect the overall demand for goods and services when benefits were unexpectedly cut. The previous analysis did not account for any of those effects.

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12. See Congressional Budget Office, *The 2017 Long-Term Budget Outlook* (March 2017), [www.cbo.gov/publication/52480](http://www.cbo.gov/publication/52480).



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## About This Document

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

Overseen by Julie Topoleski and prepared with guidance from Devrim Demirel, Edward Harris, John Kitchen, John McClelland, David Weaver, and Jeff Werling, the report represents the work of many analysts at CBO. Xiaotong Niu prepared the visual summary. Ricci Reber wrote Chapter 1 with contributions from James Otterson. Jaeger Nelson and Kerk Phillips wrote Chapter 2. Aaron Betz and Ricci Reber wrote Appendix A with contributions from Gloria Chen, Edward Gamber, and Robert Shackleton. Marina Miller wrote Appendix B with contributions from Jaeger Nelson, James Otterson, and Kerk Phillips. Jessica Banthin, Barry Blom, Lori Housman, Jamease Kowalczyk, Noah Meyerson, Eamon Molloy, Sam Papenfuss, Lisa Ramirez-Branum, Dan Ready, Sarah Sajewski, Emily Stern, Robert Stewart, and Rebecca Yip contributed to the analysis.

Charles Pineles-Mark developed the long-term budget simulations with assistance from Nathaniel Milhous, Marina Miller, Xiaotong Niu, and Ricci Reber. Aaron Betz, Junghoon Lee, Jaeger Nelson, James Otterson, Kerk Phillips, and Robert Shackleton prepared the macroeconomic simulations with contributions from Mark Lasky. Edward Harris coordinated the revenue simulations, which were prepared by Kathleen Burke, Paul Burnham, Bayard Meiser, Shannon Mok, and Kurt Seibert. Jimmy Chin, Nathaniel Milhous, and Adam Staveski fact-checked the report. The report builds on the 10-year projections of the budget and economy that CBO released earlier this year, which reflected the contributions of more than 100 people at the agency.

Wendy Edelberg, Mark Hadley, Jeffrey Kling, and Robert Sunshine reviewed the report. Christine Bogusz, Bo Peery, Benjamin Plotinsky, and Elizabeth Schwinn edited it, and Robert Rebach prepared it for publication. Nathaniel Milhous, Marina Miller, and Charles Pineles-Mark prepared the supplemental data. The report is available on CBO's website ([www.cbo.gov/publication/55331](http://www.cbo.gov/publication/55331)).

CBO continually seeks feedback to make its work as useful as possible. Please send any comments to [communications@cbo.gov](mailto:communications@cbo.gov).

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