

# CBO

## The 2020 Long-Term Budget Outlook



SEPTEMBER 2020

## At a Glance

Each year, the Congressional Budget Office publishes a report presenting its projections of what federal deficits, debt, spending, and revenues would be for the next 30 years if current laws governing taxes and spending generally did not change. This report is the latest in the series.

- **Deficits.** Even after the effects of the 2020 coronavirus pandemic fade, deficits in coming decades are projected to be large by historical standards. In CBO's projections, deficits increase from 5 percent of gross domestic product (GDP) in 2030 to 13 percent by 2050—larger in every year than the average deficit of 3 percent of GDP over the past 50 years.
- **Debt.** By the end of 2020, federal debt held by the public is projected to equal 98 percent of GDP. The projected budget deficits would boost federal debt to 104 percent of GDP in 2021, to 107 percent of GDP (the highest amount in the nation's history) in 2023, and to 195 percent of GDP by 2050.

High and rising federal debt makes the economy more vulnerable to rising interest rates and, depending on how that debt is financed, rising inflation. The growing debt burden also raises borrowing costs, slowing the growth of the economy and national income, and it increases the risk of a fiscal crisis or a gradual decline in the value of Treasury securities.

- **Spending.** After the effects of increased spending associated with the pandemic dissipate, spending as a percentage of GDP rises in CBO's projections. With growing debt and higher interest rates, net spending for interest nearly quadruples in relation to the size of the economy over the long term, accounting for most of the growth in total deficits. Also increasing are spending for Social Security (mainly owing to the aging of the population) and for Medicare and the other major health care programs (because of rising health care costs per person and, to a lesser degree, the aging of the population).
- **Revenues.** Once the effects of decreased revenues associated with the economic disruption caused by the pandemic dissipate, revenues measured as a percentage of GDP are projected to rise. After 2025, they increase in CBO's projections largely because of scheduled changes in tax rules, including the expiration of nearly all of the changes made to individual income taxes by the 2017 tax act. After 2030, they continue to rise—but that growth does not keep pace with the growth in spending. Most of the long-term growth in revenues is attributable to the increasing share of income that is pushed into higher tax brackets.

Because future economic conditions are uncertain and budgetary outcomes are sensitive to those conditions, CBO analyzed how those outcomes would differ from its projections if productivity growth or interest rates were higher or lower than the agency expects. Even if economic conditions were more favorable than CBO currently projects, debt in 2050 would probably be much higher than it is today.

CBO now projects that debt as a percentage of GDP will be 45 percentage points higher in 2049 than the agency projected last year. Larger projected deficits in 2020 and 2021 contribute significantly to that difference. The increase in those deficits results primarily from the effects of the pandemic and actions taken to respond to it.



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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, when constructing its 10-year baseline projections. Both sets of projections incorporate the assumptions that current laws generally remain unchanged, that some mandatory programs are extended after their authorizations lapse, and that spending for Medicare and Social Security continues as scheduled even if their trust funds are exhausted.

In most years, CBO examines budgetary outcomes under both the extended baseline and an extended alternative fiscal scenario. Under the alternative fiscal scenario, current law would be changed to maintain certain policies that are now in place. In order to release this report when it would be most useful to the Congress, CBO examines budgetary outcomes for the extended baseline only in this report. The agency expects to examine budgetary outcomes under both the extended baseline and alternative fiscal scenario in the next report in this series.

Unless this report indicates otherwise, all years referred 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. For the graphics in this report, budget projections have been adjusted to exclude the effects of those timing shifts.

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

Unless this 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 this report on CBO's website ([www.cbo.gov/publication/56516](http://www.cbo.gov/publication/56516)). Previous editions of this report are also available on the website (<https://go.usa.gov/xmezZ>).

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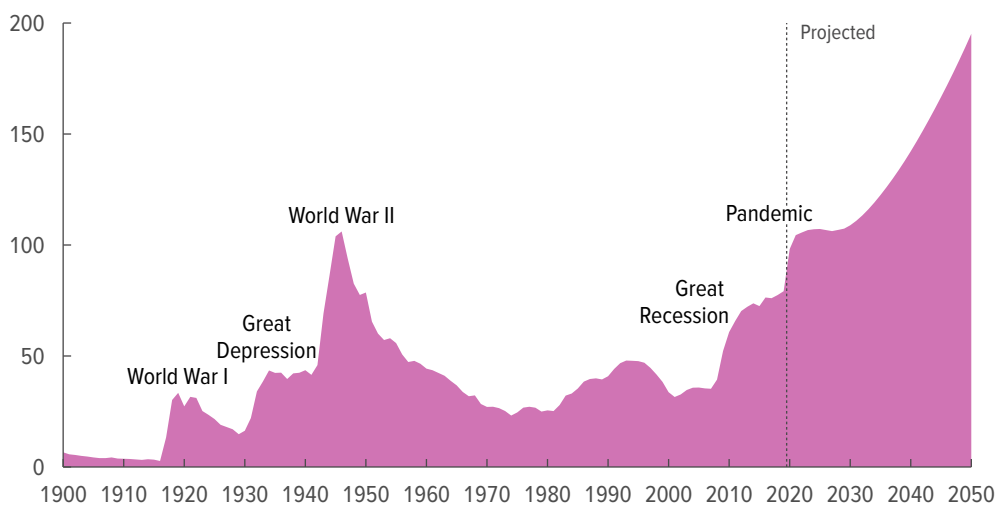
# Visual Summary

Each year, the Congressional Budget Office issues a set of long-term budget projections—often referred to as the extended baseline projections—that provide estimates of what federal debt, deficits, spending, and revenues would be over the next 30 years if current laws generally remained unchanged. Relative to the size of the economy, federal debt is higher in this year’s projections than it was in last year’s projections. The economic disruption caused by the 2020 coronavirus pandemic and the federal government’s response to it contribute significantly to that difference.

## Debt and Deficits

Federal debt held by the public is projected to equal 195 percent of gross domestic product (GDP) in 2050, and the deficit is projected to equal 13 percent of GDP.

Percentage of Gross Domestic Product



In CBO’s projections, federal debt held by the public surpasses its historical high of 106 percent of GDP in 2023 and continues to climb in most years thereafter. In 2050, debt as a percentage of GDP is nearly 2.5 times what it was at the end of last year.

See Figure 1 on page 6

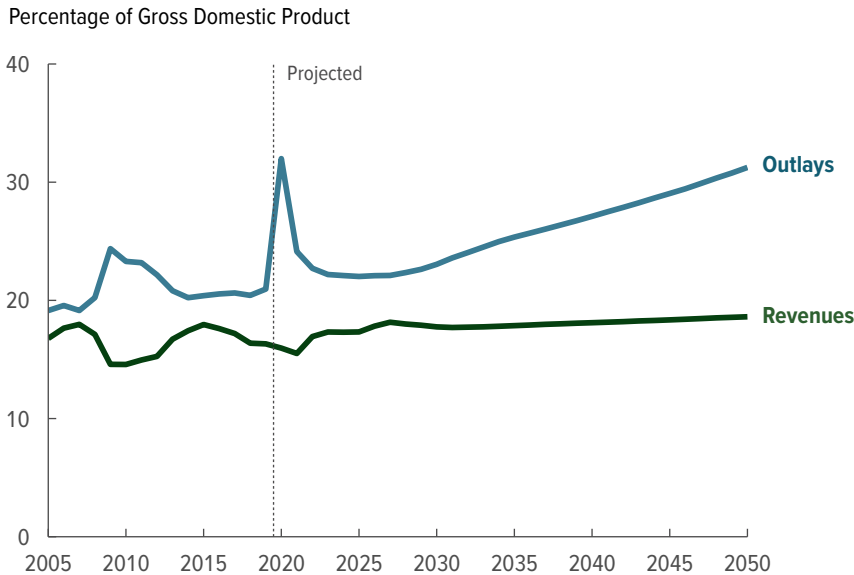
Percentage of Gross Domestic Product



Deficits grow from an average of 4.8 percent of GDP from 2010 to 2019 to an average of 10.9 percent from 2041 to 2050, driving up debt. Net spending for interest rises rapidly and accounts for much of the growth in total deficits in the last two decades of the projection period.

See Figure 4 on page 11

Debt and Deficits (Continued)

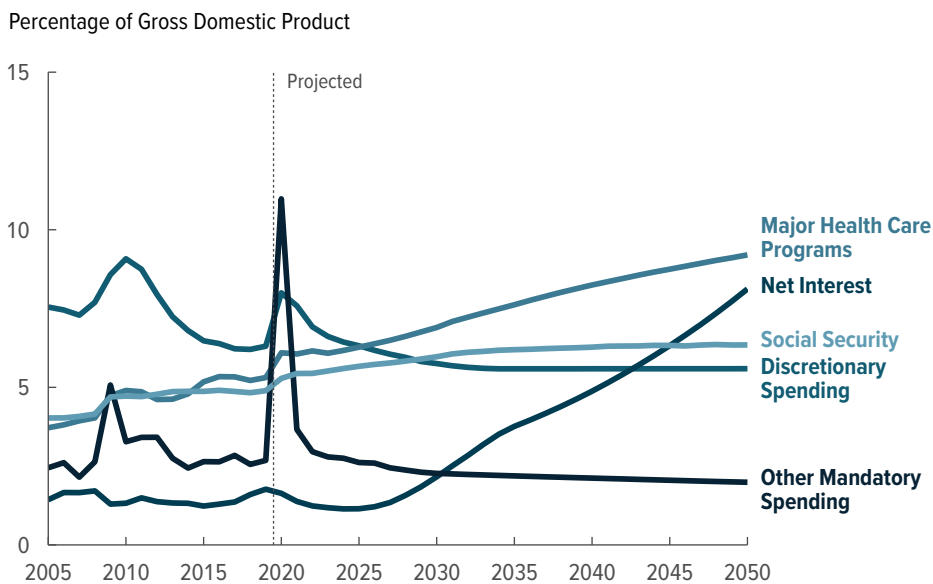


In CBO's projections, growth in outlays outpaces growth in revenues, resulting in larger budget deficits over the long run.

See Figure 3 on page 10

Spending

Federal spending grows from an average of 21.3 percent of GDP from 2010 to 2019 to an average of 29.3 percent from 2041 to 2050.

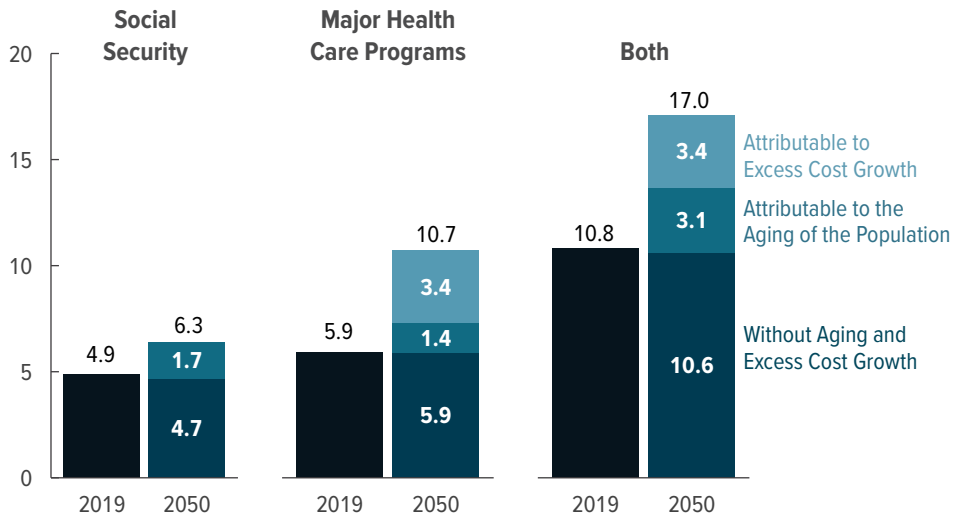


Net spending for interest, measured as a share of GDP, nearly quadruples over the last two decades of the projection period. In addition, after the effects of increased spending associated with the pandemic dissipate, spending as a share of GDP increases for the major health care programs and Social Security.

See Figure 3 on page 10

Spending (Continued)

Percentage of Gross Domestic Product



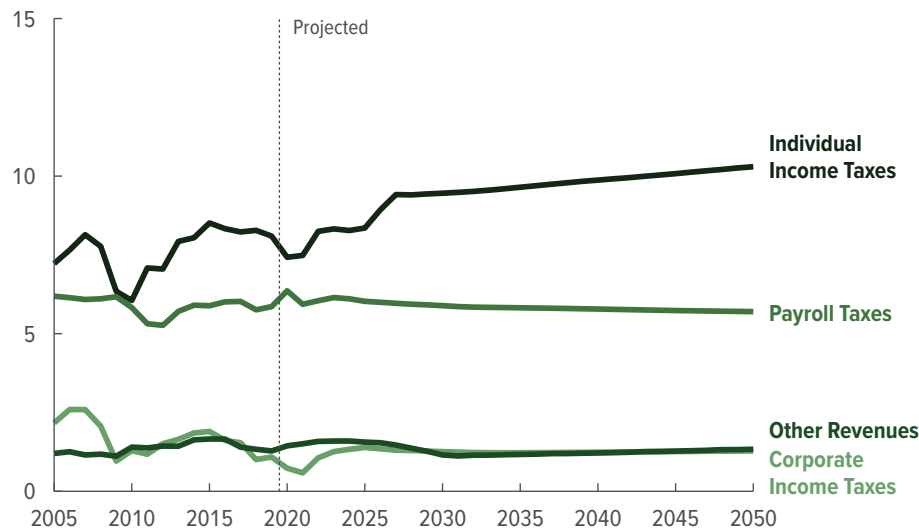
Much of the growth in combined spending for Social Security and the major health care programs results from the aging of the population. Growth in spending for the major health care programs is also driven by excess cost growth—the extent to which the growth rate of health care costs per person (adjusted for demographic changes) exceeds the growth rate of potential GDP (the economy’s maximum sustainable output) per person.

See Figure 11 on page 32

Revenues

In CBO’s projections, federal revenues increase from an average of 16.4 percent of GDP from 2010 to 2019 to an average of 18.4 percent from 2041 to 2050.

Percentage of Gross Domestic Product

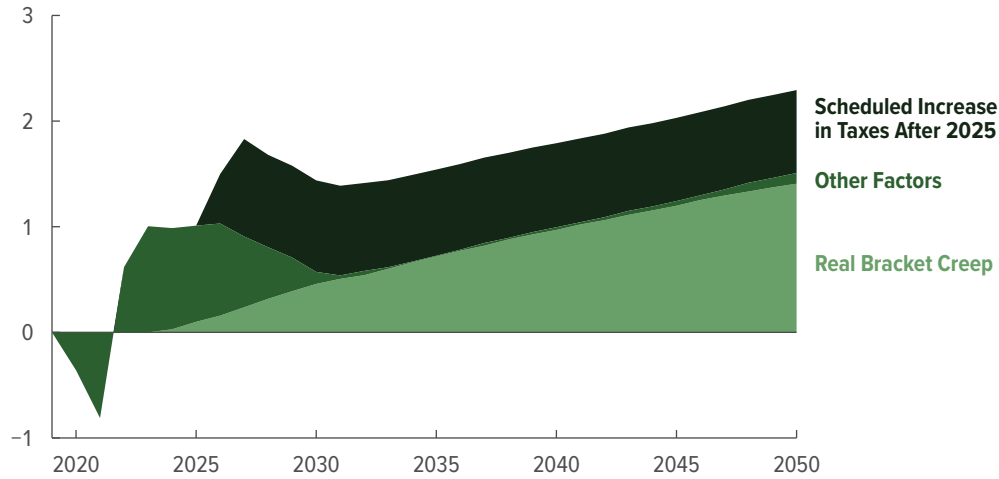


Increases in receipts from individual income taxes account for most of the rise in total revenues. Those receipts increase in 2025 because of the expiration of nearly all provisions of the 2017 tax act that affect individual income taxes.

See Figure 3 on page 10

Revenues (Continued)

Percentage of Gross Domestic Product



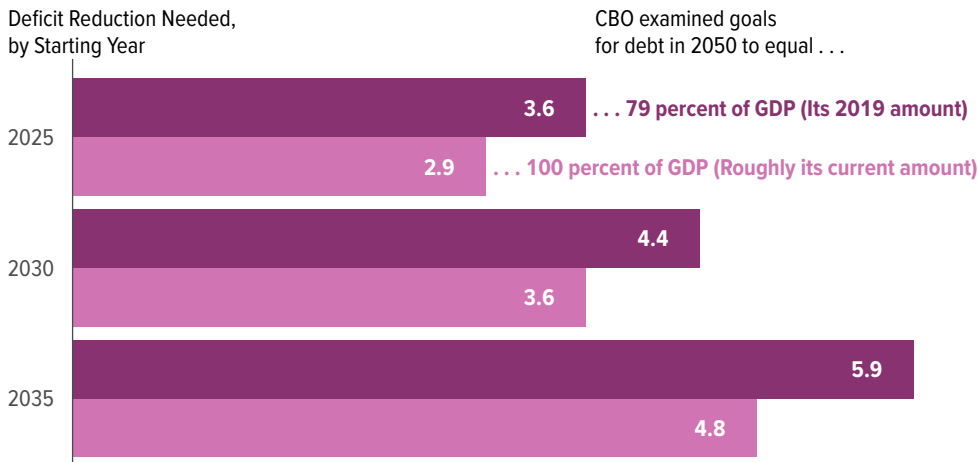
Over the long term, the largest source of growth in tax revenues is real bracket creep—the process in which, as income rises faster than inflation, a larger proportion of income becomes subject to higher tax rates.

See Figure 13 on page 36

Policy Changes Needed to Meet Various Targets for Debt

The reduction in the annual primary deficit (which excludes net spending for interest) needed to make federal debt held by the public in 2050 equal a certain goal would be smaller the sooner the policy changes were implemented.

Percentage of Gross Domestic Product



Even if policymakers took action soon, significant cuts to primary deficits would be necessary for debt to equal 100 percent of GDP in 2050.

See Figure 5 on page 17





# The 2020 Long-Term Budget Outlook

## Overview

By the end of 2020, federal debt held by the public is projected to equal 98 percent of gross domestic product (GDP)—its highest level since shortly after World War II. If current laws governing taxes and spending generally remained unchanged, debt would first exceed 100 percent of GDP in 2021 and would reach 107 percent of GDP, its highest level in the nation's history, by 2023, the Congressional Budget Office projects.

Debt would continue to increase in most years thereafter, reaching 195 percent of GDP by 2050 (see Figure 1). That amount of debt would be the highest by far in the nation's history, and it would be on track to increase further. High and rising federal debt makes the economy more vulnerable to rising interest rates and, depending on how that debt is financed, rising inflation. The growing debt burden also raises borrowing costs, slowing the growth of the economy and national income, and it increases the risk of a fiscal crisis or a gradual decline in the value of Treasury securities.

## 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 earlier this month, which incorporate the effects of legislation enacted through August 4, 2020, and the economic forecast that the agency published in July 2020.<sup>1</sup> Those projections incorporate the budgetary and economic effects of the 2020 coronavirus pandemic and associated measures taken to limit in-person interactions. They also reflect the economic and budgetary effects of laws enacted to address the public health emergency and to support households, businesses, and

state and local governments.<sup>2</sup> In CBO's assessment, the economic effects of those laws will partially offset the deterioration in economic conditions brought about by the pandemic.<sup>3</sup>

CBO's long-term projections extend most of the concepts underlying its 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.<sup>4</sup>

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 these assumptions:

- Current laws affecting revenues and spending generally remain unchanged;
- Some programs—for example, the Supplemental Nutrition Assistance Program (SNAP)—are

1. See Congressional Budget Office, *An Update to the Budget Outlook: 2020 to 2030* (September 2020), [www.cbo.gov/publication/56517](http://www.cbo.gov/publication/56517), and *An Update to the Economic Outlook: 2020 to 2030* (July 2020), [www.cbo.gov/publication/56442](http://www.cbo.gov/publication/56442). 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.

2. The laws enacted in response to the pandemic include the Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020 (Public Law 116-123, enacted on March 6, 2020), the Families First Coronavirus Response Act (P.L. 116-127, enacted on March 18, 2020), the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136, enacted on March 27, 2020), the Paycheck Protection Program and Health Care Enhancement Act (P.L. 116-139, enacted on April 24, 2020), and the Paycheck Protection Program Flexibility Act of 2020 (P.L. 116-142, enacted on June 5, 2020).

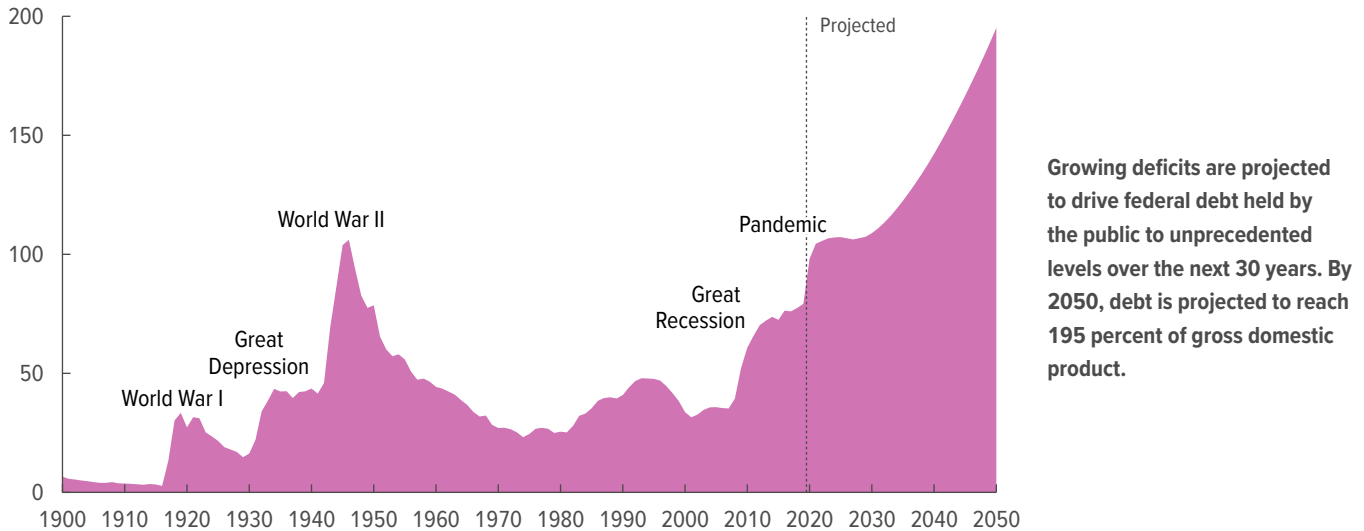
3. See Congressional Budget Office, *The Effects of Pandemic-Related Legislation on Output* (September 2020), [www.cbo.gov/publication/56537](http://www.cbo.gov/publication/56537).

4. CBO's projections are also based on assumptions about the Federal Reserve's implementation of monetary policy. The projections and discussion in this report do not reflect recent updates to that policy. See Board of Governors of the Federal Reserve System, "Federal Open Market Committee Announces Approval of Updates to Its Statement on Longer-Run Goals and Monetary Policy Strategy" (press release, August 27, 2020), <https://go.usa.gov/xGXXn>.

Figure 1.

**Federal Debt Held by the Public, 1900 to 2050**

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 2050, debt is projected to reach 195 percent of gross domestic product.**

Source: Congressional Budget Office.

nevertheless extended after their authorizations lapse; and

- Spending for Medicare and Social Security continues as scheduled even after their trust funds are exhausted.

In making those assumptions, which are specified in law, CBO produces its baseline projections to give lawmakers a point of comparison from which to measure the effects of policy options or proposed legislation.

In most years, CBO examines budgetary outcomes under both the extended baseline and an extended alternative fiscal scenario. Under the alternative fiscal scenario, current law would be changed to maintain certain policies that are now in place. In order to release this report when it would be most useful to the Congress, CBO examines budgetary outcomes for the extended baseline only in this report. The agency expects to examine budgetary outcomes under both the extended baseline and an alternative fiscal scenario in the next report in this series.

**Why Federal Debt Has Grown in Recent Years**

Debt held by the public is the amount of money that the federal government has borrowed in financial markets by

issuing Treasury securities—including those held by the Federal Reserve—to pay for its operations and activities. Debt as a percentage of GDP is a useful measure for comparing amounts of debt in different years because it shows debt in relation to the size of the economy. That measure places the effects of potential adjustments to the budget within the context of the nation's resources. If debt as a percentage of GDP rises indefinitely, then debt will become unsustainable because the costs of financing deficits and servicing the debt will consume an ever-growing proportion of the nation's income. In particular, when the economy is operating close to its potential output, the Federal Reserve in all likelihood will not be able to extensively support government borrowing without increasing expected inflation and causing an erosion of confidence in the U.S. dollar as an international reserve currency.

Federal debt held by the public has increased significantly in recent years. At the end of 2007, federal debt was 35 percent of GDP. Deficits arising from the 2007–2009 recession and from policies implemented to counter the effects of the downturn caused debt to grow 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, and it has climbed since then, reaching 79 percent by 2019.

In the first quarter of 2020, the coronavirus pandemic ended the longest economic expansion in U.S. history and triggered the deepest downturn in output and employment since the demobilization following World War II. Increased spending and decreased revenues associated with the pandemic and ensuing recession have created a challenging budgetary situation, putting debt held by the public on track to reach an estimated 98 percent of GDP by the end of this year (see Table 1). By historical standards, that amount of debt is very high. Over the past 50 years, debt has averaged 43 percent of GDP. It has exceeded 98 percent of GDP in only two years in U.S. history—when debt reached 106 percent of GDP following the surge in federal spending as a result of World War II.

### Why Debt Is Projected to Continue to Grow

Debt as a percentage of GDP is projected to increase in most years as the government incurs budget deficits that are large relative to the growth of the economy (see Figure 2). If current laws generally remained unchanged, federal budget deficits would be substantially larger over the next 30 years than they were over the past 50 years. In CBO's projections, deficits rise after 2030 as mandatory spending—in particular, outlays for the major health care programs—and interest payments on federal debt grow faster than revenues (see Figure 3 on page 10).<sup>5</sup> That growth in deficits causes projected debt to rise as a percentage of GDP over the 2030–2050 period.

**Deficits From 2020 to 2030.** At an estimated 16.0 percent of GDP, the deficit in 2020 is the largest it has been since the end of World War II, including the years during and immediately following the 2007–2009 recession. In CBO's projections, deficits fall to 8.6 percent of GDP in 2021 and continue to fall through 2027. Deficits increase again in the last few years of the decade, reaching 5.3 percent of GDP in 2030. That level is historically high and more than one-and-a-half times the average over the past 50 years (3.0 percent of GDP).

5. Mandatory, or direct, spending includes outlays for some federal benefit programs and for certain other payments to people, businesses, nonprofit institutions, and state and local governments. Such outlays are generally governed by statutory criteria and are not normally constrained by the annual appropriation process.

In CBO's projections, mandatory spending decreases from 22.4 percent of GDP in 2020 to 14.2 percent of GDP in 2024, primarily because of declining spending related to the pandemic. In most years thereafter, mandatory spending rises, reaching 15.1 percent of GDP in 2030. Those increases in mandatory spending stem from the aging of the population, which causes the number of participants in Social Security to grow faster than the overall population, and growth in federal health care costs per beneficiary that exceeds the growth in GDP per capita. From 2025 to 2030, increased mandatory spending as a percentage of GDP is responsible for much of the increase in deficits over that period. Discretionary spending, which is generally projected to keep pace with inflation, decreases in relation to the size of the economy over the decade, from 8.0 percent of GDP in 2020 to 5.8 percent in 2030.<sup>6</sup> Revenues rise from 16.0 percent of GDP in 2020 to 17.8 percent in 2030; roughly half of that increase comes from the scheduled increases in taxes at the end of calendar year 2025.

As a result of those changes in spending and revenues, primary deficits (which exclude net spending for interest) fall in most years in CBO's projections, from 14.4 percent of GDP in 2020 to 3.1 percent of GDP in 2030. In CBO's projections, federal debt rises over most of the 2020–2030 period. However, net outlays for interest decline from 1.6 percent of GDP in 2020 to 1.1 percent in 2024 and 2025 as interest rates, which have fallen in recent months, remain low. Interest rates are projected to rise over time as the economy expands. Because federal debt remains high, net outlays for interest rise to 2.2 percent of GDP in 2030.

**Deficits From 2030 to 2050.** In the second and third decades of CBO's projection period, deficits grow from 5.3 percent of GDP in 2030 to 9.0 percent by 2040 and 12.6 percent by 2050. Over that 20-year period, deficits average 9.0 percent of GDP, which is much higher than their 50-year average of 3.0 percent of GDP.

After 2030, mandatory spending continues to increase faster than economic output, reaching 16.6 percent of GDP in 2040 and 17.5 percent in 2050, whereas

6. Discretionary spending encompasses an array of federal activities that are funded through or controlled by appropriations. That category includes most defense spending, outlays for highway programs, and spending for many other nondefense activities, such as elementary and secondary education, housing assistance, international affairs, and the administration of justice.

Table 1.

**Key Projections in CBO's Extended Baseline**

Percentage of Gross Domestic Product

	2020	Projected Annual Average		
		2021–2030	2031–2040	2041–2050
<b>Revenues</b>				
Individual income taxes	7.4	8.8	9.7	10.1
Payroll taxes	6.4	6.0	5.8	5.7
Corporate income taxes	0.7	1.2	1.2	1.3
Other <sup>a</sup>	1.4	1.4	1.2	1.3
<b>Total Revenues</b>	<b>16.0</b>	<b>17.5</b>	<b>17.9</b>	<b>18.4</b>
<b>Outlays</b>				
Mandatory				
Social Security	5.3	5.7	6.2	6.3
Major health care programs <sup>b</sup>	6.1	6.4	7.7	8.8
Other	11.0	2.6	2.2	2.0
Subtotal	22.4	14.8	16.1	17.2
Discretionary	8.0	6.3	5.6	5.6
Net interest	1.6	1.5	3.8	6.5
<b>Total Outlays</b>	<b>32.0</b>	<b>22.5</b>	<b>25.4</b>	<b>29.3</b>
<b>Deficit</b>	<b>-16.0</b>	<b>-5.0</b>	<b>-7.5</b>	<b>-10.9</b>
<b>Debt Held by the Public at the End of the Period</b>	<b>98</b>	<b>109</b>	<b>142</b>	<b>195</b>
<b>Memorandum:</b>				
Social Security				
Revenues <sup>c</sup>	4.9	4.5	4.5	4.4
Outlays <sup>d</sup>	5.3	5.7	6.2	6.3
<b>Contribution to the Federal Deficit<sup>e</sup></b>	<b>-0.4</b>	<b>-1.2</b>	<b>-1.6</b>	<b>-1.9</b>
Medicare				
Revenues <sup>c</sup>	1.5	1.5	1.7	1.7
Outlays <sup>d</sup>	4.2	4.7	6.0	7.1
Offsetting receipts	-0.7	-0.8	-1.1	-1.4
<b>Contribution to the Federal Deficit<sup>e</sup></b>	<b>-2.0</b>	<b>-2.4</b>	<b>-3.2</b>	<b>-4.0</b>
Gross Domestic Product at the End of the Period (Trillions of dollars)	20.6	30.7	43.8	62.0

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.

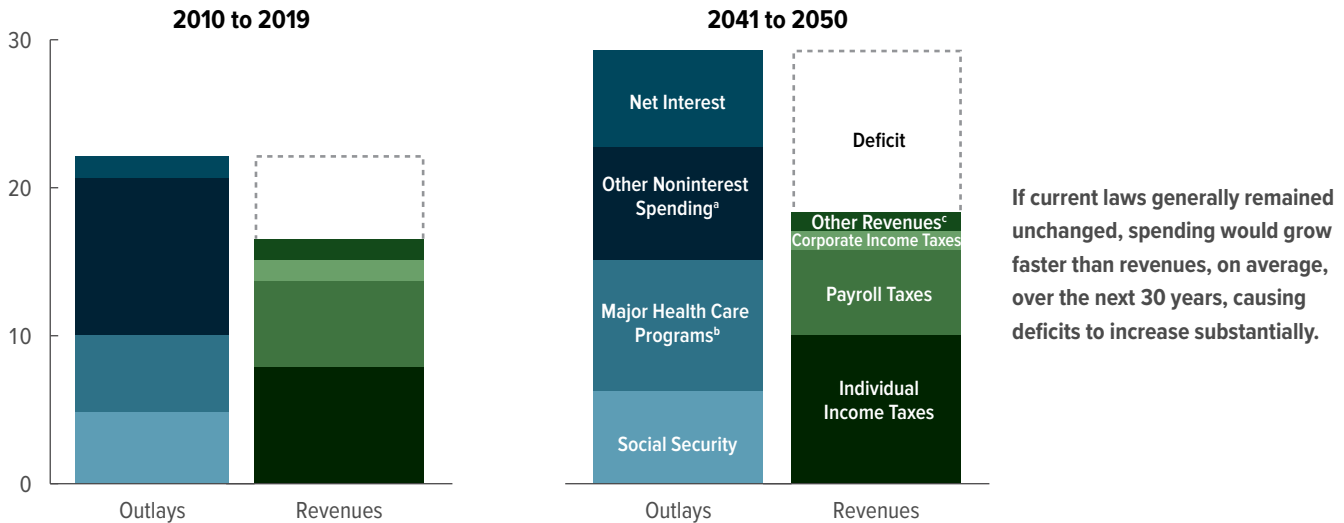
The extended baseline projections, which generally reflect current law, follow CBO's 10-year baseline budget projections and then extend most of the concepts underlying those projections for the rest of the long-term projection period.

- 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 2.

**The Federal Budget, on Average, 2010 to 2019 and 2041 to 2050**

Percentage of Gross Domestic Product



If current laws generally remained unchanged, spending would grow faster than revenues, on average, 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.

discretionary spending is assumed to remain roughly constant as a share of GDP throughout the period. Revenues also rise after 2030 (to 18.6 percent of GDP in 2050), although not as quickly as mandatory spending. Driving that increase in revenues is 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).

As a result of those developments, primary deficits are projected to increase to 4.1 percent of GDP in 2040 and 4.5 percent by 2050 (see Figure 4). In CBO’s projections, rising federal debt and higher interest rates combine to nearly quadruple net outlays for interest from 2.2 percent of GDP in 2030 to 8.1 percent in 2050, adding substantially to projected deficits.

**Consequences of High and Rising Federal Debt**

If federal debt as a percentage of GDP continued to rise at the pace that CBO projects it would under current

law, in the long term the economy would be affected in two significant ways:

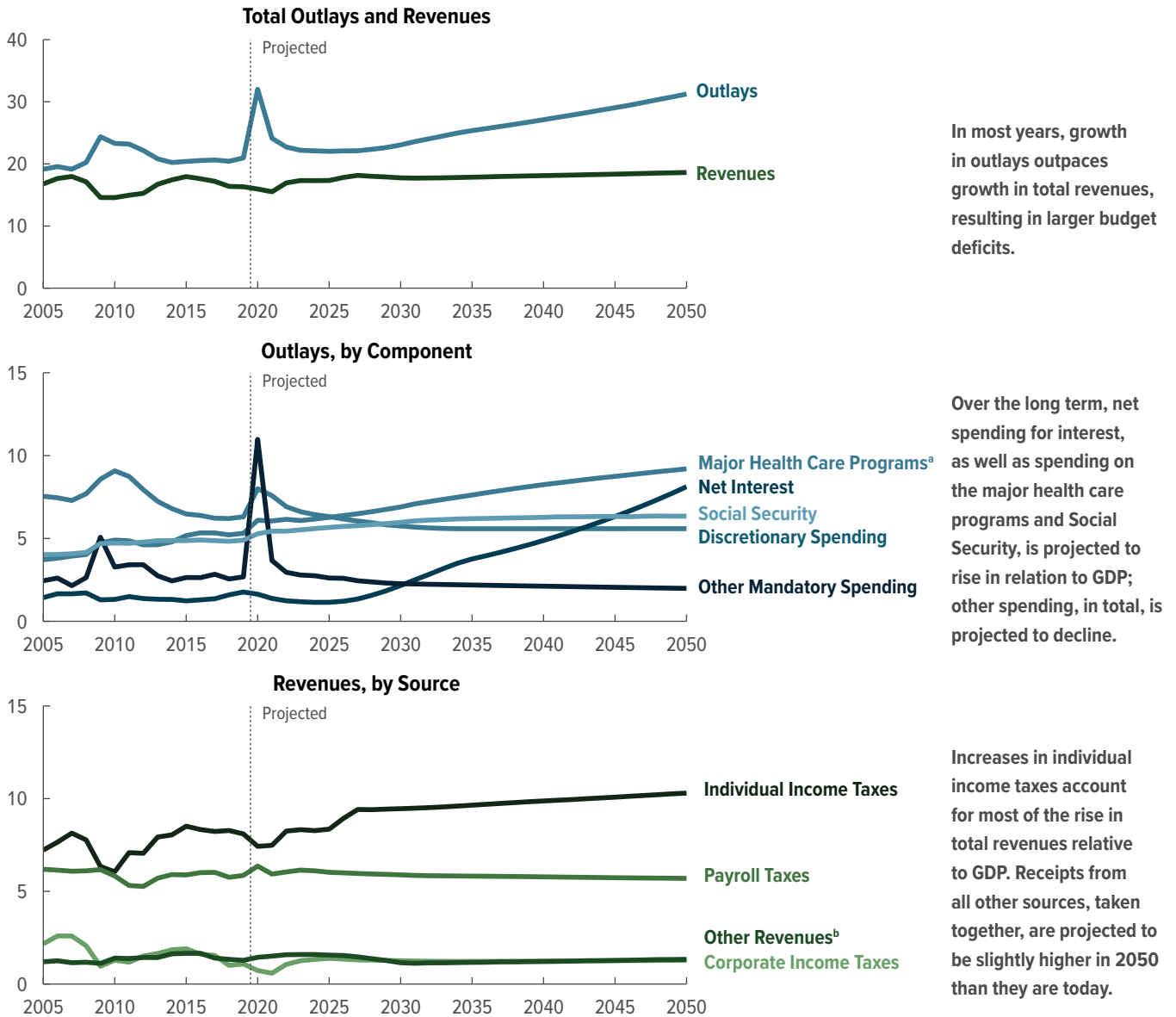
- That debt path would raise borrowing costs, reduce business investment, and slow the growth of economic output over time,<sup>7</sup> and
- Rising interest costs associated with that debt would increase interest payments to foreign holders of U.S. debt and thus reduce U.S. national income.

7. When the federal government borrows in financial markets, it competes with other participants for funds. That competition can crowd out private investment, reducing economic output and income in the long term. 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. 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 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.

Figure 3.

### CBO's Projections of Outlays and Revenues

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

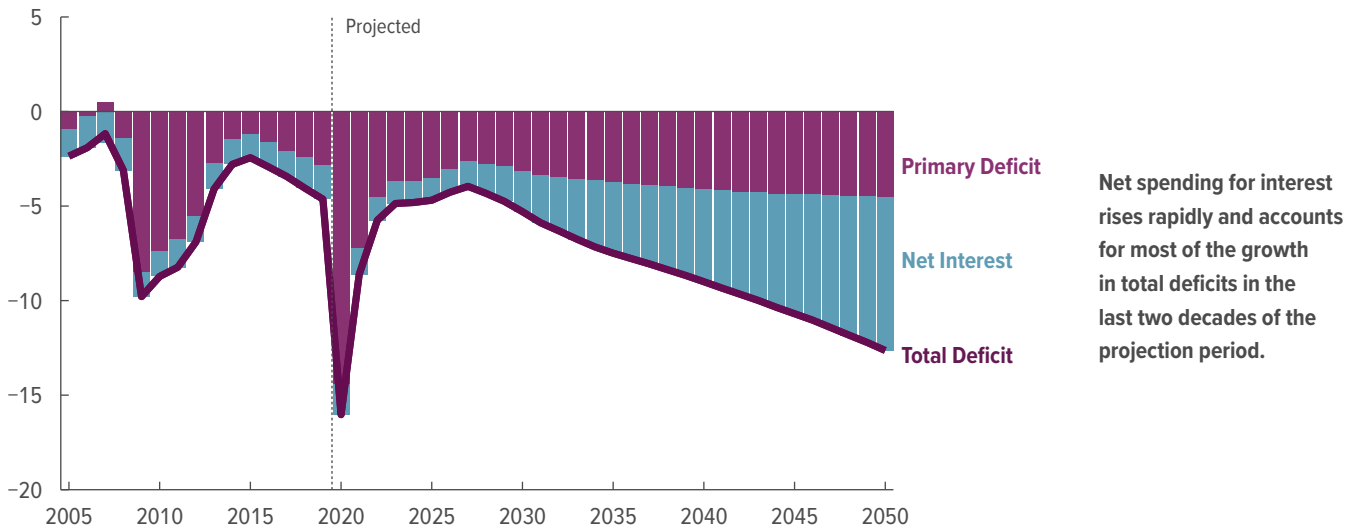
GDP = gross domestic product.

- 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.

Figure 4.

**Total Deficits, Primary Deficits, and Net Interest**

Percentage of Gross Domestic Product



Net spending for interest rises rapidly and accounts for most of the growth in total deficits in the last two decades of the projection period.

Source: Congressional Budget Office.

Primary deficits or surpluses exclude net spending for interest.

Persistently rising debt as a percentage of GDP would also pose significant risks to the fiscal and economic outlook, although financial markets currently do not reflect those concerns. In particular, that debt path would have these economic and financial effects:

- It would increase the risk of a fiscal crisis—that is, a situation in which investors lose confidence in the U.S. government’s ability to service and repay its debt, causing interest rates to increase abruptly, inflation to spiral upward, or other disruptions—and
- It would increase the likelihood of less abrupt, but still significant, negative effects, such as expectations of higher rates of inflation and more difficulty financing public and private activity in international markets.

In addition, high and rising debt makes government financing more vulnerable to increases in interest rates because costs to service that debt rise more for a given increase in interest rates when debt is higher than when it is lower. High and rising debt also 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 higher debt and a higher projected path for debt would be negative. Short-term increases in deficits and debt can provide fiscal support to the economy during challenging times, such as the current pandemic. Also, over time a higher debt path would boost interest rates above what they otherwise would be, promoting private saving and giving the Federal Reserve more flexibility in implementing monetary policy. (Higher interest rates would have adverse economic effects, too, as described below.)

Information about the potential effects of high and rising debt better enables policymakers to weigh the consequences of changing fiscal policy sooner rather than later. The benefits of reducing deficits sooner include a smaller accumulated debt and therefore less risk to long-run economic growth and stability. Addressing the debt sooner also means that smaller policy changes would be required to achieve long-term objectives, and it means that households and businesses would have less uncertainty about the effectiveness of policies that lawmakers would adopt.



The risk of reducing deficits sooner is that spending cuts or tax increases that were implemented suddenly might cause economic and financial disruptions because people would have insufficient time to plan for or adjust to the new measures. But the longer policymakers take to implement policies that would reduce federal spending or increase taxes, the more debt would accumulate in the meantime. That additional debt would further slow long-term growth in output and income and ultimately require that even larger policy changes be implemented to reach any given target for debt.<sup>8</sup>

Depending on the path that lawmakers chose, the distributional implications of proposed changes—that is, who would bear the burden of particular cuts in spending or increases in taxes and who would realize the economic benefits—would differ. In general, if policymakers postponed fiscal tightening and if debt as a share of GDP continued to rise, then future generations would bear more of the burden of the changes necessary to stabilize debt. Earlier generations—most notably, people in those generations with higher income and more wealth—would bear less of the burden.

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

The high and rising path of federal borrowing in CBO's extended baseline projections would have negative economic consequences over the longer term. Although interest rates remain low for an extended time in CBO's baseline projections, the eventual rise in rates together with the larger amount of debt generates a growing burden of interest payments. Rising interest costs would crowd out the resources available for private investment, diminishing the growth of economic output and income. In addition, rising interest payments would result in increasingly large payments to foreign investors, further dampening domestic income.

**Crowding Out of Private Investment.** In CBO's extended baseline projections, when the government borrows in financial markets, it does so from people and businesses whose savings would otherwise finance private investment, such as factories and computers. Although an increase in government borrowing strengthens people's incentive to save—in part by boosting interest rates—the resulting rise in private saving is not as large as

the increase in government borrowing; national saving, or the amount of domestic resources available for private investment, therefore declines.<sup>9</sup> Private investment falls by less than national saving does in response to larger 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.

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, they would receive lower compensation, and they would thus be less inclined to work. Those effects would increase over time as federal borrowing grew. If federal borrowing declined, however, those effects would decrease. In CBO's estimation, budgetary changes that began in 2025 and steadily reduced debt to 79 percent of GDP in 2050 (its value in 2019) would, all else being equal, boost economic growth each year by an average of about 0.2 percentage points compared with growth in the agency's extended baseline projections. As a result, GDP would be 5.0 percent higher in 2050 than it is in the extended baseline projections, and GDP per person in 2050 would be about \$4,600 higher (in 2019 dollars).

**Rising Interest Payments.** CBO projects a substantial increase in interest costs over the next 30 years, in part from a projected rise in interest rates. Because debt is already high, even moderate increases in interest rates would lead to significantly higher interest costs. Moreover, federal borrowing is projected to rise significantly, further driving up interest costs. That increase in interest costs would not happen immediately, however, because the lower interest rates associated with the pandemic and the Federal Reserve's policy response to it would offset the effect from financing the rising amount of debt.

8. See Congressional Budget Office, *The Deficit Reductions Necessary to Meet Various Targets for Federal Debt* (August 2018), [www.cbo.gov/publication/54181](http://www.cbo.gov/publication/54181).

9. In CBO's assessment, another reason that an increase in government borrowing strengthens people's incentive to save is that some of them expect policymakers to 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 lower 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 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).



CBO expects interest rates to rise as the economy recovers and then continues to expand, particularly in the latter half of the coming decade. The agency expects the interest rate on 10-year Treasury notes to average 1.3 percent over the 2020–2025 period and 2.8 percent over the 2026–2030 period. Beyond 2030, the interest rate on 10-year Treasury notes is projected to rise steadily, reaching 4.8 percent by 2050. In CBO’s extended baseline projections, net outlays for interest grow from 1.6 percent of GDP in 2020 to 2.2 percent in 2030 and then continue to rise over the next two decades to more than 8 percent by 2050.

Those higher outlays would include an increase in payments to foreign investors (who hold 39 percent of Treasury securities), which reduces net U.S. international income and gross national product (GNP) relative to total domestic economic output (GDP). If, for example, debt was reduced to 79 percent of GDP by 2050, GNP—which, unlike GDP, includes income that U.S. residents earn abroad and excludes income payments to nonresidents—would be 6.7 percent higher than it is in CBO’s extended baseline projections. (Such a reduction in debt would result in a smaller increase in GDP—5.0 percent.) In 2050, GNP per person would be \$6,300 higher (in 2019 dollars) than it is in the extended baseline projections.

A larger amount of debt makes the United States’ fiscal position more vulnerable to an increase in interest rates than it would be if the amount was smaller. In CBO’s projections, the average interest rate on federal debt initially decreases from 2.0 percent in 2020 to 1.1 percent in 2025 and then increases to 4.4 percent by 2050. The change in interest rates accounts for about one-fifth of the projected growth in debt as a share of GDP over the 2020–2050 period. (The cost of financing the primary deficits projected over that period at current interest rates accounts for the remaining four-fifths of that increase.) Therefore, even though rising interest rates have a sizable effect on the fiscal outlook, rising debt levels would substantially boost interest costs even if rates remained unchanged.

CBO’s projections of interest rates reflect several factors. Among them are the historically low interest rates over the past decade, the trajectory of federal debt in the agency’s baseline, and prices in financial markets that indicate expectations of future interest rates. Although factors such as slower growth of the labor force are

projected to put downward pressure on interest rates, CBO expects rates to rise because those factors are more than offset by other, larger factors, such as increases in federal borrowing and slower growth in saving owing to the aging of the population (see Appendix A for details).

Over the past decade, interest rates on Treasury securities have remained relatively low compared with rates in prior decades, despite the historically large amount of federal borrowing. And interest rates have been low recently, even with the increased borrowing to fund fiscal actions in response to the pandemic. Those low rates over the past decade and more recently also partly reflect actions taken by the Federal Reserve.

Recognizing the persistence of the lower interest rates, CBO revised its projections of interest rates downward several times in recent years. For example, the average interest rate on federal debt from 2020 to 2030 is projected to be 1.5 percent, which is 3.5 percentage points lower than what 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 -0.5 percent, which is 3.1 percentage points lower than CBO’s 2010 projection. Those downward revisions lower the projected costs of federal borrowing under current law and reduce the estimated changes in fiscal policy that would be necessary to stabilize debt as a share of GDP.

Although persistently low interest rates have dampened the costs of federal borrowing, such low rates can constrain the traditional use of interest rates as the Federal Reserve’s predominant monetary policy tool. If short-term interest rates are very low or even decline to zero, the Federal Reserve is less able to lower interest rates to support economic growth or respond to a negative shock—such as the sudden slowdown in the global economy associated with the pandemic. During and after the financial crisis associated with the 2007–2009 recession, and also in response to the adverse economic effects of the pandemic, the Federal Reserve has employed additional policy tools beyond interest rates. For example, it has set up special credit facilities and instituted large-scale purchases of financial assets to promote liquidity and bolster economic activity. Nonetheless, the effectiveness of such policies on the long-run performance of the economy is unclear. By keeping interest rates higher over time, higher debt would allow for greater potential use of traditional monetary policy tools.

### Greater Risk of a Fiscal Crisis

High and rising federal debt increases the likelihood of a fiscal crisis. Such a crisis can occur as investors' confidence in the U.S. government's fiscal position erodes, undermining the value of Treasury securities and driving up interest rates on federal debt because investors would demand higher yields to purchase those securities. Concerns about the government's fiscal position could lead to a sudden and potentially spiraling increase in people's expectations of inflation, a large drop in the value of the dollar, or a loss of confidence in the government's ability or commitment to repay its debt in full. The risk of a fiscal crisis appears to be low in the short run despite the higher deficits and debt stemming from the pandemic. That risk is also mitigated in the short run by certain characteristics of the U.S. financial system, including independent monetary policy, government debt issued in U.S. dollars, and a central place in the global financial system. Nonetheless, the much higher debt over time would raise the risk of a fiscal crisis in the years ahead.

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 would have several options to respond to a fiscal crisis. Each option would have economic and distributional consequences, though, and choosing among them would involve difficult trade-offs. One policy option would be to dramatically cut noninterest spending or increase taxes, which would have adverse effects on the economy in the short run. Two other options would have more significant effects on currency and financial markets. One option would be to use monetary policy to purchase Treasury securities, which may initially have limited adverse effects but which ultimately would in all likelihood raise inflation (relative to prior inflation expectations), thereby reducing the real cost of financing outstanding debt. Such an action could lead to depreciation of the dollar and undermine its role in international currency markets, which in turn could lead to even higher inflation and declines in real wealth and purchasing power. The other option would

be to restructure the debt (that is, modify the contractual terms of existing obligations) so that repayment was feasible. (Restructuring the debt is generally viewed as less likely because it would undermine investors' confidence in the government's commitment to repay its debt in full.) Coordination of fiscal and monetary policies in times of crisis also could present significant challenges.

The risk of a fiscal crisis depends on factors beyond the amount of federal debt. Ultimately, what matters is the ability to service the debt and the cost of doing so. Among the factors affecting that ability and cost are investors' expectations about the budget and economic outlook, which can change over time, and about domestic and international financial conditions, including interest rates and exchange rates. Furthermore, the relationships between those factors and the risk of a crisis are uncertain and can shift—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; nor is there an identifiable set point at which interest costs as a percentage of GDP become unsustainable. Indeed, CBO cannot reliably quantify the probability that a fiscal crisis might 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.

The risk of a fiscal crisis in the near future is not currently apparent in financial markets, even though the pandemic has increased the federal deficit and caused great uncertainty about the speed and scope of a recovery. However, financial markets do not always fully reflect risks on the horizon and, more importantly, the risk of a fiscal crisis could change suddenly in the wake of subsequent unexpected events. For example, a sudden rise in interest rates could lead investors to become concerned about the government's fiscal position over the long term as their uncertainty grew as to whether the rise was temporary or signaled a long-run trend.

### 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—who would hold larger and larger amounts of that high and rising debt—could pose other challenges, such as making U.S. financial markets more vulnerable to a change in the valuation of U.S. assets by participants in global markets.

The projected amount of debt increases 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 the average borrowing rate was 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 15 percent of GDP 30 years from now, which is 7 percentage points more than in CBO’s extended baseline projections. That amount is equal to about four-fifths of federal revenues projected for 2050. Moreover, under those circumstances, federal debt would be over 260 percent of GDP, which is about 70 percentage points higher than in the extended baseline projections. If interest rates jumped, investors could become concerned about the government’s fiscal position over the long term as they tried 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 and rising debt (and the large deficits that result) might also constrain policymakers’ choices about fiscal policy going forward. As the federal government increased its borrowing, ever-larger cuts in primary deficits would be required to achieve particular targets for deficits or debt. As a result, policymakers could feel restrained from using deficit-financed fiscal policy to respond to unforeseen events or for other purposes (to promote economic activity or further other goals, for example), a situation that might not occur if debt and deficits were lower (or the increase was smaller). High debt could also undermine national security if it compromised the international geopolitical role of the United States or if policymakers felt constrained from increasing national security spending to prepare for or resolve an international crisis.

Risks also arise from the interaction of fiscal and monetary policy in response to higher debt. For example, the Federal Reserve’s large-scale purchases of Treasury securities and other financial assets in response to the pandemic pose risks to the outlook for interest rates. CBO expects the Federal Reserve’s holdings of Treasury securities, measured as a share of GDP, to begin declining after 2024, which would put modest upward pressure on long-term interest rates. There is some risk, however, that participants in financial markets could react adversely to the Federal Reserve’s efforts to taper its holdings of such assets by sharply reducing their demand for Treasury securities, which would cause long-term interest rates to rise rapidly. There is also a possibility that concern about such an adverse reaction by financial market participants could cause the Federal Reserve to delay reducing its holdings of Treasury securities, which would result in lower long-term interest rates for longer than CBO projects in its baseline.

### **The Size and Timing of Policy Changes Needed to Meet Various Targets for Debt**

CBO estimated the size of changes in spending or revenues (or both) 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 deficit reductions occurred later, and it examined how waiting to resolve the long-term fiscal imbalance would affect the economy and different generations of the U.S. population.

#### **The Size of Policy Changes**

If lawmakers wanted debt in 2050 to remain at roughly its level at the end of this fiscal year (about 100 percent of GDP), they could cut noninterest spending or raise revenues (or do both) in each year beginning in 2025 by amounts totaling 2.9 percent of GDP (see Table 2). In 2025, 2.9 percent of GDP would be about \$730 billion, or \$2,200 per person. If such an adjustment was made in 2025 and each year thereafter, the budget would show a primary deficit of 1.9 percent of GDP in 2030 and 4.7 percent of GDP by 2050. If such changes came entirely from either revenues or spending, they would amount to a 17 percent increase in revenues or a 14 percent cut in noninterest spending, on average (relative to amounts in CBO’s extended baseline projections). After 2050, growth in spending relative to the size of the economy would probably continue to outpace growth in revenues, and deficits would rise further.

Table 2.

### The Size of Policy Changes Needed to Make Federal Debt Meet Two Possible Goals in 2050

	2050 Debt Target	
	79 Percent of GDP	100 Percent of GDP
Deficit Reduction Needed		
Annually, 2025 to 2050 (Percentage of GDP)	3.6	2.9
Total reduction in 2025 (Billions of dollars)	900	730
Per person reduction in 2025 (Dollars)	2,700	2,200

Source: Congressional Budget Office.

In this table, the indicated sizes of policy changes are relative to CBO's extended baseline projections. Those projections, which generally reflect current law, follow CBO's 10-year baseline budget projections and then extend 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.

Increases in revenues or cuts in noninterest spending would need to be larger than 2.9 percent of GDP to reduce debt to its 2019 level (79 percent of GDP) by 2050. To achieve that goal, lawmakers could increase revenues or cut noninterest spending (in relation to amounts under current law) or adopt some combination of those two actions beginning in 2025 by amounts totaling 3.6 percent of GDP each year. In 2025, 3.6 percent of GDP would be about \$900 billion, or \$2,700 per person. If such changes were made solely by increasing revenues or cutting noninterest spending, total revenues would need to be about 20 percent higher, or noninterest spending would need to be about 17 percent lower, on average, in each year over the 2025–2050 period.

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 resources available for private investment in capital goods and services, which boosts 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

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 stabilize or reduce debt as a percentage of GDP.

CBO estimated the extent to which the size of policy adjustments would change if deficit reduction was delayed until 2030 or 2035. (The agency did not make any assumptions about the specific policy changes that might be used to reduce the deficit.) If lawmakers sought to reduce debt as a share of GDP to 79 percent in 2050 and if the necessary policy changes did not take effect until 2030, the annual reduction in the primary deficit would need to amount to 4.4 percent of GDP rather than the 3.6 percent that would accomplish the same goal if the changes were made starting in 2025 (see Figure 5). If lawmakers chose to wait another five years to implement the policies (having them take effect in 2035), even larger changes would be necessary; in that case, the required annual reduction in the primary deficit would amount to 5.9 percent of GDP.

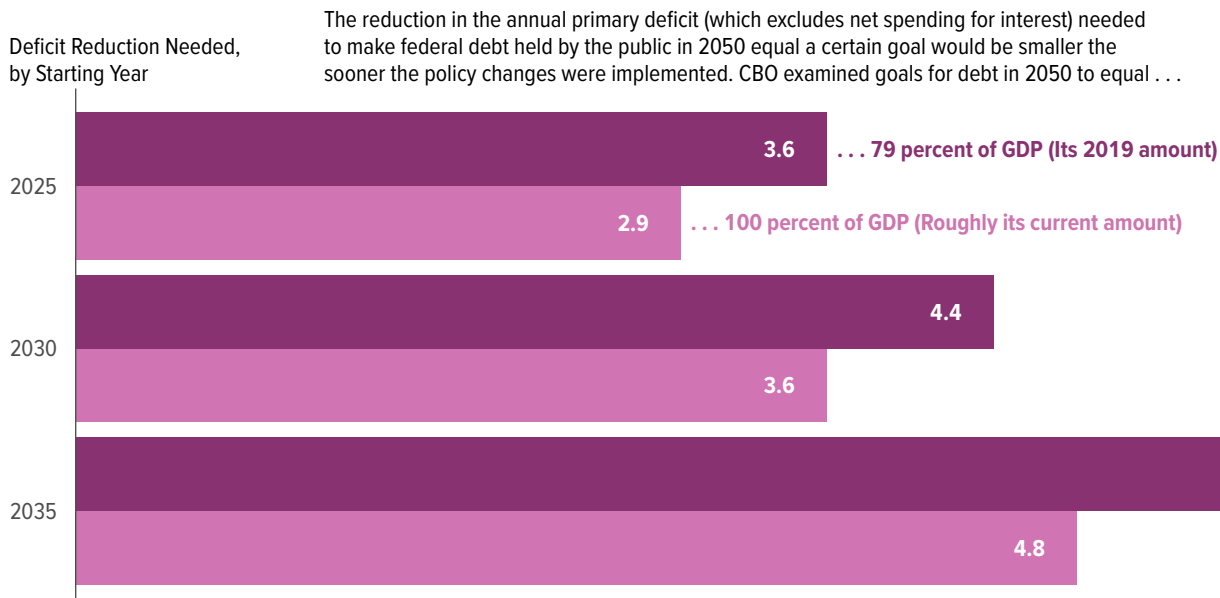
**Effects on the Economy.** Over the first few years following their adoption, such policy changes would dampen overall demand for goods and services, thus decreasing output and employment below amounts projected under current law. (CBO did not analyze short-term economic outcomes under those scenarios.) That dampening effect would be temporary, however. Lower deficits and debt would eventually reduce prices and interest rates, which would increase the resources available for private investment, household consumption, and net exports.

If policymakers decided to reduce the deficit sooner rather than later, the benefits would include a smaller accumulated debt, smaller policy changes required to achieve long-term outcomes, and less uncertainty about the expected changes.

Figure 5.

### How Timing Affects the Size of Policy Changes Needed to Make Federal Debt Meet Two Possible Goals in 2050

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

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.

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 adjusting 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 reduced 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.

**Effects on Different Generations.** Faster or slower implementation of policies to reduce budget deficits would tend to impose different burdens on different generations. Reducing deficits sooner would probably impose a greater burden on older workers and retirees but a lesser burden on younger workers and future generations. Reducing deficits later would impose a smaller burden on older workers and retirees but a greater burden on younger workers and future generations. However, the additional burden on people in younger generations resulting from delaying policy changes would be relatively small compared with their lifetime earnings potential because, on average, people in future generations are expected to have much higher income than those in current generations.

CBO studied the effects on the average real disposable income per person in various generations from waiting to resolve the long-term fiscal imbalance. In particular, the agency 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 people in generations born after the earlier implementation date would be lower under the policy with a 10-year delay.<sup>10</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 two groups could either gain or lose from delayed action, depending on the specific details of the policy changes.<sup>11</sup>

CBO's analysis indicates that delaying policy changes would reduce the well-being of younger generations (compared with their well-being if policy changes occurred earlier). Moreover, the farther 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.

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

CBO's projections of demographic and economic trends are key determinants of the long-term budget outlook. (For a description of those projections, see Appendix A.) Through 2030, the economic and demographic projections presented in this report are the same as those that CBO published in July.<sup>12</sup> Those projections reflect the demographic and economic effects of the pandemic and associated social distancing measures, and they include the agency's estimates of the economic effects of enacted

legislation. In CBO's assessment, that legislation will partially offset the deterioration in economic conditions brought about by the pandemic.<sup>13</sup> For years beyond 2030, CBO 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>14</sup>

- A demographic model is used to project the size of the population by age and sex.
- A microsimulation model is used to project annual changes in demographic characteristics and economic outcomes for 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.
- A model of economic growth is used to simulate how demographic changes, economic factors, and fiscal policy affect the U.S. economy and, in turn, the federal budget.

Those four components interact in various ways. For example, the economic projections reflect how increases in spending and revenues in the extended baseline projections would affect the economy. 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 affects the federal budget and the nation's economy. For example, the age distribution 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 334 million at the beginning of 2020 to 378 million in 2050, expanding by 0.4 percent per year, on average. That rate is slower than the average annual rate of growth over the past 50 years (0.9 percent). The share of the population

10. Those results are preliminary conclusions from an update to 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).

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

12. See Congressional Budget Office, *An Update to the Economic Outlook: 2020 to 2030* (July 2020), [www.cbo.gov/publication/56442](http://www.cbo.gov/publication/56442).

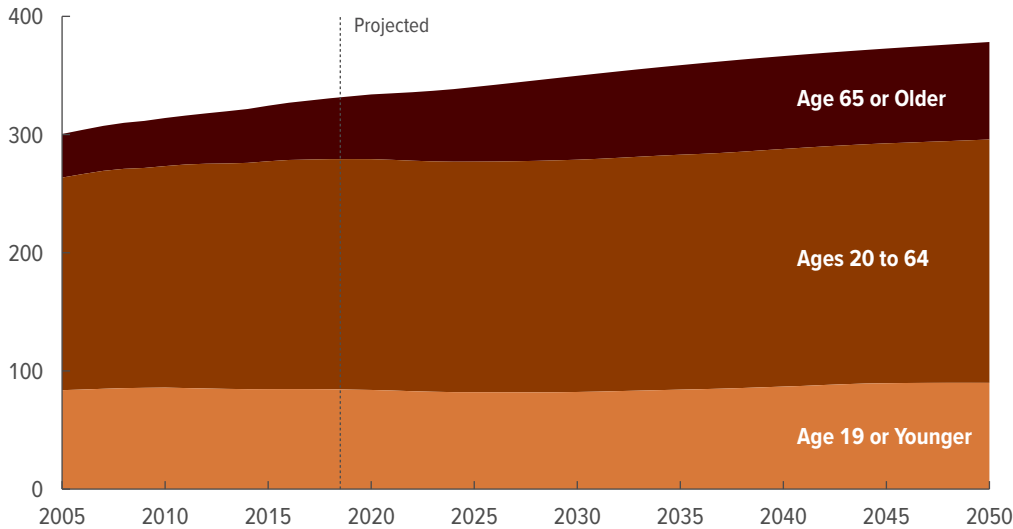
13. See Congressional Budget Office, *The Effects of Pandemic-Related Legislation on Output* (September 2020), [www.cbo.gov/publication/56537](http://www.cbo.gov/publication/56537).

14. 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 6.

**Population, by Age Group**

Millions of People



CBO projects that the population will become older, on average, throughout the projection period as the share of the population age 65 or older continues to grow.

Source: Congressional Budget Office.

Actual data are shown through calendar year 2018, the most recent year for which such data are available.

that is age 65 or older also expands over the coming decades, continuing a long-standing historical trend. By 2050, 22 percent of the population will be 65 or older, whereas today that share is 16 percent (see Figure 6). To estimate the growth of the U.S. population, CBO projects rates of fertility, net immigration, and mortality.

**Fertility.** In CBO’s projections, the total fertility rate—representing the average number of children that a woman has in her lifetime—decreases from 1.7 children per woman in 2020 to 1.6 children per woman in 2021 in response to the pandemic. The rate gradually increases to 1.9 children per woman by 2028 and remains at that level through 2050. That rate is below the replacement-level fertility rate of 2.1 children per woman that generally ensures that the population will remain steady, with no migration.

In general, the total fertility rate falls during recessions and rebounds during recoveries. Instead of rebounding after the 2007–2009 recession, however, the fertility rate fell from 2.1 children per woman in 2007 to 1.7 children per woman in 2019 (the most recent year for which

data are available).<sup>15</sup> That decline in fertility rates, which was largely attributable to fewer births among women younger than age 24, results in slower growth of the population in the future and reduces CBO’s projections of economic growth in the second decade of the projection period (2031 to 2040).

**Immigration.** Because fertility is projected to remain below its replacement-level rate, the projected growth of the U.S. population increasingly stems from net immigration flows. In 2018, net immigration accounted for approximately 48 percent of overall population growth. In 2050, by contrast, projected net immigration accounts for nearly all population growth. CBO’s projection of net immigration in the near term includes the effects of changing economic conditions, heightened travel restrictions, and reduced visa processing capabilities associated with the pandemic. In CBO’s projections, the rate of net annual immigration averages 2.8 immigrants per 1,000 people in the U.S. population over the next 30 years, rising from 1.6 immigrants per 1,000 people in 2020 to 2.9 immigrants per 1,000 people by 2050.

15. See Brady E. Hamilton and others, *Births: Provisional Data for 2019*, Vital Statistics Rapid Release Report 8 (National Center for Health Statistics, May 2020), [www.cdc.gov/nchs/data/vsrr/vsrr-8-508.pdf](http://www.cdc.gov/nchs/data/vsrr/vsrr-8-508.pdf) (372 KB).

CBO projects net flows for three broad categories of immigrants: legal permanent residents, foreign-born people without legal status, and legal temporary residents.<sup>16</sup> Net flows of legal permanent residents constitute the largest category, averaging 790,000 people per year in the first decade of the projection period (2020 to 2030), rising to 870,000 people per year in the third decade (2041 to 2050). The other two categories are much smaller: Net flows of foreign-born people without legal status average 10,000 people per year in the first decade, rising to 130,000 people per year in the third decade. The net flow of legal temporary residents averages 60,000 people per year in the first decade, rising to 80,000 people per year in the third decade. Between 2021 and 2040, immigration is projected to increase as the effects of the pandemic ease and economic conditions are once again an important predictor of net flows of foreign-born people without legal status.

**Mortality.** Mortality rates are projected to decline (that is, life expectancy is projected to increase) over the next 30 years, on average. That decline in mortality rates is projected to occur even though the number of deaths per 1,000 people in the U.S. population has increased in recent years, because CBO expects the rate of mortality improvement to return to its longer-run trend.<sup>17</sup> In the near term, the agency's projections of mortality incorporate more deaths among people age 55 or older to reflect the effects of the pandemic. Those additional deaths include fatalities directly attributable to the coronavirus as well as increased fatalities attributable to heart disease, diabetes, and pneumonia and other respiratory illnesses; they are partially offset by decreases in fatalities associated with a reduction in accidental deaths. Life expectancy at birth is projected to increase from an average of

79.0 years in the first decade of the projection period to an average of 81.6 years in the third decade. Similarly, life expectancy at age 65 is projected to increase from an average of 19.7 years in the first decade to an average of 21.3 years in the third decade of the period.<sup>18</sup>

### Economic Projections

The performance of the U.S. economy in coming decades will affect the federal government's spending, revenues, and accumulation of debt. CBO makes its long-run economic projections by assessing trends in key economic variables, such as the size of the labor force, productivity growth, and interest rates. The agency also considers the ways in which factors like climate change and fiscal policy influence economic activity.

In CBO's extended baseline projections, growth in potential (or maximum sustainable) GDP over the next 30 years is slower than it has been over the past 50 years. From 2020 to 2050, real potential GDP increases at an average rate of 1.6 percent per year, whereas it grew at an average annual rate of 2.8 percent from 1969 to 2019.

**Size of the Labor Force.** That slower growth in potential GDP 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 0.3 percent per year, on average, through 2050; over the past 50 years, its average annual rate of growth was 1.4 percent (see Figure 7). Slowing population growth and the aging of the population account for most of that slowdown.

**Productivity Growth.** The agency projects that real GDP per hour worked, a measure of economywide productivity, will grow at an average annual rate of just under 1.3 percent over the next 30 years. That rate is nearly 0.3 percentage points slower than the average annual rate of growth over the past 30 years. A separate measure of productivity, potential labor force productivity (that is, potential output per member of the potential labor force) is also expected to grow at an annual average rate of 1.3 percent over the 2020–2050 period (see Figure 7).

16. CBO uses the term “foreign-born people without legal status” to refer to foreign-born people who entered the United States illegally or who entered legally in a temporary status and then remained after that legal status expired; both categories of people are not authorized to work in the United States. Foreign-born people without legal status also include beneficiaries under Temporary Protected Status, beneficiaries under policies whereby the executive branch does not seek their immediate deportation (such as Deferred Action for Childhood Arrivals), and people who are paroled and allowed into the country while awaiting deportation proceedings in immigration courts. Many of those people are authorized to work in the United States.

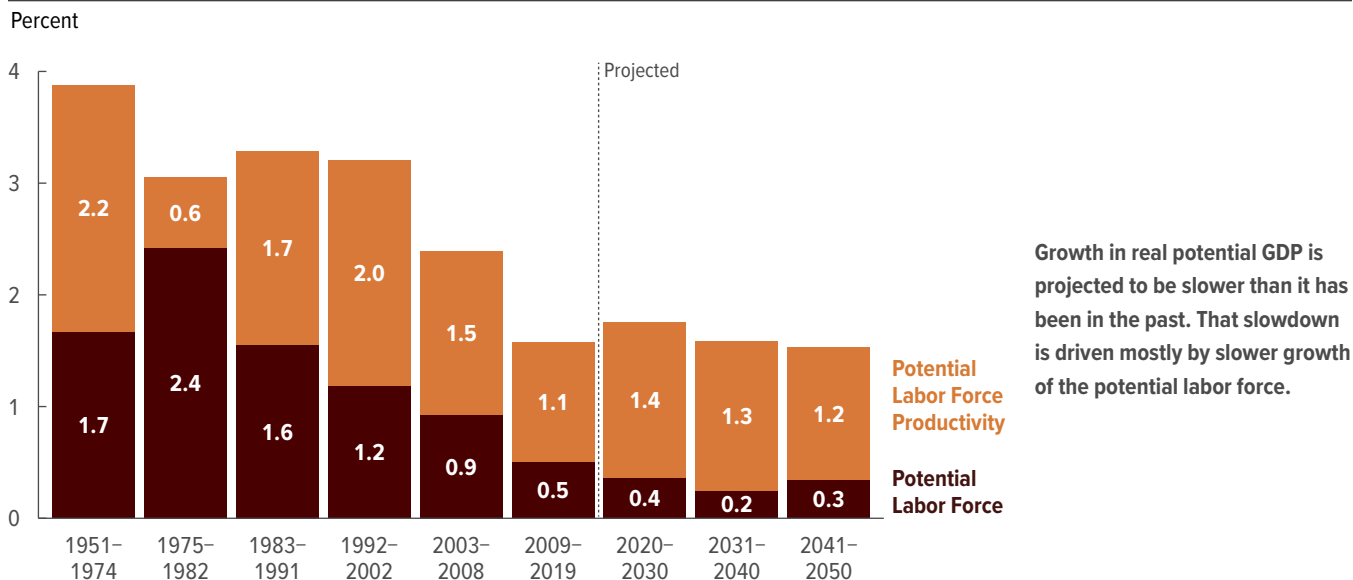
17. See Jiaquan Xu and others, *Mortality in the United States, 2018*, Data Brief 355 (National Center for Health Statistics, January 2020), [www.cdc.gov/nchs/data/databriefs/db355-h.pdf](http://www.cdc.gov/nchs/data/databriefs/db355-h.pdf) (424 KB).

18. That measure is for 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 people of various ages.



Figure 7.

### Average Annual Growth of Real Potential GDP



Growth in real potential GDP is projected to be slower than it has been in the past. That slowdown is driven mostly by slower growth of the potential labor force.

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 to real potential GDP growth are growth in the potential labor force and growth in 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. Growth in potential labor force productivity is the growth of the ratio of real potential GDP to the potential labor force, or the growth in real potential GDP that is not explained by growth in the potential labor force.

GDP = gross domestic product.

Growth of GDP per hour worked is determined by two factors. One factor is the accumulation of capital, such as structures and equipment, intellectual property products (such as computer software), and residential housing. The second factor is the growth of total factor productivity (TFP)—real output per unit of combined labor and capital in the various sectors of the economy. Most TFP growth occurs in the nonfarm business sector, which accounts for about three-quarters of economic activity. Several trends and developments underlie CBO’s projection of TFP, including trends in labor quality (workers’ educational attainment and experience), federal investment, and climate change. Although many of those trends are unaffected by the pandemic, some may be affected in ways that could have persistent effects on output. For instance, a significant loss of effective schooling among today’s children would have lasting negative effects.

Both factors are projected to grow more slowly over the coming 30 years than they did in the preceding 30 years. Capital accumulation is projected to grow particularly slowly, in part because increased federal borrowing is projected to crowd out private investment. In contrast, growth of nonfarm business TFP is projected to accelerate from its historically slow rate of recent years and grow at an average rate only slightly slower than the average of the past 30 years.

**Interest Rates.** CBO expects interest rates to be lower in 2020 than they were in 2019, and short-term interest rates to remain low through 2025 before gradually rising over the remainder of the decade. In CBO’s projections, rates continue to rise from 2030 to 2050 but still remain lower than they have been historically. Notably, the interest rate on 10-year Treasury notes rises from an average of 0.7 percent in mid-2020 to 3.2 percent in 2030 and 4.8 percent in 2050—one percentage point below the 5.8 percent average recorded over the 1990–2007 period.

Several factors, including slower growth of the labor force, slower productivity growth, and lower inflation than in the past, are expected to keep interest rates below their historical levels; in CBO's projections, the effects of those three factors and others outweigh the effects of rising federal debt and other factors that tend to push interest rates 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 because shorter-term debt is less risky, and the average term to maturity for federal debt has been less than 10 years since the 1950s.) On the basis of projections of interest rate spreads, CBO expects the average interest rate on federal debt to be 0.3 percentage points lower than the interest rate on 10-year Treasury notes after 2035. As a result, in CBO's projections, the average interest rate on federal debt rises from 2.1 percent in 2030 to 4.4 percent by 2050.

**Effects of Climate Change.** Climate change is expected to affect GDP in a variety of ways, some of which will increase output and some of which will reduce output, though CBO expects that climate change will, on net, reduce GDP. For instance, longer growing seasons in northern states are expected to increase agricultural output, but increased instances of extreme heat in other regions are expected to reduce agricultural output. Stronger hurricanes and bigger storm surges caused by rising sea levels are expected to decrease economic output, on net, by reducing the nation's capital stock.

CBO projects that, on net, climate change will reduce the growth rate of real GDP from 2020 to 2050 by an average of 0.03 percentage points compared with what the growth rate of real GDP would have been if the climatic conditions remained the same through 2050 as they were at the end of the 20th century. That growth rate reduction, accumulated over 30 years, lowers CBO's projected level of real GDP in 2050 by 1.0 percent.

CBO's projection is in the middle of a wide range of possible outcomes, reflecting a variety of economic and scientific uncertainties. CBO also expects climate change

to have various effects on the United States that are not directly reflected in economic output (see Box 1).<sup>19</sup>

**Effects of Fiscal Policy.** CBO's economic projections incorporate the macroeconomic effects of projected federal deficits as well as changes in federal tax and spending policies under current law. In particular, the agency projects that borrowing by the federal government would crowd out some private investment in capital over time. Over the next few years, that crowding out of private investment would be much smaller than it would be otherwise because economic conditions brought about by the pandemic will cause short-term interest rates to remain near zero, CBO projects. As the economy expands and interest rates rise, the crowding out of private investment would increase, causing output to be lower in the long term than it would be otherwise, especially in the last two decades of the projection period. Less private investment and a smaller capital stock would also make workers less productive, leading to lower wages, which 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. Under current law, marginal tax rates on individual income are scheduled to rise at the end of 2025. Moreover, as more income is pushed into higher tax brackets over time, labor and capital income face higher effective tax rates.<sup>20</sup> Higher marginal tax rates on labor income would reduce people's after-tax wages and thus lessen their incentive to work. Similarly, an increase in the marginal tax rate on capital income would reduce people's incentives to save and invest, resulting in a lower stock of productive capital, which reduces labor productivity and puts downward pressure on wages. All told, less private investment and a smaller labor supply would decrease economic output and income.

19. For additional information on the methodology CBO used to estimate the effect of climate change on GDP, see Evan Herrstadt and Terry Dinan, *CBO's Projection of the Effect of Climate Change on U.S. Economic Output*, Working Paper 2020-06 (Congressional Budget Office, September 2020), [www.cbo.gov/publication/56505](http://www.cbo.gov/publication/56505).

20. See Congressional Budget Office, "How Income Growth Affects Tax Revenues in CBO's Long-Term Budget Projections" (presentation, June 2019), [www.cbo.gov/publication/55368](http://www.cbo.gov/publication/55368).

## Projected Spending Through 2050

Spending by the government is projected to represent a larger percentage of GDP in coming years than it has, on average, over the past 50 years. Moreover, 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 by 2050 (see Figure 8 on page 26). Net spending for interest would account for a much greater portion of total federal spending in 2050 than it did in 2019, 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 smaller share of all federal noninterest spending in 2050 than it did in 2019.

Excluding net spending on interest, federal outlays averaged about 18 percent of GDP from 1970 to 2019. Under current law, noninterest outlays are projected to reach 30.4 percent of GDP in 2020 (because of increased spending in response to the pandemic and decreased nominal GDP from the previous year), up from 19.2 percent in 2019. In CBO's baseline projections, noninterest spending starts to decline as a share of GDP in 2021, as the effects of legislation related to the pandemic wane, and reaches 20.9 percent in 2030.

Relative to GDP, mandatory spending is projected to fall from 2021 to 2024 and then rise in most years through 2030. (Mandatory spending includes spending on Social Security and the major health care programs—mainly Medicare and Medicaid—as well as outlays for many smaller programs.) Outlays for discretionary programs decrease in relation to GDP from 2021 to 2030 because of caps on 2021 funding and because the rate of inflation is projected to be lower than the rate of growth of nominal GDP. (Inflation rates are used to project future spending under the rules that govern the construction of CBO's baseline projections.)

After 2030, under the assumptions that govern the extended baseline, noninterest spending relative to the size of the economy continues to rise, reaching 23.1 percent of GDP by 2050. (For a summary of the assumptions about spending and revenues that underlie CBO's extended baseline, see Table 3 on page 27.) The two biggest mandatory spending programs, Social Security and Medicare, account for most of the increase in noninterest outlays, whereas discretionary spending is assumed to remain constant as a share of GDP through 2050.

Under current law, net interest costs are projected to decline in the first few years of the projection period, as the average interest rates on debt held by the public remain low and the effects of those lower rates initially more than offset the effects of the accumulating debt. After several years, though, rising average interest rates on federal debt, along with projected increases in the amount of that debt, cause net interest costs to increase. By 2050, those costs are projected to equal 8 percent of GDP (nearly quadruple their value in 2030), boosting total federal spending to 31 percent of GDP in that year. 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.

## 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 the number of people age 65 or older—the group that receives most of the benefits provided by Social Security and Medicare—has been growing significantly. In CBO's extended baseline, the aging of the U.S. population continues to drive up outlays for Social Security and Medicare. Outlays for Medicare also climb because, in CBO's estimation, health care costs per person will continue to rise. By 2050, CBO projects, federal spending for Social Security, Medicare, and Medicaid (the federal health care program for people with limited income and resources) for people age 65 or older would account for about half of all federal noninterest spending, rising from about one-third in 2020.

**Social Security.** Social Security is the largest single program in the federal budget. Its two components pay benefits to about 65 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.

In CBO's projections, spending for Social Security increases noticeably as a share of the economy, continuing the trend of the past five decades. The number of Social Security beneficiaries rises from about 65 million

## Box 1.

**Interpreting CBO's Projection of the Effect of Climate Change on Economic Output**

The Congressional Budget Office takes into account many factors in producing its long-term economic forecasts, including the effect of climate change on growth in real (inflation-adjusted) U.S. gross domestic product (GDP). Climate change is expected to have both positive and negative effects on the U.S. economy. CBO projects that, on net, climate change will reduce the growth rate of real GDP from 2020 to 2050 by an average of 0.03 percentage points compared with what the growth rate of real GDP would have been if the climatic conditions remained the same through 2050 as they were at the end of the 20th century. That reduction in the growth rate, accumulated over 30 years, lowers CBO's projected level of real GDP in 2050 by 1.0 percent.

This box provides information on the effects of climate change on GDP and on aspects of people's well-being not reflected in GDP. It also examines the uncertainty associated with CBO's projection and the method that the agency uses in this projection compared with the method it used in previous years.<sup>1</sup>

**How Climate Change Affects GDP**

Climate change affects GDP both directly and indirectly over various time periods. Some aspects of climate change would affect GDP in a relatively direct manner and would occur immediately. For example, if a farmer's crop yield was lower because of extreme heat, that farmer's contribution to GDP would also be smaller in that year. But if a farmer's yield was higher because a cold-weather region experienced a longer-than-usual growing season, that farmer's contribution to GDP would be larger. Similarly, if extreme heat made construction workers less productive and reduced the number of jobs their crew could complete in a season, their contribution to GDP would be smaller in that year. But if a reduction in extreme cold allowed that crew to work a longer construction season, their contribution to GDP would be larger in that year.

Other aspects of climate change would have more complicated and indirect effects on GDP that might arise over an extended period. For example, suppose that increases in hurricane damage induced by climate change resulted in the destruction of \$50 million worth of factory equipment.

Because the value of that stock of equipment is not counted in the current production of U.S. goods and services, that \$50 million worth of damage would not count as a reduction in GDP. Instead, the \$50 million of damage would affect future GDP in three ways.

First, the factory would not be able to produce at its prehurricane level, and GDP would be reduced to the extent that other U.S. factories could not make up that missing output. Second, if the owner of the factory replaced the \$50 million of destroyed equipment, that investment would be included in GDP in the year the new equipment was purchased. Third, the economy's capital stock would be smaller in the future, either because the owner did not replace the destroyed equipment or because replacing the equipment crowded out other investments that would have been made in the absence of climate change. The smaller capital stock would result in less production, which would decrease GDP in the future. The cumulative loss of GDP could thus exceed the initial \$50 million worth of damage.

Although CBO's projection reflects those types of direct and indirect effects, it does not fully capture all aspects of climate change that could affect GDP. The agency cannot determine whether the net effect of those aspects is positive or negative. For example, CBO's projection does not fully account for potential spillover effects on the U.S. economy from migration, social upheaval, and reduced economic performance in other countries owing to climate change. Those international spillovers could have positive effects on U.S. GDP (for example, an increase in the labor supply resulting from higher immigration rates) or negative effects on U.S. GDP (for example, a reduction in demand for U.S. exports). In addition, CBO's projection does not capture all the effects of rising sea levels on GDP (it captures the effects of storm surge damage but not the effects of inundation) or all the effects of investments made to adapt to the changing climate. Expenditures on such adaptations, such as seawalls, air conditioning, or irrigation systems, may boost GDP in the year that the spending occurs. However, investing in such measures could also crowd out other productive investments and thus reduce GDP in the future. Even investing in more climate-resilient versions of existing capital could increase costs without enhancing productivity. Finally, CBO's projection does not fully capture all the effects associated with adjusting to a new climate, such

1. For additional information, see Evan Herrnstadt and Terry Dinan, *CBO's Projection of the Effect of Climate Change on U.S. Economic Output*, Working Paper 2020-06 (Congressional Budget Office, September 2020), [www.cbo.gov/publication/56505](http://www.cbo.gov/publication/56505).

Continued

Box 1.

Continued

## Interpreting CBO's Projection of the Effect of Climate Change on Economic Output

as the movement of people away from regions of the country that have become uncomfortably hot or toward regions that have become more temperate.

### How Climate Change Affects People's Well-Being Beyond GDP

In addition to its effects on GDP, climate change would have other effects on people's well-being—some positive and some negative. For example, GDP does not reflect the changes in people's comfort because of milder winters and hotter summers, the risks and living constraints associated with increases in asthma from higher temperatures, increases in premature deaths from heat or tropical disease and decreases in cold-related premature deaths, or the potential disproportionate effects on disadvantaged communities if they are less able to adapt to climate change.

### Uncertainty in CBO's Projection of the Effect of Climate Change on GDP

CBO's analysis of the effect of climate change on GDP is uncertain for many reasons. Some of those reasons relate to inherent uncertainty about the future, such as the following:

- Scientific uncertainty associated with projecting the diffusion of greenhouse gas emissions from the atmosphere into the oceans and biosphere; uncertainty in translating concentrations of greenhouse gases into changes in global climatic conditions, such as global temperatures, sea surface temperatures, and sea levels; and uncertainty in translating those conditions into changes in U.S. regional temperatures, precipitation patterns, hurricane frequencies, and sea levels.
- Uncertainty about the effects of climate change on the rest of the world and the resulting changes to the U.S. economy.
- Uncertainty associated with interactions between future climate change and economic growth. For example, the damage caused by future climate-induced changes in hurricane frequencies and sea levels would be amplified by coastal development.
- Uncertainty about how underlying economic and demographic factors, such as changes in population, income per person, energy use, and technology, will affect future greenhouse gas emissions.

Other sources of uncertainty relate to CBO's modeling approach, such as these:

- Uncertainty in the estimates of the historical relationship between regional weather and regional output.
- Uncertainty about how closely those estimated historical relationships will map to the effects of future climate-determined weather patterns on future U.S. output (including uncertainty about the effects of adaptation), and interactive effects that may arise as different regions simultaneously experience (and adapt to) changes in weather.
- Uncertainty about the persistence of effects from damage, such as GDP losses from damage to capital.

### Changes in CBO's Projection Method

In past analyses, CBO's economic projections incorporated the effect of climate change on the growth rate of real GDP through recent economic data that the agency used to develop its forecast, but the agency did not separately report that effect in its baseline projection of GDP. In light of recent academic research, the agency now expects that the negative effect on the GDP growth rate over the next 30 years will be larger than the rate implied by the effect of climate change on economic outcomes in the past 25 years. In the estimates presented in this report, the agency accounted for that larger negative effect of climate change on economic growth.

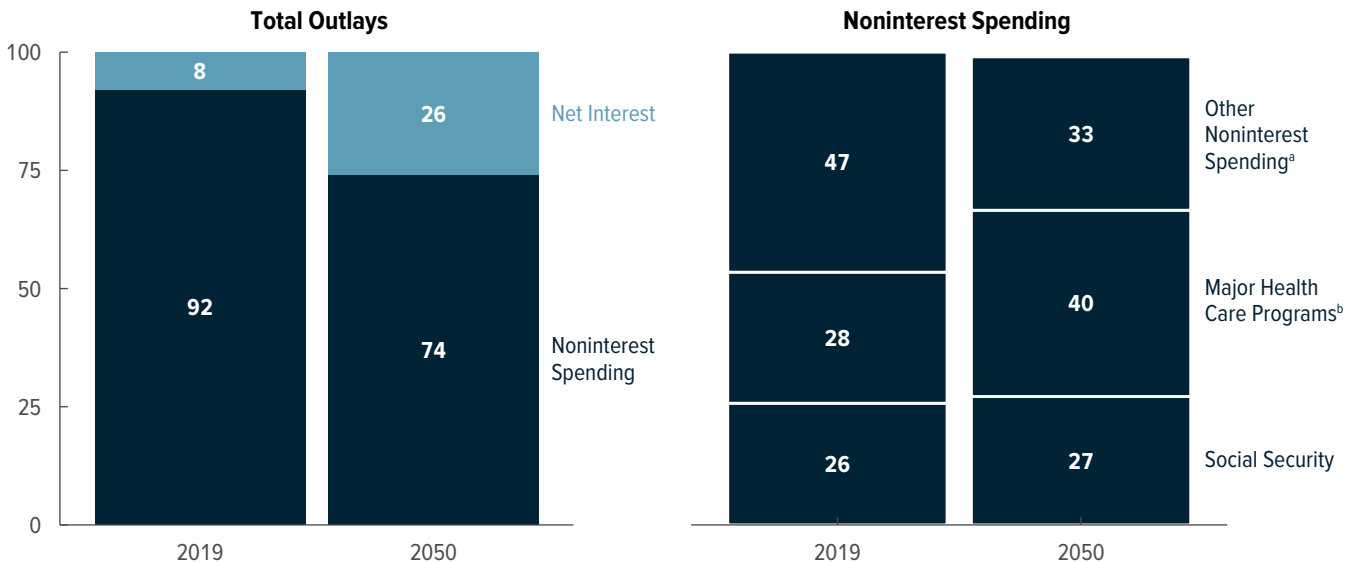
The 0.03 percentage-point reduction in the GDP growth rate that CBO projects reflects both the continuation of the recent effect of climate change on the real GDP growth rate and the impact of increases in that effect that are expected in the future. On its own, the continuation of recent effects of climate change on the growth rate would reduce the average real GDP growth rate from 2020 to 2050 by 0.01 percentage point, relative to the climatic conditions that prevailed at the end of the 20th century, lowering the level of real GDP in 2050 by 0.4 percent. In addition, CBO projects that the increased effects of climate change on real GDP growth will reduce the growth rate by another 0.02 percentage points, reducing the level of real GDP in 2050 by an additional 0.6 percent.



Figure 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.

in 2020 to 96 million in 2050, and spending for the program increases from 5.3 percent of GDP to 6.3 percent over that period (see Figure 9). 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>21</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>22</sup>

The Social Security program is funded by dedicated tax revenues from two sources. Currently, 96 percent of the funding comes from a payroll tax; the rest is collected

from income taxes on Social Security benefits. Revenues from the payroll 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, equaling 4.5 percent of GDP in 2050.

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>23</sup> For Social Security,

21. 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 Barry F. Huston, *Social Security: What Would Happen If the Trust Funds Ran Out?* Report RL33514, version 31 (Congressional Research Service, July 29, 2020), <https://go.usa.gov/xEtw>.

22. 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)).

23. 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.

Table 3.

**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 2030; thereafter, projected spending depends on the estimated number of beneficiaries, the growth of potential GDP per person, and health care costs per beneficiary (for which excess cost growth is projected to move smoothly to a rate of 1 percent by 2050) <sup>a</sup>
Medicaid	As scheduled under current law through 2030; thereafter, projected spending depends on the estimated number of beneficiaries, the growth of potential GDP per person, and health care costs per beneficiary (for which excess cost growth is projected to move smoothly to a rate of 1 percent by 2050)
Children’s Health Insurance Program	As projected in CBO’s baseline through 2030; remaining constant as a percentage of GDP thereafter
Subsidies for Health Insurance Purchased Through the Marketplaces	As scheduled under current law through 2030; thereafter, projected spending depends on the estimated number of beneficiaries, an additional indexing factor for subsidies, the growth of potential GDP per person, and excess cost growth for private health insurance premiums (which is projected to move smoothly to a rate of 1 percent by 2050)
Other Mandatory Spending	As scheduled under current law through 2030; 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 2026 and 2030 in the agency’s baseline published in March 2020
Discretionary Spending	As projected in CBO’s baseline through 2030; beyond that year, CBO projects that, after a five-year transition period, discretionary spending would grow at the rate of nominal GDP
<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>b</sup>
Estate and Gift Taxes	As scheduled under current law
Other Sources of Revenues	As scheduled under current law through 2030; remaining constant as a percentage of GDP thereafter

Source: Congressional Budget Office.

The extended baseline projections, which generally reflect current law, follow CBO’s 10-year baseline budget projections and then extend 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, *An Update to the Budget Outlook: 2020 to 2030* (September 2020), [www.cbo.gov/publication/56517](http://www.cbo.gov/publication/56517).

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

GDP = gross domestic product.

- a. Assumes the payment of full benefits as scheduled under current law, regardless of the amounts in the program’s trust funds.
- b. The exception to the current-law assumption applies 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 9.

### 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.



Table 4.

**Summary Financial Measures for the Social Security System**

Projection Period (Calendar years)	Income Rate	Cost Rate	Actuarial Balance (Difference)
<b>As a Percentage of Gross Domestic Product</b>			
25 Years (2020 to 2044)	5.1	6.3	-1.2
50 Years (2020 to 2069)	4.8	6.3	-1.5
75 Years (2020 to 2094)	4.7	6.3	-1.6
<b>As a Percentage of Taxable Payroll</b>			
25 Years (2020 to 2044)	14.5	17.9	-3.4
50 Years (2020 to 2069)	14.0	18.4	-4.3
75 Years (2020 to 2094)	14.0	18.7	-4.7

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 2050, the projections incorporate the feedback from changes in economic variables caused by rising federal debt and marginal tax rates. After 2050, they do not account for such feedback.

Over each projection period, the income rate is the present value of annual tax revenues plus the initial trust fund balance, and the cost rate is the present value of annual outlays plus the present value of a year’s worth of benefits as a reserve at the end of the period, each divided by the present value of gross domestic product 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 specific time. The present value depends on a rate of interest, known as the discount rate, that is used to translate past and future cash flows into current dollars.) The actuarial balance is the difference between the income and cost rates.

that difference is traditionally expressed as a percentage of the present value of taxable payroll over 75 years.<sup>24</sup>

Because the trust funds’ revenues are projected to grow more slowly than their expenditures, the Social Security program has a long-term actuarial deficit. Over the next 75 years, if current laws remained in place, the program’s actuarial deficit would be 1.6 percent of GDP, or 4.7 percent of taxable payroll, CBO projects (see Table 4).<sup>25</sup> (The 75-year projection period used here begins in calendar year 2020 and ends in calendar year 2094.) Thus, according to CBO’s projections, the federal

government could pay the benefits prescribed by current law and maintain the necessary trust fund balances through 2094 if payroll taxes were raised immediately by about 4.7 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.

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 financial path that was sustainable beyond that period. Estimates of the actuarial deficit do not account for revenues or outlays after the 75-year projection period ends, and the gap between revenues and outlays would rise thereafter. Because projected shortfalls are smaller earlier in the period than they are later, such a policy would create surpluses in the next few decades but result in deficits later and would not leave the system on a sustainable financial path after calendar year 2094.

To put Social Security on a sustainable path beyond the 75th year, a policy would need to address the growing gap between revenues and outlays after that year. Even if a policy change was projected to make the system solvent

24. Taxable payroll is the total amount of earnings (wages and self-employment income) from employment covered by Social Security that is below the maximum amount subject to taxation (\$137,700 in 2020).

25. The Social Security trustees have estimated that the program’s 75-year actuarial shortfall would be 3.2 percent of taxable payroll, which is 1.5 percentage points less than CBO’s projection. The projections and analysis in the Social Security trustees’ report do not reflect the potential effects of the pandemic on the Social Security program. For details on the trustees’ projections, see Social Security Administration, *The 2020 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds* (April 2020), [www.ssa.gov/oact/trf/2020](http://www.ssa.gov/oact/trf/2020).

for the next 75 years, it might fail to do so or might exceed its goals because of unexpected changes in demographics or in the economy. Additionally, a substantial policy change would probably have economic effects and could alter the behavior of workers and beneficiaries. Those effects, which are not included in the calculation of the actuarial balance, could cause a policy change to fall short of or exceed its stated goals.

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 2026 and the OASI trust fund would be exhausted in calendar year 2031. If their balances were combined, the OASDI trust funds would be exhausted in calendar year 2031, CBO estimates. The total reduction in annual benefits necessary for the trust funds' outlays to match their revenues in each year after the OASDI trust funds were exhausted would be about 25 percent in 2032 and would rise to about 31 percent in 2050, in CBO's estimation.

**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 for premium tax credits and related spending.<sup>26</sup> Spending on Medicare, which provides health insurance to about 62 million people (most of whom are at least 65 years old), accounts for about three-fifths of that spending.

For 2020 through 2030, CBO projects federal spending for the government's major health care programs under the assumption that the laws governing those programs will, in general, remain unchanged. CBO assumes that Medicare will pay benefits as scheduled under current law (the same assumption it makes for Social Security), regardless of the amounts in the program's trust funds. For projections beyond 2030, CBO uses a formulaic approach that 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. (CBO chose that approach to

address the considerable uncertainty that surrounds the evolution of health care delivery and financing systems.)

Over the past five decades, spending for the major health care programs has grown faster than the economy, and that trend persists in CBO's extended baseline. In 2020, net federal spending for the major health care programs is estimated to equal 6.1 percent of GDP. If current laws generally remained in place, net outlays for those programs would increase to 9.2 percent in 2050: Medicare spending, net of offsetting receipts (mostly premiums paid by enrollees), would grow by 2.5 percent of GDP, and spending on Medicaid and CHIP, combined with outlays for premium tax credits and related spending, would grow by 0.6 percent of GDP (see Figure 10).<sup>27</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 health care programs over the next 30 years. The extent to which health care costs per person (adjusted for demographic changes) grow faster than potential GDP per person is known as excess cost growth. In CBO's extended baseline projections, combined spending for Social Security and the major health care programs grows from 10.8 percent of GDP in 2019 to 17.0 percent in 2050 (see Figure 11).<sup>28</sup> Spending for Social Security increases from 4.9 percent of GDP in 2019 to 6.3 percent in 2050, and spending for the major health care programs rises from 5.9 percent of GDP to 10.7 percent.

In developing its projections, if CBO had set the shares of the population by age at the proportions for 2019 and had set excess cost growth at zero, projected spending for Social Security and the major health care programs as a share of GDP in 2050 would have been 10.6 percent instead of 17.0 percent as projected for 2050. That amount, 10.6 percent of GDP in 2050 without aging and excess cost growth, would be slightly lower than spending on those programs as a share of GDP in 2019,

26. Premium tax credits are federal subsidies for health insurance purchased through the marketplaces established by the Affordable Care Act. Related spending consists almost entirely of payments for risk adjustment and the Basic Health Program (an optional state program that covers low-income residents outside of the health insurance marketplaces).

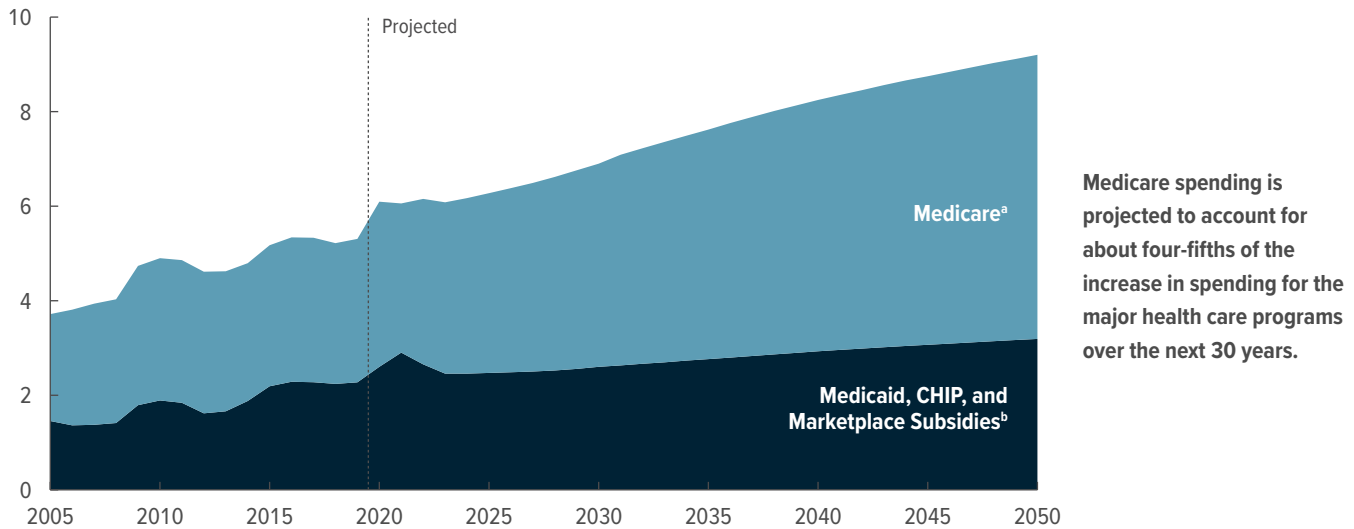
27. In CBO's projections, the outlays for subsidies for insurance purchased through the marketplaces and related spending are combined with outlays for Medicaid and CHIP. Federal subsidies for health insurance for low- and moderate-income households account for most of those outlays.

28. This analysis of the causes of spending growth encompasses gross spending on Medicare and does not reflect receipts credited to the program from premiums and other sources.

Figure 10.

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

Percentage of Gross Domestic Product



Medicare spending is projected to account for about four-fifths 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. “Medicare” refers to spending for Medicare net of premiums and other offsetting receipts.

b. “Marketplace Subsidies” refers to spending to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

which is 10.8 percent of GDP.<sup>29</sup> However, taking into account the aging of the population and rising health care costs per person boosts projected spending for Social Security and the major health care programs by 6.5 percentage points in 2050. Of that difference, the aging of the population accounts for 3.1 percentage points, or about half. Excess cost growth accounts for the remaining 3.4 percentage points of the difference.

**Aging of the Population.** In CBO’s projections, the aging of the baby-boom generation (people born between 1946 and 1964) and improved life expectancy increase

the share of the population that is age 65 or older from 16 percent to 22 percent between 2019 and 2050.<sup>30</sup>

Aging accounts for more than the projected increase in Social Security spending as a percentage of GDP. In other words, if not for the aging of the population, spending on Social Security as a share of the economy would decline from 4.9 percent of GDP in 2019 to 4.7 percent of GDP in 2050. Because the share of the population that is 65 or older is growing, however, a larger segment of the population will receive Social Security benefits, boosting federal spending for the program. Taking that factor into account, CBO projects that

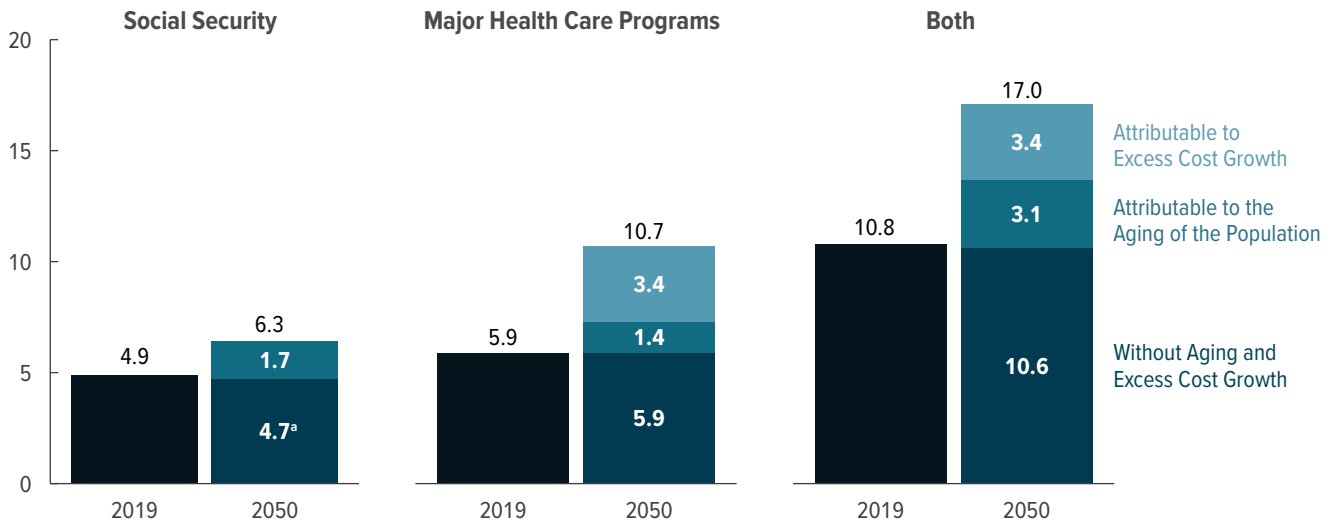
29. If the effects of aging and excess cost growth were removed, spending on Social Security as a percentage of GDP would be smaller in 2050 than it was in 2019, mainly because of the scheduled increases in the full retirement age for Social Security. For more details about the full retirement age for Social Security, see Zhe Li, *The Social Security Retirement Age*, Report R44670, version 11 (Congressional Research Service, September 13, 2019), <https://go.usa.gov/xGnEx>.

30. The youngest baby boomers will reach age 65 in 2029. Their retirement is projected to put upward pressure on Social Security spending, and that pressure will be greater over the next 10 years than over the remainder of the projection period. CBO projects that Social Security spending would increase from 4.9 percent of GDP in 2019 to 6.0 percent by 2030. Spending for the program would continue to grow through 2050 (to 6.3 percent of GDP), although not as quickly as it did between 2019 and 2030.

Figure 11.

**Spending for Social Security and the Major Health Care Programs in 2019 and 2050**

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

Spending for the major health care programs consists of gross spending for Medicare (which does not account for offsetting receipts and premiums), 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.

Excess cost growth is the extent to which the growth rate of nominal health care spending per person (adjusted for demographic changes) 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 did not occur after 2019, spending on Social Security as a share of GDP would be lower in 2050, mainly because of the scheduled increases in the full retirement age for Social Security.

spending on Social Security as a share of the economy would increase to 6.3 percent of GDP in 2050.

Over the 2019–2050 period, aging accounts for about one-third of the projected increase in spending, relative to GDP, for the major health care programs in total. The effects of aging on spending for Medicare are the most significant driver of the effects of aging on spending for the health care programs overall, because Medicare is the largest such program, and most beneficiaries qualify for it 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.

**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. From 2020 through 2050, the average rate of excess cost growth in CBO's projections is 1.2 percent for Medicare and 1.5 percent for Medicaid. In the agency'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 2050.

**Other Noninterest Spending**

In CBO's extended baseline projections, total federal spending for all programs and activities other than Social Security, the major health care programs, and net interest costs reaches a historically high level in 2020 and then declines as a share of GDP to its lowest level in more than 70 years (see Figure 9 on page 28). 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 to mid-1970s) and as low as 8 percent (in the late 1990s and early 2000s). Other noninterest spending is projected to increase in 2020 to 19.0 percent

of GDP as a result of the laws enacted in response to the pandemic. CBO projects that, under current law, such spending would fall to 8.0 percent of GDP in 2030 and to 7.6 percent of GDP in 2050. Discretionary spending is projected to decline in relation to GDP over the next 10 years and assumed to stay roughly constant from 2030 to 2050, while mandatory spending excluding that for Social Security and the major health care programs (referred to as other mandatory spending) is projected to decline in relation to GDP over the next 30 years.

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

CBO estimates that discretionary outlays will increase to 8.0 percent of GDP in 2020, stemming from the policies put in place to counter the pandemic-related economic disruption. (Over the past half-century, those outlays diminished from 11.5 percent in 1970 to 6.3 percent in 2019.) In CBO's baseline projections, discretionary outlays decrease steadily from 7.6 percent of GDP in 2021 to 5.8 percent in 2030.

Through 2021, most discretionary funding is limited by caps on annual discretionary appropriations that were specified in the Bipartisan Budget Act of 2019 (P.L. 116-37). In CBO's projections, the decline in discretionary outlays relative to GDP over the following nine years reflects the statutory limits on discretionary funding in 2021 and CBO's assumption (required by law for its 10-year baseline projections) that discretionary funding will grow at the rate of inflation—which is slower than the projected growth of nominal GDP—beginning in 2022.<sup>31</sup>

31. In accordance with section 257 of the Deficit Control Act, CBO projects budget authority over the 10-year period by applying the specified inflation rate to the most recent appropriations for discretionary accounts. Because of the unusual size and nature of the emergency funding provided in recently enacted legislation in response to the pandemic, CBO, in consultation with the House and Senate Committees on the Budget, deviated from the standard procedures for constructing its current extended baseline and did not extrapolate the discretionary budget authority provided by the three laws responding to the pandemic that were enacted after March 6, 2020.

After 2030, in CBO's projections, discretionary spending transitions over a five-year period from growing with the rate of inflation to growing with nominal GDP. Beyond 2035, CBO's extended baseline projections reflect the assumption that discretionary spending will grow with nominal GDP and remain constant at 5.6 percent of GDP through 2050 (see Figure 12).<sup>32</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. That category of spending includes outlays for SNAP, unemployment compensation, retirement programs for federal civilian and military employees, certain veterans' programs, Supplemental Security Income, and certain refundable tax credits.<sup>33</sup>

Other mandatory spending is projected to equal 11.0 percent of GDP in 2020 and 3.7 percent in 2021, an increase from its value of 2.7 percent in 2019, mainly because of policies enacted in response to the pandemic and associated economic downturn. For the rest of the 10-year period, such spending declines gradually as a share of the economy, reaching 2.3 percent of GDP in 2030.<sup>34</sup> The projected decline occurs in part because benefit amounts for many of those programs are adjusted for inflation each year, and inflation in CBO's economic forecast is estimated to be less than the rate of growth in nominal GDP.

In CBO's extended baseline projections, other mandatory spending falls to 2.0 percent of GDP by 2050. In part, that reduction is attributable to growth in income, which decreases the number of people who qualify for refundable tax credits. That reduction also reflects the

32. Although discretionary spending declines in relation to GDP from 2020 to 2030 in CBO's projections, the agency does not expect it to decline further. That is because discretionary spending has historically been a larger share of economic output than it is projected to be in 2030.

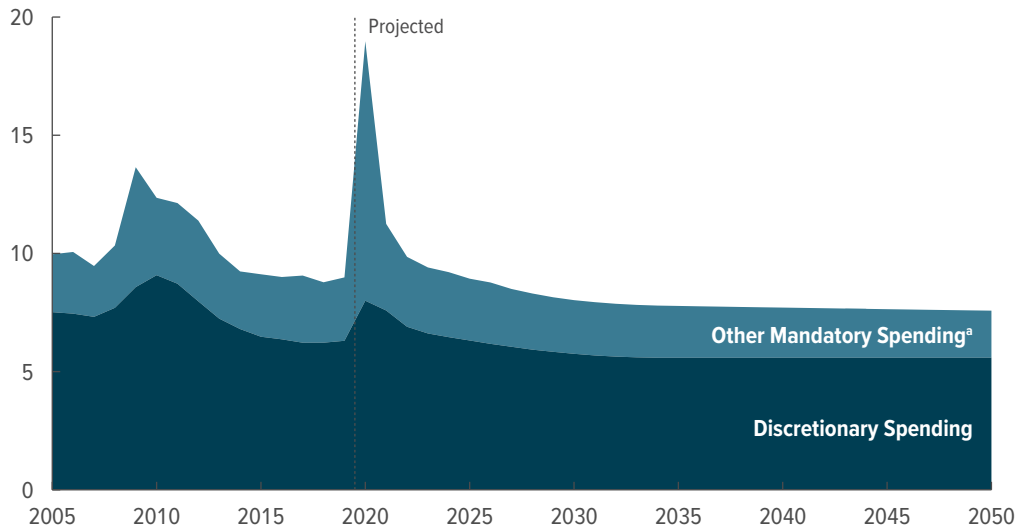
33. Refundable tax credits reduce a filer's overall income tax liability; if the credit exceeds the rest of the filer's income tax liability, the government pays all or some portion of that excess to the taxpayer (and the payment is treated as an outlay in the budget). See Congressional Budget Office,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

34. 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.

Figure 12.

## Other Federal Noninterest Spending

Percentage of Gross Domestic Product



Over the long term, other federal noninterest spending, measured as a percentage of economic output, declines in CBO's projections.

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 tax credit, the child tax credit, and the American Opportunity Tax Credit.

assumption that after 2030 other mandatory spending, excluding outlays for such tax credits, declines at roughly the same rate by which it is projected to fall between 2026 and 2030.<sup>35</sup>

### 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. Over the first half of the next decade, in CBO's projections, net interest costs as a share of the economy decrease from 1.6 percent of GDP in 2020 to 1.1 percent in 2025 because of continued low interest rates. Those costs increase to 2.2 percent by 2030 as greater federal borrowing boosts debt-service costs and as interest rates rise. Net interest costs reach 8.1 percent of GDP by 2050—higher than they have ever been (see Figure 9 on page 28). If net interest costs followed

that projected path, they would exceed other mandatory spending by 2031, exceed all discretionary spending by 2043, surpass spending for Social Security by 2046, and be larger than any single program by 2050.

Over the long term, 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. Net interest costs are projected to increase from an average of 6 percent of total spending in the first decade (2020 to 2030) to more than one-fifth in the third decade (2041 to 2050). Moreover, net interest costs account for about one-quarter of the total deficit in the first decade and about three-fifths in the third decade. In large part, those rising interest costs result from increases in interest rates that reflect long-term economic trends, which CBO projects would occur even if debt did not grow beyond its current level. But greater federal borrowing places additional upward pressure on interest rates and thus on interest costs. Moreover, growth in interest costs and growth in debt reinforce one another: Rising interest costs boost deficits and debt, and rising debt pushes up interest costs.

35. For years after 2030, CBO did not project other mandatory spending in detail because of the many programs involved and the various factors that influence spending on them. Instead, CBO projected that spending for those programs (except for certain refundable tax credits) would decline as a share of GDP in the later decades at roughly the same annual rate at which it is projected to decline between 2026 and 2030 in the agency's baseline published in March 2020.



## Projected Revenues Through 2050

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. Revenues have averaged 17.4 percent of GDP over the past 50 years, but they have fluctuated between 15 percent and 20 percent of GDP over that period because of changes in tax laws and interactions between those laws and economic conditions.

CBO projects a sharp decline in revenues in 2020 and 2021, reflecting the economic disruption caused by the pandemic and the federal government's response to it, including the enactment of legislation. If current laws generally remained unchanged, revenues would grow for the remainder of the decade. After declining from 16.3 percent in 2019 to 15.5 percent in 2021, total revenues as a share of GDP are projected to reach 17.3 percent in 2025. Largely because of scheduled increases in taxes resulting from the expiration of certain provisions of the 2017 tax act that affect individual income taxes, revenues are projected to rise after 2025, reaching 17.8 percent of GDP by 2030.

CBO's revenue projections are based on the assumption that the rules for all tax sources (individual income taxes, corporate income taxes, payroll taxes, and other taxes) will change only as scheduled under current law.<sup>36</sup> In CBO's extended baseline projections, revenues continue to grow faster than GDP after 2030 and total 18.6 percent of GDP in 2050.

Increases in receipts from individual income taxes account for most of the projected 2.7 percentage-point rise in total revenues as a share of GDP from 2020 to 2050. Revenues from corporate income taxes also rise relative to GDP over that period, whereas revenues from payroll taxes and other sources decline (see Figure 9 on page 28).

## Reasons for the Growth in Revenues

The underlying causes of the projected increase in total revenues as a share of GDP over the 30-year period are real bracket creep in the individual income tax system,

scheduled increases in taxes, expiring temporary tax provisions, and other factors (see Figure 13).

**Real Bracket Creep.** The largest contributor to the increase in total revenues over the next three decades is real bracket creep, which occurs when income grows faster than inflation, as typically happens during economic expansions. If current laws generally remained unchanged, real bracket creep would continue to gradually push up taxes in relation to income through 2050, CBO projects, thereby increasing tax receipts. Even though most income tax brackets, exemptions, credits, and other tax thresholds are indexed to inflation, more income is pushed into higher tax brackets, and credits are phased out when income growth exceeds the rate of inflation.<sup>37</sup> Between 2030 and 2050, the share of income taxed at the top rate of 39.6 percent would rise by 2 percentage points—and the share of income excluded from taxation would fall by 3 percentage points—because of real bracket creep (see Figure 14).<sup>38</sup>

**Scheduled Increases in Taxes After 2025.** Another factor pushing up taxes relative to income is the scheduled expiration after calendar year 2025 of nearly all provisions of the 2017 tax act that affect individual income taxes. The provisions that are scheduled to expire include lower statutory tax rates, the higher standard deduction, the repeal of personal exemptions, and the expansion of the child tax credit.<sup>39</sup> Those expirations would cause tax liabilities to rise in calendar year 2026, boosting individual income tax receipts relative to GDP by 0.9 percentage points between 2020 and 2030.

**Other Factors.** Many other factors affect revenues—but to a lesser extent—in the extended baseline projections. Initially, temporary tax provisions enacted in response to the pandemic and associated economic disruption are expected to significantly reduce receipts in 2020 and 2021. The expiration of those temporary provisions,

36. The sole exception is 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 in the past.

37. 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.

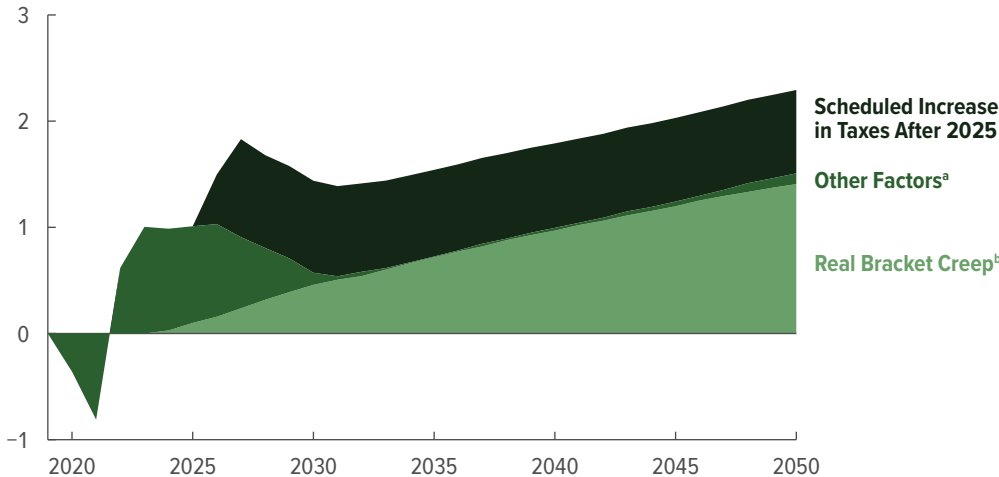
38. For more details, see Congressional Budget Office, "How Income Growth Affects Tax Revenues in CBO's Long-Term Budget Projections" (presentation, June 2019), [www.cbo.gov/publication/55368](http://www.cbo.gov/publication/55368).

39. Rules allowing accelerated depreciation deductions for certain business investments, which are scheduled to phase out between 2022 and 2027, are not included here.

Figure 13.

**Changes in Revenues**

Percentage of Gross Domestic Product



Revenues are projected to decline sharply in 2020 and 2021 and then rebound over the next few years, reflecting the economic disruption caused by the pandemic and the federal government's response to it. Projected revenues rise sharply following the expiration at the end of 2025 of certain temporary provisions of the 2017 tax act and then resume steady growth.

Source: Congressional Budget Office.

- a. Other factors include temporary tax provisions enacted in response to the pandemic, which reduce revenues in 2020 and 2021, as well as factors that affect revenues over the longer term, such as the aging of the population, changes in the distribution of wages, and growth in nontaxable compensation as a result of rising costs for health care.
- b. 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.

taken together, is projected to boost receipts as a share of GDP by 1.3 percentage points between 2020 and 2030.

A different set of factors affects revenues over the longer term. One of those factors is taxable retirement income, which tends to grow more rapidly than GDP as the population ages. CBO expects the retirement of members of the baby-boom generation to cause a gradual increase in distributions from tax-deferred retirement accounts and traditional defined benefit pension plans, as well as taxable Social Security benefits.

A second factor is change in the distribution of earnings. Earnings are projected to grow faster for higher-earning people than for other people over the next 30 years. That trend would cause a larger share of individual earnings to be taxed at higher rates. However, 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 the share of earnings above the maximum amount subject to Social Security payroll taxes would grow. Workers do not accrue additional Social Security benefits for earnings above the maximum taxable amount. For a given total amount of

earnings, therefore, an increase in the share above the limit would reduce overall future benefit payments.

A third factor is growth in health care costs, which is projected to reduce revenues as a share of GDP over the next three decades. The share of employees' compensation that is paid in the form of wages and salaries, which are subject to income and payroll taxes, is projected to decline because of rising spending on fringe benefits (such as employment-based health insurance), which are not taxable. That shift in compensation would decrease taxable income—and thus revenues from both income and payroll taxes—relative to GDP.

**Implications for Effective Tax Rates**

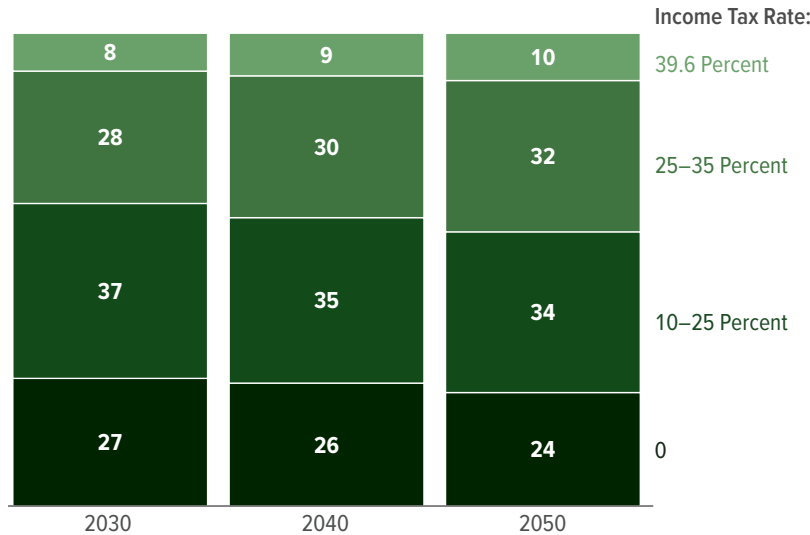
Taken together, those factors would, under current law, cause the tax system in 2050 to differ substantially from the system today. On average, taxpayers across the income distribution would pay more of their income in taxes in 2050 than similar taxpayers do now if current laws generally remained unchanged. Furthermore, a larger share of each additional dollar of income that households earned would go toward taxes because the effective marginal federal tax rate on labor would rise (see



Figure 14.

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

Percent



The largest contributor to growth in revenues over the next 30 years is real bracket creep. That is the process in which, as income rises faster than inflation, a larger proportion of income becomes subject to higher tax rates. As the share of income taxed at higher rates grows, the share exempt from taxation shrinks.

Source: Congressional Budget Office.

In this figure, income 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 tax rate is zero (because of deductions and exemptions).

Table 5). The effective marginal tax rate on capital would also rise but by a smaller amount. Higher marginal rates would dampen economic activity and investment by reducing people’s incentives to work and save.<sup>40</sup>

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

CBO’s budget projections depend on its projections of economic factors, including economic growth and interest rates. To assess the sensitivity of its budget projections to those changes, CBO analyzed how its budget projections would change if productivity growth and interest rates were higher or lower (see Figure 15).<sup>41</sup>

40. 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.

41. In most years, CBO examines budgetary outcomes under both the extended baseline and an extended alternative fiscal scenario, under which current law would be changed to maintain certain policies that are now in place. Although CBO examines budgetary outcomes for the extended baseline only in this report, the agency expects to examine such outcomes under both the

**Growth of Nonfarm Business Productivity**

CBO examined the sensitivity of its projection of federal debt to changes in the growth rate of total factor productivity in the nonfarm business sector. The agency projected economic and budgetary outcomes using rates of growth for nonfarm business TFP that were 0.5 percentage points higher and 0.5 percentage points lower than the rate underlying the extended baseline projections. The range reflects the variation of about three-quarters of a percentage point in average TFP growth over 30-year periods between 1950 and the present and also the fact that such variation represents only some of the uncertainty about CBO’s projection of TFP growth.

- If nonfarm business productivity grew 0.5 percentage points faster than CBO projects, federal debt held by the public would be 155 percent of GDP in 2050 rather than 195 percent, as it is in the extended baseline projection.

extended baseline and an alternative fiscal scenario in the next report in this series.

Table 5.

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

Percent	2020	2030	2050
Marginal Tax Rate on Labor Income	27.3	30.4	31.9
Marginal Tax Rate on Capital Income	15.7	17.4	15.9

Source: Congressional Budget Office.

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

The effective marginal federal 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. The effective marginal federal 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. 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 asset values for each combination.

- If nonfarm business productivity grew 0.5 percentage points more slowly than projected, federal debt held by the public would be 239 percent of GDP in 2050.

### Interest on Federal Debt Held by the Public

CBO also examined the sensitivity of its projections of the federal debt to changes in interest rates within a range of 2 percentage points. 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 than CBO projects, federal debt held by the public would be 264 percent of GDP in 2050 rather than the 195 percent in the extended baseline projection.
- If federal borrowing rates were 1.0 percentage point lower than in CBO's extended baseline projections, federal debt held by the public would be 149 percent of GDP in 2050.

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

Budget projections are inherently uncertain. Even if future tax and spending policies did not vary from those specified in current law, budgetary outcomes would undoubtedly differ from those in CBO's extended baseline projections because of unexpected changes in demographics, the economy, and other factors. In previous years, CBO has examined how its budget projections would change if a set of key factors—several demographic and economic factors and the growth of health care costs—together deviated from the paths underlying those projections, and the agency has examined other sources of uncertainty in detail.<sup>42</sup> In order to release this report when it would be most useful to the Congress, CBO examines budgetary outcomes for the extended baseline only in this report. Those projections represent the middle of the distribution of possible outcomes, in CBO's assessment.

Because of the current pandemic, the projections in this report are subject to an unusually high degree of uncertainty. That uncertainty stems from many sources, including changes to demographics (how the pandemic will affect rates of fertility, net immigration, and mortality), the economy (how the pandemic will affect economic growth and interest rates), and health care expenditures (how the pandemic will shift the demand for and supply of health care services). Uncertainty also surrounds the effectiveness of monetary and fiscal policy and the response of global financial markets to the substantial projected increases in public deficits and debt. The agency expects to examine uncertainty in its projections in greater depth in the next report in this series.

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

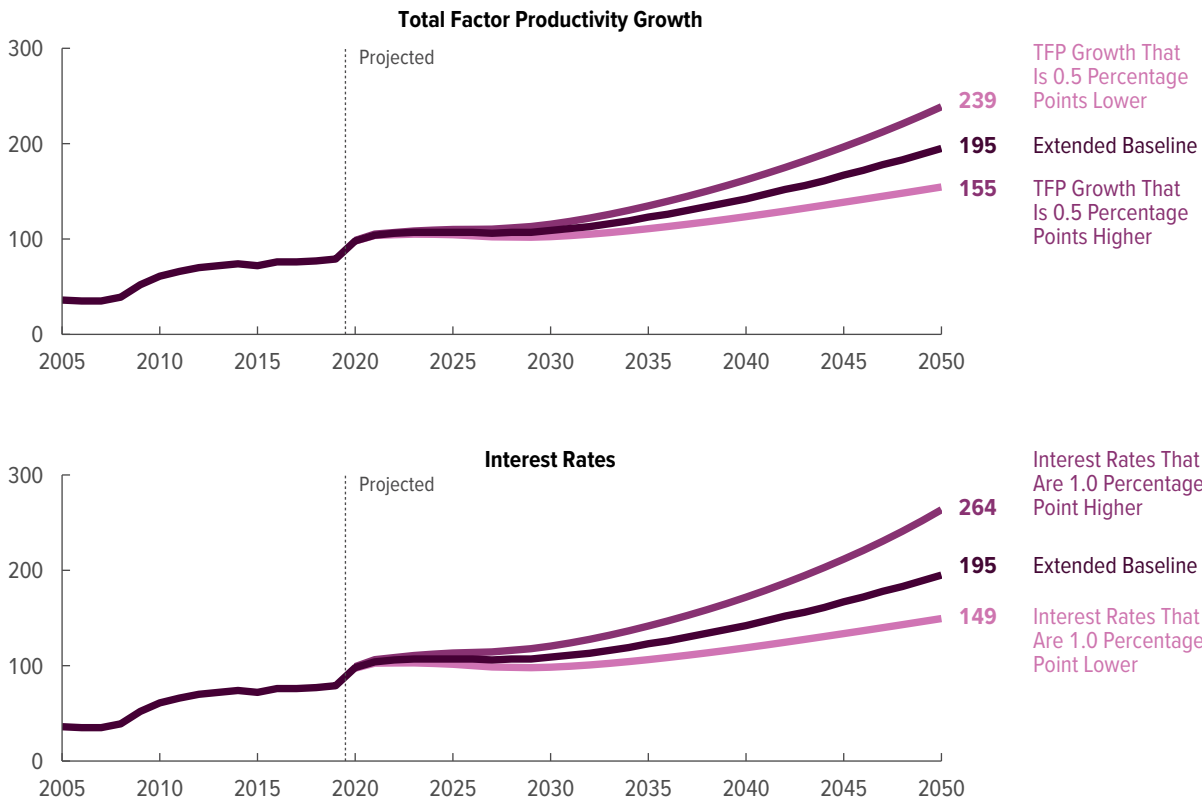
As a share of GDP, federal debt and deficits are now projected to be greater over the next three decades than CBO projected last year. In the agency's current extended baseline projections, debt reaches 189 percent of GDP in 2049, which is 45 percentage points higher than the amount the agency projected last year. In addition, projected primary and total deficits as a share of GDP in this year's report are larger throughout most of the projection period than those in last year's report. (See Appendix B

42. See Congressional Budget Office, *The 2019 Long-Term Budget Outlook* (June 2019), [www.cbo.gov/publication/55331](http://www.cbo.gov/publication/55331), and *The 2016 Long-Term Budget Outlook* (July 2016), [www.cbo.gov/publication/51580](http://www.cbo.gov/publication/51580).

Figure 15.

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

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

Total factor productivity growth is the growth of real output per unit of combined labor and capital services in the nonfarm business sector. The interest rate is the effective rate on federal debt.

TFP = total factor productivity.

for more information on the changes in CBO’s long-term budget projections since last year.)

Higher projected outlays and lower projected revenues at the beginning of the 30-year period contribute significantly to those upward revisions to the agency’s projected deficits. The increase in those deficits results primarily from the effects of the pandemic and actions taken to respond to it. Partially offsetting those changes is net spending for interest on the debt, which is now projected to be lower through 2033 than in last year’s projections. Net spending for interest rises faster through the end of the projection period than it was projected to in last year’s report, however, as greater federal borrowing

increases average interest rates on that debt. In addition, over the next three decades discretionary spending is higher than it was projected to be last year, primarily because of higher caps on discretionary funding in 2020 and 2021 put in place by the Bipartisan Budget Act of 2019 and the projected growth from the higher 2021 amount. Revenues are projected to be lower than they were in last year’s projections because of legislative changes, such as the repeal of the tax on employment-based health insurance plans with high premiums and a reduction in the projected rate of real bracket creep stemming from the downward revision to the agency’s projections of economic growth.





# Appendix A: 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 factors over the next three decades. The projections presented in this report are consistent with the economic projections for the 2020–2030 period that CBO published in July.<sup>1</sup> Those projections incorporate the budgetary and economic effects of the 2020 coronavirus pandemic and associated measures taken to limit in-person interaction. They also reflect the economic and budgetary impact of laws enacted to address the public health emergency and to support households, businesses, and state and local governments. (A set of annual projections is included in this report's supplemental data; they are available online at [www.cbo.gov/publication/56516](http://www.cbo.gov/publication/56516).)

## Demographic Factors

Changes in the size and composition of the U.S. population influence the growth of the economy and affect federal tax revenues and spending. Rates of fertility, net immigration, and mortality determine how the population evolves, and the relative contribution of each of those factors changes over time.

CBO expects the population to increase from 334 million people at the beginning of 2020 to 378 million in 2050. Although the population will increase over that period, population growth is expected to decline from an average rate of 0.5 percent per year over the next decade to an average rate of 0.3 percent per year in the last decade of the projection period.

The population is projected to become older, on average, throughout the projection period. In the agency's projections, the share of the population age 65 or older grows over the 30-year period, whereas the share that is of working age (ages 20 to 64) shrinks. As a result, the ratio of working-age people to people 65 or older falls from an

average of 3.1 to 1 over the first decade of the period to an average of 2.5 to 1 during the last decade.

CBO expects the population to be 2.8 percent smaller (equaling 11 million fewer people) in 2050 than the agency projected last year (see Figure A-1). Those changes result from revisions to the agency's projected rates of fertility, net immigration, and mortality.

## Fertility

CBO projects that the total fertility rate will remain at its most recent historical value of 1.7 children per woman in 2020 and decline to 1.6 children per woman in 2021 in response to the economic effects of the pandemic.<sup>2</sup> CBO expects the fertility rate to gradually rise through the remainder of the decade, averaging 1.8 children per woman from 2020 to 2030 and 1.9 children per woman in the following two decades.

**Projections of Fertility.** CBO projects fertility rates on the basis of the agency's assessment of historical fertility trends, the effects of the pandemic, and other factors. Though fertility rates tended to decline during recessions and rebound during recoveries in the two decades preceding the 2007–2009 recession, the fertility rate did not recover after that recession. That rate was 2.0 children per woman, on average, in the 20 years before the recession, peaking at 2.1 in 2007. The rate was 1.7 children per woman in 2019 (the most recent year for which data are available). The decline was largely attributable to lower fertility rates among women age 24 or younger.<sup>3</sup>

CBO projects the fertility rate to average 1.9 births per woman from 2020 to 2050, which is below the replacement rate—the fertility rate required for a generation to

1. See Congressional Budget Office, *An Update to the Economic Outlook: 2020 to 2030* (July 2020), [www.cbo.gov/publication/56442](http://www.cbo.gov/publication/56442).

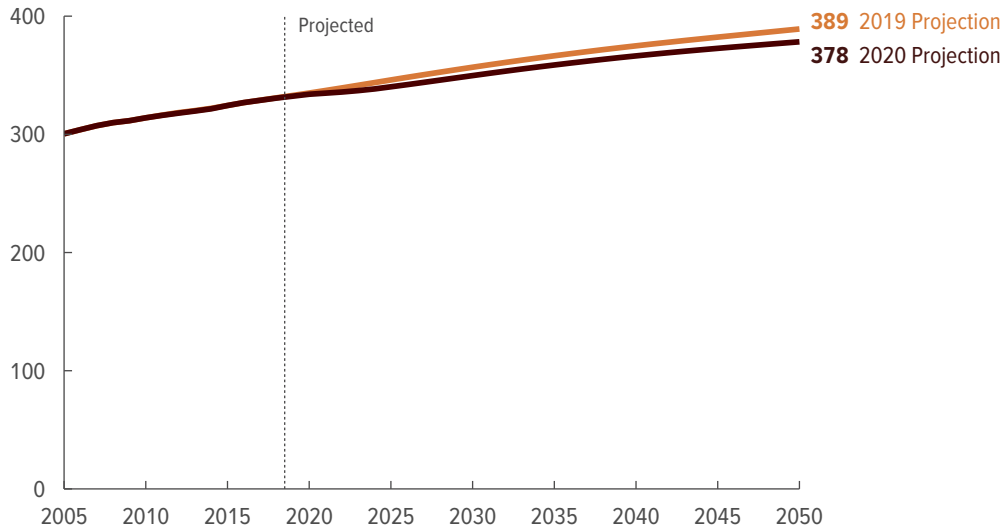
2. The total fertility rate represents the average number of children that a woman would have in her lifetime.

3. See Brady E. Hamilton and others, *Births: Provisional Data for 2019*, Vital Statistics Rapid Release Report 8 (National Center for Health Statistics, May 2020), [www.cdc.gov/nchs/data/vsrr/vsrr-8-508.pdf](http://www.cdc.gov/nchs/data/vsrr/vsrr-8-508.pdf) (372 KB).

Figure A-1.

**CBO's 2019 and 2020 Projections of Population**

Millions of People



In 2020, CBO projects fertility rates to be lower, mortality rates to be higher, and rates of net immigration to be lower than it did last year. As a result, the United States is now projected to have 11 million fewer people in 2050 than CBO projected last year.

Source: Congressional Budget Office.

Actual data are shown through calendar year 2018, the most recent year for which such data are available.

exactly replace itself—of 2.1 children per woman. CBO's projections of fertility rates are consistent with the recommendation made to the Social Security Advisory Board by its 2019 Technical Panel on Assumptions and Methods.<sup>4</sup>

**Changes in Projections of Fertility Since Last Year.**

CBO's current projection of the total fertility rate is lower, on average, than the agency previously projected for the 2020–2030 decade and is unchanged from previous projections for 2031 to 2050. In response to the recession brought on by the pandemic, the projected rate of the economic recovery, and a lower-than-expected total fertility rate in 2019, CBO now projects that the fertility rate will be 1.7 births per woman in 2020, 1.6 births per woman in 2021, and 1.9 births per woman by 2028. In contrast, last year CBO projected the fertility rate to be slightly less than 1.9 births per woman in 2020 and to rise to 1.9 births per woman by 2022.

CBO currently projects 2.8 million fewer births over the first half of the projection period than it did last year. That projected reduction in births lowers the projected number of working-age and childbearing-age people in the second half of the projection period and lowers the projected number of births over that period. Over the second half of the projection period, CBO currently projects a total of 1.6 million fewer births and an average of 5.4 million fewer working-age people per year.

**Immigration**

Under current law, CBO projects that 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) rises to from 0.9 million people, on average, in the first decade of the projection period to 1.1 million people, on average, in the third decade of the period.

**Projections of Immigration.** CBO projects immigration rates in three categories: lawful permanent residents (LPRs), legal temporary residents (LTRs), and foreign-born people without legal status. Over the first two decades of the projection period, CBO projects net flows for each category by using a detailed modeling approach that is based on the agency's economic projections and assessment of recent trends. In the last decade,

4. In the 2019 Technical Panel on Assumptions and Methods, the Social Security Advisory Board recommended reducing the total fertility rate from 2.0 to 1.95 in the long run. For details, see Supplement to 2019 Technical Panel on Assumptions and Methods, *Report to the Social Security Advisory Board* (September 2019), p. 9, <https://go.usa.gov/xfyAy> (PDF, 597 KB).



in CBO's projections, net immigration grows each year at a rate equal to overall population growth in the previous year (0.3 percent per year on average).

In 2020, immigration is projected to fall because of travel restrictions and reduced visa-processing capabilities related to the pandemic. Between 2021 and 2040, immigration is projected to increase as the effects of the pandemic ease and economic conditions are once again an important predictor of net flows of foreign-born people without legal status. The annual net flow of LPRs is projected to increase from 790,000 people per year, on average, in the first decade to 850,000 per year in the second decade. The annual net flow of LTRs is projected to average 60,000 people per year in the first decade and 80,000 people per year in the second decade. The net flow of foreign-born people without legal status is projected to be 10,000 people per year, on average, in the first decade of the projection period, rising to 130,000 people per year, on average, in the second decade of the period.

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

CBO's current projection of net immigration is less than its projection in 2019. The agency projects an average net immigration rate of 2.8 immigrants per 1,000 people between 2020 and 2050, compared with its projection of 3.1 immigrants per 1,000 people through the projection period in last year's report.

In CBO's projections, 2.5 million (or 21.0 percent) fewer people, on net, immigrate in the first decade of the projection period than the agency projected last year. That reduction occurs in part because of travel restrictions and reduced visa-processing capabilities related to the pandemic and includes 0.8 million fewer LPRs, 0.3 million fewer LTRs, and 1.4 million fewer foreign-born people without legal status than the agency projected last year.

In the second decade of the projection period, CBO projects lower net flows of foreign-born people without legal status and LPRs than it did last year. In response to data that show weak net flows of foreign-born people without legal status in recent years, CBO projects fewer immigrants from this category. Additionally, because net flows of LPRs in the second decade grow with population, reductions to net flows of LPRs in the first decade result in fewer immigrants from this category in the second decade. As a result of those changes, there are a

total of 840,000 (or 7.4 percent) fewer immigrants, on net, between 2031 and 2040.

In the third decade of the projection period, CBO's projections of net immigration flows are based on overall population growth in the previous year. The agency's projection of lower net immigration before 2040 thus reduces its projections of immigration flows after that date. Additionally, in CBO's current projections, numerical limits on certain categories of LPRs do not increase as the population grows. As a result of that change and of CBO's reduced projection of population growth, total net immigration is projected to grow at an average annualized rate of 0.2 percent between 2041 and 2050, compared with 0.4 percent in last year's projections. In total, CBO projects approximately 1 million (or 8.5 percent) fewer people to immigrate, on net, over the 2041–2050 period than the agency projected last year.

#### Mortality

CBO projects that mortality rates, which represent the annual number of deaths per thousand people, decline over the projection period. As a result, life expectancy at birth is projected to increase from its average of 79.0 years from 2020 to 2030 to 81.6 years, on average, from 2041 to 2050. Similarly, life expectancy at age 65 is projected to rise from an average of 19.7 years in the first decade of the projection period to an average of 21.3 years in the third decade.

**Projections of Mortality.** CBO projects mortality rates on the basis of its assessment of historical trends in mortality and the effects of the pandemic. The mortality rate has generally declined in the United States since the early 20th century, although the rate of that decline has slowed over time and even reversed in recent years. For the most part, mortality rates have decreased more quickly for younger people than for older people during the past century. However, mortality rates rose in recent years, particularly among people ages 15 to 44. The result was that life expectancy at birth also declined, marking the first decreases in that metric since 1993. Those decreases are primarily driven by increases in mortality from Alzheimer's disease, suicide, and drug overdoses (particularly opioids).<sup>5</sup>

5. 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, 2018* (NCHS, 2019), [www.cdc.gov/nchs/data/abus/abus18.pdf](http://www.cdc.gov/nchs/data/abus/abus18.pdf) (1.6 MB).

Through 2021, CBO initially projects mortality rates to decrease at roughly the same average rate as in the previous decade (2008 to 2017). The agency then adjusts those initial projections to account for the additional deaths associated with the pandemic. Additional deaths include fatalities directly attributable to the coronavirus as well as increased fatalities attributable to heart disease, diabetes, pneumonia, and other respiratory illnesses. Additional deaths from causes other than the coronavirus may result from individuals delaying or not seeking treatment during the pandemic, or they may be directly attributable to the coronavirus but misclassified because of other underlying conditions. The increased number of additional deaths is partially offset by a decrease in the number of accidental deaths. For the remainder of the projection period, the agency expects a return to longer-run trends in mortality improvement, with mortality rates for each age group generally declining at the average pace experienced between 1950 and 2017.

After projecting average mortality rates for men and women in each age group, CBO incorporates differences in those rates for people age 30 or older on the basis of marital status, education, disability-insurance status, and lifetime household earnings (for people younger than 30, the mortality projections account for age and sex only). CBO projects lower mortality rates and longer life expectancy for people who are married, have more education, do not receive benefits through the Social Security Disability Insurance program, or are high earners.<sup>6</sup>

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

CBO currently projects a higher mortality rate for all age groups in the near term and a lower rate of mortality improvement over the next three decades than it did last year. As a result, CBO projects 1.4 million (or 1.2 percent) more deaths over the next three decades than it projected last year. Higher mortality rates also contribute to shorter life expectancies than the agency projected last year.

6. 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://go.usa.gov/xGcme> (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).

To reflect recent trends, CBO currently projects that mortality rates for working-age adults decline in the near term at a slower rate than the agency previously projected. For most people age 55 or older, CBO then revises those projections upward for 2020 and 2021 to reflect the greater number of fatalities from the pandemic in that age group. After 2021, CBO expects mortality rates to decline at roughly the average rate each age group experienced between 1950 and 2017. That rate of mortality improvement is generally lower than CBO projected last year because of the incorporation of two additional years of higher-than-expected mortality rates.

CBO's projections of mortality rates affect the agency's projections of life expectancy. Compared with last year's projections, mortality rates are declining more slowly for people age 65 or younger (especially for those younger than age 45). As a result, life expectancy at birth is projected to be 82.0 years in 2050, whereas CBO projected last year that it would be 82.6 years. Life expectancy at age 65 is projected to be 21.6 years in 2050, unchanged from last year's projection.

#### Contributions of Demographic Factors to Population Growth

The combination of the three demographic factors described above—fertility, immigration, and mortality—determine CBO's projections of total population growth. Over the course of the next decade, immigration accounts for about half of the overall increase in the size of the population, and changes in fertility and mortality account for the other half (see Table A-1). With fertility rates expected to remain below the replacement rate, immigration becomes an increasingly important part of overall population growth in the United States. By 2050, in CBO's projections, nearly all of the nation's population growth is driven by net immigration (see Figure A-2).

#### Economic Factors

The federal government's revenues, spending, and debt depend on 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.

Table A-1.

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

	1990–2019	2020–2030	2031–2040	2041–2050	Overall, 2020–2050
Growth of Population (Percent)	0.9	0.5	0.5	0.3	0.4
Growth of Population Ages 20 to 64 (Percent)	0.9	0.1	0.2	0.2	0.2
Growth of Population Age 65 or Older (Percent)	1.8	2.7	1.0	0.5	1.4
Contribution to Population Growth (Percentage points)					
Births	1.4	1.2	1.2	1.1	1.2
Deaths	-0.9	-1.0	-1.0	-1.1	-1.0
Net immigration	0.4	0.2	0.3	0.3	0.3
Growth of Civilian Noninstitutionalized Population (Percent) <sup>a</sup>	1.1	0.6	0.4	0.4	0.5
<b>Memorandum:</b>					
Fertility Rate (Children per woman)	2.0	1.8	1.9	1.9	1.9
Life Expectancy at Birth, End of Period (Years) <sup>b</sup>	78.6	79.8	81.0	82.0	82.0
Life Expectancy at Age 65, End of Period (Years) <sup>b</sup>	19.4	20.2	20.9	21.6	21.6
Immigration Rate (Per 1,000 people in the U.S. population)	3.8	2.5	2.9	2.9	2.8

Source: Congressional Budget Office.

The extended baseline projections, which generally reflect current law, follow CBO's 10-year baseline budget projections and then extend 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.

**Gross Domestic Product**

CBO expects real (inflation-adjusted) GDP to grow 1.6 percent per year, on average, over the 2020–2050 period (see Table A-2). That is 0.9 percentage points less than the average growth of 2.5 percent for the past three decades and 0.3 percentage points less than CBO projected last year for the 2019–2049 period. CBO expects growth in real GDP per person to average 1.1 percent over the next three decades, 0.4 percentage points less than the average growth of 1.5 percent over the past three decades and 0.2 percentage points less than CBO projected last year for 2019 to 2049.

**Projections of GDP.** In CBO's projections, the average annual growth of real GDP slows from slightly more than 1.6 percent in the first decade of the projection period to slightly less than 1.6 percent in the second decade and just over 1.5 percent in the third decade. The deceleration in growth in the second decade occurs because the potential labor force—the share of the civilian noninstitutionalized population age 16 or older that

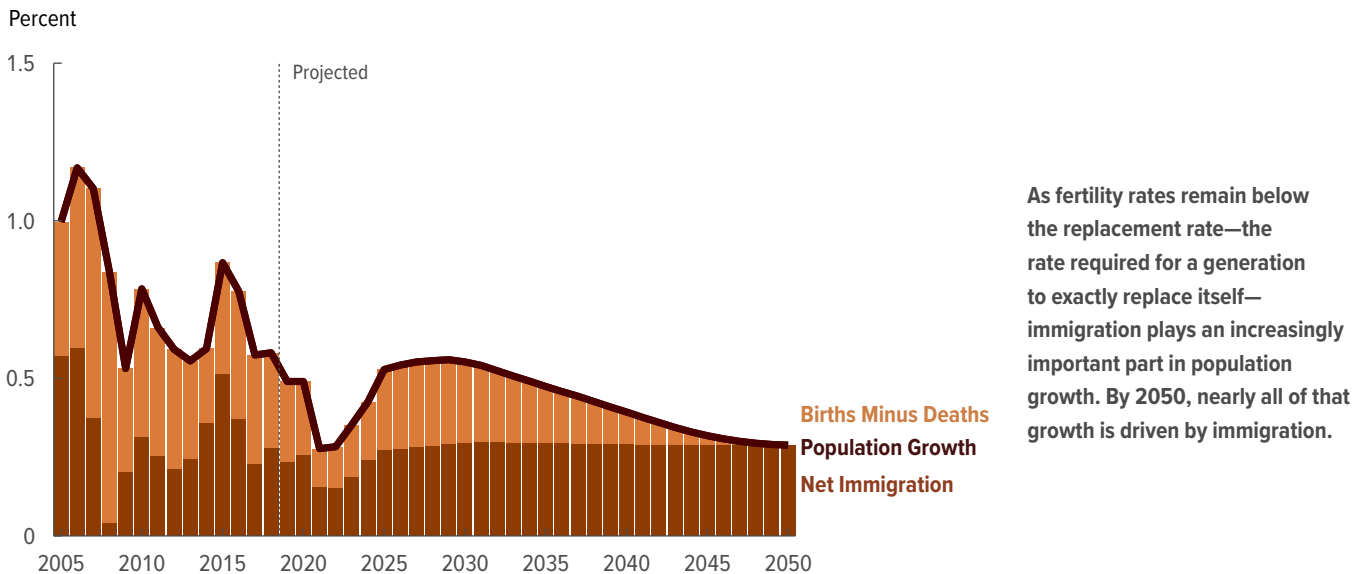
would be working or seeking work if the economy were at full employment—is expected to grow more slowly than in the first decade.<sup>7</sup> In the third decade, however, the deceleration arises from slower growth in two areas: total factor productivity (TFP) in the nonfarm business sector, and capital accumulation.

CBO's long-term projections of GDP reflect the agency's projections of potential (maximum sustainable) output. In CBO's forecasts, the growth rate of actual output typically converges with the growth rate of potential output in the second half of the first decade, and actual output stays about 0.5 percent below potential output. That persistent gap between actual output and potential output reflects the agency's assessment that actual output falls short of potential output to a greater extent and for longer periods during and after economic downturns

7. The civilian noninstitutionalized population includes individuals age 16 or older who are not inmates of institutions or on active duty in the armed forces.

Figure A-2.

### Demographic Factors That Contribute to Population Growth



Sources: Congressional Budget Office; Social Security Administration.

Net immigration is a measure of all people who either enter or leave the United States in any year.

than actual output exceeds potential output during economic booms.<sup>8</sup>

In CBO's projections, real GDP drops significantly below real potential GDP in 2020 because of the recession caused by the pandemic. In the current forecast, the economy recovers from the recession and achieves its previous peak of real GDP by the middle of 2022. Even then, however, actual output is well below its potential. As a result, over most of the first decade of the projection period, actual output grows more quickly than potential output until it returns to its long-run relationship with potential output near the end of the decade. In the rest of the 30-year projection period, the growth rates of both actual and potential GDP reflect projected increases in the supply of labor, capital services, and productivity.

8. A recent study explains the existence of a persistent output gap by examining asymmetric fluctuations in the unemployment rate around its long-term trend. See Stéphane Dupraz, Emi Nakamura, and Jón Steinsson, *A Plucking Model of Business Cycles*, Working Paper 748 (Banque de France, January 2020), <https://tinyurl.com/y32ezhm4>. For an assessment of the persistent output gap, 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).

Real GDP per person is expected to increase at a slower pace than in the past—at an average annual rate of 1.1 percent over the 2020–2050 period, compared with 1.5 percent for the past 30 years. That slower increase occurs mainly because the labor force is projected to grow less rapidly than the population.

**Changes in Projections of GDP Since Last Year.** Real GDP is projected to grow at an average annual rate that is nearly a quarter of a percentage point lower over the 2019–2049 period than was projected in June 2019. In CBO's current projections, real GDP is 1.3 percent lower in 2029 and 6.7 percent lower in 2049 than the agency projected last year. In the first decade, real GDP grows more slowly than it did in last year's projection, primarily because of the recession caused by the pandemic. GDP is also projected to grow more slowly in the second and third decades of the period (2031 to 2050); however, in those years that slower growth occurs mainly because of slower growth in capital services than projected last year.

Slower growth in capital services arises from several changes in CBO's projections. The agency projects larger federal budget deficits in the second and third decades than it did last year, which reduce the funding available for investment and ultimately decrease the growth of

Table A-2.

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

Percent

	1990–2019	2020–2030	2031–2040	2041–2050	Overall, 2020–2050
<b>Growth of GDP</b>					
Real GDP <sup>a</sup>	2.5	1.6	1.6	1.5	1.6
Real potential GDP <sup>b</sup>	2.4	1.8	1.6	1.5	1.6
Potential labor force	0.9	0.4	0.2	0.3	0.3
Potential labor force productivity	1.5	1.4	1.3	1.2	1.3
Nominal GDP (Fiscal year)	4.6	3.4	3.6	3.5	3.5
Real GDP per person	1.5	1.1	1.1	1.2	1.1
<b>Growth of the Labor Force</b>					
Labor Force Participation Rate	65.4	61.3	60.2	59.6	60.4
<b>Unemployment</b>					
Unemployment rate	5.8	6.1	4.2	4.0	4.8
Natural rate of unemployment	5.0	4.3	4.0	3.8	4.0
<b>Growth of Average Hours Worked</b>					
	-0.1	*	*	*	*
<b>Growth of Total Hours Worked</b>					
	0.9	0.2	0.3	0.3	0.3
<b>Earnings as a Share of Compensation</b>					
	81	81	80	80	80
<b>Growth of Real Earnings per Worker</b>					
	1.1	1.2	1.0	0.8	1.0
<b>Share of Earnings Below the Taxable Maximum</b>					
	85	83	82	81	82
<b>Growth of Productivity</b>					
Total factor productivity in the nonfarm business sector	1.3	1.0	1.1	1.1	1.1
Real GDP per hour worked	1.6	1.4	1.3	1.2	1.3
<b>Inflation</b>					
Growth of the CPI-U	2.4	2.0	2.2	2.2	2.1
Growth of the GDP price index	2.0	1.8	2.0	2.0	1.9
<b>Interest Rates</b>					
<b>Real rates</b>					
On 10-year Treasury notes and the OASDI trust funds	2.1	*	1.4	2.2	1.1
<b>Nominal rates</b>					
On 10-year Treasury notes and the OASDI trust funds	4.5	2.0	3.6	4.4	3.3
On all federal debt held by the public <sup>c</sup>	4.6	1.5	3.2	4.1	2.9

Source: Congressional Budget Office.

The extended baseline projections, which generally reflect current law, follow CBO's 10-year baseline budget projections and then extend 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 percent and 0.05 percent.

- Real values are nominal values that have been adjusted to remove the effects of changes in prices.
- Real potential GDP is the maximum sustainable output of the economy, adjusted to remove the effects of inflation. The two contributing factors to real potential GDP growth are growth in the potential labor force and growth in potential labor force productivity. The potential labor force is the labor force (that is, the civilian noninstitutionalized population that is age 16 or older and is either working or actively seeking work), adjusted to remove the effects of fluctuations in the business cycle. Growth in potential labor force productivity is the growth of the ratio of real potential GDP to the potential labor force, or the growth in real potential GDP that is not explained by growth in the potential labor force.
- 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.



capital. In addition, CBO has reduced its projection of labor force growth, reducing the need for investment to provide workers with capital. Finally, the agency now accounts for the effects of slower population growth and fewer new households on private investment in residential housing, resulting in slower growth of residential capital.

CBO's current projections also include its central estimate—the middle of a range of possible outcomes—of the effect of climate change on economic growth. In the agency's assessment, that effect slightly decreases growth in real GDP, reducing the level of real GDP by 1.0 percent by 2050, compared with what growth would have been if climate conditions were the same in 2050 as they were at the end of the 20th century. About 0.4 percentage points of that effect was incorporated in CBO's previous projections, so the agency has adjusted TFP growth in nonfarm business in this year's projection to reduce the level of real GDP in 2050 by an additional 0.6 percentage points.<sup>9</sup>

### Labor Force Participation and Labor Force Growth

The size of the labor force depends on the rates at which people in 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, predominantly because of the aging of the population.<sup>10</sup> CBO expects that decline to continue over the next couple of decades before it levels off toward the end of the 30-year projection period. Because a falling participation rate lessens the effect of population growth on the growth of the labor force, the labor force is expected to grow even more slowly than the population over the projection period, at an average rate of 0.3 percent per year from 2020 to 2050. CBO's current projections of labor force participation are significantly lower than last year's for the 2020–2025 period, reflecting the effects of the pandemic and the subsequent recession and recovery. Relative to the agency's previous projection, CBO projects slightly lower labor force participation, on average, after 2025; slower growth in the labor force over

the second and third decades; and a smaller labor force throughout the projection period.

**Projections of Labor Force Participation.** In CBO's projections, the rate of labor force participation falls from 63.1 percent in 2019 to 61.8 percent in 2020, reflecting the effects of the pandemic and economic crisis. The labor force participation rate continues to decline to 60.7 percent in 2030 and to 59.9 percent in 2040, primarily because of the aging of the population. After 2040, as demographic shifts slow, the participation rate also gradually stabilizes, averaging 59.6 percent in the third decade of the projection period.

The heightened health risks from the pandemic and the social-distancing measures taken to slow the spread of disease precipitated a sudden drop in economic activity and caused the labor force participation rate to fall by more than 3 percentage points in March and April this year—an unprecedented decline since the current system of monthly data collection began in 1948. The labor force participation rate has since rebounded, but only partially. The decline in the rate of labor force participation is partly the result of some people leaving the labor force or postponing job searches because of factors such as illness, health risks, and school closures. CBO projects that those factors will diminish in the remainder of 2020. As a result, the agency expects the overall labor force participation rate to continue to recover throughout the rest of the year. But that recovery is projected to stall after 2020 as downward pressure from the aging population offsets upward momentum from the economic recovery. In particular, CBO projects the labor force participation rate to decline after 2021, even as the gap from its potential continues to diminish.

In CBO's projections, the aging of the population accounts for most of the decline in the overall labor force participation rate over the next 30 years. People age 65 or older tend to participate in the labor force at lower rates than younger people—in 2019, the average participation rate for people ages 25 to 54 was 82.5 percent, and the rate for people age 65 or older was about 20 percent. Among the civilian noninstitutionalized population age 16 or older, the share of people age 65 or older increased from 16.3 percent in 2010 to 20.9 percent in 2020, and is projected to rise to 27.3 percent by 2050. At the same time, the share of the population ages 25 to 54 is expected to decline from 48.4 percent of the total population in 2020 to 44.5 percent by 2050. Were

9. See Evan Herrstadt and Terry Dinan, *CBO's Projection of the Effect of Climate Change on U.S. Economic Output*, Working Paper 2020-06 (September 2020), [www.cbo.gov/publication/56505](http://www.cbo.gov/publication/56505).

10. The labor force participation rate is the share of the civilian noninstitutionalized population age 16 or older that is working or actively seeking work.



it not for the aging of the population, the overall rate of labor force participation over the coming decades would be higher and more stable than currently projected, in CBO's assessment.

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

- Members of each generation that follows the baby boomers (particularly men) tend to participate in the labor force at lower rates than their predecessors did at the same ages. (One notable exception in later generations is that the share of women age 34 or younger who work is higher than it was for baby-boomer women 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, and unmarried men tend to participate in the labor force at lower rates than married men.

CBO expects those forces to be mostly offset by two trends that it projects will increase participation in the labor force:

- 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, also affect the labor force. For example, growing federal deficits are projected to slow growth in the stock of private capital and to limit the growth of wages, thereby reducing the supply of labor. 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 bracket creep, raising their effective tax rates. Higher tax rates and bracket creep are projected to decrease participation in the labor

force because individuals would earn less return on their labor.

**Changes in Projections of Labor Force Participation Since Last Year.** CBO's current projection of the overall labor force participation rate is significantly lower than it previously projected for 2020 to 2025 and slightly lower, on average, than the agency projected for 2026 to 2049. The agency lowered its projection of the labor force participation rate in the near term because of the effects of the pandemic. In addition, many workers near retirement might choose to retire early because of the pandemic. The drop in participation over the next five years is projected to be slightly offset by data showing more labor force participation than CBO projected in 2019.

CBO lowered its projection of the labor force participation rate after 2025, primarily reflecting revisions in the demographic composition of the population over the medium and long term. This year's projections of lower fertility rates, increased mortality rates for the working-age population, and a reduced net inflow of immigrants (who tend to be young or of working age) mean that the overall population will have a greater share of older people than previously projected. That, in turn, results in a reduced projection of the overall labor force participation rate.

**Projections of Labor Force Growth.** The pandemic is projected to cause the labor force to shrink by nearly 2 percent by the end of 2020; after that, growth is projected to pick up slightly as the economy continues to recover and population growth increases from its 2020 trough. However, the long-run decline in labor force participation means that less of the population's growth translates into labor force growth. For the 2020–2050 period, the number of people age 16 or older is expected to grow by 0.5 percent per year, on average, and the labor force is projected to grow at an average rate of 0.4 percent per year after 2020. That represents a significant slowdown from earlier periods: For example, the average annual growth rate in the labor force was 1.2 percent during the 1990–2006 period and 0.7 percent during the 2010–2019 period.

**Changes in Projections of Labor Force Growth Since Last Year.** CBO's current projection of labor force growth is slightly higher than its previous projection for most of the first decade of the 30-year projection period,

reflecting a catch-up in economic growth during the recovery from the pandemic and recession. Labor force growth is projected to be lower in the second and third decades of the projection period than CBO projected last year, largely because the population is expected to grow more slowly.

### 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 includes projections of 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 revisions in historical data, reassessments of economic and demographic trends, and changes to the agency's methodology.

**Unemployment.** After surging to 14.7 percent in April 2020, the unemployment rate for the civilian noninstitutionalized population age 16 or older fell to 8.4 percent in August 2020, when this report was written. In CBO's projections, the unemployment rate averages 10.6 percent in 2020, about 6.2 percentage points higher than the underlying long-run trend of unemployment. As the economy continues to recover from the recession, the unemployment rate is projected to continue to fall and eventually approach that underlying long-run trend. From 2028 on, the unemployment rate is expected to remain roughly one-quarter of one percentage point above that underlying long-run trend, a difference that is consistent with both the historical average relationship between the two measures and the projected gap of one-half of one percent between actual and potential GDP.

CBO projects the long-run trend of unemployment to decline gradually over the next three decades, from 4.4 percent in 2020 to 4.1 percent in 2030 and 3.7 percent in 2050, as the labor force ages and becomes increasingly educated. (Older and more educated workers tend to have lower rates of unemployment.) As the long-run trend declines, the actual unemployment rate is also projected to decline. By 2050, the long-run trend of unemployment is projected to reach 3.7 percent, and the actual rate is projected to reach 4.0 percent.

**Average Hours Worked.** Workers tend to work a different number of hours depending on their industry: For example, those in manufacturing work more than

40 hours per week, on average, whereas those in service industries work about 32 hours per week. As the share of workers employed in manufacturing has decreased and the share employed in service industries has increased over the past several decades, the average number of hours worked per week has declined for the economy as a whole. During the past decade, the shares of workers in the manufacturing and service industries have been largely stable. In CBO's assessment, future changes in the employment shares of different industries are unlikely to have substantial effects on the economywide number of average hours worked.

CBO projects that incentives under current tax law will influence the average number of hours worked. Higher tax rates on individual income take effect when certain provisions of the 2017 tax act expire at the end of 2025 under current law, which slightly reduces the average number of hours worked beginning in 2026. In addition, CBO expects effective tax rates on individual income rise because of bracket creep. Given economic trends and current law, CBO expects the average number of hours worked to decline slightly over the next 30 years. By 2050, CBO expects the average worker to work about 0.6 percent fewer hours per week than he or she does today.

**Total Hours Worked.** On the basis of projections of the size of the labor force, average hours worked, and unemployment, CBO estimates that total hours worked increase at an average annual rate of 0.3 percent between 2020 and 2050. That is less than the average annual increase of 0.9 percent in total hours worked over the past three decades. The deceleration 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.

In CBO's projections, the average growth in total hours worked is 0.2 percent in the first decade, 0.3 percent in the second decade, and 0.4 percent in the third decade. Growth in total hours worked increases in the second and third decades because of a falling unemployment rate. It also increases in the third decade because the rate of labor force participation stops decreasing by 2046 and begins to increase in 2047.

**Earnings as a Share of Compensation.** Workers' total compensation consists of taxable earnings and nontaxable benefits such as employers' contributions to

health insurance and pensions. Over the years, the share of total compensation paid in the form of wages and salaries has declined—from 91 percent in 1960 to 81 percent in 2019—mainly because the cost of health insurance has risen more quickly than total compensation.<sup>11</sup> Because CBO expects that trend in health care costs to continue, the portion of total compensation that workers receive as earnings declines to 80 percent over the 2020–2050 period and to 79 percent by 2050.

**Growth of Real Earnings per Worker.** Projections of prices, nonwage compensation (such as employment-based health insurance), average hours worked, and labor productivity (discussed below) imply that real earnings per worker grow by an average of 1.0 percent annually over the 2020–2050 period. That rate is lower than the 1.1 percent average annual growth of real earnings per worker over the last 30 years.

**Distribution of Earnings.** In CBO's projections, earnings grow faster for higher earners than for lower earners. As a result, the share of earnings accruing to workers in the top 10 percent of the earnings distribution increases at an average rate of 0.2 percent per year. That rate of growth is lower than it was between 1978 and 2018, when the share of earnings accruing to workers in the top 10 percent of the earnings distribution increased by 0.6 percent per year.

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 in taxes 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 (\$137,700 in 2020). 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 83 percent in 2018.<sup>12</sup> The

portion of earnings subject to Social Security taxes is projected to remain at 83 percent, on average, between 2020 and 2030 and fall to an average of 82 percent in the second decade and to an average of 81 percent in the third decade, equaling 81 percent in 2050. That decline in the share of covered earnings below the taxable maximum reduces the projected balance of the Social Security trust funds.

### Changes in Projections of Other Labor Market

**Outcomes Since Last Year.** Several projections of labor market outcomes are different from last year's projections. CBO's current projection of the unemployment rate is higher than it was last year in the first five years of the projection period but lower than it was last year in the final two decades of the period. In the first five years of the period, the projected unemployment rate is higher because of the recession caused by the pandemic and the ensuing slow recovery. The projected lower unemployment rate in the second and third decades is largely attributable to the agency's reassessment of the underlying long-run trend of unemployment. Because CBO now expects the labor force to have a larger percentage of older workers, as well as a larger percentage of more educated workers, CBO lowered its estimate of the underlying long-run trend of unemployment for the projection period.

CBO's current projections of real earnings per worker are slightly lower than last year's, mainly because updates to wage and salary data indicate that earnings as a share of GDP were, on average, lower over the past decade than previously reported. As a result, CBO reduced its projection of wages and salaries over the next three decades.

In CBO's current projections, earnings as a share of compensation are lower than previously projected. The projection is lower largely because an excise tax on high-premium health insurance, which was scheduled to take effect in 2022, was repealed. Had that tax not been repealed, some employers and workers would have been expected to choose insurance plans with smaller premiums to avoid paying the tax. Those shifts would have generally increased taxable wages, increasing earnings as a share of compensation.

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

12. 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. No additional benefits accrue to earnings that exceed covered earnings.

CBO also projects that the distribution of earnings will differ from last year's projection. The share of earnings for the top 10 percent of earners in 2049 is projected to be 45.5 percent, or 1.5 percentage points lower than the projection from last year. That projection changed because data for recent years show a smaller-than-expected share of earnings accruing to high-wage earners, and CBO expects that trend to continue. Those recent data also caused CBO to increase its projection of the share of covered earnings on which Social Security payroll taxes are paid.

### Capital Accumulation and Productivity

In addition to the rate of labor force participation, labor force growth, and other labor market outcomes, two other factors directly affect CBO's projections of output. One is the accumulation of capital—structures and equipment, land, intellectual property such as computer software, and residential housing. That accumulated stock of capital contributes a stream of services to production. The second factor is the growth of TFP—real output per unit of combined labor and capital services in the various sectors of the economy. In CBO's projections, most TFP growth occurs in the nonfarm business sector, which accounts for about three-quarters of economic activity.

**Capital Services.** Over the longer term, in CBO's view, private saving, international flows of financial capital, and federal borrowing drive growth in the nation's stock of private capital. Private saving and international capital flows tend to move in tandem with the rate of return on investment—a rate that measures the extent to which investment in the stock of capital results in a flow of income. CBO's projection of that rate is consistent with the agency's projection that the average real interest rate on 10-year Treasury securities (calculated by subtracting the rate of increase in the consumer price index from the nominal yield on those notes) would be 0.9 percent in 2030 and 2.5 percent in 2050. The projected increase in federal borrowing would increase interest rates, thus reducing private investment and tamping down growth in the private capital stock.

**Total Factor Productivity.** The annual growth of TFP in the nonfarm business sector is projected to average 1.0 percent in the 2020–2030 period and 1.1 percent from 2030 to 2050, yielding an average annual growth rate of slightly less than 1.1 percent from 2020 to 2050. That projected growth rate is about 0.3 percentage

points slower than the average annual rate since 1950 of 1.4 percent and 0.2 percent slower than the average rate since 1990.

CBO projects nonfarm business TFP to grow more slowly than its long-term historical average for several reasons. Recent analysis of historical trends in TFP growth suggests that projections for the next few decades should place greater weight on slower recent growth than on faster growth in the more distant past. Thus, although CBO projects growth in nonfarm business TFP to accelerate from its unusually slow recent rate, the agency expects the future rate of growth to be slower than its long-term historical average.

A number of developments support CBO's projection of slower growth in nonfarm business TFP. One is the anticipated slower improvement in labor quality—a measure of workers' skills that accounts for educational attainment and work experience—that is implicitly included in CBO's measure of TFP. Labor quality improved rapidly during the 1980s and 1990s and more slowly after 2000. In CBO's assessment, that slowdown was the result of both a less rapid increase in average educational attainment and the continued retirement of the baby-boom generation, a large, experienced portion of the workforce. In future decades, however, that slower improvement in labor quality is expected to be partly offset by the overall aging of the workforce, as better health and longer life expectancy lead people to continue working past the ages at which previous generations retired. (Older workers generally have more experience than younger ones, and that group also includes a larger proportion of highly educated workers, who tend to remain in the labor force longer than workers with less education.)

Another development that affects nonfarm business TFP is changing federal investment in long-lived assets, such as buildings, roads, and intellectual property, that produce a stream of benefits to private businesses. In CBO's projections, federal discretionary spending declines to a much smaller percentage of GDP over the next decade than in past decades.<sup>13</sup> If federal investment spending generally remained unchanged as a share of discretionary

13. Discretionary spending includes most defense spending, outlays for highway programs, and spending for many other nondefense activities, such as elementary and secondary education, housing assistance, international affairs, and the administration of justice.

spending, reductions in discretionary spending as a percentage of GDP would mean that federal investment spending would also decrease as a share of GDP. A reduction in federal investment spending as a share of GDP would dampen growth in TFP, in CBO's assessment.<sup>14</sup>

CBO also estimated the effects of climate change on economic growth in future decades, drawing on studies that relate differences in regional economic activity and growth to differences in regional weather patterns, as well as studies of the economic effects of increases in hurricane damage.<sup>15</sup> In the agency's assessment, those effects slightly decrease growth in real GDP, reducing the level of real GDP by 1.0 percent by 2050, compared with growth had climate conditions remained the same through 2050 as they were at the end of the 20th century. However, a portion of those effects was already accounted for in the economic data the agency uses to make its projections. The share of such effects that was not already accounted for in CBO's projections is projected to reduce growth in nonfarm business TFP. Compared with last year's projections, TFP growth is lower on average by about 0.01 percentage point per year over the next decade and by nearly 0.03 percentage points per year from 2030 to 2050. As a result, the level of TFP is about 0.7 percent lower and the level of GDP about 0.6 percent lower in 2050 than the two metrics would have been without those additional effects.

**Real GDP per Hour Worked.** Given the projected growth of capital services and TFP described above, real GDP per hour worked (a measure of economy-wide productivity) is expected to grow by an annual average of 1.3 percent over the 2020–2050 period. Potential labor force productivity (potential output per member of the potential labor force) is also expected to grow by an annual average of 1.3 percent over the 2020–2050 period.

**Changes in Projections of Capital Accumulation and Productivity Since Last Year.** Several changes in CBO's projections have led the agency to lower its projection

of growth in capital services compared with last year's projection. First, the agency's projections of federal deficits are larger this year than they were last year, leading to more federal borrowing and thus more crowding out of private investment. Second, CBO has reduced its projection of labor force growth, reducing the need for investment to provide workers with capital. Third, CBO has revised its analytic methods to better account for the effects of slower population growth and slower formation of new households on private investment in residential housing. The agency now projects that as population growth and household formation continue to slow, housing starts and other forms of private investment will also grow more slowly in the long term, further reducing the projected growth of capital services.

The effects of long-term demographic trends and larger projected deficits on investment, along with the effects of climate change on the growth of nonfarm business TFP, reduce the projected growth of real GDP per hour worked from 2019 to 2049 by nearly 0.2 percentage points, from an annual average of 1.5 percent in last year's forecast to 1.3 percent this year. Because CBO expects slightly fewer people to hold multiple jobs and the unemployment rate to be slightly higher than the agency projected last year, the growth of potential labor force productivity is revised downward by only about 0.1 percentage point, slightly less than the growth of real GDP per hour worked.

### Inflation

CBO projects rates of inflation for two categories: prices of consumer goods and services and prices of final goods and services.<sup>16</sup> Those rates influence nominal (current-dollar) levels of interest rates, income, and indexation of income tax brackets, thereby influencing 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 2020–2050 period, that measure of inflation averages 2.1 percent in CBO's projections. That long-term rate is less than the average rate of inflation

14. For more details about how CBO estimates the macroeconomic effects of federal investment, see Congressional Budget Office, *The Macroeconomic and Budgetary Effects of Federal Investment* (June 2016), [www.cbo.gov/publication/51628](http://www.cbo.gov/publication/51628).

15. For more information about hurricanes, see Congressional Budget Office, *Potential Increases in Hurricane Damage in the United States: Implications for the Federal Budget* (June 2016), [www.cbo.gov/publication/51518](http://www.cbo.gov/publication/51518).

16. Final goods and services include those purchased directly by consumers, businesses (for investment), and governments, and also include net exports.



since 1990 of 2.4 percent per year. Under a chained measure of CPI-U inflation, CBO projects prices to grow at a rate that is about 0.25 percentage points less than the annual increase in the traditional CPI-U.<sup>17</sup>

**Prices of Final Goods and Services.** Over the 2020–2050 period, 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 1.9 percent. That long-term rate is slightly lower than the average growth in the GDP price index since 1990. The GDP price index grows at a different rate than the consumer price index because it is based on the prices of a different set of goods and services and uses a different method of calculation.

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

Inflation, as measured by growth in either the CPI-U or the GDP price index, is projected to be considerably lower from 2020 to 2024 than CBO projected last year. Lower inflation is an effect of the pandemic, which reduced the supply of certain goods and services, putting upward pressure on their prices, and caused demand for certain other goods and services to plummet, putting downward pressure on those prices. On net, in CBO's projections, the effects of the pandemic point to a significant drop in inflation over the next few years. Over the 2020–2024 period, CBO expects the CPI-U to grow at an average annual rate of 1.7 percent, significantly less than the average of 2.4 percent that the agency projected last year for the same period. The agency expects the GDP price index to grow at an average annual rate of 1.5 percent over the first five years of the projection period, substantially less than the 2.1 percent average that the agency projected for that period last year.

CBO revised its projection for the period after 2024 to better reflect the average effects of business cycles that are expected to occur in the remaining 25 years of the projection period. Historical data show that during and

after economic downturns, actual output falls short of potential output to a greater extent and for longer periods than actual output exceeds potential output during economic booms. On average, that observed asymmetry decreases the demand for goods and services, resulting in less upward pressure on prices. To reflect that historical experience, CBO reduced average inflation slightly in the second and third decades of the projection period. CBO also slightly reduced the projected difference in growth rates between the GDP price index and the CPI-U to better reflect recent historical data. The difference between the inflation rates for those two price indexes is now projected to average 0.3 percentage points in the second and third decades of the projection period, about 0.1 percentage point less than last year's projection. As a result of those changes, over the second and third decades of the projection period, the GDP price index grows less than 0.1 percentage point more slowly, on average, than in last year's projection, and the CPI-U grows about 0.2 percentage points more slowly.

#### Interest Rates

CBO projects the interest rates that apply to federal borrowing, including the rates on 10-year Treasury notes and special-issue Social Security bonds. It also projects the average 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 balances of the trust funds.

After considering a number of changes in its projections from last year, including slower growth in the labor force, slower growth in TFP, and more government debt, CBO expects real interest rates on federal borrowing to be lower in the future than their average over the 1990–2007 period, the period CBO uses for historical comparison. The real interest rate on 10-year Treasury notes averaged roughly 3.1 percent between 1990 and 2007.<sup>18</sup> That rate has averaged 0.8 percent since 2009 and is projected to be 0.9 percent in 2030. In CBO's projections, the rate rises thereafter, reaching 2.5 percent in 2050. That rate is 0.6 percentage points below the average real interest rate on 10-year Treasury notes over the 1990–2007 period. CBO's current projections of real interest rates over the 2020–2049 period are lower,

17. The chained CPI-U tends to grow more slowly than the traditional 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 about 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.

18. 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 Retroactive Series Using Current Methods (R-CPI-U-RS)" (August 5, 2020), [www.bls.gov/cpi/research-series/home.htm](http://www.bls.gov/cpi/research-series/home.htm).



on average, than last year's projections because of the unprecedented low rates caused by the pandemic and the prolonged recovery from the pandemic that is expected to occur. After 2030, the real interest rate on 10-year Treasury notes is expected to rise at a faster pace than projected last year because debt as a share of GDP rises at a faster pace than was projected last year. By 2049, the agency projects the real interest rate on the 10-year Treasury note to reach 2.5 percent, 0.3 percentage points higher than last year's projection.

**Factors Affecting Interest Rates.** Interest rates are determined by a number of factors. CBO projects those rates by comparing how the values of factors that affect them are expected to differ in the long term relative to those factors' average values over the 1990–2007 period. That period was chosen for comparison because expectations of inflation were stable and there were no severe economic downturns or significant financial crises.<sup>19</sup>

Some factors reduce interest rates; others increase them. In CBO's estimates for the 2020–2050 period, several factors tend to reduce interest rates on government securities below their 1990–2007 average:

- The labor force is projected to grow much more slowly than it did from 1990 to 2007. Slower growth in the number of workers tends 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>20</sup>
- The share of total earnings received by higher-earning 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 earnings 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, a lower rate of productivity growth reduces the return on capital and results in lower interest rates, all else being equal.
- CBO expects investors' preference for Treasury securities over riskier assets to remain greater than it was during 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 2007–2009 recession, the slow expansion that followed, and the response of financial institutions to increased regulatory oversight. The recent recession caused by the pandemic further increased investors' demand for Treasury securities instead of riskier assets. That greater demand contributed to lower interest rates for Treasury securities. CBO expects the preference for Treasury securities to gradually decline over the next three decades but to remain stronger than it was from 1990 to 2007.

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

- In CBO's extended baseline projections, federal debt is much larger as a percentage of GDP than it was before 2007, reaching 109 percent by 2030 and 195 percent by 2050. The latter figure is about five times the average over the 1990–2007 period. Greater federal borrowing 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 rising for the past few decades. That share is projected to decline from its current level over the next decade but to remain greater than its average in previous decades. The factors that appear to have contributed to capital's rising share of income (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

19. 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).

20. 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).

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 in the size of the labor force means that fewer workers are in their prime saving years relative to the number of older people who are drawing down their savings, CBO projects. As a result, the total amount of saving available for investment is projected to be less than it otherwise would be (all else being equal). CBO expects that decrease to reduce the amount of capital per worker and thereby push up interest rates. (CBO estimates that the effect of that decrease only partially offsets the positive effect of increased earnings dispersion on saving, leaving a net increase in the amount of savings available for investment.)
- CBO expects emerging-market economies to attract a greater share of foreign investment in coming decades than they did in the 1990–2007 period. As those economies recover from the global economic downturn caused by the pandemic, they become increasingly attractive destinations for foreign investment. CBO projects that development to 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 by using theoretical models and the findings of existing research. The extent to which other factors affect interest rates is more difficult to estimate. A shift in preferences for low-risk rather than high-risk assets is not directly observable, for example. That shift is especially uncertain in light of the unprecedented increase in federal debt in response to the pandemic and recession. It is difficult to anticipate how financial markets will respond to that rising debt once the economy begins to recover. The effect on interest rates of changes in the distribution of earnings is also difficult to quantify.

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 from now. The rate on 30-year Treasury bonds since the onset of the

recession caused by the pandemic points to considerably lower interest rates well into the future than the interest rates of recent decades.

**Projections of Interest Rates.** The nominal interest rate on 10-year Treasury notes is projected to average 3.3 percent over the 2020–2050 period and to reach 4.8 percent in 2050. The real interest rate on 10-year Treasury notes is projected to average 1.1 percent over that period and to be 2.5 percent in 2050.

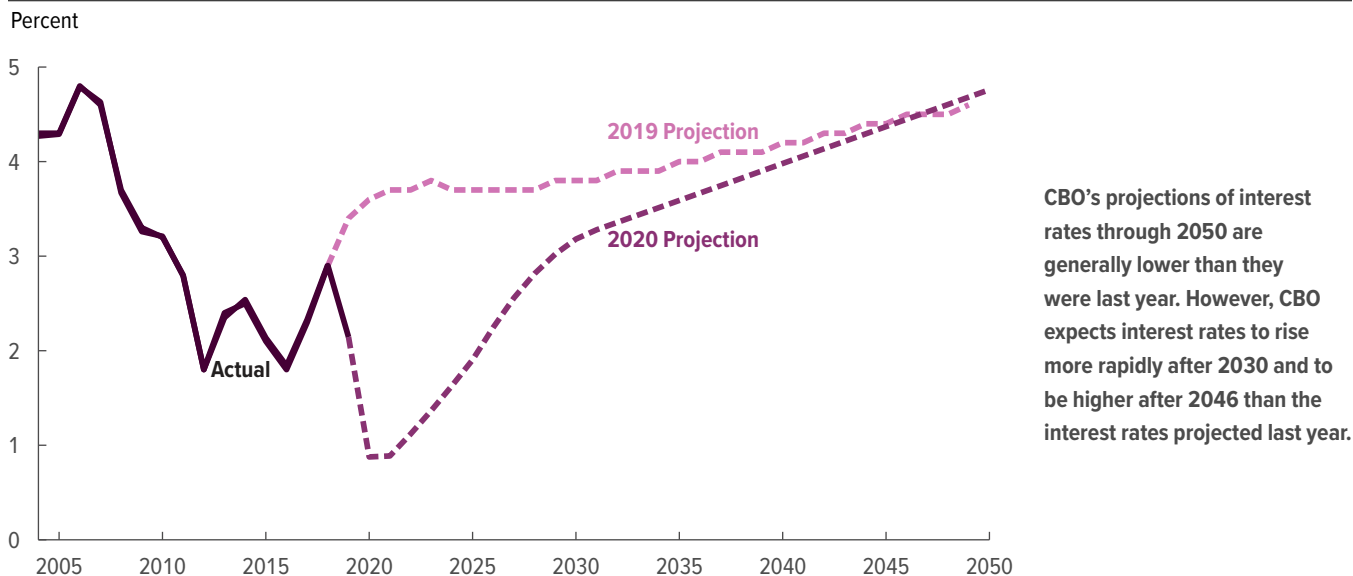
The average interest rate on federal debt held by the public tends to be lower than the rates on 10-year Treasury notes because interest rates are generally lower on shorter-term debt than on longer-term debt and because Treasury securities are expected to mature, on average, over periods of less than 10 years.<sup>21</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 2020–2050 period. That difference is projected to average 0.5 percentage points over the next decade. The difference is larger before 2031 because the federal debt consists of the Treasury securities issued during the recession caused by the pandemic. CBO projects the difference to decrease to 0.3 percentage points by 2035 as the earlier securities with relatively low interest rates mature, and to remain at 0.3 percentage points thereafter. The same factors that increase interest rates would also increase the effective interest rate on federal debt held by the public between 2040 and 2050. In CBO's projections, the average nominal interest rate on federal debt held by the public is about 2.9 percent for the 2020–2050 period, reaching 4.4 percent in 2050.

The Social Security trust funds hold special-issue bonds that generally earn interest at rates that are higher than the average rate of interest 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; it averages 3.3 percent over the 2020–2050 period and reaches 4.8 percent in 2050. The corresponding real rates are 1.1 percent, on average, over the full period and 2.5 percent in 2050.

Because interest rates have been low for much of the past decade and because the pandemic has driven rates even lower, the average interest rate earned by all bonds (both

21. 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.

Figure A-3.

**CBO's 2019 and 2020 Projections of the Interest Rate on 10-Year Treasury Notes**

Source: Congressional Budget Office.

Data are fourth-quarter values.

new and previously issued) held by the Social Security trust funds is projected to be slightly lower than the interest rate on bonds issued 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 3.3 percent for the 2020–2050 period.<sup>22</sup>

**Changes in Projections of Interest Rates Since Last Year.**

CBO's projections of interest rates in this year's long-term budget outlook are generally lower than they were last year (see Figure A-3). However, CBO expects interest rates to rise more rapidly after 2030 and to be higher than last year's projected interest rates after 2046.

CBO lowered its projection of average nominal interest rates. The nominal rates on 10-year Treasury notes and Social Security bonds are projected to average 3.3 percent over the 30-year projection period. Last year, CBO projected both rates to average 4.0 percent over the

30-year period. The agency also lowered its projection of average real interest rates. The real rates on 10-year Treasury notes and Social Security bonds are projected to average 1.1 percent over the 30-year projection period. Last year, CBO projected that both rates would average 1.6 percent over the 30-year period.

CBO's projections of lower average interest rates over the coming decade are primarily the result of factors related to the recession caused by the pandemic. That recession prompted CBO to lower its forecasts of investment demand, labor force growth, and productivity growth. Those lower forecasts point to lower interest rates. The Federal Reserve's policy actions—lowering the federal funds rate to near zero and increasing purchases of Treasury and other securities—put additional downward pressure on both short-term and long-term interest rates. The recession also caused investors' appetite for risk to decline (and, consequently, the demand for Treasury securities to rise). CBO expects those factors to continue to weigh down interest rates over the next several years.

Beyond the next decade, CBO expects investors' appetite for risk to increase, but at a slower pace than previously projected. CBO expects more private saving in the

22. 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.

United States and greater net capital inflows from foreign economies than it did in last year's projections, and those two factors put downward pressure on real interest rates. CBO has also increased its projection of the share of income paid to capital. When a greater share of income is paid to owners of capital, interest rates go up, somewhat offsetting the factors that are pushing interest rates down. CBO's reduced projections for interest rates are consistent with signals from financial markets that participants have lowered their long-term expectations for interest rates since the agency released its long-term projections last year.

Another reason CBO lowered its projection of nominal interest rates is that it projects the average rate of inflation

to be lower. The agency's 0.2 percentage-point downward revision to CPI-U inflation over the second and third decades of the projection period accounts for 0.2 percentage points of the projected reduction in nominal interest rates over that period.

Although the agency lowered its projection of average interest rates over the projection period, it expects interest rates to rise more quickly between 2030 and 2050 than it projected for the 2029–2049 period last year, with the 10-year Treasury note rate rising to 4.7 percent by 2049, higher than was projected for 2049 last year. That steeper rise occurs because the agency increased its projection of debt as a share of GDP.



# Appendix B: Changes in CBO's Long-Term Budget Projections Since June 2019

## Overview

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 2019 because of 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> The current extended baseline projections are consistent with the 2020–2030 economic forecast that CBO published in July 2020 and the 2020–2030 budget projections that the agency published in September 2020.<sup>2</sup> The extended baseline projections presented in this report incorporate the budgetary and economic effects of the 2020 coronavirus pandemic and associated measures taken to limit in-person interaction. They also reflect the economic and budgetary effects of laws enacted to address the public health emergency and to support households, businesses, and state and local governments.<sup>3</sup>

This appendix compares CBO's current long-term budget projections with the projections the agency published in June 2019. Because most of last year's projections

ended in 2049, 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 currently projected to be significantly higher in the near term than CBO projected last year (see Figure B-1). Those increases stem from the economic disruption caused by the pandemic and from the federal government's response to it. In the long term, budget deficits and federal debt held by the public are now projected to be higher, as a percentage of GDP, than CBO projected last year.

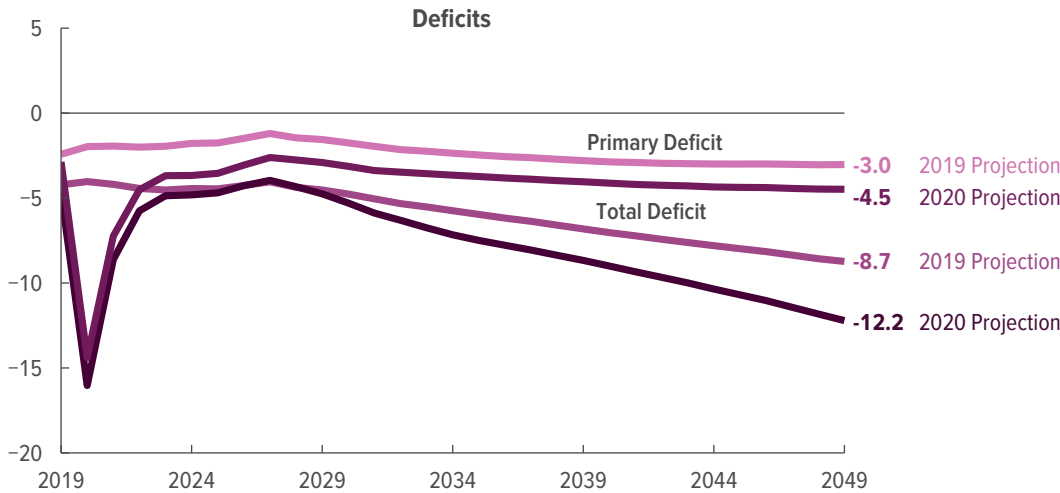
1. See Congressional Budget Office, *The 2019 Long-Term Budget Outlook* (June 2019), [www.cbo.gov/publication/55331](http://www.cbo.gov/publication/55331). For the changes in projections of demographic and economic factors since 2019, see Appendix A of this report.
2. See Congressional Budget Office, *An Update to the Economic Outlook: 2020 to 2030* (July 2020), [www.cbo.gov/publication/56442](http://www.cbo.gov/publication/56442), and *An Update to the Budget Outlook: 2020 to 2030* (September 2020), [www.cbo.gov/publication/56517](http://www.cbo.gov/publication/56517). The 10-year baseline budget projections incorporate the effects of legislation enacted through August 4, 2020.
3. The laws enacted in response to the pandemic include the Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020 (Public Law 116-123, enacted on March 6, 2020), the Families First Coronavirus Response Act (P.L. 116-127, enacted on March 18, 2020), the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136, enacted on March 27, 2020), the Paycheck Protection Program and Health Care Enhancement Act (P.L. 116-139, enacted on April 24, 2020), and the Paycheck Protection Program Flexibility Act of 2020 (P.L. 116-142, enacted on June 5, 2020).

- In the current projections, deficits are 16.0 percent of GDP in 2020 and average 5.0 percent of GDP from 2021 to 2030—0.6 percentage points more than they averaged over that period in last year's projections. Deficits are projected to grow beyond the first 10 years, rising from 5.9 percent of GDP in 2031 to 12.2 percent in 2049; projected deficits in those two years are 0.8 percentage points and 3.5 percentage points greater, respectively, than projected last year.
- Primary deficits (that is, deficits excluding net spending for interest) are now projected to be 14.4 percent of GDP in 2020 and to average 3.6 percent of GDP from 2021 to 2030—1.9 percentage points more than they averaged over that period in last year's projections. Primary deficits continue to increase thereafter in CBO's projections, rising from 3.4 percent of GDP in 2031 to 4.5 percent in 2049; those projections are 1.4 percentage points and 1.5 percentage points greater, respectively, than they were last year.
- Debt held by the public as a percentage of GDP is projected to be higher than projected last year. In CBO's current projections, federal debt rises from 98 percent of GDP in 2020 to 189 percent in 2049, and it averages 131 percent of GDP from 2020 to 2049. Last year, CBO projected that it would rise

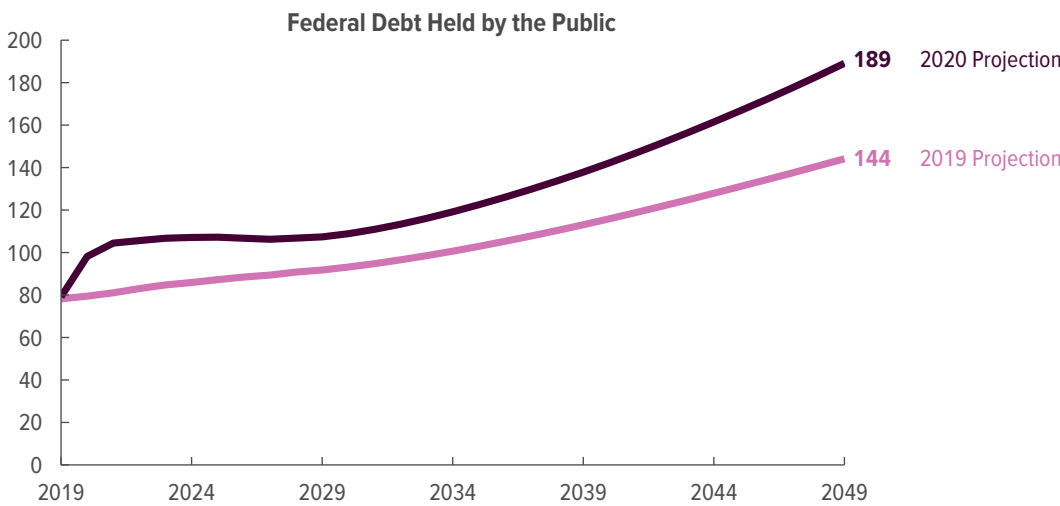
Figure B-1.

**CBO's 2019 and 2020 Extended Baseline Projections of Deficits and Federal Debt Held by the Public**

Percentage of Gross Domestic Product



Over the next three decades, deficits—both primary and total—are generally larger in this year’s projections than they were in last year’s. After large increases in total deficits in 2020 and 2021, the differences are relatively small for most of the rest of the decade, because net spending for interest is now projected to be lower through 2033.



Debt is also projected to be higher now. In the current projections, debt as a percentage of GDP in 2049 is 45 percentage points higher than it was in last year’s projections.

Source: Congressional Budget Office.

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

Primary deficits exclude net spending for interest.

GDP = gross domestic product.

from 79 percent of GDP in 2020 to 144 percent in 2049 and average 106 percent of GDP from 2020 to 2049.

The increases in projections of deficits and debt result from upward revisions in projected spending and downward revisions in projected revenues since last year. Following the increases in deficits and debt due to the

pandemic in the near term, the increases over the longer term stem mostly from higher projections of discretionary spending and interest costs and lower projections of revenues.

- Outlays for Social Security as a percentage of GDP are higher than they were in last year’s projections at the beginning and end of the projection period and



roughly the same in the middle of that period. CBO has lowered its projections of outlays for Social Security in nominal dollars throughout the 30-year period, but the downward revision in the agency's projections of GDP generally offset that decrease.<sup>4</sup> (For details about the revisions that CBO made to its projections of GDP, see Appendix A).

- As a percentage of GDP, outlays for the major health care programs in the agency's current projections are higher than they were in last year's projections early in the projection period but lower thereafter. CBO increased its projections of outlays for the major health care programs in the near term to incorporate the budgetary effects of legislation related to the pandemic. Those effects largely dissipate by the middle of the first decade of the projection period. The agency lowered its projections of such spending in the long term because it projects a smaller population, and thus fewer beneficiaries, than it did last year.
- Mandatory spending excluding that for Social Security and the major health care programs (referred to as other mandatory spending) as a share of GDP is projected to be significantly higher in 2020 and 2021 than CBO projected last year because of the economic disruption caused by the pandemic and the legislation enacted in response to it.<sup>5</sup> For most of the rest of the long-term projection period, projections of such spending are roughly the same as they were last year.
- Discretionary spending as a share of GDP in 2020 and 2021 is higher in CBO's current projections than it was in last year's projections; that increase stems from legislation enacted to address the pandemic and related economic disruption.<sup>6</sup> Over the next

three decades, such spending is projected to be higher than it was projected to be last year, primarily because of the higher caps on discretionary funding for 2020 and 2021 put in place by the Bipartisan Budget Act of 2019 (Public Law 116-37).<sup>7</sup> In CBO's current projections, discretionary spending in 2049 is 5.6 percent of GDP—0.5 percentage points higher than it was in last year's projections.

- Net spending for interest on debt, measured as a share of GDP, is projected to be lower than projected last year through 2033 and then higher for the remainder of the period. Even though debt is now projected to be higher than projected last year, interest spending is lower in the current projections in the near term mainly because CBO revised its projections of interest rates in those years downward. In the agency's projections, the effect of lower interest rates diminishes over the long term as greater federal borrowing pushes interest costs up. In 2049, net spending for interest equals 7.7 percent of GDP—2.0 percentage points higher than it was in last year's projections.
- Revenues as a share of GDP are projected to be lower in 2020 and 2021 than they were projected to be last year because of the economic effects of the pandemic and the legislation enacted in response to it. In the long term, revenues are now projected to be lower because of the repeal of the excise tax on employment-based health insurance plans with high premiums, a reduction in real bracket creep stemming from slower projected economic growth, and other factors.<sup>8</sup>

In January 2020, CBO published less detailed long-term budget projections than those in this volume.<sup>9</sup> Those

4. In CBO's current projections, GDP is 4.6 percent lower in fiscal year 2029 and 10.0 percent lower in fiscal year 2049 than the agency projected last year.

5. Mandatory, or direct, spending includes outlays for some federal benefit programs and for certain other payments to people, businesses, nonprofit institutions, and state and local governments. Such outlays are generally governed by statutory criteria and are not normally constrained by the annual appropriation process.

6. Discretionary spending encompasses an array of federal activities that are funded through or controlled by appropriations. That category includes most defense spending, outlays for highway

programs, and spending for many other nondefense activities, such as elementary and secondary education, housing assistance, international affairs, and the administration of justice.

7. See Congressional Budget Office, cost estimate for the Bipartisan Budget Act of 2019 (July 23, 2019), [www.cbo.gov/publication/55478](http://www.cbo.gov/publication/55478).

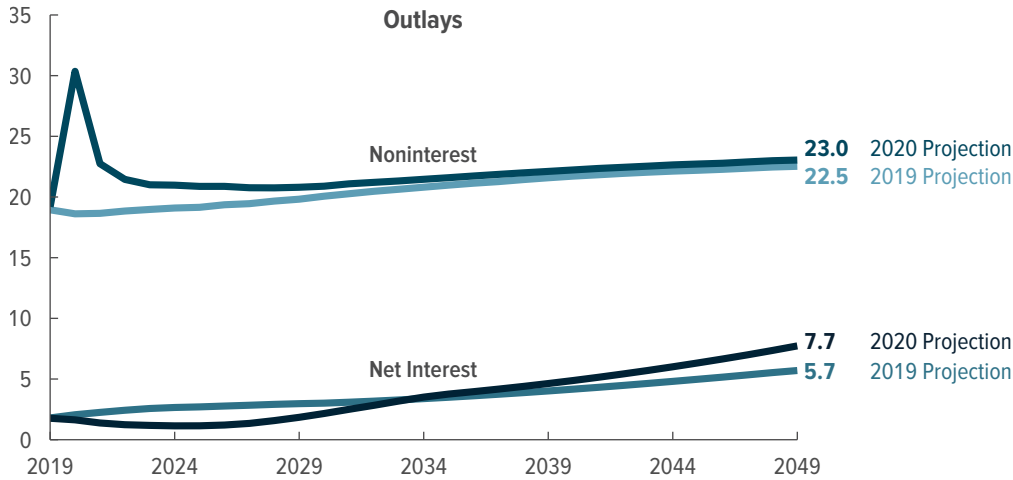
8. Real bracket creep is the process in which, as income rises faster than inflation, a larger portion of income becomes subject to higher tax rates.

9. See Congressional Budget Office, *The Budget and Economic Outlook: 2020 to 2030* (January 2020), Box 1-1, [www.cbo.gov/publication/56020](http://www.cbo.gov/publication/56020).

Figure B-2.

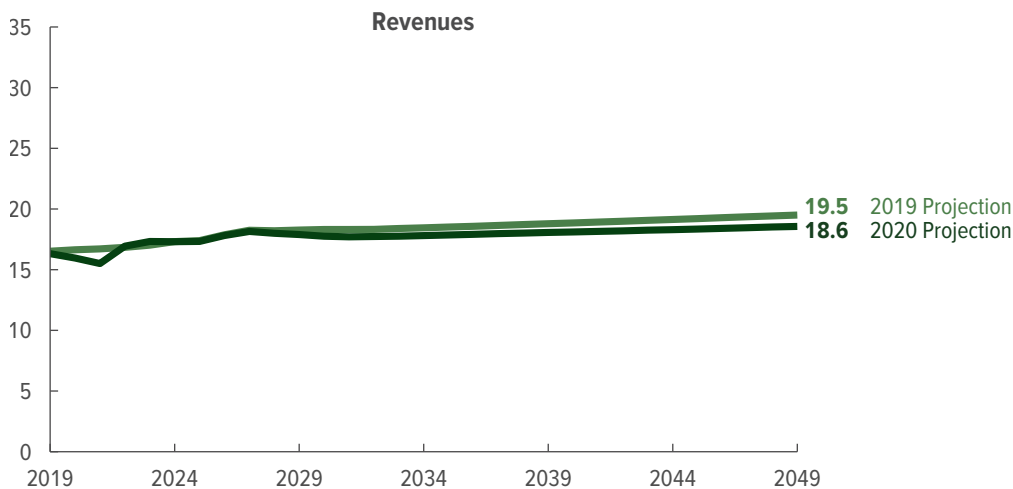
**CBO's 2019 and 2020 Extended Baseline Projections of Outlays and Revenues**

Percentage of Gross Domestic Product



Noninterest spending is now projected to be higher than it was projected to be last year.

CBO's projections of net spending for interest on debt are lower than last year's projections through 2033 and then higher through 2049.



Revenues are lower over the next three decades in this year's projections than they were in last year's. By 2049, the difference amounts to 0.9 percent of GDP.

Source: Congressional Budget Office.

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

GDP = gross domestic product.

projections were not a full update; rather, they were prepared using a simplified approach that the agency uses between full updates. The most recent budget, economic, and demographic projections—many of which have changed significantly since January—were fully incorporated into CBO's long-term model to produce the projections presented here.

**Changes in Projected Spending**

In CBO's extended baseline projections, noninterest spending as a percentage of GDP is higher than it was in last year's projections, whereas net spending for interest is lower through 2033 and higher thereafter (see Figure B-2).

### Noninterest Spending

In the near term, the increase in noninterest spending—that is, spending for Social Security and the major federal health care programs, other mandatory spending, and discretionary spending—as a percentage of GDP stems from the economic disruption caused by the pandemic and from the federal government's response to it. In the long term, most of that increase stems from higher projections of discretionary spending.

**Spending for Social Security.** As a percentage of GDP, spending for Social Security in 2020 is now projected to be higher (5.3 percent of GDP) than it was projected to be last year (5.0 percent of GDP). The difference between the current and previous projections generally declines through 2027, is roughly zero for the next 15 years, and then increases again starting in 2043. In 2049, spending for Social Security is projected to equal 6.3 percent of GDP—0.2 percentage points higher than projected last year.

In dollar terms, projected outlays for both of Social Security's components—Old-Age and Survivors Insurance (OASI) and Disability Insurance (DI)—are less than they were last year throughout the 30-year period, but the downward revision in the agency's projections of GDP generally offset that decrease. Over the next decade, spending is projected to be lower in dollar terms primarily because CBO has decreased its projections of the cost-of-living adjustments that beneficiaries will receive in the near term to reflect downward revisions in projections of inflation. The agency has also reduced its projections of average wages, thus lowering the initial benefits expected to be received by new Social Security claimants. Those downward revisions to CBO's projections of spending for Social Security were partially offset by a 1.8 percent increase since last year in the projected number of DI beneficiaries from 2020 to 2029 because of the recent economic downturn.

After 2030, the reductions in CBO's projections of OASI outlays stem from downward revisions to the agency's projections of the population age 65 or older and to its projections of average wages. (See Appendix A for a discussion of changes in CBO's demographic and economic projections.) The reduction in projected DI outlays after the first decade results from a downward revision in the projected number of DI beneficiaries in the long term due to a smaller projected population.

**Spending for the Major Health Care Programs.** Spending for the government's major health care programs consists 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 and related spending.

*Medicare.* As a share of GDP, spending for Medicare net of offsetting receipts (which are mostly premiums paid by beneficiaries) is projected to be about 0.5 percentage points higher in 2020 than projected last year and 0.2 percentage points higher, on average, over the first decade of the projection period. Spending in 2020 is higher largely because of payments made in advance of expected future health care claims. Under current law, CBO expects those payments will be recouped from providers through 2021.

For the rest of the decade, spending in dollar terms is lower in the current projections than it was in last year's, but as a percentage of GDP, such spending is higher because the agency's projections of GDP are now lower. From 2031 to 2049, net spending for Medicare as a share of GDP is projected to be a total of about 0.2 percentage points lower than CBO projected last year because the agency lowered its population projections and thus its projections of the number of Medicare beneficiaries (see Appendix A).

*Medicaid, CHIP, and Marketplace Subsidies.* As a percentage of GDP, outlays for Medicaid and 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 an average of 0.4 percentage points higher from 2020 to 2023 than they were in last year's projections. In nominal dollars, such outlays are projected to be higher through 2022 and about the same in 2023. The differences from last year's projections stem primarily from changes in Medicaid projections. In the near term, deterioration in the economy has caused projected enrollment in Medicaid to rise. In addition, legislation has raised matching rates (that is, the portion of costs the federal government must cover) and required continuous coverage for all enrollees in the program during the public health emergency regardless of any changes in their income or circumstances that would otherwise have

caused them to become ineligible.<sup>10</sup> The effects of those changes in law persist through December 2022 in CBO's projections.

From 2024 through 2030, the payments that Medicaid makes to providers grow at a slower pace in CBO's current projections than in last year's because of a downward revision to the agency's forecast of inflation; thus, the agency's projections of Medicaid spending are now lower. After the first decade in CBO's current projections, spending for Medicaid, CHIP, and the marketplace subsidies is 0.1 percentage point lower, on average, than projected last year. That reduction stems from a downward revision to the agency's population projections, which reduced the projected number of Medicaid beneficiaries.

*Methods Underlying CBO's Projections of Health Care Spending.* To project spending for the major health care programs in the long term, CBO used the same method that it used last year. Namely, it combined its projections of the number of beneficiaries in those programs with estimates of the growth of spending per beneficiary (adjusted to account for demographic changes in the beneficiaries in each program). To estimate the growth of spending per beneficiary, CBO combined its projections of growth in potential nominal GDP per person with projections of excess cost growth for each program. (Potential GDP is the maximum sustainable output of the economy; excess cost growth is the extent to which the growth rate of health care costs per person, after being adjusted for demographic changes, exceeds the growth rate of 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 3.1 percent per year, 0.3 percentage points slower than CBO projected last year.

CBO calculates the specific rates of excess cost growth implicit in the 10-year baseline projections for Medicare, Medicaid, and private health insurance premiums. In last year's projections, the rate of excess cost growth for each program in 2030 equaled the program's average projected rate over the previous five years. In CBO's current projections, the rate of excess cost growth for each program in 2031 equals the program's average projected rate from 2028 to 2030. That change mitigates the effects of spending associated with the pandemic on CBO's projections of excess cost growth in the extended baseline.

10. See Sec. 6008 of the Families First Coronavirus Response Act of 2020, P.L. 116-127, 134 Stat. 208, 209.

After 2031, the program-specific rates move linearly, by the same fraction of a percentage point each year, from their respective rates to a rate of 1.0 percent in 2050.<sup>11</sup>

For Medicare, the average annual rate of excess cost growth implicit in CBO's baseline projections is 1.1 percent from 2028 through 2030—lower than last year's average rate of 1.2 percent from 2027 through 2029. The projected rate of excess cost growth for 2031 is 1.1 percent—lower than last year's projection of 1.2 percent for 2030. Over the last two decades of the projection period, excess cost growth is projected to average 1.1 percent, about 0.1 percentage point lower than last year's estimate for the 2030–2049 period and roughly equal to the average rate 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 1.6 percent from 2028 through 2030—0.1 percentage point lower than last year's average for 2027 through 2029. The projected rate for 2031 is 1.6 percent—about 0.1 percentage point lower than last year's estimate for 2030. In the last two decades of the projection period, excess cost growth is projected to average 1.3 percent, about 0.1 percentage point lower than last year's estimate for the 2030–2049 period and 0.6 percentage points higher than the average rate from 1985 to 2017.

For private health insurance premiums, which CBO uses as an input in its calculation of marketplace subsidies, the average annual rate of excess cost growth from 2028 through 2030 implicit in CBO's baseline projections is 1.5 percent, which is higher than last year's estimate of 1.4 percent for the 2027–2029 period. The projected rate for 2031 is 1.5 percent—the same as last year's estimate for 2030. Over the last two decades of the projection period, the rate of excess cost growth is projected to average 1.2 percent—about the same as last year's estimate for the 2030–2049 period and 0.9 percentage points lower than the average rate from 1985 to 2017.

**Other Mandatory Spending.** CBO's projections of other mandatory spending as a share of GDP in the near term

11. For more information about CBO's long-term projections of spending for the major health care programs, 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). Unlike outlays for the larger health care programs, outlays for CHIP are projected to be a constant percentage of GDP after 2030.

are significantly higher than they were last year, and its projections for most of the long-term projection period are roughly the same as they were last year. Such spending includes outlays for retirement programs for federal civilian and military employees, certain programs for veterans, certain refundable tax credits, the Supplemental Nutrition Assistance Program (SNAP), and all other mandatory programs aside from Social Security and the health care programs described above.

Other mandatory spending is now projected to account for 11.0 percent of GDP in 2020 and 3.7 percent in 2021—8.4 percentage points and 1.1 percentage points more, respectively, than CBO projected such spending would be in those years last year. Those increases in projected mandatory spending are attributable to provisions of legislation enacted to address the pandemic and the related economic downturn—particularly the Paycheck Protection Program, the expansion of unemployment compensation, and the recovery rebates.

From 2022 to 2028, other mandatory spending as a share of GDP in the current projections remains higher than projected last year; thereafter, it is roughly the same as it was in last year's projections. From 2022 to 2049, other mandatory spending as a percentage of GDP in CBO's current projections is less than 0.1 percentage point higher, on average, than projected last year.<sup>12</sup> That small change was the cumulative result of several updates that CBO made to its projections for legislative, economic, and technical reasons.

**Discretionary Spending.** In CBO's current projections, discretionary spending is 8.0 percent of GDP in 2020 and 7.6 percent in 2021—2.2 percentage points and 1.9 percentage points higher, respectively, than it was in those years in last year's projections. That upward revision reflects policies enacted in response to the pandemic and related economic downturn. In accordance with section 257 of the Deficit Control Act, CBO projects

budget authority over the next 10 years by applying the specified inflation rate to the most recent appropriations for discretionary accounts. However, because of the unusual size and nature of the emergency funding provided in recently enacted legislation, CBO, after consulting with the budget committees, deviated from the standard procedures for constructing its baseline and did not extrapolate the discretionary budget authority provided by the laws enacted in response to the pandemic after March 6, 2020.<sup>13</sup>

CBO also boosted its projections of discretionary spending as a share of GDP after 2021. Whereas last year the agency projected discretionary spending would equal 5.5 percent of GDP in 2022 and 4.9 percent in 2030, it now projects such spending to equal 6.9 percent of GDP in 2022 and 5.8 percent in 2030. That upward revision results primarily from the increases in the caps on discretionary funding in 2020 and 2021 that were put in place by the Bipartisan Budget Act of 2019. The higher 2021 caps were used to extrapolate the projected path of discretionary spending in the extended baseline.

CBO made a technical change to its projections of discretionary spending over the longer term. Those projections now incorporate a five-year phase-in period starting from the second decade of the projection period (from 2031 to 2035 in this year's projections)—in which discretionary spending transitions from growing at the rate of inflation to growing with nominal GDP.<sup>14</sup> After 2035, the end of the phase-in period, CBO's current extended baseline projections, like last year's projections, reflect the assumption that discretionary spending will grow with nominal GDP.

Over the last two decades of the projection period, discretionary spending in the agency's current projections is higher than it was in last year's projections. Whereas last year discretionary spending as a share of GDP was projected to be 4.9 percent in 2031 and 5.1 percent in

12. For the years after 2030, CBO's projections reflect the assumption that, measured as a share of GDP, other mandatory spending (excluding outlays for certain refundable tax credits) will decline at roughly the same rate that it was projected to fall between 2026 and 2030 in the baseline projections that the agency published in March 2020. In CBO's assessment, the pandemic and current economic downturn will not affect the growth rate of other mandatory spending between 2030 and 2050. One technical change CBO made this year was to include spending for SNAP in its calculation of the projected growth rate of other mandatory spending at the end of the first decade.

13. The first law enacted in response to the pandemic, the Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020 (P.L. 116-123, enacted on March 6, 2020), was incorporated into CBO's March baseline projections and follows the typical baseline treatment—that is, the associated budget authority is projected to increase from the 2020 amount at the rate of inflation each year through the end of the projection period.

14. Incorporating that five-year phase-in period in the projections decreased discretionary spending as a share of GDP by less than 0.2 percentage points for each year from 2031 to 2050.



2049, this year, such spending is projected to be 5.7 percent in 2031 and 5.6 percent in 2049.<sup>15</sup>

### Net Spending for Interest

As a share of GDP, net spending for interest—that is, the government’s interest payments on debt held by the public minus interest income that the government receives—is projected to be lower than projected last year through 2033 and then higher for the remainder of the projection period. Whereas in last year’s projections such spending rose from 2.1 percent of GDP in 2020 to 3.0 percent in 2030 and averaged 2.7 percent over that decade, in CBO’s current projections, such spending declines from 1.6 percent of GDP in 2020 to 1.1 percent in 2025 and then increases to 2.2 percent in 2030, averaging 1.5 percent over the 2020–2030 period. By 2049, net interest spending is projected to reach 7.7 percent of GDP—2.0 percentage points higher than projected last year (see Figure B-2 on page 62).

Since last year, CBO has lowered its projections of interest rates for most of the 30-year period, resulting in projections of net interest spending as a share of GDP that are lower than last year’s estimates through 2033 despite increases in the agency’s projections of federal debt. Thereafter, the increases in federal debt more than offset the effect of the lower interest rates in CBO’s current projections, so net spending for interest in those later years is now higher than it was in last year’s projections. (For a discussion of changes to CBO’s projections of interest rates, see Appendix A.)

### Changes in Projected Revenues

In CBO’s current extended baseline projections, federal revenues total 16.0 percent of GDP in 2020 and 15.5 percent in 2021—0.7 percentage points and 1.2 percentage points less, respectively, than CBO projected last year. By 2049, revenues are projected to reach 18.6 percent of GDP; that projection is 0.9 percentage points less than last year’s. Because of downward revisions to CBO’s projections of GDP and of revenues as a share of GDP, projected revenues, in dollar terms, are generally lower than they were last year throughout the 30-year projection period.

Legislation enacted in response to the pandemic reduced projected revenues early in the period, but the downward revision in projected revenues in the long run results primarily from a provision in the Further Consolidated Appropriations Act, 2020 (P.L. 116-94, enacted on December 20, 2019), that repealed the excise tax on employment-based health insurance plans with high premiums. Other factors, including the reduction in the projected rate of real bracket creep stemming from the downward revision to the agency’s projections of economic growth, also led CBO to lower its projections of revenues.

The repeal of the tax on employment-based health insurance plans with premiums exceeding certain thresholds accounts for lower revenues in CBO’s current projections. That tax was scheduled to take effect in 2022. Last year, CBO projected that revenues stemming from the tax—including not only revenues from the excise tax itself but also revenues from its effects on income and payroll taxes—would equal 0.7 percent of GDP in 2049. Though some employers and workers would have remained in plans subject to the tax, other employers and workers would have shifted to insurance plans with lower premiums to avoid the tax or to reduce their tax liability. CBO and the staff of the Joint Committee on Taxation estimated that those shifts would have generally increased income tax revenues because affected workers would have received less of their compensation in nontaxable health benefits and more in taxable wages. Therefore, repealing that tax is projected to reduce collections of excise taxes and collections of income and payroll taxes (because taxable wages are projected to be lower than they would have been if the tax had taken effect). Those revenue reductions are projected to grow steadily throughout the period.

In addition, projected revenues as a share of GDP are lower because CBO revised its projections of economic growth downward. Slower economic growth reduces the rate of real bracket creep. That slowdown in real bracket creep reduces the growth in individual income tax revenue as a share of GDP.

Several other factors account for the remaining downward revisions to projected revenues. For example, CBO has lowered its projections of the share of total wages and salaries going to high-wage earners because that share has been smaller than expected in recent years. When that share is smaller, individual income tax revenues fall

15. In last year’s projections, discretionary spending increased slightly as a percentage of GDP because of the economic effects of the policies underlying the extended baseline. In this year’s projections, discretionary spending is constant as a share of GDP between 2036 and 2050.

because people with less income are subject to lower income tax rates than high-wage earners; payroll taxes rise, however, because the share of total earnings going to people whose annual earnings are below the maximum amount subject to Social Security payroll taxes is larger.

### The Size and Timing of Policy Changes Needed to Meet Various Targets for Debt

CBO has changed the goals used in its analysis of the size of the policy changes needed to meet various targets for debt. Last year, the agency calculated the size of the reduction in primary deficits needed to achieve debt targets of 78 percent of GDP and 42 percent of GDP if policymakers began those reductions in 2020, 2025, and 2030. Projections of debt as a share of GDP are significantly higher this year than they were last year in part because of the increase in spending and reduction in revenues associated with the pandemic and ensuing recession. CBO therefore changed the hypothetical debt targets to 79 percent of GDP (the amount of debt at the end of 2019) and 100 percent of GDP (roughly the amount of debt at the end of 2020). In addition, rather than using next year as a starting year in its analysis, the agency changed the years in which policymakers might start implementing policies to 2025, 2030, and 2035.

CBO's estimates of the size of the changes necessary to meet goals for debt are significantly larger this year than they were last year. That difference stems from increased projections of primary deficits and debt and from changes to the years in which policymakers might start implementing policies in CBO's analysis. Last year, CBO estimated that if policymakers sought to reduce debt as a share of GDP to 78 percent by 2049, they would need to cut primary deficits each year by 1.8 percent of GDP if they started in 2020 or by 2.7 percent of GDP if they started in 2030. CBO now estimates that to reduce debt to 79 percent of GDP by 2050, policymakers would need to reduce primary deficits each year by 3.6 percent of GDP if they started in 2025 or by 5.9 percent of GDP if they started in 2035.

### 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 1.6 percent of GDP (which is higher than last year's estimate of 1.5 percent) or 4.7 percent of taxable payroll (which is higher than

last year's estimate of 4.6 percent).<sup>16</sup> That is, the federal government would be able to pay the benefits prescribed by current law and maintain the necessary trust fund balances through 2094 if payroll taxes were raised immediately by 4.7 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. Such a change would eliminate the projected 75-year shortfall, but it would not necessarily place Social Security on a financial path that was sustainable beyond that period.

Those projections reflect several developments since last year that increased the 75-year actuarial deficit. In part, the deficit increased because CBO incorporated another year with a relatively large deficit into the analysis. The agency also significantly lowered its projections of interest rates in the near term. The cumulative effect of those lower rates is to place greater weight on future years, when projected financial shortfalls are larger.<sup>17</sup> Some changes decreased Social Security's projected revenues, including the downward revision to the agency's projections of economic growth and the size of the population, which reduced the number of adults ages 20 to 64 (the people most likely to be paying payroll taxes). The repeal of the excise tax on high-premium health insurance led CBO to lower its projections of earnings as a share of compensation, which decreased projected payroll tax revenues.

Other factors partially offset those effects and decreased the actuarial deficit. The downward revision to CBO's projections of high-wage earners' share of total wages and salaries resulted in an increase, relative to last year's projections, in the projected share of earnings below the maximum amount subject to Social Security payroll

16. The actuarial deficit is calculated 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 single point in time.

17. Interest rates determine the discount rate applied in calculating the actuarial deficit; the discount rate determines how much weight is given to the annual differences between Social Security's outlays and revenues throughout the projection period. Because the cumulative effect of the lower interest rates in the near term is to put more weight on future years—which are projected to have larger financial shortfalls—they increase the actuarial deficit.



taxes and thus in an increase in payroll tax revenues. The projected gap between the cost-of-living adjustments that beneficiaries will receive and changes in the GDP price index (a summary measure of the prices of all goods and services produced in the economy) over the 75-year projection period has shrunk since last year, meaning that benefits for existing beneficiaries are growing at a slower pace relative to prices in the economy than they grew in last year's projections. In addition, CBO's projections of average wages are lower this year, which lowered the initial benefits expected to be received by new Social Security claimants.

CBO projects that if current laws governing the program's taxes and benefits did not change, the DI trust fund would be exhausted in fiscal year 2026, and the OASI trust fund would be exhausted in calendar year 2031. If the DI and OASI trust funds were combined, the projected exhaustion date would be in calendar year 2031.<sup>18</sup> Last year, the projected exhaustion date for the DI trust fund was two years later, and the projected exhaustion dates for the OASI trust fund and for the combined trust funds were one year later.<sup>19</sup> The earlier exhaustion dates result mainly from the downward revisions to the funds' projected income, which more than offset the reductions in projected expenditures from the funds.

### Changes in Long-Term Budget Projections Since January 2020

CBO published updated long-term budget projections in January 2020 that were based on the economic and

budget baseline projections for 2020 to 2030 released at that time. For years after 2030, those long-term projections incorporated updated long-term population, economic, and revenue projections developed in January. For its spending projections, CBO used a simplified approach that it regularly uses between full updates—it applied the growth rates from the most recent full update of the agency's extended baseline projections (at the time, those from June 2019).<sup>20</sup> The projections in the current report, by contrast, constitute a full update. To prepare them, CBO incorporated its most recent budget, economic, and population projections—which account for the effects of the pandemic, economic downturn, and related legislation—in its long-term model.

Whereas in January, CBO projected that federal debt held by the public would reach 180 percent of GDP in 2050, the agency now projects federal debt to reach 195 percent of GDP that year. An increase in the agency's projections of total outlays and a decrease in its projections of total revenues at the beginning of the 30-year period—both of which result primarily from the economic downturn caused by the pandemic and the legislation enacted in response to it—contribute to that upward revision in the agency's projections of federal debt. Those changes are partially offset by the reduction in the agency's projections of net spending for interest on debt through 2031, but they are compounded by the increase in projected net spending for interest in later years as increased federal borrowing pushes interest costs up. In addition, the increase in the agency's projections of debt as a share of GDP reflect the downward revisions that CBO has made to its projections of GDP since January.

18. For more details on the OASI and DI Trust Funds, see Congressional Budget Office, *The Outlook For Major Federal Trust Funds: 2020 to 2030* (September 2020), [www.cbo.gov/publication/56523](http://www.cbo.gov/publication/56523).

19. Earlier this year, CBO projected that the DI trust fund would be solvent through the end of the 10-year projection period. See Congressional Budget Office, "Details About Baseline Projections for Selected Programs: Social Security Trust Funds" (March 2020), [www.cbo.gov/publication/51309](http://www.cbo.gov/publication/51309).

20. See Congressional Budget Office, *The 2019 Long-Term Budget Outlook* (June 2019), [www.cbo.gov/publication/55331](http://www.cbo.gov/publication/55331).



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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 Molly Dahl and prepared with guidance from Devrim Demirel, Edward Harris, Joseph Kile, John Kitchen, John McClelland, Julie Topoleski, and Jeffrey Werling, the report represents the work of many analysts at CBO. Nathaniel Milhous and Jordan Trinh prepared the visual summary. Daniel Crown prepared the main text, in collaboration with Aaron Betz and with contributions from Kathleen Burke, Xinzhe Cheng, Terry M. Dinan, Edward Gamber, Evan Herrstadt, John Kitchen, Kyoung Mook Lim, and Robert Shackleton. Kyoung Mook Lim coordinated work on Appendix A, in collaboration with Aaron Betz and Daniel Crown and with contributions from Yiqun Gloria Chen, Edward Gamber, Jeffrey Schafer, and Robert Shackleton. Xinzhe Cheng prepared Appendix B, with contributions from Kathleen Burke, Daniel Crown, and Nathaniel Milhous. Barry Blom, Lori Housman, Noah Meyerson, Eamon Molloy, Sam Papenfuss, Lisa Ramirez-Branum, Dan Ready, Sarah Sajewski, Emily Stern, and Robert Stewart contributed to the analysis in this report.

Charles Pineles-Mark coordinated the long-term budget simulations, which he prepared along with Xinzhe Cheng, Daniel Crown, Kyoung Mook Lim, and Nathaniel Milhous. Edward Harris and Joshua Shakin coordinated the revenue simulations, which were prepared by Kathleen Burke, Paul Burnham, Madeleine Fox, Nathaniel Frentz, Bayard Meiser, Kurt Seibert, Jennifer Shand, Ellen Steele, and James Williamson. Robert Arnold, Aaron Betz, Yiqun Gloria Chen, Erin Deal, Daniel Fried, Edward Gamber, Ron Gecan, Mark Lasky, Michael McGrane, Sarah Robinson, Jeffrey Schafer, John Seliski, Robert Shackleton, and Christopher Williams prepared the macroeconomic projections. Daniel Crown developed the population projections. Erin Deal, Bayard Meiser, Sarah Robinson, and Jordan Trinh fact-checked the report. The report builds on the 10-year projections of the budget that CBO released on September 2, 2020, and the economic forecast that the agency published in July 2020.

Mark Doms, Jeffrey Kling, and Robert Sunshine reviewed the report. Christine Bogusz, Bo Peery, and Elizabeth Schwinn were the editors, and Robert Rebach was the graphics editor. Casey Labrack and Robert Rebach were the cover illustrators. Nathaniel Milhous, Charles Pineles-Mark, and Jordan Trinh prepared the supplemental data. The report is available on CBO's website([www.cbo.gov/publication/56516](http://www.cbo.gov/publication/56516)).

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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September 2020