

**Congressional Budget Office**

*Nonpartisan Analysis for the U.S. Congress*



# The 2022 Long-Term Budget Outlook



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# At a Glance

Each year, the Congressional Budget Office publishes a report presenting its budget projections and economic forecast for the next 30 years under the assumption that current laws governing taxes and spending generally do not change. This report is the latest in the series.

- **Deficits.** At 3.9 percent of gross domestic product (GDP), the projected deficit in 2022 is much smaller than those recorded in 2020 and 2021, because federal spending in response to the coronavirus pandemic has waned and revenues have risen sharply. Nevertheless, in CBO's projections, federal deficits over the 2022–2052 period average 7.3 percent of GDP (more than double the average over the past half-century) and generally grow each year, reaching 11.1 percent of GDP in 2052. That projected growth in total deficits is largely driven by increases in interest costs: Net interest outlays more than quadruple over the period, rising to 7.2 percent of GDP in 2052. Primary deficits—that is, deficits excluding net outlays for interest—grow from 2.3 percent of GDP in 2022 to 3.9 percent in 2052.

- **Debt.** By the end of 2022, federal debt held by the public is projected to equal 98 percent of GDP. The rapid growth of nominal GDP—which reflects both high inflation and the continued growth of real GDP (that is, GDP adjusted to remove the effects of inflation)—helps hold down the amount of debt relative to the nation's output in 2022 and 2023. In CBO's projections, debt as a percentage of GDP begins to rise in 2024, surpasses its historical high in 2031 (when it reaches 107 percent), and continues to climb thereafter, rising to 185 percent of GDP in 2052.

Debt that is high and rising as a percentage of GDP could slow economic growth, push up interest payments to foreign holders of U.S. debt, heighten the risk of a fiscal crisis, elevate the likelihood of less abrupt adverse effects, make the U.S. fiscal position more vulnerable to an increase in interest rates, and cause lawmakers to feel more constrained in their policy choices.

- **Spending.** In CBO's projections, outlays in 2022 are 23.5 percent of GDP—less than last year's total—and they continue to decline in 2023 and 2024 as federal spending in response to the pandemic diminishes. Outlays then steadily increase, reaching 30.2 percent of GDP in 2052. Rising interest costs and growth in spending on the major health care programs and Social Security—driven by the aging of the population and growth in health care costs per person—boost federal outlays significantly over the 2025–2052 period.
- **Revenues.** In CBO's projections, revenues rise to 19.6 percent of GDP in 2022, one of the highest levels ever recorded, because of sizable increases in collections of individual income taxes. After falling in relation to the size of the economy for the next few years, revenues increase in 2026, largely because of scheduled changes in tax rules. They continue to rise after 2030 as an increasing share of income is pushed into higher tax brackets. In 2052, revenues reach 19.1 percent of GDP.

Future economic conditions are uncertain. But even if they were more favorable than CBO currently projects, debt in 2052 would probably be much higher than it is today. Moreover, according to CBO's analysis, if future paths for spending and revenues were more consistent with such paths in the past, debt in 2052 would probably be much higher than CBO projects.

In this year's projections, debt as a percentage of GDP is lower in most years than CBO projected last year. In the current projections, federal debt rises from 98 percent of GDP in 2022 to 180 percent in 2051. Those amounts are lower than CBO's previous projections—by 4 percentage points and 22 percentage points, respectively.

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# Notes

The Congressional Budget Office’s extended baseline projections follow the agency’s 10-year baseline budget projections and then extend most of the concepts underlying those projections for an additional 20 years. In accordance with statutory requirements, CBO’s projections reflect the assumptions that current laws generally remain unchanged, that some mandatory programs are extended after their authorizations lapse, and that spending on Medicare and Social Security continues as scheduled even if their trust funds are exhausted.

The budget projections in this report are based on CBO’s economic projections and include the effects of legislation enacted through April 8, 2022. The economic projections reflect economic developments through March 2, 2022. The projections do not include budgetary or economic effects of subsequent legislation, economic developments, administrative actions, court rulings, or regulatory changes.

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 (GDP), are calculated on a fiscal year basis; economic variables, such as GDP or interest rates on Treasury securities, are calculated on a calendar year basis.

When October 1 (the first day of the fiscal year) falls on a weekend, certain payments that ordinarily would have been made on that day are instead made at the end of September and thus are shifted into the previous fiscal year. 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 premiums paid by beneficiaries and other offsetting receipts, which reduce outlays for the program.

In this report, the term “additional cost growth” is used instead of “excess cost growth” (which was used in past reports) to describe the amount by 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.

Detailed projections about the size of the U.S. population and its age and sex composition are presented in a companion report; see Congressional Budget Office, *The Demographic Outlook: 2022 to 2052* (July 2022), [www.cbo.gov/publication/57975](http://www.cbo.gov/publication/57975).

Supplemental information files—the data underlying the tables and figures in this report, supplemental budget projections, and the economic variables underlying those projections—are posted on CBO’s website ([www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data)). Previous editions of this report are also available on the website (<https://go.usa.gov/xmezZ>).



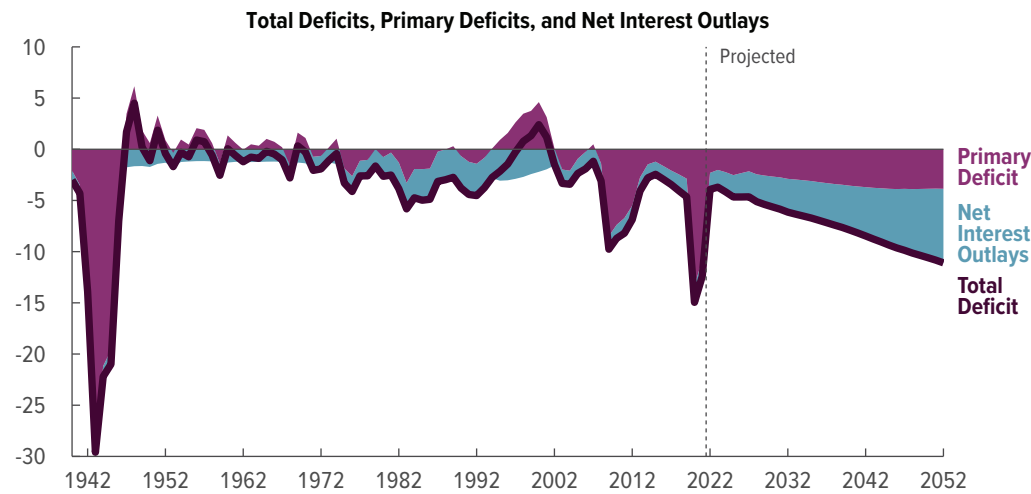
# Visual Summary

In this report, the Congressional Budget Office describes its projections of what the federal budget would look like over the next 30 years if current laws generally remained unchanged; it also presents the economic forecast underlying those projections. The United States faces a challenging fiscal outlook according to those extended baseline projections, which show budget deficits and federal debt held by the public growing steadily in relation to gross domestic product (GDP) over the next three decades.

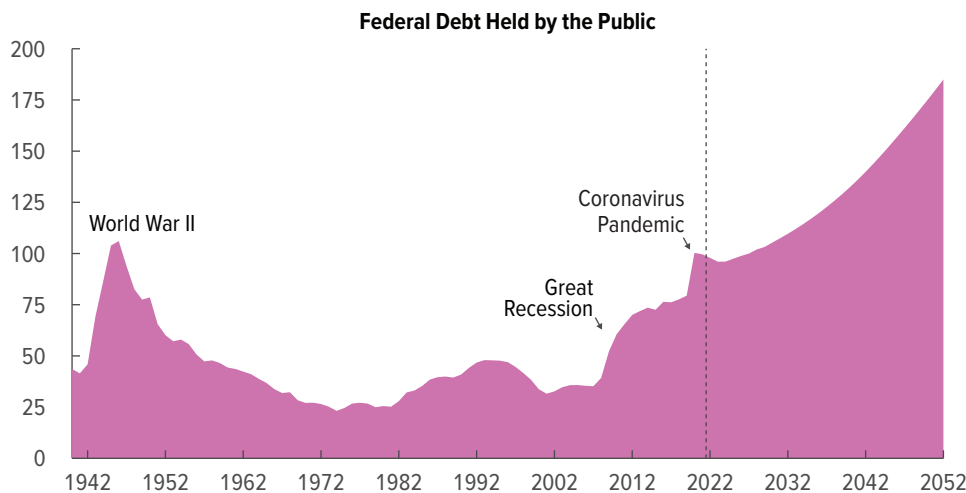
## Deficits and Debt

Federal deficits are projected to nearly triple over the next 30 years, from 4 percent of GDP in 2022 to 11 percent in 2052. Such persistently growing deficits would cause federal debt held by the public, which is already high, to continue to rise even further. In CBO's projections, such debt reaches 185 percent of GDP in 2052.

Percentage of Gross Domestic Product



Net interest outlays more than quadruple as a percentage of GDP over the 2022–2052 period in CBO's projections, reaching 7.2 percent of GDP in 2052. Primary deficits (which exclude net interest costs) grow in most years and reach 3.9 percent of GDP at the end of the projection period; they exceed the 50-year average of 1.5 percent of GDP throughout the period.



Debt is projected to rise in relation to GDP over the 30-year period, and it is on track to grow even larger after 2052.

See Figure 1-1 on page 6

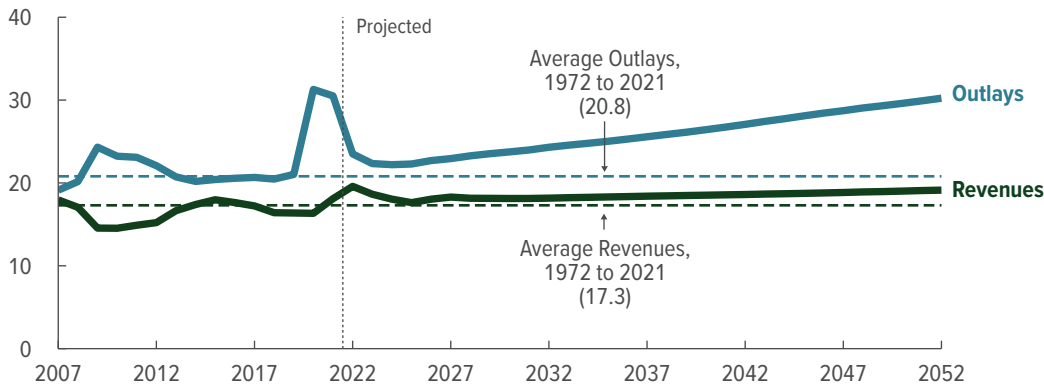


## Spending and Revenues

In CBO’s projections, federal spending grows from an average of 23 percent of GDP over the 2022–2032 period to an average of 29 percent of GDP over the 2043–2052 period. Federal revenues increase from an average of 18 percent of GDP over the 2022–2032 period to an average of 19 percent over the 2043–2052 period.

### Total Outlays and Revenues

Percentage of Gross Domestic Product

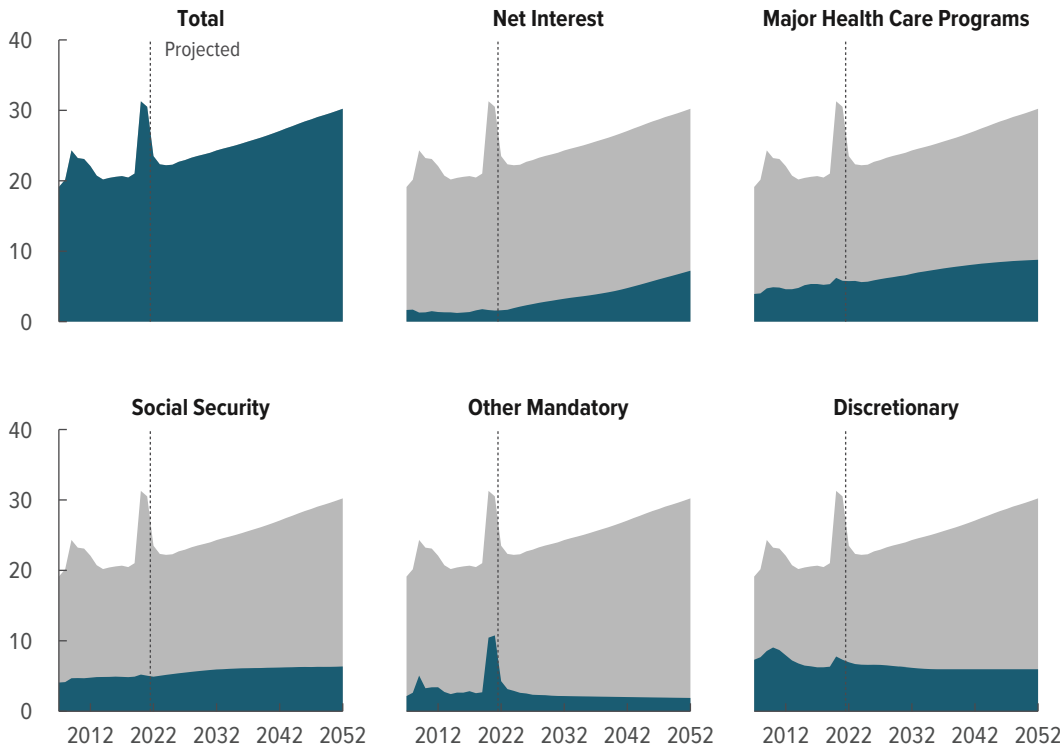


The gap between outlays and revenues widens over the long term. Outlays increase faster than revenues—mainly because of rising interest costs and growth in spending for Medicare and Social Security—resulting in ever-larger budget deficits.

See Figure 2-1 on page 16

### Outlays, by Category

Percentage of Gross Domestic Product



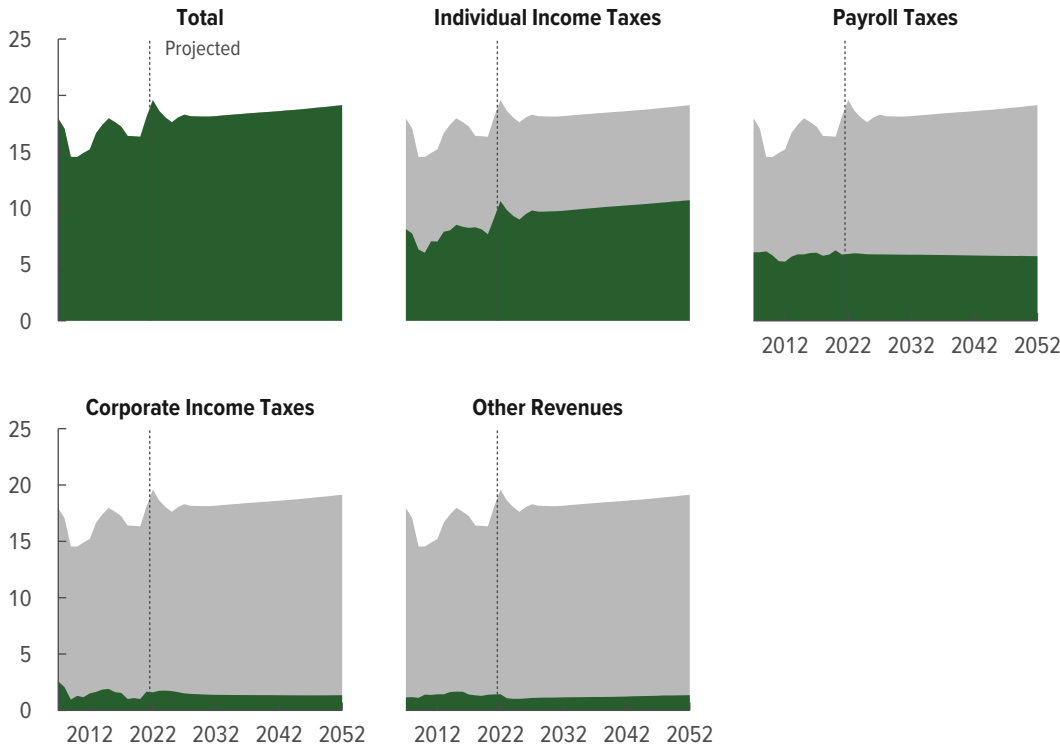
Rising interest rates and mounting debt cause net interest outlays to increase from 1.6 percent of GDP in 2022 to 7.2 percent in 2052 in CBO’s projections. Outlays for the major health care programs also rise, from 5.8 percent of GDP in 2022 to 8.8 percent in 2052. Likewise, outlays for Social Security increase in almost every year of the period.

See Figure 2-2 on page 17

## Spending and Revenues (Continued)

### Revenues, by Source

Percentage of Gross Domestic Product

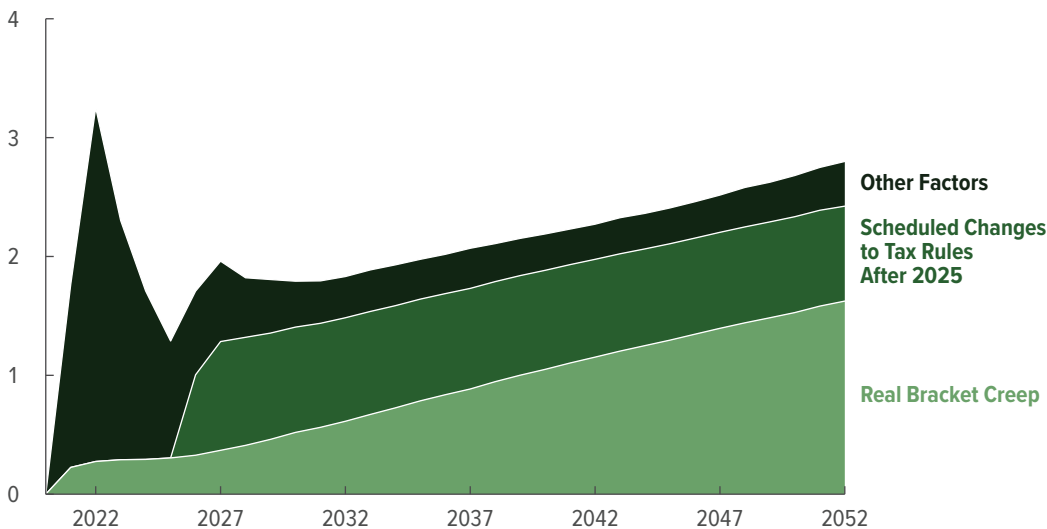


Measured as a percentage of GDP, revenues in 2022 are projected to be at one of the highest levels ever recorded. As temporary factors that boosted tax receipts fade, revenues fall in relation to the size of the economy for the next few years. They increase in 2026, largely because of the scheduled expiration of some provisions of the 2017 tax act.

See Figure 2-6 on page 22

### Composition of Changes in Revenues, 2020 to 2052

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 prices, a larger proportion of income becomes subject to higher tax rates.

See Figure 2-7 on page 23



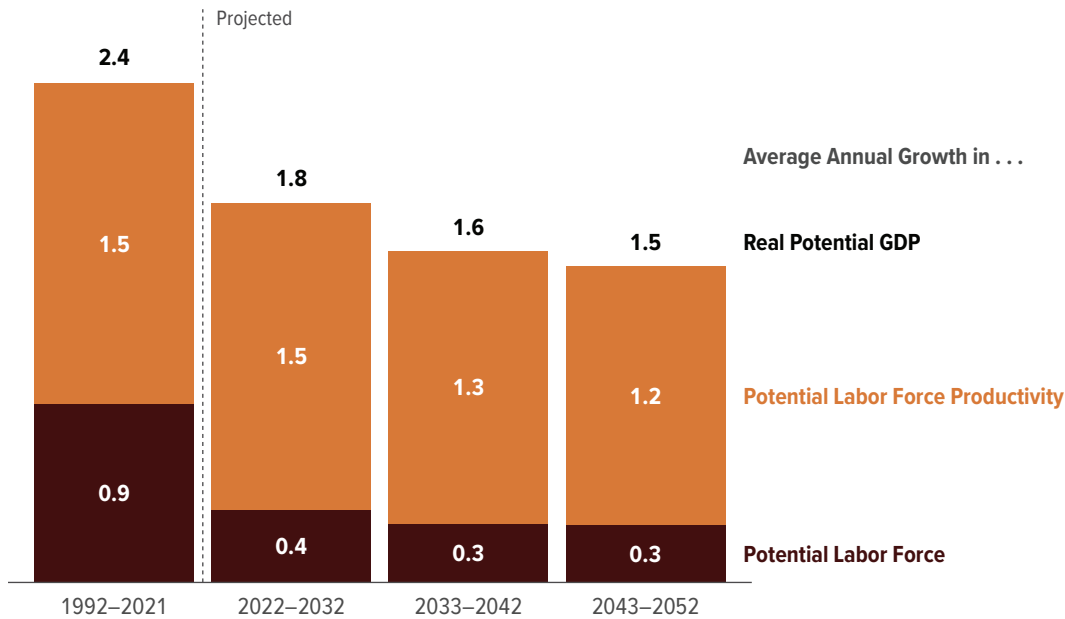
## The Economy

In CBO’s projections, real potential GDP (that is, the maximum sustainable output of the economy, adjusted to remove the effects of inflation) grows more slowly throughout the 2022–2052 period than it has, on average, over the past 30 years. Beginning in 2028 and continuing through the end of the projection period, potential output and actual output grow at the same rate, and the level of real GDP remains about 0.5 percent below the level of real potential GDP. That gap between real GDP and real potential GDP reflects the agency’s assessment that actual output falls short of potential output by more and for longer during and after economic downturns than actual output exceeds potential output during economic booms.

The growth of real potential GDP is determined by the growth of the potential labor force (the labor force adjusted for fluctuations in the business cycle) and the growth of potential labor force productivity (potential output per member of the potential labor force).

### Composition of the Growth of Real Potential GDP

Percent



Real potential GDP is projected to grow more slowly over the next 30 years than it did over the past 30 years, mostly because the potential labor force is projected to grow more slowly than it has in the past. From 2022 to 2052, the growth of real potential GDP slows primarily because the growth of potential labor force productivity slows in those years.

See Figure 3-2 on page 27





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# Chapter 1: Deficits and Debt

## Overview

If current laws governing taxes and spending generally remained unchanged, the federal budget deficit, measured in relation to gross domestic product (GDP), would nearly triple over the next 30 years, the Congressional Budget Office projects. Those growing deficits are projected to drive up federal debt held by the public substantially. As a percentage of GDP, such debt in 2052 would far exceed any previously recorded level and be on track to increase further (see Figure 1-1).

As federal spending in response to the coronavirus pandemic wanes and revenues rise sharply, this year's budget deficit is set to be much smaller than those recorded in 2020 and 2021. Nevertheless, in CBO's projections, federal deficits are large by historical standards and generally grow over the next 30 years, reaching 11.1 percent of GDP in 2052.<sup>1</sup> In the past 100 years, the deficit has been that large only during World War II and during the pandemic in 2020 and 2021. The projected growth in deficits is largely driven by increases in interest costs. Over that period, deficits average 7.3 percent of GDP, more than double the average over the past half-century.

Those persistently increasing deficits generate high-and-rising debt in the agency's projections. Measured in relation to GDP, federal debt held by the public dips over the next two years but then rises, reaching 110 percent at the end of 2032—the highest it has ever been. Debt continues to climb thereafter and reaches 185 percent of GDP at the end of 2052.

Such high and rising debt could have significant economic and financial consequences. It could, among other things, slow economic growth, drive up interest payments to foreign holders of U.S. debt, elevate the risk of a fiscal crisis, increase the likelihood of less abrupt adverse effects, make the U.S. fiscal position more vulnerable to an increase in interest rates, and

cause lawmakers to feel more constrained in their policy choices.

CBO estimated the size of changes in spending or revenues that would be needed if lawmakers wanted to achieve certain targets for federal debt held by the public. The size of those changes would depend on the level of debt that lawmakers wanted to achieve and when the changes were implemented. In addition, how and when lawmakers responded to high and rising debt would determine who bore the burden of the changes in spending or taxes and who realized the economic benefits of those changes.

Even if federal laws remained unchanged, CBO's budget projections would be subject to considerable uncertainty. Those projections depend on the agency's economic projections and many other factors, including the course of the ongoing pandemic. Developments that diverged from those underlying CBO's projections could lead to budgetary outcomes that were very different from those reported here. That uncertainty increases in later years of the projection period because changes in the economy, demographics, and a variety of other factors are more difficult to anticipate over longer time horizons.

This analysis does not account for some contingencies that could have significant effects on the budget—for example, an economic depression (such as the Great Depression of the 1930s), a catastrophe or major war, unexpectedly significant effects of climate change, or the development of a previously underused natural resource. Such occurrences could create conditions in the next 30 years that are substantially better or worse than those reflected in the historical data on which CBO based its analysis.

## Deficits and Debt Through 2052

In CBO's projections, deficits drop below 4.0 percent of GDP for a few years and then generally rise again through 2052. Similarly, debt measured as a percentage of GDP dips for two years before increasing through 2052 as the federal government persistently incurs budget deficits that are large relative to the size of the economy.

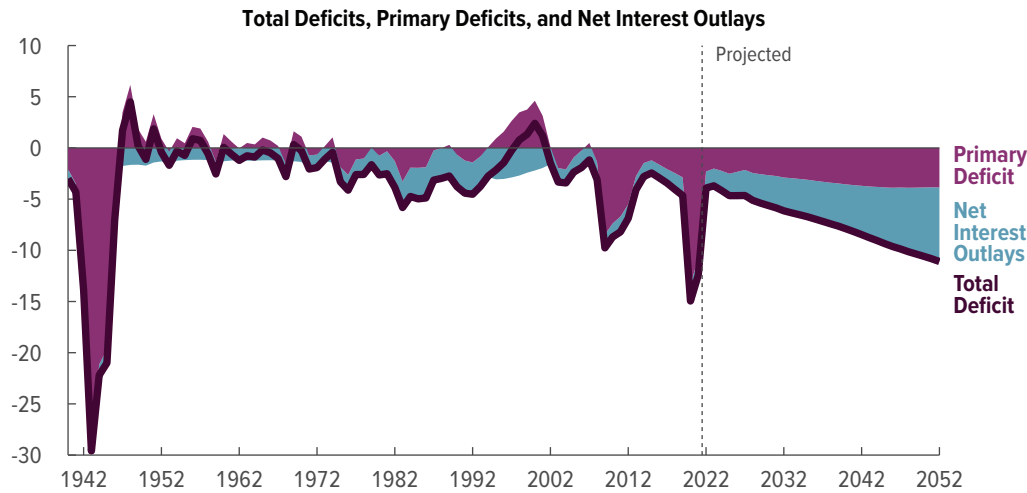
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1. The long-term projections of federal spending, revenues, deficits, and debt in this report are consistent with the baseline budget projections and the economic forecast for 2022 to 2032 that CBO published in May 2022. See Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), [www.cbo.gov/publication/57950](http://www.cbo.gov/publication/57950).

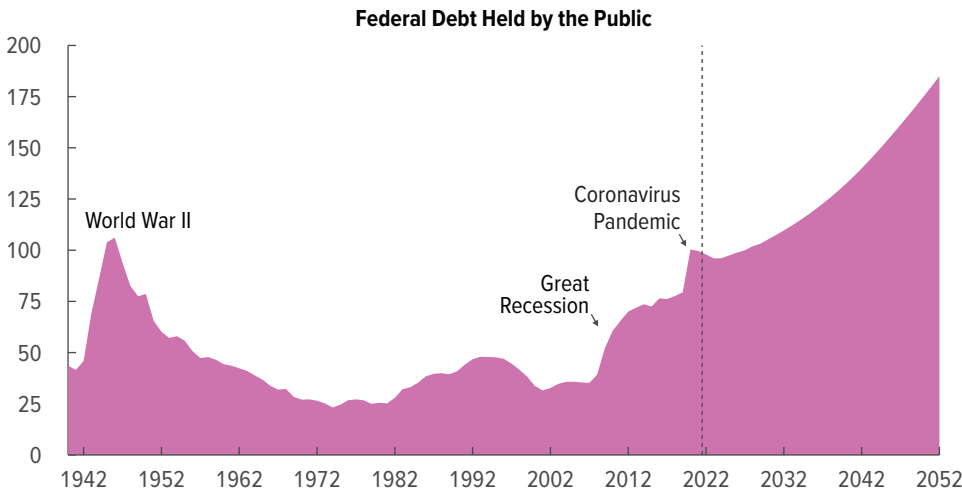
Figure 1-1.

## Deficits and Debt

Percentage of GDP



In CBO’s projections, primary deficits grow in most years and reach 3.9 percent of GDP in 2052; they exceed the 50-year average of 1.5 percent of GDP throughout the projection period. Driven up by large and sustained primary deficits and rising interest rates, net interest outlays more than quadruple as a percentage of GDP over the 2022–2052 period, reaching 7.2 percent of GDP in 2052.



Those persistently growing deficits push federal debt held by the public, which is already high, further up throughout the 30-year period—to 185 percent of GDP in 2052. Such debt would continue to rise thereafter.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

Primary deficits exclude net outlays for interest.

GDP = gross domestic product.

### Deficits

The total deficit—that is, the deficit including net outlays for interest—in 2022 is estimated to be 3.9 percent of GDP, significantly smaller than it was in 2021. In CBO’s projections, the total deficit declines to 3.7 percent of GDP in 2023 before increasing again. Over the 2043–2052 period, those deficits average 10.0 percent of GDP—almost three times the 3.5 percent of GDP they averaged over the past 50 years (see Table 1-1). Moreover, in years in the past half-century when unemployment was relatively low, as it is in CBO’s projections, the average total deficit was even smaller.

Primary deficits—that is, deficits excluding net outlays for interest—capture the aspects of federal spending and revenues that policymakers can, in principle, affect directly through legislation; thus, they are the main mechanism through which lawmakers can influence the trajectory of federal debt and net interest outlays. In CBO’s extended baseline projections, the primary deficit grows from 2.3 percent of GDP in 2022 to 3.9 percent of GDP in 2052, exceeding the 1.5 percent of GDP such deficits averaged over the past 50 years in every year of the projection period. Persistently large primary deficits increase federal debt and, in turn, net interest outlays in

Table 1-1.

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

Percentage of Gross Domestic Product

	2022	Projected Annual Average		
		2023–2032	2033–2042	2043–2052
<b>Revenues</b>				
Individual income taxes	10.6	9.6	10.0	10.5
Payroll taxes	5.9	5.9	5.8	5.8
Corporate income taxes	1.6	1.5	1.4	1.3
Other <sup>a</sup>	1.4	1.1	1.2	1.3
<b>Total Revenues</b>	<b>19.6</b>	<b>18.1</b>	<b>18.4</b>	<b>18.9</b>
<b>Outlays</b>				
Mandatory				
Social Security	4.9	5.5	6.1	6.3
Major health care programs <sup>b</sup>	5.8	6.2	7.6	8.6
Other	4.3	2.4	2.1	1.9
Subtotal	14.9	14.2	15.8	16.8
Discretionary	7.0	6.5	6.0	6.0
Net interest	1.6	2.6	4.0	6.2
<b>Total Outlays</b>	<b>23.5</b>	<b>23.2</b>	<b>25.8</b>	<b>28.9</b>
<b>Deficit</b>	<b>-3.9</b>	<b>-5.1</b>	<b>-7.4</b>	<b>-10.0</b>
<b>Debt Held by the Public at the End of the Period</b>	<b>98</b>	<b>110</b>	<b>140</b>	<b>185</b>
<b>Memorandum:</b>				
<b>Social Security</b>				
Revenues <sup>c</sup>	4.5	4.6	4.6	4.5
Outlays <sup>d</sup>	4.9	5.5	6.1	6.3
<b>Contribution to the Federal Deficit<sup>e</sup></b>	<b>-0.4</b>	<b>-1.0</b>	<b>-1.5</b>	<b>-1.8</b>
<b>Medicare</b>				
Revenues and offsetting receipts <sup>c</sup>	2.3	2.3	2.8	3.1
Outlays <sup>d</sup>	3.8	4.6	6.1	7.1
<b>Contribution to the Federal Deficit<sup>e</sup></b>	<b>-1.5</b>	<b>-2.3</b>	<b>-3.4</b>	<b>-4.1</b>
Gross Domestic Product at the End of the Period (Trillions of dollars)	24.7	36.7	52.6	74.5

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

This table provides the information 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 an additional 20 years.

When October 1 (the first day of the fiscal year) falls on a weekend, certain payments that ordinarily would have been made on that day are instead made at the end of September and thus are shifted into the previous fiscal year. All projections have been adjusted to exclude the effects of those timing shifts.

- 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 outlays for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as subsidies for health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.
- Includes all payroll taxes for the program except for those paid by the federal government on behalf of its employees; those payments are intragovernmental transactions. For Social Security, income taxes paid on Social Security benefits, which are credited to the trust funds, are included; for Medicare, premiums and other offsetting receipts are included. Amounts shown do not include any interest credited to the trust funds.
- Does not include outlays related to the administration of the program, which are discretionary. For Social Security, outlays do not include intragovernmental offsetting receipts stemming from the employer's share of payroll taxes paid to the Social Security trust funds by federal agencies on behalf of their employees.
- The contribution to the deficit shown here differs from the change in the trust fund balance for the program. It does not include intragovernmental transactions, interest earned on balances, or outlays related to the administration of the program.

later years of the projection period. Combined with rising interest rates, large and sustained primary deficits cause net interest outlays measured as a percentage of GDP to more than quadruple over the period: They rise from 1.6 percent of GDP in 2022 to 7.2 percent in 2052.

### Federal Debt Held by the Public

Measured in relation to the size of the economy, debt dips from 100 percent of GDP at the end of 2021 to 96 percent in 2023 in CBO's projections. The rapid growth of nominal GDP over that period—which reflects both high inflation and the growth of real GDP (that is, GDP adjusted to remove the effects of inflation)—helps hold down debt measured as a percentage of GDP. After 2023, debt rises. It reaches 185 percent of GDP in 2052—far higher than its historical peak of 106 percent of GDP recorded in 1946, immediately after World War II—and is on track to rise higher still.

### Consequences of High and Rising Federal Debt

If federal debt continued to rise in relation to GDP at the pace that CBO projects it would under current law, the economy would be affected in two significant ways in the long term:

- That debt path would raise borrowing costs throughout the economy, reduce private investment, and slow the growth of economic output over time.
- Rising interest costs associated with that debt would drive up interest payments to foreign holders of U.S. debt, decreasing the nation's net international income.

Persistently rising debt would also pose significant risks to the fiscal and economic outlook.<sup>2</sup> Such a debt path would have the following effects:

- It would elevate 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 to occur.
- It would increase the likelihood of less abrupt, but still significant, adverse effects, such as creating widespread expectations of higher rates of inflation, eroding confidence in the U.S. dollar as the dominant international reserve currency, or making it more difficult to secure financing for public and private activities in international markets.

2. For a fuller discussion of federal debt and the consequences of its growth, see Congressional Budget Office, *Federal Debt: A Primer* (March 2020), [www.cbo.gov/publication/56165](http://www.cbo.gov/publication/56165).

- It would make the United States' fiscal position more vulnerable to an increase in interest rates because costs to service federal debt rise more for a given increase in interest rates when debt is higher than they do when it is lower.
- Policymakers might feel constrained 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.

### Slower Economic Growth

High and rising federal debt such as that resulting from the federal borrowing in CBO's extended baseline projections would, over time, push up borrowing costs in all sectors of the economy, reduce private investment, and slow the growth of GDP, all else being equal.

Higher debt tends to lead to higher interest rates and thus increased borrowing costs in both the public and private sectors. When the government borrows, it does so from people and businesses whose savings would otherwise finance private investment in productive capital, such as housing and commercial structures. The portion of private savings used to buy Treasury securities is no longer available to fund such investment, so the borrowing costs of both the private and public sectors increase.

On net, an increase in government borrowing reduces private investment. The increases in borrowing costs reduce private investment, but at least three other effects tend to boost private investment and partially offset that reduction:

- Additional government borrowing strengthens the incentive to save—in part, by driving up interest rates—but the increase in private saving is not as large as the increase in government borrowing; national saving (or the amount of domestic resources available for investment) thus declines.<sup>3</sup>
- Higher interest rates tend to attract more foreign capital to the United States, and some of those funds become available for private investment.

3. In CBO's assessment, another reason that an increase in government borrowing would strengthen the incentive to save is that some people would 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 would increase their saving to prepare for paying higher taxes or receiving less in benefits. 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).

- Borrowing that supports increased high-quality and effective federal investment typically boosts private-sector productivity, investment, and output. However, the increasing deficits and debt in CBO's projections result primarily from increases in noninvestment spending. For instance, federal spending for Social Security, Medicare, and Medicaid for people age 65 or older, which accounts for less than 30 percent of all federal noninterest spending in 2022, accounts for more than 40 percent in 2052.

In CBO's assessment, the increases in private investment stemming from those three factors would not be as large as the reduction in private investment stemming from the additional government borrowing.

The reduction in private investment would slow economic growth. If investment in capital goods declined, workers would, on average, have less capital to use in their jobs. As a result, they would be less productive, their compensation would be lower, and they would thus be less inclined to work. Those effects would increase over time as federal borrowing grew.

### Increased Interest Payments to Foreign Holders of U.S. Debt

If federal debt continued to rise, the government would spend more on interest payments. Larger outlays for interest would include an increase in payments to foreign investors, who currently hold roughly one-third of all federal debt held by the public (or 45 percent of such debt not held by the Federal Reserve). The increases in interest payments to foreign investors would, in turn, reduce the nation's net international income—the difference between the nation's income (as measured by its gross national product, or GNP) and its total production (as measured by GDP).<sup>4</sup> Typically, the nation's net international income is positive—that is, GNP exceeds GDP. When net international income falls, national income also declines, all else being equal.

### Greater Risk of a Fiscal Crisis

The likelihood of a fiscal crisis increases as federal debt continues to rise, because mounting debt could erode

investors' confidence in the U.S. government's fiscal position. Such an erosion of confidence would undermine the value of Treasury securities and drive up interest rates on federal debt as investors demanded 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 for 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, all of which would make a fiscal crisis more likely.

A fiscal crisis could lead to a financial crisis. 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. Because the United States plays a central role in the international financial system, such a crisis could spread globally.

**Risk Factors.** The risk of a fiscal crisis depends on factors beyond the amount of federal debt. Ultimately, it is the cost of servicing the debt and the ability to refinance it as needed that matter. Among the factors affecting those two things are investors' assessment of the outlook for the budget and the economy, which can change over time, and their expectations about domestic and international financial conditions, including interest rates and exchange rates. 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.

Because the risk of a fiscal crisis depends on many uncertain and shifting factors, CBO cannot quantify the probability that a fiscal crisis would occur. In CBO's assessment, no tipping point exists at which the debt-to-GDP ratio would become so high that it made a crisis likely or imminent; nor is there a fixed point at which interest costs would become so high in relation to GDP that they were unsustainable.

**Risk of a Crisis in the Near Term.** The risk of a fiscal crisis in the near term appears to be low despite the larger deficits and higher debt stemming from the pandemic. The near-term risk is mitigated by certain characteristics of the U.S. financial system. For example, the Federal Reserve conducts independent monetary policy, government debt is issued in U.S. dollars, the dollar holds

4. Whereas GDP is the value of all final goods and services produced within the borders of the United States (whether the labor and capital used to produce them are supplied by residents or nonresidents), GNP is the value of all final goods and services produced by labor and capital supplied by residents of the United States, regardless of where that labor and capital are located.



a central place in the global financial system, and few investments can provide returns comparable to those of Treasury securities at similarly low levels of risk.

In addition, concern about a fiscal crisis in the near term is not currently apparent in financial markets. However, financial markets do not always fully reflect risks on the horizon, and the risk of a fiscal crisis could change suddenly in the wake of unexpected events. For example, a sudden rise in interest rates could cause investors to become concerned about the government's fiscal position over the long term as their uncertainty grew about whether the rise was temporary or signaled a long-term trend.

**Options for Responding to Such a Crisis.** If a fiscal crisis occurred, policymakers would have several options to respond, though choosing among them would involve difficult trade-offs. One policy option would be to dramatically cut noninterest spending or increase taxes, either of which could have adverse effects on the economy in the short run.

A second option would be for the Federal Reserve to fund deficits through the purchase of Treasury securities. That option, if pursued extensively, would raise inflation—and notably so, relative to the inflation expectations that were incorporated in the interest rates on existing debt—thereby reducing the real cost of financing outstanding debt. Such an action would also put downward pressure on the value of the dollar. High inflation over an extended period could, therefore, undermine the role of the dollar in international currency markets, depending on the attractiveness of other currencies. Such a development would lead to even higher inflation and declines in real wealth and in purchasing power.

A third 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, however, generally viewed as less likely than the other two options because it would undermine investors' confidence in the government's commitment to repay its debt in full.

### **Increased Likelihood of Less Abrupt Adverse Effects**

Even in the absence of an abrupt fiscal crisis, high and rising debt could have persistent adverse 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 increases in people's inflation expectations. Increases in federal borrowing could also lead to an erosion of confidence in the U.S. dollar as the dominant international reserve currency. Such developments would, among other things, make it more difficult to finance public and private activity.

### **Greater Vulnerability of U.S. Fiscal Position to an Increase in Interest Rates**

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. Debt of the amounts in CBO's extended baseline projections 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 the agency's projections. (The average interest rate on federal debt in CBO's projections increases from 1.8 percent in 2022 to 3.1 percent in 2032 and to 4.2 percent in 2052.) Conversely, lower interest rates would result in interest costs that were less than those in CBO's projections. (For further discussion of the potential effects of alternative interest rates on federal debt, see Chapter 4.)

### **Increased Perception of Fiscal Constraints Among Policymakers**

The size of budget deficits and debt could influence policymakers' choices. Policies that increase spending or reduce revenues can provide support to the economy during challenging times, such as the current pandemic. Furthermore, increased high-quality and effective federal investment—which may require the federal government to borrow more and thus result in higher deficits and debt—would boost private-sector productivity and output (though it would only partially mitigate the adverse consequences of that additional borrowing).<sup>5</sup>

However, if policymakers perceived that debt was already very high, they could feel constrained from using deficit-financed fiscal policy to respond to unforeseen events, promote economic activity, or further other goals. They might not feel as hindered if debt was lower (or if the increases in deficits and debt that would result

5. See Congressional Budget Office, *Effects of Physical Infrastructure Spending on the Economy and the Budget Under Two Illustrative Scenarios* (August 2021), [www.cbo.gov/publication/57327](http://www.cbo.gov/publication/57327), and *The Macroeconomic and Budgetary Effects of Federal Investment* (June 2016), [www.cbo.gov/publication/51628](http://www.cbo.gov/publication/51628).



from policy changes were 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 respond to an international crisis.

### **Other Consequences**

Certain risks arise from the interaction of fiscal and monetary policy implemented 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. In CBO's baseline projections, the Federal Reserve begins reducing its holdings of Treasury securities in 2022, which puts modest upward pressure on long-term interest rates. There is, however, some risk that long-term interest rates would rise rapidly. It is also possible that concern about an adverse reaction by market participants could cause the Federal Reserve to delay reducing its holdings of Treasury securities, thereby causing long-term interest rates to remain lower for longer than CBO projects.

## **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 certain targets for federal debt held by the public. The agency also assessed the extent to which the size of the necessary adjustments would change if the implementation of policies aimed at reducing deficits was delayed. Finally, 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**

The size of policy changes necessary to achieve a given debt target would depend on the level of debt that lawmakers wanted to achieve. If lawmakers wanted debt in 2052 to remain at roughly its level at the end of this fiscal year (about 100 percent of GDP), they could, for example, cut noninterest spending or raise revenues (or do both) to reduce the deficit in each year beginning in 2027 by an amount equal to 2.8 percent of GDP, which would amount to \$800 billion, or about \$2,400 per person, in 2027.

The changes would need to be larger if lawmakers wanted to achieve a lower debt target. For example, to reduce debt to its approximate level in 2019 (80 percent of GDP) by 2052, lawmakers would need to increase revenues or cut noninterest spending (or adopt some combination of those two actions) to reduce the deficit by an amount equal to 3.5 percent of GDP each year starting in 2027.

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

### **The Timing of Policy Changes**

The longer policymakers waited to address high and rising debt, the greater the policy changes required to achieve long-term objectives would be. Reducing deficits sooner would result in a smaller accumulated debt and therefore less risk to long-term economic growth and stability. But reducing deficits sooner might also lead to economic and financial disruptions if people had insufficient time to plan for or to adjust to the new measures, or if such a reduction occurred when the economy was weak. In addition, there may be favorable effects of delaying deficit reduction. If the policies that resulted in large deficits supported the economy during challenging times or increased high-quality and effective federal investment, changing those policies to reduce deficits sooner would dampen those effects.

CBO estimated the extent to which the size of the necessary policy adjustments would change if deficit reduction was delayed until 2032 or 2037. If lawmakers sought to reduce debt as a share of GDP to 80 percent in 2052 and if the necessary policy changes did not take effect until 2032, the annual reduction in the primary deficit would need to amount to 4.3 percent of GDP rather than the 3.5 percent that would accomplish the same goal if the changes were made starting in 2027. If, instead, lawmakers chose to wait until 2037 to implement the policies, even larger changes would be necessary; in that case, the required annual reduction in the primary deficit would amount to 5.7 percent of GDP.

### Effects on Different Generations

How lawmakers responded to high and rising debt would determine who bore the burden of the changes in spending or taxes and who realized the economic benefits of those changes.<sup>6</sup> In general, if policymakers postponed fiscal tightening and if debt as a share of GDP continued to rise, future generations—who CBO projects would have higher incomes, in aggregate and on average, than earlier generations—would bear more of the burden of the changes necessary to stabilize debt. Earlier generations—particularly people in those generations who have higher income and more wealth—would bear less of the burden. Within any given generation, who bore the brunt of the burden would depend on the specific policies implemented and on how long policymakers waited to implement those policies.

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

The long-term budget outlook is highly uncertain. CBO's budget projections depend on the agency's economic projections and demographic projections, both of which are themselves uncertain. Even if future tax and spending policies did not vary from those specified in current law, budgetary outcomes over the next 30 years would undoubtedly differ from those in CBO's extended baseline projections because of unexpected changes in the economy and demographics, among other factors. Not only can small changes in some factors, compounding over many years, greatly affect projected budgetary outcomes decades into the future, but the pandemic's effects on long-term trends are unknown. Furthermore, the effectiveness of monetary and fiscal policy and the response of global financial markets to the substantial projected increases in federal deficits and debt are also uncertain.

### Uncertainty About Budgetary Outcomes

Developments that vary from what CBO projects could lead to budgetary outcomes that are very different from those in the baseline projections. (For a discussion of how changes in economic conditions, spending, or revenues could cause budgetary outcomes to differ from those in CBO's budget projections, see Chapter 4.) That uncertainty increases in later years of the projection period because changes in the economy, demographics, and a variety of other factors are more difficult to anticipate over longer time horizons.

Moreover, outcomes will depend on future legislative action, which could increase or decrease budget deficits. For example, CBO's baseline projections reflect the scheduled expiration of several individual income tax provisions contained in Public Law 115-97 (referred to as the 2017 tax act in this report). If the scheduled expirations did not occur and, instead, current tax policies continued, much larger deficits and greater debt would result. Also, in accordance with CBO's standard procedures for projecting discretionary spending, funding provided for 2022 by the Infrastructure Investment and Jobs Act (P.L. 117-58) continues each year with adjustments for inflation in the agency's baseline projections. If, instead, only the funding amounts stated in that law were included in CBO's projections, the deficit, including the associated debt-service costs, would be smaller, and debt would be lower.

### Uncertainty About the Economic Outlook

CBO's economic projections are subject to a high degree of uncertainty, including uncertainty about the course of the ongoing pandemic. In particular, projections of economic output and labor market conditions are highly uncertain: Growth in the labor force or in labor force productivity could be faster or slower than expected. Other key sources of uncertainty are future monetary policy and the path of interest rates. For example, uncertainty about the path of interest rates contributes to the uncertainty of the agency's estimates of the impact that higher deficits and debt would have on the economy.

### Uncertainty About the Demographic Outlook

CBO's demographic projections for the next 30 years are subject to significant uncertainty because, compounded over many years, even small changes in rates of fertility, mortality, or net immigration—such as any long-term effects that may result from the pandemic—could greatly affect outcomes later in the projection period.<sup>7</sup> For example, because many immigrants are of working age, if immigration rates were higher or lower than CBO projected, the size of the labor force would be larger or smaller than it is in CBO's projections. Changes in fertility rates would have larger effects in later years of the projection period, once members of the affected generations reach working age. Changes in mortality rates, which would probably most affect the size of the older population, would result in outlays for the major health care programs and Social Security that differed from those in CBO's projections.

6. See Congressional Budget Office, *The Economic Effects of Waiting to Stabilize Federal Debt* (April 2022), [www.cbo.gov/publication/57867](http://www.cbo.gov/publication/57867).

7. For the agency's latest demographic projections, see Congressional Budget Office, *The Demographic Outlook: 2022 to 2052* (July 2022), [www.cbo.gov/publication/57975](http://www.cbo.gov/publication/57975).

## Potential Developments and Their Possible Effects on the Budget

The sources of uncertainty discussed above are not the only ones associated with long-term budget projections. Other plausible but unpredictable developments could also increase or decrease federal debt in relation to CBO's projections. Such contingencies include a severe economic depression; catastrophes, such as a major natural disaster or world war; effects of climate change that are more significant than expected; or the development of previously underused natural resources.

### A Severe Economic Downturn

In general, when economic output rises or falls, the federal budget is affected. For example, economic downturns can reduce revenues significantly and raise some outlays, such as those for unemployment insurance and nutrition assistance. In addition, downturns have historically prompted policymakers to enact legislation that further reduces revenues and increases federal spending—as they did during the pandemic—to help people suffering from the weak economy, to bolster the financial position of state and local governments, and to stimulate additional economic activity and employment. For instance, federal debt measured relative to the size of the economy doubled from 35 percent of GDP in 2007 to 70 percent in 2012 as a result of the financial crisis and its aftermath.

Severe economic downturns—like the Great Depression of the 1930s—are rare; for that reason and others, their size and timing cannot be readily predicted, and CBO's projections do not account for their possibility. The agency's long-term projections of output and unemployment do, however, reflect economic trends from the end of World War II to the present, a period that included several economic downturns that were not fully offset by upturns of similar magnitude.

### Catastrophes or Wars

The federal government also faces implicit obligations in the case of catastrophes and could spend large sums to fight a major war. However, because such events are rare and unpredictable, it is very difficult to estimate the probability of their occurring in the future and their possible effects on the budget.

Small-scale natural and manmade disasters occur fairly often in the United States; they may seriously damage local communities and economies, but they rarely have significant, lasting impacts on the national economy.

By contrast, a catastrophe—such as another pandemic or a massive earthquake—could affect budgetary outcomes by reducing economic growth over several years or by leading to substantial increases in federal spending. For instance, federal debt measured as a percentage of GDP rose by 20 percentage points from 2019 to 2021 in response to the pandemic and the recession it brought about.

The United States' involvement in a major war could also have a significant impact on the economy and federal budget. For example, federal debt held by the public measured in relation to GDP rose by about 60 percentage points during World War II. Geopolitical events, including Russia's invasion of Ukraine, add to the uncertainty of the economic outlook, particularly the outlook for inflation.

### Climate Change

In CBO's assessment, climate change will reduce GDP, on net. Some aspects of climate change will have positive effects on output in some parts of the country—warmer temperatures will increase the productivity of agricultural land in some areas by extending growing seasons, for example—but the negative effects in other areas are projected to outweigh those positive effects. Similarly, the net effects of climate change on labor productivity, labor supply, and the private sector's production costs are all expected to reduce output, on net, even though some of those factors will be positive in some instances. Other aspects of climate change are entirely negative. For instance, wildfires, floods, hurricanes, and tropical storms reduce the nation's output of goods and services by damaging and destroying buildings, equipment, and inventory.<sup>8</sup>

In CBO's projections, real GDP in 2052 is 1.0 percent lower than it would have been if climatic conditions from 2022 to 2052 were the same as they were at the end of the 20th century.<sup>9</sup> Any projection that attempts to account for the impact of climate change on the economy or on the budget is highly uncertain. CBO's projection is in the middle of a range of likely outcomes,

8. See Congressional Budget Office, *Budgetary Effects of Climate Change and of Potential Legislative Responses to It* (April 2021), [www.cbo.gov/publication/57019](http://www.cbo.gov/publication/57019).

9. For additional information about the methods that CBO used to estimate the effects 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).

reflecting a variety of economic and scientific uncertainties. The agency also expects climate change to have various effects on the United States that are not directly reflected in economic output.

Though CBO's extended baseline projections incorporate some effects of climate change, unexpected and significant changes to the climate still pose a sizable risk to the federal budget. In the future, if weather-related disasters increased in frequency or magnitude, lawmakers could respond by increasing funding above the amounts in CBO's projections.<sup>10</sup> For example, increased damage from storm surges might lead the Congress to pass additional emergency supplemental appropriations for disaster relief or to approve legislation providing funding to protect infrastructure that is vulnerable to rising sea levels. Conversely, lawmakers could amend existing laws to reduce federal spending on weather-related disasters. For instance, the Congress might decide to alter flood insurance or crop insurance programs in a way that provided insured parties with a greater incentive to avoid potential damage.

Because, on net, climate change has a negative effect on the budget and the economy, successful investments in mitigation or adaptation—those that reduce the extent of climate change or its adverse consequences—can generally be expected to yield future savings to the federal budget.<sup>11</sup> Such savings might stem from reductions in physical damage, increases in the productivity of land and outdoor labor, or lower health care costs. Some efforts to mitigate climate change or adapt to its effects would take a long time to implement but could provide long-lasting budgetary savings in the future or provide

10. 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).

11. See Congressional Budget Office, *Budgetary Effects of Climate Change and of Potential Legislative Responses to It* (April 2021), [www.cbo.gov/publication/57019](http://www.cbo.gov/publication/57019).

benefits to the private sector or other governments that would not be reflected in the federal budget. Ineffective policies could, however, impose costs on federal, state, and local governments without yielding budgetary savings or other benefits to justify those costs. Determining whether a particular policy would lower harmful emissions and improve the climate trajectory can be difficult.

### **Advances in the Development of Natural Resources**

The future discovery and development of productive natural resources may increase federal receipts. For example, advances in combining two drilling techniques, hydraulic fracturing and horizontal drilling, have allowed access to large deposits of shale resources—that is, crude oil and natural gas trapped in shale and certain other dense rock formations. Virtually nonexistent 15 years ago, the production of oil and natural gas from shale has boomed in the United States since then. The primary budgetary impact of that increase in production is an increase in federal tax revenues.<sup>12</sup> Advances in the development of other resources might also contribute to federal receipts by bolstering the economy and making federally owned resources more valuable.

It is impossible to predict the discovery of new natural resources or ways to extract them—particularly discoveries that would have significant effects on the economy or the federal budget. Furthermore, the effects of any such discoveries on the federal budget would depend on the natural resource in question. The effects would also depend on the amount of private investment, government regulations, and the availability of the infrastructure necessary to access and transport those resources. As a result, CBO's projections do not account for the budgetary effects of the unexpected development of natural resources.

12. See Congressional Budget Office, *The Economic and Budgetary Effects of Producing Oil and Natural Gas From Shale* (December 2014), [www.cbo.gov/publication/49815](http://www.cbo.gov/publication/49815).



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# Chapter 2: Spending and Revenues

## Overview

Under current law, spending by the federal government is projected to represent a larger percentage of gross domestic product (GDP) in coming years than it did, on average, during the past 50 years. From 1972 to 2021, total federal outlays averaged 21 percent of GDP; over the 2022–2052 period, such outlays are projected to average 26 percent of GDP (see Figure 2-1).

In CBO’s projections, outlays in 2022 are 23.5 percent of GDP—less than last year’s total—as federal spending in response to the coronavirus pandemic wanes.<sup>1</sup> Outlays increase after 2022, reaching 24.3 percent of GDP in 2032. Subsequently, total spending rises relative to the size of the economy, reaching about 30 percent of GDP in 2052. Spending has exceeded that level only once, for a three-year period during World War II. In those years, when defense spending increased sharply, total federal spending topped 40 percent of GDP. (CBO develops its extended baseline projections according to certain assumptions that are specified in law. For a discussion of those assumptions and the methods underlying the projections, see Appendix A.)

Over the 2022–2052 period, revenues measured as a percentage of GDP are projected to be higher than they have been, on average, in recent decades. Revenues averaged about 17 percent of GDP over the past 50 years. Over the next 30 years, they are projected to average about 19 percent of GDP.

In CBO’s projections, revenue growth is strong in 2022, following the sharp increase in revenues observed in 2021. That strong growth results mostly from large increases in receipts from individual income taxes. From 2023 to 2025, revenues decline as a percentage of GDP

as the effects of temporary factors that had boosted tax receipts in recent years fade. In 2026 and 2027, by contrast, revenues rise in relation to GDP because of changes to rules governing the individual income tax that are scheduled to occur at the end of calendar year 2025. After 2032, revenues grow faster than GDP, reaching 19.1 percent of GDP in 2052.

## Spending

Total spending comprises spending on mandatory programs, discretionary spending, and net outlays for interest. In CBO’s projections, federal outlays for mandatory programs, measured as a percentage of GDP, initially fall through 2025 as pandemic-related mandatory spending continues to decline. Such outlays then rise steadily to 17.0 percent of GDP in 2052. Much of that increase is driven by growth in spending on the major health care programs (see Figure 2-2).

The response to the global pandemic has also resulted in a near-term boost to discretionary spending, though pandemic-related discretionary spending will decrease this year and next. However, in CBO’s projections, the effects of the Infrastructure Investment and Jobs Act (IIJA, Public Law 117-58) somewhat offset that decrease.<sup>2</sup> Discretionary outlays equal 6.2 percent of GDP in 2032 and 6.0 percent in 2052.

Finally, net interest costs measured as a percentage of GDP are projected to increase throughout the 2022–2052 period. Those costs increase nearly four and one-half times, from 1.6 percent of GDP in 2022 to 7.2 percent in 2052. If net interest costs followed their projected path, they would exceed all mandatory spending other than that for the major health care programs and Social Security by 2027, discretionary spending by 2047, and spending on Social Security by 2049.

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1. The budget projections in this report include the effects of legislation enacted through April 8, 2022, and are based on the Congressional Budget Office’s economic projections. Those economic projections reflect economic developments through March 2, 2022. The projections do not include budgetary or economic effects of subsequent legislation, economic developments, administrative actions, court rulings, or regulatory changes.

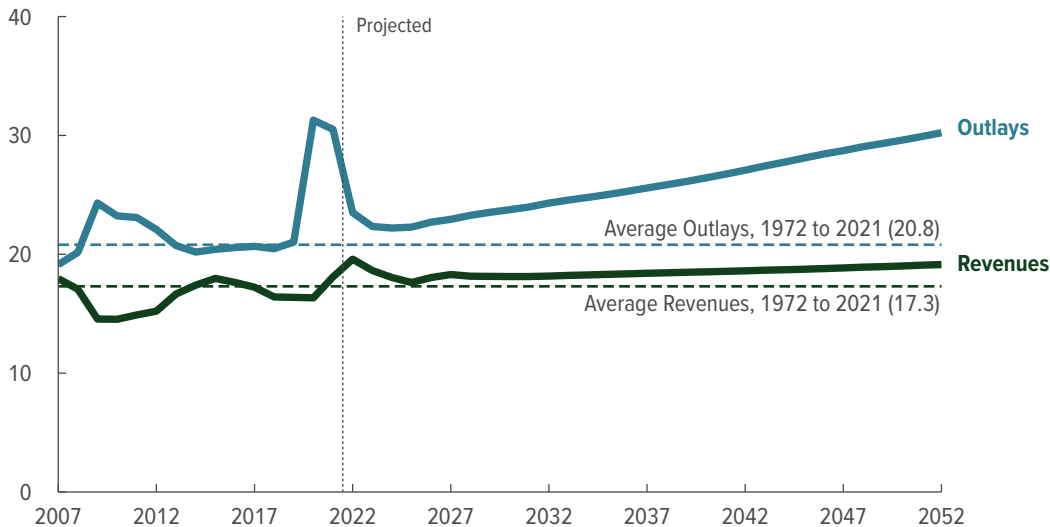
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2. For a discussion of how the IIJA affects CBO’s projections of discretionary spending over the 2022–2032 period, see Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), pp. 76–77, [www.cbo.gov/publication/57950](http://www.cbo.gov/publication/57950).

Figure 2-1.

## Total Outlays and Revenues

Percentage of Gross Domestic Product



In most years, growth in outlays is projected to outpace growth in revenues, resulting in widening budget deficits.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

Moreover, CBO projects that growth in spending on the major health care programs and on interest would reshape the spending patterns of the U.S. government by 2052 (see Figure 2-3). Net interest costs would account for a much greater portion of total federal spending in 2052 than they have historically, as would spending on the major health care programs.

### Mandatory Spending

In CBO's extended baseline projections, the growth in spending on mandatory programs is driven primarily by increases in spending on the major health care programs and, especially in the first decade, by increases in spending on Social Security. Other mandatory spending is projected to decline in relation to GDP over the next 30 years, particularly in the first decade of that period.

Spending on the major health care programs climbs largely because, in CBO's estimation, health care costs per person will continue to rise. The aging of the population also contributes to the increases in spending on health care programs and on Social Security.

**Major Health Care Programs.** Outlays for the major health care programs consist of spending on 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.<sup>3</sup> Spending on Medicare, which provides health insurance to roughly 64 million people (about 85 percent of whom are at least 65 years old), will account for nearly half of that spending in 2022, CBO projects.

Over the past five decades, spending on the major health care programs has grown faster than the economy, and that trend persists in CBO's extended baseline projections.<sup>4</sup> In 2022, net federal spending on the major health care programs is estimated to equal 5.8 percent of GDP. In the agency's projections, net outlays for those programs increase to 8.8 percent in 2052.<sup>5</sup> Spending on

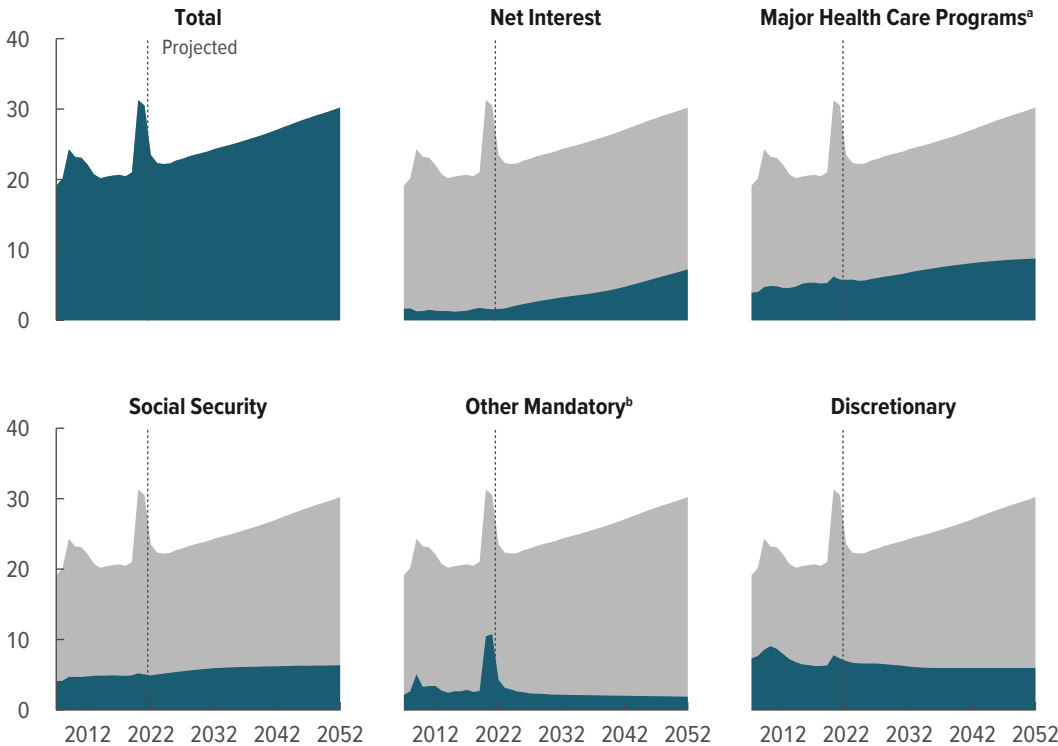
3. Federal subsidies for health insurance for low- and moderate-income households account for most of the outlays for subsidies for insurance purchased through the marketplaces and related spending. The related spending consists almost entirely of payments for risk adjustment (which are financed by funds collected from insurers with healthier enrollees and made to health insurers whose enrollees are in poorer health) and spending for the Basic Health Program (an optional state program that covers low-income residents outside the health insurance marketplaces).
4. Since publishing *The 2021 Long-Term Budget Outlook*, CBO has refined its projections of the increase in health care costs per person. See Appendix D for a discussion of that change.
5. 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.



Figure 2-2.

## Outlays, by Category

Percentage of GDP



Over the long term, net outlays for interest and spending on the major health care programs and Social Security are projected to rise in relation to GDP; other spending, in total, is projected to decline.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

GDP = gross domestic product.

- a. Consists of spending on 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 mandatory spending other than that for Social Security and the major health care programs. “Other Mandatory” includes the refundable portions of the earned income tax credit, the child tax credit, and the American Opportunity Tax Credit.

Medicare (net of offsetting receipts, which are mostly premiums paid by enrollees) is the primary driver of that increase; such spending, measured as a percentage of GDP, grows by 2.9 percentage points. Spending on Medicaid and CHIP, combined with outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending, grows by 0.1 percentage point (see Figure 2-4).

**Social Security.** In CBO’s projections, spending on Social Security increases as a percentage of GDP over the next 30 years, continuing the trend of the past five decades. The number of Social Security beneficiaries rises from 66 million (or one-fifth of the population) in 2022 to 77 million in 2032 and then to 97 million (or over one-quarter of the projected population)

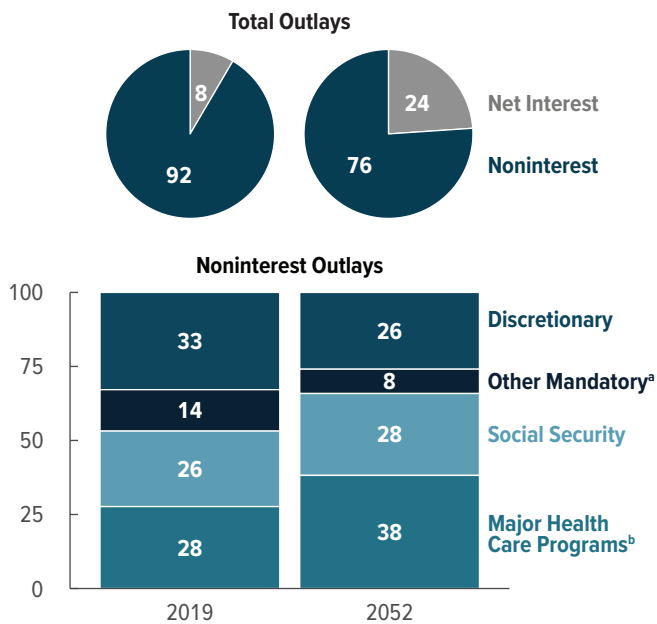
in 2052. Spending on the program increases from 4.9 percent of GDP in 2022 to 5.9 percent in 2032. Spending continues to increase but slows along with the pace of population growth as members of the large baby-boom generation die; spending on Social Security reaches 6.4 percent of GDP in 2052.<sup>6</sup>

6. 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. That approach is consistent with a statutory requirement that CBO’s 10-year baseline projections reflect the assumption that funding for such programs is adequate to make all payments required by law. See sec. 257(b)(1) of the Balanced Budget and Emergency Deficit Control Act of 1985, P.L. 99-177 (codified at 2 U.S.C. §907(b)(1) (2016)). The baby-boom generation comprises people born between 1946 and 1964.

Figure 2-3.

### Composition of Outlays, 2019 and 2052

Percent



Net outlays for interest would, under current law, account for a greater portion of total federal outlays in 2052 than they did in 2019 (before the coronavirus pandemic), and spending on the major health care programs would account for a much larger share of all federal noninterest spending.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

- Consists of all mandatory spending other than that for Social Security and the major health care programs. “Other Mandatory” includes the refundable portions of the earned income tax credit, the child tax credit, and the American Opportunity Tax Credit.
- Consists of spending on 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.

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 income tax on benefits are credited to the Old-Age and Survivors Insurance (OASI) Trust Fund and the Disability Insurance (DI) Trust Fund, which finance the program’s benefits. In CBO’s extended baseline projections, dedicated tax revenues for the combined trust funds decline from 4.5 percent of GDP in 2022 to 4.4 percent in 2052.

A commonly used measure of Social Security’s financial position is the dates by which the trust funds would be exhausted. CBO projects that the OASI trust fund would be exhausted in calendar year 2033 and that the DI trust fund would be exhausted in calendar year 2048. If their balances were combined, the Old-Age, Survivors, and Disability Insurance (OASDI) trust funds would be exhausted in calendar year 2033. CBO estimated the amounts that annual benefits would have to be reduced by for the trust funds’ outlays to match their revenues in each year after the two funds were exhausted. Benefits would need to be reduced (in relation to the agency’s baseline projections) by about 25 percent in 2034, an amount that would climb to about 30 percent in 2052.

**Other Mandatory Programs.** Before the pandemic, mandatory spending excluding that for the major health care programs and Social Security had generally remained between 2 percent and 4 percent of GDP since the mid-1960s (it was 2.7 percent of GDP in 2019, for example). Such spending includes outlays for the Supplemental Nutrition Assistance Program (SNAP), unemployment compensation, retirement programs for federal civilian and military employees, certain programs for veterans, Supplemental Security Income, and certain refundable tax credits.<sup>7</sup> That spending increased significantly in 2020 and 2021—to 10.4 percent and 10.8 percent of GDP, respectively—mainly because of policies enacted in response to the pandemic and the associated economic downturn.

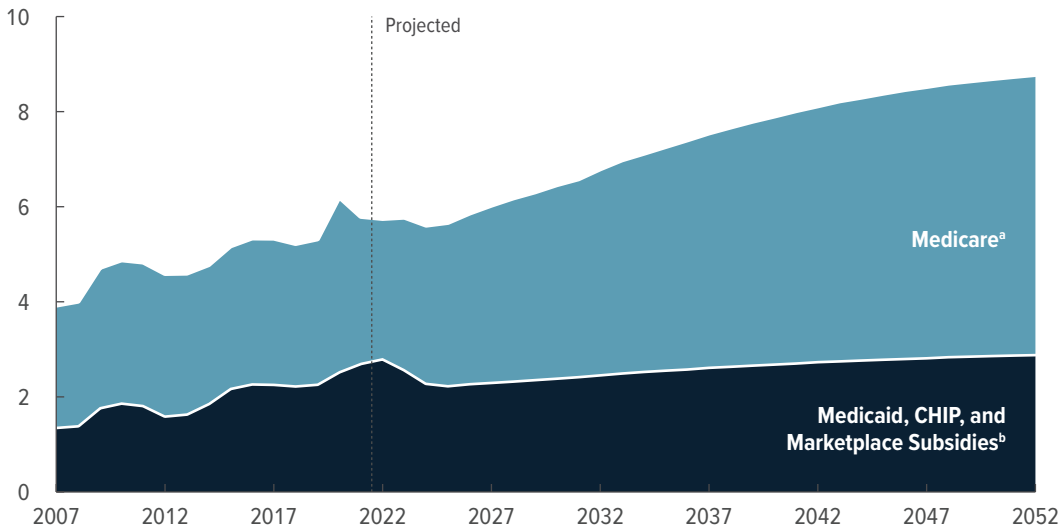
In CBO’s projections, other mandatory spending totals 4.3 percent of GDP in 2022. It then generally declines as a share of the economy, reaching 2.2 percent of GDP in 2032 and 1.9 percent in 2052.<sup>8</sup> The projected decline through 2032 occurs in part because the amounts of benefits for many of the programs are adjusted for inflation each year, and in CBO’s economic forecast, inflation is projected to be less than the rate of growth in nominal GDP. The decline from 2032 to 2052 is partly attributable to growth in income, which decreases the number of people who qualify for refundable tax credits.

- Refundable tax credits reduce a filer’s overall income tax liability; if the credit exceeds 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).
- 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 2-4.

## Composition of Outlays for the Major Health Care Programs

Percentage of Gross Domestic Product



Spending on Medicare is projected to account for more than four-fifths of the increase in spending on the major health care programs over the next 30 years.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

CHIP = Children's Health Insurance Program.

a. Net of premiums and other offsetting receipts.

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

**Causes of Growth in Mandatory Spending.** Rising health care costs per person and the aging of the population are the primary reasons for the sharp rise in projected spending on the major health care programs over the next 30 years. The aging of the population also contributes to the increase in spending on Social Security.

In CBO's estimation, if, over the 2022–2052 period, health care costs per person (adjusted for demographic changes) grew at the rate of potential GDP per person—which would mean that costs grew more slowly than the agency currently projects—and the population was not aging, then spending on the major health care programs would be 6.4 percent of GDP in 2052, or 0.3 percentage points lower than the agency currently projects for 2022.<sup>9</sup> And if the effects of the aging of the population alone were excluded, then spending on Social Security would be 4.9 percent of GDP in 2052, the same as the agency projects for 2022 (see Figure 2-5).

9. Potential GDP is the maximum sustainable output of the economy. The analysis of the causes of the growth in spending on the major health care programs encompasses gross spending on Medicare and does not reflect receipts credited to the program from premiums and other sources.

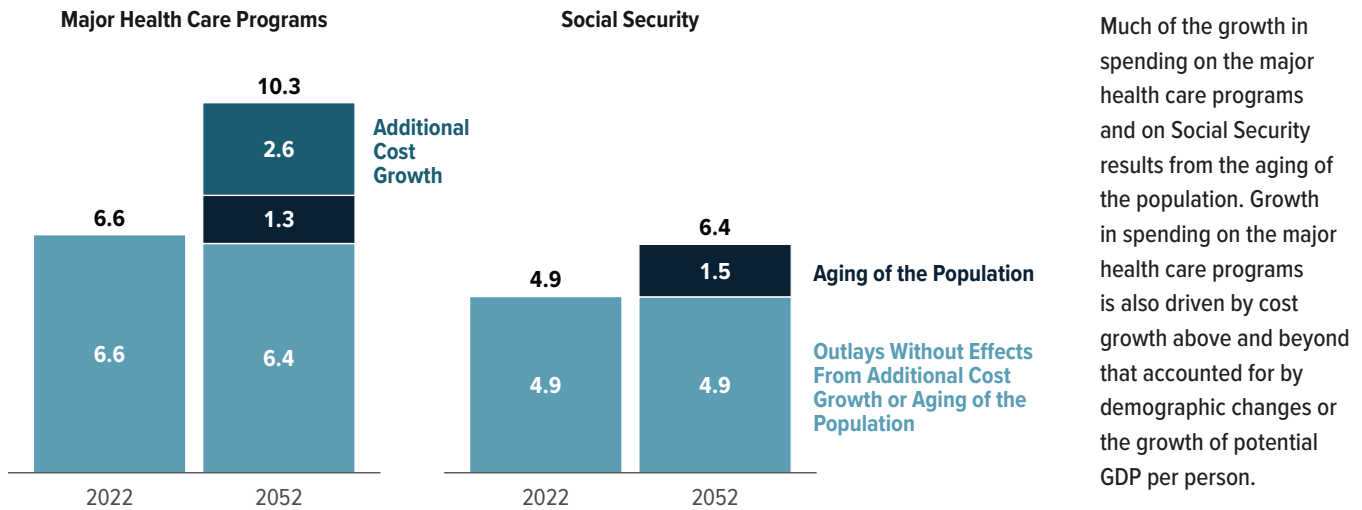
**Rising Health Care Costs per Person.** The growth of health care costs per person has recently slowed. However, in CBO's extended baseline projections, such costs, adjusted for demographic changes, continue to grow faster than potential GDP per person—0.9 percent faster for Medicare and 0.9 percent faster for Medicaid, on average—over the second and third decades of the projection period. That growth in health care costs per person accounts for about two-thirds of the increase in spending, measured as a percentage of GDP, on the major health care programs between 2022 and 2052.

**Aging of the Population.** Over the 2022–2052 period, about one-third of the projected increase in total spending on the major health care programs, measured as a percentage of GDP, is attributable to the aging of the population and is mostly the result of increased spending on Medicare. (See Figure 3-1 on page 26 for CBO's projections of the population by age group.) That is because Medicare is the largest of the major health care programs, and most beneficiaries qualify for it at age 65. As the group of people who qualify for Medicare becomes larger and, on average, older, Medicare spending will increase, not only because the number of beneficiaries will rise but also because spending on health care tends to increase as people age.

Figure 2-5.

## Composition of Growth in Outlays for the Major Health Care Programs and Social Security, 2022 to 2052

Percentage of GDP



Much of the growth in spending on the major health care programs and on Social Security results from the aging of the population. Growth in spending on the major health care programs is also driven by cost growth above and beyond that accounted for by demographic changes or the growth of potential GDP per person.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

The spending on the major health care programs examined here consists of gross spending on Medicare (which does not account for premiums or 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.

Additional 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.

From 2022 to 2052, all of the projected increase in spending on Social Security, measured as a percentage of GDP, is attributable to the aging of the population. The effects of the aging of the population, which push spending on Social Security up, are offset by scheduled increases in the full retirement age for Social Security, which reduce the lifetime benefits for affected beneficiaries and thus push spending down.<sup>10</sup>

### Discretionary Spending

About 45 percent 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.

In the half-century preceding the pandemic, discretionary outlays decreased significantly in relation to the size of the economy, from 11.5 percent of GDP in 1970 to 6.3 percent in 2019. In 2020 and 2021, such outlays were boosted to 7.8 percent and 7.3 percent of GDP, respectively, by policies put in place to counter the pandemic-related economic disruption. In the agency's projections, discretionary outlays generally decrease as a percentage of GDP, from 7.0 percent in 2022 to 6.0 percent in 2036. After that, CBO's extended baseline projections reflect the assumption that discretionary spending remains constant at 6.0 percent of GDP through 2052.

### Net Interest Costs

Over the past 50 years, the government's net interest costs have ranged from 1.2 percent to 3.2 percent of GDP, averaging 2.0 percent of GDP. In CBO's projections, net interest costs are 1.6 percent of GDP in 2022. By 2032, those costs double, reaching 3.3 percent of GDP, as federal debt grows and interest rates rise.

10. For more details about the full retirement age for Social Security, see Zhe Li, *The Social Security Retirement Age*, Report R44670, version 14 (Congressional Research Service, July 6, 2022), <https://go.usa.gov/xGnEx>.

Net interest costs continue to rise thereafter, reaching 7.2 percent of GDP in 2052. They would be higher in that year than spending on Social Security, discretionary spending, or all mandatory spending other than that for the major health care programs and Social Security—and higher than at any time since at least 1940 (the first year for which the Office of Management and Budget reports such data).<sup>11</sup>

The increase in interest payments is the result of escalating interest rates and the rising level of debt. CBO estimates that the increase in interest rates accounts for about one-half of the projected growth in net outlays for interest over the 2022–2052 period.<sup>12</sup>

## Revenues

In CBO's projections, revenues measured as a percentage of GDP are generally higher over the next 30 years than they have been, on average, in recent decades.<sup>13</sup> Revenues averaged 17.3 percent of GDP over the past 50 years, but they fluctuated between 14.5 percent and 20.0 percent of GDP over that period because of changes in tax laws and interactions between those laws and economic conditions. Over the 2022–2052 period, revenues average 18.6 percent of GDP in the agency's projections.

## Projected Revenues

In CBO's projections, the strong growth in federal revenues seen in 2021 continues temporarily as revenues

equal 19.6 percent of GDP in 2022, one of the highest levels ever recorded. That strong growth is largely the result of sizable increases in collections of individual income taxes. From 2023 to 2025, revenues decline as a percentage of GDP as the effects of temporary factors that boosted tax receipts in 2021 and 2022 fade. In 2026 and 2027, by contrast, revenues rise in relation to GDP because of changes to rules governing the individual income tax that are scheduled to occur at the end of calendar year 2025. In the agency's extended baseline projections, revenues grow faster than the economy after 2032, totaling 19.1 percent of GDP in 2052.

From 2022 to 2052, total revenues, measured as a percentage of GDP, fall by one-half of one percentage point in CBO's projections. Receipts from corporate income taxes and payroll taxes decline by a small amount over that period (by 0.3 percent of GDP and 0.2 percent of GDP, respectively). Receipts of individual income taxes increase slightly, on net, reflecting offsetting factors. Such receipts initially fall from their highs seen in 2022 as the effects of the temporary factors that had boosted tax receipts dissipate; but they then resume their growth, ending the 30-year projection period at 10.7 percent of GDP—one-tenth of one percentage point higher than their value in 2022 (see Figure 2-6).

## Factors Affecting Revenues

The small projected decline in total revenues as a percentage of GDP over the next 30 years is the result of several factors whose effects are largely offsetting. Real bracket creep, scheduled changes to tax rules, and faster earnings growth for higher-earning people (who are taxed at higher individual income tax rates) are among the factors that cause revenues to increase. But the near-term boost to tax receipts dissipates, which, along with growing health care costs, causes revenues to decrease (see Figure 2-7).

**End of the Temporary Boost to Tax Receipts.** In CBO's estimation, some of the causes of the recent jump in individual income tax receipts will dissipate, reducing revenues as a percentage of GDP from 2023 to 2025. First, a pandemic-related tax provision allowed some taxes due in 2020 and 2021 to be deferred until 2022 and 2023. That provision boosts tax receipts in 2022 and 2023 but will have no effect thereafter, causing receipts to drop.

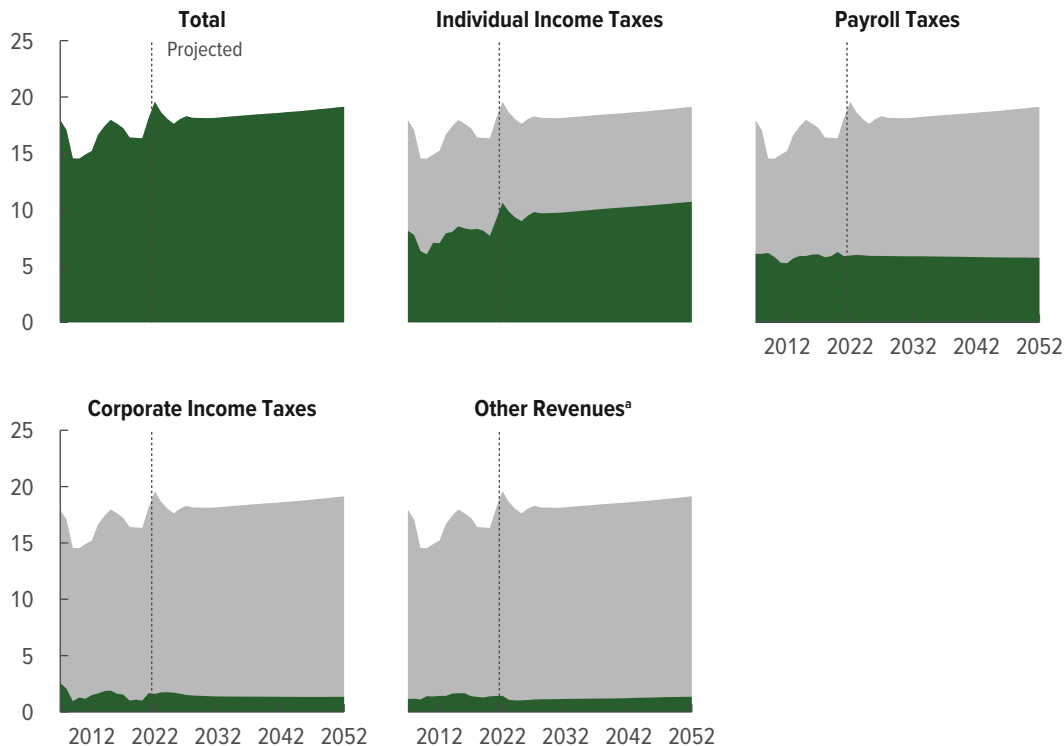
11. Since publishing *The 2021 Long-Term Budget Outlook*, CBO has refined its projections of the average interest rate on federal debt held by the public. See Appendix D for a discussion of that change.
12. The agency estimated the contribution of rising interest rates to net interest costs by keeping interest rates on marketable debt held by the public at their values at the end of 2021. In that scenario, the average interest rate on federal debt gradually declines to 1.3 percent in 2052 instead of rising to 4.2 percent in 2052, as CBO currently projects. That analysis accounts only for the reduction in interest payments from lower interest rates and the reduction in federal borrowing from smaller deficits. It does not account for the economic effects that would result from lower interest rates or less federal borrowing.
13. 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 as scheduled under current law. 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.



Figure 2-6.

## Revenues, by Source

Percentage of Gross Domestic Product



Taken together, receipts from all sources of revenues are projected to be about the same percentage of GDP in 2052 as they are today. Receipts from individual income taxes—the largest source of federal revenues—are projected to continue the strong growth observed in 2021 this year, mostly because of temporary factors whose effects quickly subside. Those receipts are projected to rise again after 2025 because of the scheduled expiration of some provisions of the 2017 tax act.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

a. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

Second, various types of taxable income are projected to decline as a percentage of GDP in the near term. The most notable declines are in the realizations of capital gains and in wages and salaries.

Third, and most significant, the strength of recent tax receipts is projected to gradually dissipate over the next few years, thus better reflecting the past relationship between tax revenues and the state of the economy. The source of that recent strength in individual income tax receipts is uncertain. Receipts in the past few years have been larger than expected given currently available data on economic activity. Those larger-than-anticipated receipts may result from several factors whose effects could persist, end, or reverse.

**Real Bracket Creep.** The income thresholds for the various tax rate brackets in the individual income tax are indexed to increase with inflation (as measured by the

chained consumer price index for all urban consumers as published by the Bureau of Labor Statistics). If income grows faster than prices—as typically happens during economic expansions—more income is pushed into higher tax brackets, even when the underlying distribution of income remains unchanged. That process is known as real bracket creep and is the largest source of growth in total revenues over the next three decades. If current laws generally remained unchanged, real bracket creep would continue to gradually push up taxes in relation to income through 2052, CBO projects, thereby increasing tax receipts. From 2032 to 2052, the share of income taxed at the top rate of 39.6 percent would rise by 1 percentage point—and the share of income excluded from taxation would fall by 3 percentage points—because of real bracket creep (see Figure 2-8).<sup>14</sup>

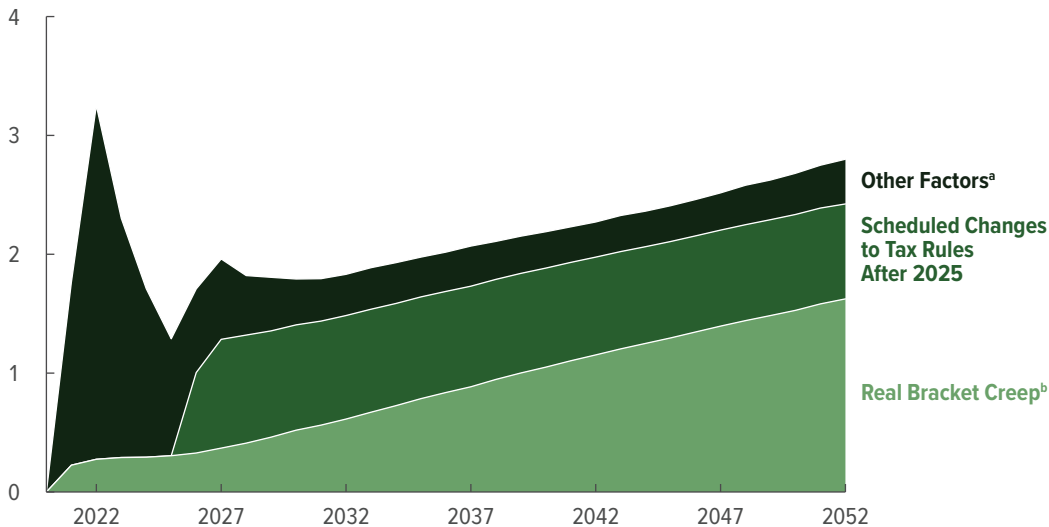
14. For more details, see Congressional Budget Office, “How Income Growth Affects Tax Revenues in CBO’s Long-Term Budget Projections” (June 2019), [www.cbo.gov/publication/55368](http://www.cbo.gov/publication/55368).



Figure 2-7.

## Composition of Changes in Revenues, 2020 to 2052

Percentage of GDP



Over the long term, the largest source of growth in tax revenues is real bracket creep. Revenues as a percentage of GDP are projected to rise in 2022 as a result of temporary increases in the collections of individual income taxes. Projected revenues rise sharply after certain temporary provisions of the 2017 tax act expire at the end of 2025.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

GDP = gross domestic product.

- Other factors include an end to the temporary boost to tax receipts as recent strength in collections dissipates, as well as factors that affect revenues over the longer term, such as changes in the distribution of wages and growth in nontaxable compensation resulting from health care costs.
- 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, even when the underlying distribution of income remains unchanged.

**Scheduled Changes to Tax Rules.** The most significant factor pushing up taxes in relation to income is the scheduled expiration, after calendar year 2025, of nearly all provisions of the 2017 tax act (P.L. 115-97) that affect individual income taxes. The expiring provisions include lower statutory tax rates, the higher standard deduction, the repeal of personal exemptions, and the expansion of the child tax credit. The scheduled changes to tax rules after 2025 would cause tax liabilities to rise in calendar year 2026. Those changes boost revenues as a share of GDP by 0.8 percentage points, on average, after 2025.

**Other Factors.** Two other factors affect revenues—but to a lesser extent—in CBO’s projections. The first factor is the growth in health care costs, which is projected to reduce revenues as a percentage of GDP over the next three decades. The share of employees’ compensation that is paid in the form of spending on fringe benefits, such as employment-based health insurance, is projected to increase, and those benefits are not taxable. Conversely, 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. That shift in compensation would decrease taxable income—and thus revenues from both income and payroll taxes—in relation to GDP.

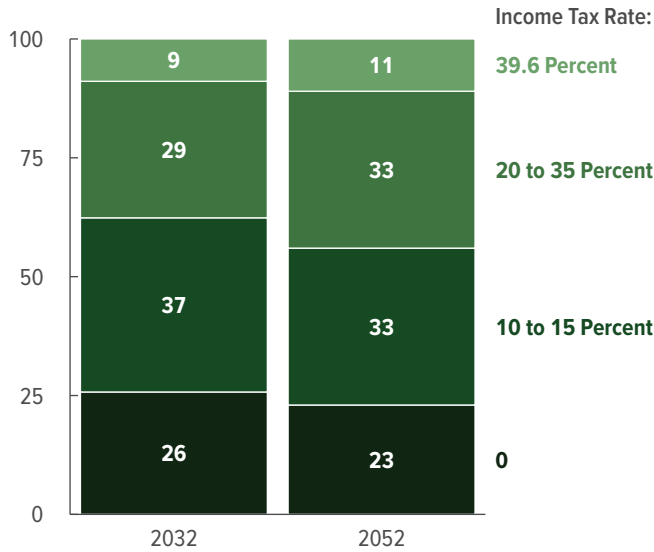
The second factor is the change in the distribution of earnings. Earnings are projected to grow faster for higher-earning people than for other people in the long term. That trend would cause a larger share of individual earnings to be taxed at higher rates. However, the resulting increase in individual 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.<sup>15</sup>

15. For additional information, see Brooks Pierce, *How Changes in the Distribution of Earnings Affect the Federal Deficit*, Working Paper 2021-12 (Congressional Budget Office, October 2021), [www.cbo.gov/publication/57217](http://www.cbo.gov/publication/57217).

Figure 2-8.

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

Percent



The largest contributor to growth in projected revenues over the long term 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. As the share of income taxed at higher rates grows, the share exempt from taxation shrinks.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

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).

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# Chapter 3: Long-Term Demographic and Economic Projections

## Overview

Demographic and economic trends are key determinants of the long-term budget outlook. By the Congressional Budget Office's estimates, the population will grow more slowly over the next 30 years than it did over the past 30 years, and it will get older, on average. The economy is projected to grow more slowly over the next three decades than it has over the past three, and interest rates are expected to rise significantly.

## Demographic Projections

The size and age profile of the U.S. population affects the nation's economy and the federal budget. For example, those two factors help determine the number of people in the labor force and thus affect both gross domestic product (GDP) and federal tax receipts. Those factors also help determine the number of beneficiaries of Social Security and other federal programs and thus federal outlays.

CBO estimates the population in future years by projecting rates of fertility, net immigration, and mortality. In the agency's projections, the population increases from 335 million people at the beginning of 2022 to 369 million people at the beginning of 2052—an average expansion of 0.3 percent per year (see Figure 3-1).<sup>1</sup> That rate is one-third the average annual rate of growth over the past 30 years (0.9 percent). Moreover, as fertility remains lower than necessary for a generation to replace itself, population growth is increasingly driven by immigration, which by 2043 accounts for all population growth.

The proportion of the population that is age 65 or older expands over the coming decades, continuing a long-standing historical trend. By 2052, 22 percent of the population will be 65 or older; today, that proportion is 17 percent.

## Economic Projections

The state of the U.S. economy in coming decades will affect the federal government's budget deficits and debt.

Key to the agency's long-term budget projections are its long-term projections of GDP, interest rates, and inflation. Among the factors incorporated into the agency's long-term economic forecast are the effects of projected deficits on private investment and the effects of marginal tax rates on the supply of labor and private saving.

## Real Potential Gross Domestic Product

In CBO's extended baseline projections, the growth of real potential GDP (the maximum sustainable output of the economy, adjusted to remove the effects of inflation) over the next 30 years is slower than it has been over the past 30 years (see Figure 3-2).<sup>2</sup> From 2022 to 2052, real potential GDP increases at an average rate of 1.7 percent per year; from 1992 to 2021, it grew at an average annual rate of 2.4 percent.

That slower growth in real potential GDP is primarily attributable to slower growth in the potential labor force (that is, the labor force adjusted to account for fluctuations in the business cycle). Whereas the potential labor force grew by an average of 0.9 percent per year over the past 30 years, in CBO's projections it grows by an average of 0.3 percent per year through 2052. Slowing population growth and the aging of the population account for most of that slowdown.

An additional factor contributing to real potential GDP's slower growth is that potential labor force productivity (that is, potential output per member of the potential labor force) is projected to grow more slowly over the next 30 years than it did over the past 30 years. In CBO's projections, potential labor force productivity grows at an average annual rate of 1.3 percent from 2022 to 2052; over the past 30 years, it grew at an average annual rate of 1.5 percent.

The slightly slower growth in potential labor force productivity is, in turn, driven by two key factors. First, the accumulation of capital—structures and equipment, intellectual property products (such as computer software), and residential housing, for example—per worker

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1. See Congressional Budget Office, *The Demographic Outlook: 2022 to 2052* (July 2022), [www.cbo.gov/publication/57975](http://www.cbo.gov/publication/57975).

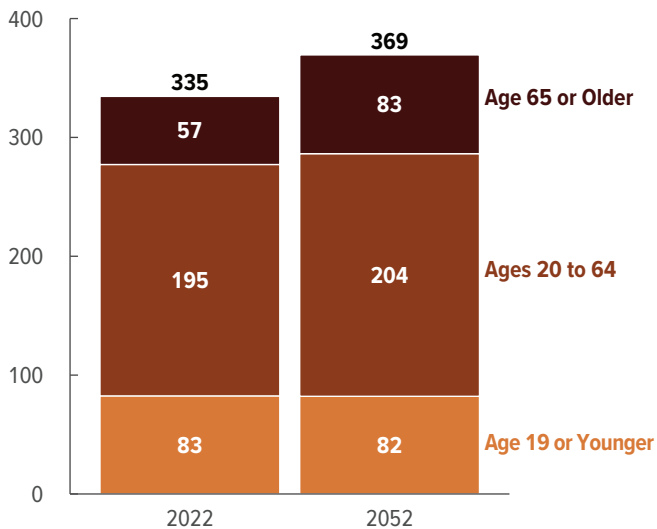
2. For a more detailed discussion of the economic projections, see Appendix B.



Figure 3-1.

## U.S. Population, by Age Group

Millions of People



CBO projects that over the next three decades, the population will become older, on average, as the share of the population age 65 or older continues to grow.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

is projected to be slower over the next three decades than it has been in the past, in part because increased federal borrowing is projected to reduce private investment. (See Chapter 1 for details.)

The second reason the growth of potential labor force productivity slows is that total factor productivity (TFP)—that is, the real output per unit of combined labor and capital in the nonfarm business sector—is also expected to grow more slowly over the next 30 years than it did over the past 30 years (although the growth of TFP is projected to accelerate from its historically slow rate in recent years). That slower growth in TFP is attributable to several factors, including the following:

- A slowdown in the growth of workers' educational attainment,
- Reductions in federal investment relative to the size of the economy, and
- Climate change.<sup>3</sup>

3. 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).

Growth in real potential GDP slows over the three decades in the projection period, from an annual average of 1.8 percent over the 2022–2032 period to an average of 1.5 percent over the 2043–2052 period. That decrease is attributable primarily to falling potential labor force productivity. From 2022 to 2032, potential labor force productivity is expected to grow at an average annual rate of 1.5 percent. Over the third decade of the projection period, that growth is expected to average 1.2 percent. That slowing growth of potential labor force productivity stems primarily from increased federal borrowing, which is projected to reduce private investment below what it otherwise would be and lower the rate of capital accumulation.

### Real Gross Domestic Product

In CBO's projections, real GDP grows slightly faster than real potential GDP, on average, over the next decade—at an average annual rate of 1.9 percent. The growth rate of real GDP converges with the growth rate of real potential GDP in the second half of the decade, and the level of real GDP stays about 0.5 percent below the level of real potential GDP thereafter. That gap reflects the agency's assessment that real GDP falls short of real potential GDP by a larger amount and for longer during and after economic downturns than actual output exceeds potential output during economic expansions.<sup>4</sup>

### Nominal Gross Domestic Product

Nominal GDP grows by 9.3 percent this year in CBO's projections. After 2022, an easing of upward pressure on prices and the same factors that slow the growth of real GDP slow the growth of nominal GDP. From 2023 to 2026, the annual growth of nominal GDP averages 4.1 percent. As is the case with real GDP, the growth rate of nominal GDP converges with the growth rate of nominal potential GDP in the second half of the first decade of the projection period.

### Interest Rates

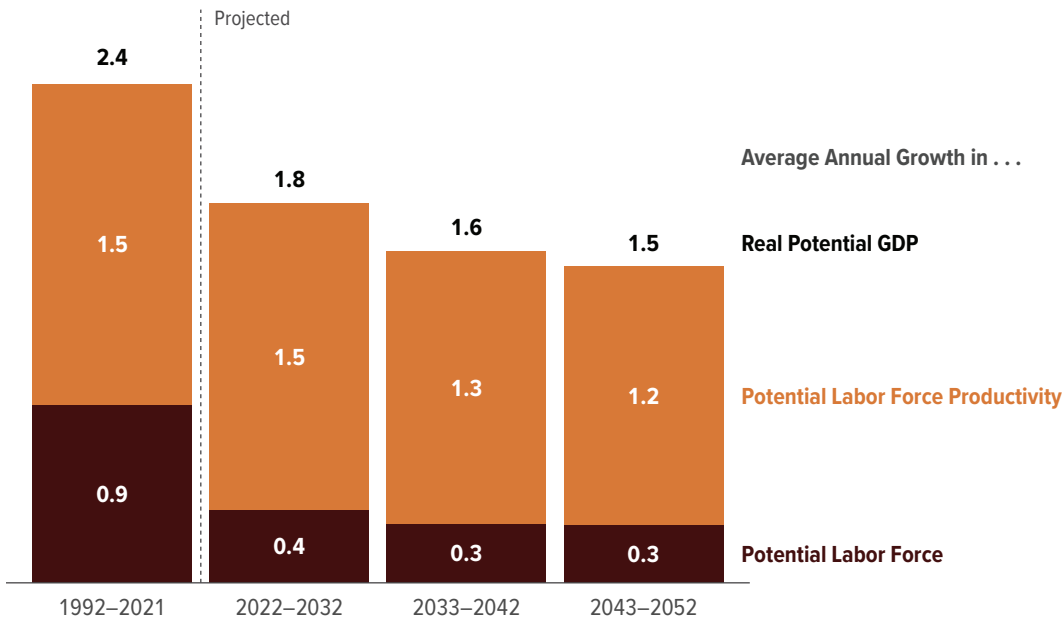
CBO expects interest rates to rise throughout the projection period but to remain lower than they have been, on

4. One recent study explains the existence of a persistent output gap by examining asymmetric fluctuations in the noncyclical rate of unemployment (that is, the rate that results from all sources except fluctuations in aggregate demand). 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/1njkmzmf>. CBO assessed the persistent output gap in an earlier report. 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).

Figure 3-2.

### Composition of the Growth of Real Potential GDP

Percent



Growth in real potential GDP is projected to be slower over the next 30 years than it was over the past 30 years. That slowdown occurs mostly because the potential labor force is projected to grow more slowly than it has in the past. Within the 2022–2052 period, the growth in real potential GDP slows primarily because the growth of potential labor force productivity slows in those years.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

Real values are nominal values that have been adjusted to remove the effects of inflation. Potential GDP is the maximum sustainable output of the economy. 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 have jobs or who are available for work and are actively seeking jobs) adjusted to remove the effects of fluctuations in the business cycle. Potential labor force productivity is the ratio of real potential GDP to the potential labor force. The sum of growth in the potential labor force and growth in potential labor force productivity is equal to growth in real potential GDP.

GDP = gross domestic product.

average, over the past three decades. In CBO’s projections, the interest rate on 10-year Treasury notes rises to 3.8 percent in 2032 and to 4.6 percent in 2052—about one percentage point below the 5.4 percent average recorded over the 1995–2004 period.<sup>5</sup> Several factors, including slower growth of the labor force and of productivity than in the past, keep interest rates in the period below their historical averages; the effects of those factors outweigh the effects of rising federal debt

and other factors that tend to push interest rates above historical rates.<sup>6</sup>

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 on shorter-term debt are generally lower than those on longer-term debt because shorter-term debt is less risky; the average term to maturity for federal debt has been less than 10 years since the 1950s.) In CBO’s projections, the average interest rate on federal debt is 3.1 percent in 2032 and 4.2 percent in 2052. Over the 2022–2052 period, that rate is an average of 0.7 percentage points lower than the interest rate on 10-year Treasury notes. (Since last year, CBO has refined the methods that it uses to project the average

5. The 1995–2004 period was chosen for comparison for several reasons. In those years, expectations for inflation were stable, there were no severe economic downturns or significant financial crises, and monetary policy was, according to CBO’s estimates, neutral, on average—that is, the real federal funds rate (the interest rate that financial institutions charge each other for overnight loans of their monetary reserves) was generally consistent with the economy’s operating at full employment.

6. See Edward N. Gamber, *The Historical Decline in Real Interest Rates and Its Implications for CBO’s Projections*, Working Paper 2020-09 (Congressional Budget Office, December 2020), [www.cbo.gov/publication/56891](http://www.cbo.gov/publication/56891).



interest rate on all federal debt. For a discussion of those changes, see Appendix D.)

### **Inflation**

In CBO's extended baseline projections, inflation in the consumer price index for all urban consumers falls to its 30-year historical average of 2.3 percent in 2024. That decline is attributable to reduced disruptions in supply chains, slower growth in the prices of goods, and actions taken by the Federal Reserve to rein in inflation by reducing monetary accommodation.<sup>7</sup> After 2024, inflation remains roughly at its historical average through the rest of the 30-year projection period. Inflation in the GDP price index—a measure of prices in the overall economy (rather than just consumer prices) that is used to derive real GDP from nominal GDP—follows a similar path over the next few years, falling to 2.0 percent, its 30-year historical average, in 2025.

### **Effects of Fiscal Policy in CBO's Economic Projections**

CBO's economic projections incorporate the effects of projected federal deficits under current law. In those budget projections, deficits grow, and as a result, the federal government borrows more. That increase in federal borrowing pushes up interest rates and thus reduces private investment in capital, 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 reduces the amount of capital per worker, making workers less productive and leading to lower wages, which reduces people's incentive to work and thus leads to a smaller supply of labor.

The agency's baseline projections also incorporate the economic effects of changes in federal tax policies scheduled under current law, including the effects of higher marginal tax rates. (The marginal tax rate is the percentage of an additional dollar of income from labor or capital that is paid in taxes.) Under current law, tax rates on individual income are scheduled to rise at the end of 2025. Moreover, as income rises faster than inflation and more income is pushed into higher tax brackets over the long term—a phenomenon referred to as real bracket creep—labor income and capital income are taxed at higher tax rates.<sup>8</sup> Higher marginal tax rates on labor income would reduce people's after-tax wages and thus weaken their incentive to work. Likewise, an increase in the marginal tax rate on capital income would lower people's incentives to save and invest, thereby reducing the stock of capital and, in turn, labor productivity; the reduction in labor productivity would put downward pressure on wages. All told, less private investment and a smaller labor supply decrease economic output and income in CBO's extended baseline projections.

7. Monetary accommodation refers to a central bank's lowering interest rates in an attempt to boost economic growth, thereby stabilizing or reducing unemployment.

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



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# Chapter 4: The Long-Term Outlook Under Alternative Paths for the Economy and Budget

## Overview

The extended baseline projections that the Congressional Budget Office describes in this report are based on the agency's economic forecast and reflect the assumption that current laws governing taxes and spending generally remain unchanged. To show how changes in economic conditions or in current law might affect budgetary outcomes, CBO analyzed four illustrative economic paths and three illustrative budgetary paths that differ from those underlying the agency's baseline projections.<sup>1</sup>

## Illustrative Economic Paths

CBO's long-term budget projections depend on its forecasts of economic factors, including productivity growth and interest rates. If economic conditions differed from those in CBO's forecast, budgetary outcomes would diverge from those in the agency's extended baseline projections. To illustrate the effects of such differences, CBO analyzed how its budget projections would differ if productivity growth or interest rates were higher or lower than it anticipated (see Figure 4-1).

## Paths for Growth of Total Factor Productivity

CBO examined the effects of changes in the growth rate of total factor productivity (TFP) in the nonfarm business sector on its projections of federal debt measured as a percentage of gross domestic product (GDP). The growth of TFP—the average real output (that is, output adjusted to remove the effects of inflation) per unit of combined labor and capital services—is a key contributor to growth in GDP.

The agency projected budgetary outcomes using rates of growth for TFP in the nonfarm business sector that were 0.5 percentage points higher and 0.5 percentage

points lower than the rates underlying the extended baseline projections. That range reflects the variation of about one percentage point in average TFP growth over the 43 30-year periods between 1950 and 2021. After accounting for the effects of the alternative paths for TFP on capital and other macroeconomic factors, CBO made the following projections:

- If nonfarm business productivity grew 0.5 percentage points faster than CBO projects, federal debt held by the public would be 140 percent of GDP in 2052 rather than the 185 percent it amounts to in the extended baseline projections.
- If nonfarm business productivity grew 0.5 percentage points more slowly than projected, federal debt held by the public would be 234 percent of GDP in 2052.

## Paths for Interest Rates on Federal Debt Held by the Public

CBO also examined the effects of changes in interest rates on its projections of federal debt as a percentage of GDP. The agency projected budgetary outcomes under two illustrative paths in which interest rates on federal debt were either higher or lower than the rates underlying the agency's extended baseline.

- For the first path, CBO boosted the average interest rate on federal debt above the baseline rate by a differential that starts at 5 basis points in 2022 and increases by 5 basis points each year (before macroeconomic effects, which are described below, are accounted for).<sup>2</sup> Under that path, federal debt held by the public equals 235 percent of GDP in 2052 rather than the 185 percent of GDP it equals in the extended baseline projections.

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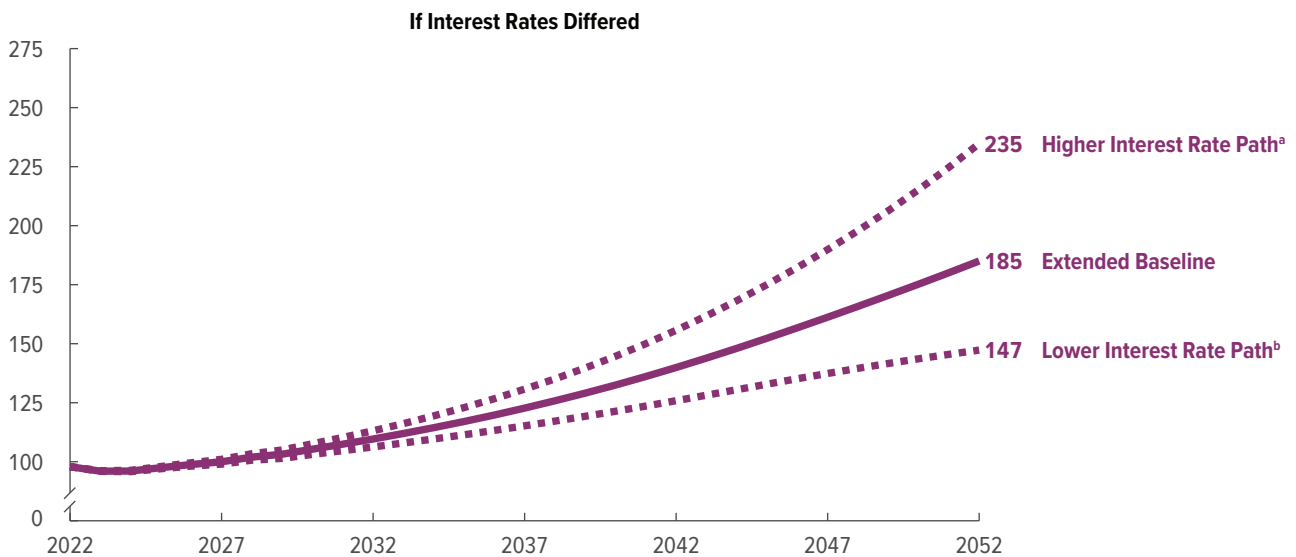
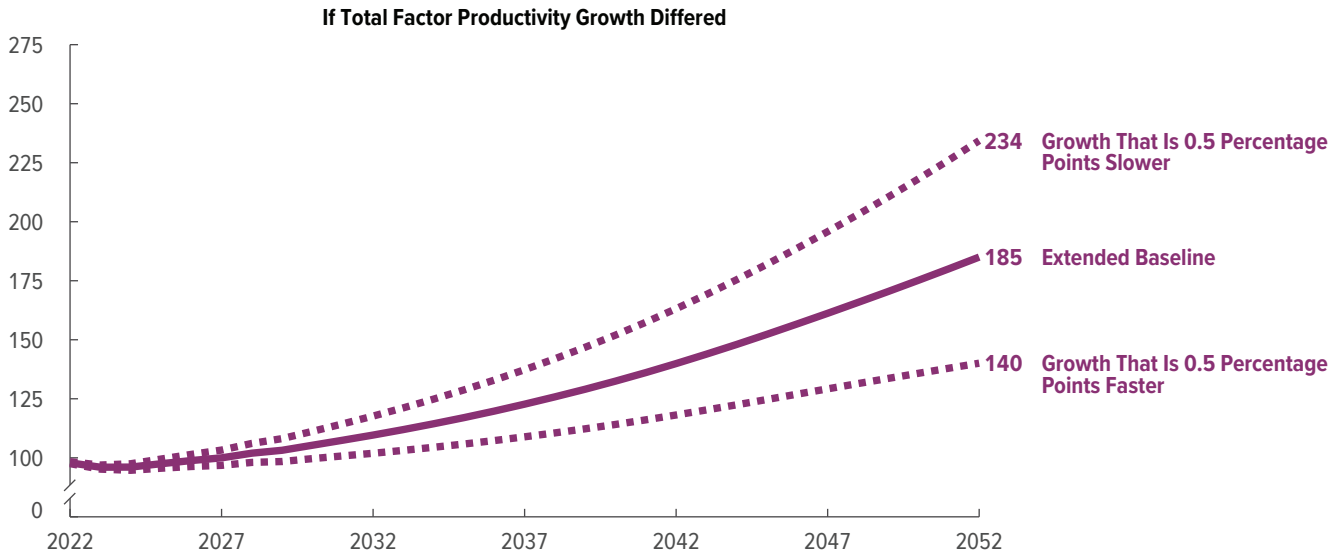
1. For detailed information about the illustrative paths, see the supplemental data for this report at [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

2. That is, the interest rate was boosted above the baseline rate by 5 basis points in 2022, 10 basis points in 2023, 15 basis points in 2024, and so on. A basis point is one one-hundredth of a percentage point.

Figure 4-1.

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

Percentage of Gross Domestic Product



Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

Total factor productivity growth is the growth of real output (that is, output adjusted to remove the effects of inflation) per unit of combined labor and capital services in the nonfarm business sector. The interest rate is the average interest rate on federal debt.

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 an additional 20 years.

- a. For this path, the average interest rate on federal debt was boosted above the rate underlying CBO’s extended baseline by a differential that starts at 5 basis points in 2022 and increases by 5 basis points each year (before macroeconomic effects are accounted for)—that is, the interest rate is 5 basis points higher than the baseline rate in 2022, 10 basis points higher than the baseline rate in 2023, 15 basis points higher than the baseline rate in 2024, and so on. (A basis point is one one-hundredth of a percentage point.)
- b. For this path, the average interest rate on federal debt was pushed below the rate underlying CBO’s extended baseline by a differential that starts at 5 basis points in 2022 and increases by 5 basis points each year (before macroeconomic effects are accounted for)—that is, the interest rate is 5 basis points lower than the baseline rate in 2022, 10 basis points lower than the baseline rate in 2023, 15 basis points lower than the baseline rate in 2024, and so on.



- For the second path, the average interest rate on federal borrowing was pushed below the baseline rate by those same amounts each year. Under that path, federal debt held by the public equals 147 percent of GDP in 2052.

Under the first path, the boost to interest rates increases the government's interest costs and thus deficits. Larger deficits and the increased federal borrowing required to finance them decrease private investment. (For a discussion of why increased federal borrowing reduces private investment, see Chapter 1.) The decrease in private investment reduces the amount of capital and increases the return on investment because more workers make use of each unit of capital. When the return on capital grows, interest rates—including the rates that the federal government pays on debt held by the public—rise further. Thus, macroeconomic effects push interest rates above the initial boost that was built into the illustrative path.

The average interest rate on federal debt, which is 4.2 percent in 2052 in the extended baseline projections, reaches 6.0 percent that year under the path with higher interest rates. That rate reflects both the initial boost of the rate built into the path and the resulting effects of larger deficits, less investment and capital, and the additional increases in interest rates. About one-eighth of the 1.8 percentage-point difference between the rate in the illustrative path and that in the extended baseline in 2052 results from those macroeconomic effects rather than from the initial boost to borrowing rates.

The lower interest rates in the second illustrative path result in smaller interest payments and smaller deficits than those in CBO's baseline projections. Those smaller deficits increase private investment, making the amount of capital per worker grow and the return on capital—and, ultimately, interest rates—fall. The average interest rate on federal debt falls to 2.4 percent in 2052 under that path.

The budgetary effects of higher or lower interest rates are highly uncertain because those effects depend on the amount of debt that the interest rates are applied to and on the macroeconomic effects of the higher or lower rates. Also, this analysis does not explicitly account for the budgetary effects that might stem from the sources of the changes in interest rates.

### Illustrative Budgetary Paths

The budget projections in this report show what federal spending, revenues, and deficits would be if current

laws governing spending and taxes generally remained unchanged. Those projections are not intended to be a forecast of budgetary outcomes; rather, they are meant to provide a benchmark that policymakers can use to assess the potential effects of policy decisions.

When constructing its baseline projections of spending and revenues, CBO follows procedures specified in law as well as long-standing guidelines. For example, the Balanced Budget and Emergency Deficit Control Act of 1985 (Public Law 99–177) requires CBO to incorporate the assumption that future discretionary funding will match the amounts most recently provided, with adjustments for inflation, through the end of the 10-year baseline projection period. For later years in the projection period, CBO assumes that after a five-year transition period, discretionary spending would grow at the rate of nominal GDP. The agency's projections also reflect the assumptions that most laws governing mandatory spending will continue beyond their statutory expiration and that scheduled payments from trust funds, such as Social Security benefits, would be made even after the program's trust funds were exhausted and its annual revenues were inadequate to fund those payments. By contrast, CBO's projections of revenues reflect the assumption that certain provisions affecting the tax code—including changes in statutory tax rates—will expire as scheduled under current law.

Spending and revenues may, however, differ from the amounts in CBO's baseline projections. For example, lawmakers can—and do—set discretionary funding at amounts that differ from the projected amounts. To illustrate how changes in spending and revenues could affect the long-term budget outlook, CBO examined three illustrative budgetary paths that are more consistent with the past than are its extended baseline projections—one in which discretionary spending (measured as a percentage of GDP) deviates from the path underlying the agency's extended baseline projections and two in which both discretionary spending and revenues (measured as a percentage of GDP) differ from their baseline amounts.<sup>3</sup>

3. In 2019, CBO analyzed an additional illustrative scenario in which the Social Security Administration would no longer pay beneficiaries the full amount specified in law once the combined trust funds were exhausted and current revenues were insufficient to pay those amounts. CBO found that such a reduction in benefits would substantially reduce the amount of debt by the end of the projection period. See Congressional Budget Office, *The 2019 Long-Term Budget Outlook* (June 2019), pp. 41–44, [www.cbo.gov/publication/55331](http://www.cbo.gov/publication/55331).

### Path for Discretionary Spending

For the first illustrative budgetary path, discretionary outlays were set to equal 7.0 percent of GDP—their value in 2022—over the entire projection period. That path for discretionary spending more closely resembles the past than does the path for such spending in CBO’s extended baseline projections. Whereas discretionary outlays have averaged 6.9 percent of GDP over the past 10 years and 7.3 percent of GDP over the past 20 years, they average 6.2 percent of GDP over the 2022–2052 period in CBO’s extended baseline projections. Discretionary spending of the amount specified in the illustrative path would exceed the amount in the extended baseline projections by 0.8 percentage points in 2032 and by 1.0 percentage point in 2052.<sup>4</sup>

### Paths for Revenues

Following changes in tax law scheduled to take effect at the end of 2025, revenues generally increase as a share of the economy in CBO’s projections; they reach 19.1 percent of GDP in 2052. That upward trend does not align with experience, however. Largely because of legislated changes, federal revenues have fluctuated around their 50-year average of 17.3 percent over the past five decades and have followed no apparent long-term trend.

In the second illustrative budgetary path, noninterest spending is about the same as it is in the illustrative path for discretionary spending throughout the projection period, and revenues are the same as they are in the agency’s extended baseline projections through 2026. Thereafter, revenues remain at 18.0 percent of GDP through the rest of the projection period—much closer to their 50-year average than are the amounts in the extended baseline but still high by historical standards.

The third illustrative budgetary path is more consistent with past revenues than is the second budgetary path. Revenues in the third path are the same as they are in the extended baseline projections through 2025, and in 2026, they return to their 50-year average of 17.3 percent of GDP, where they remain through the rest of the projection period. Noninterest spending is about the same as it is in the illustrative path for discretionary spending throughout the projection period.

4. For a more detailed discussion of the budgetary effects of a similar illustrative path through 2032, see Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), pp. 101–104, [www.cbo.gov/publication/57950](http://www.cbo.gov/publication/57950).

### Budgetary and Economic Outcomes Under the Illustrative Budgetary Paths

Different paths for spending and revenues would result in different paths for the deficit and debt and thus affect the amount of federal borrowing. That change in federal borrowing would, in turn, affect the economy, and those macroeconomic effects would feed back into the federal budget. To assess the effects of different budgetary paths on the long-term budget outlook, CBO analyzed deficits and debt under the three paths when those macroeconomic effects are taken into account (see Figure 4-2).

**Path for Discretionary Spending.** Under the first illustrative budgetary path, in which discretionary spending is set equal to 7.0 percent of GDP for the entire projection period, the primary deficit (which excludes interest costs) would be 1.2 percentage points higher in 2052 than it is in CBO’s extended baseline projections (see Table 4-1). Once the rising costs of debt service are added, the total deficit in 2052 would be 2.8 percentage points higher than the baseline amount. Debt held by the public would reach 218 percent of GDP in 2052, 33 percentage points higher than it is in CBO’s extended baseline projections.

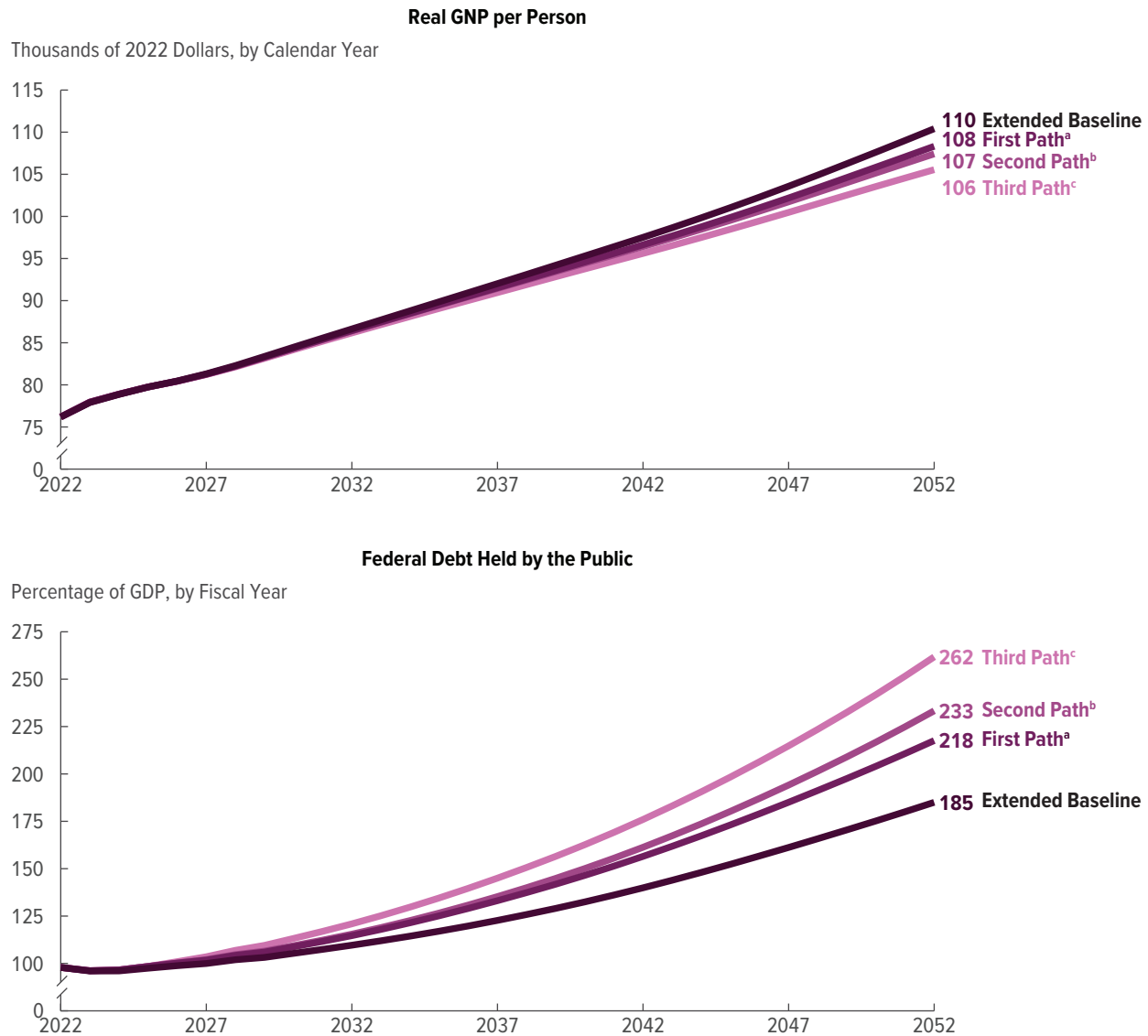
More discretionary spending and increased government borrowing would lead to a reduction in private investment and a smaller capital stock, thus causing output to be lower and interest rates to be higher in the long term than they are in the extended baseline projections. In 2052, for instance, real gross national product (GNP) under the illustrative path would be 1.9 percent lower than it is in CBO’s baseline projections, and real GNP per person would be about \$2,100 lower (in 2022 dollars).<sup>5</sup>

**Paths for Revenues.** Under the second illustrative budgetary path, in which discretionary spending is set equal to 7.0 percent of GDP for the entire projection period and revenues remain at 18.0 percent of GDP after 2026, the primary deficit in 2052 would be 2.3 percent of GDP larger than it is in CBO’s extended baseline projections, and the total deficit for that year would be 4.7 percent of GDP larger than the baseline amount.

5. Whereas GDP, the more common measure of economic output, is the value of all final goods and services produced within the borders of the United States, GNP is the value of all final goods and services produced by labor and capital supplied by residents of the United States, regardless of where that labor and capital are located.

Figure 4-2.

### Output per Person and Federal Debt Under Three Illustrative Budgetary Paths



Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

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 an additional 20 years.

The estimates of debt include macroeconomic feedback.

Whereas GDP, the more common measure of economic output, is the value of all final goods and services produced within the borders of the United States, GNP is the value of all final goods and services produced by labor and capital supplied by residents of the United States, regardless of where that labor and capital are located.

GDP = gross domestic product; GNP = gross national product.

- a. In the first path, discretionary outlays equal 7.0 percent of GDP—their value in 2022—over the entire projection period.
- b. In the second path, noninterest outlays are about the same as they are in the first path, and revenues are the same as they are in the extended baseline projections through 2026. Thereafter, revenues remain at 18.0 percent of GDP through the rest of the projection period.
- c. In the third path, noninterest outlays are about the same as they are in the first path, and revenues are the same as they are in the extended baseline projections through 2025. In 2026, revenues return to their 50-year average of 17.3 percent of GDP, where they remain through the rest of the projection period.



Table 4-1.

**Budget Projections in 2052 Under Three Illustrative Paths**

Percentage of Gross Domestic Product

	Extended Baseline	First Path <sup>a</sup>	Second Path <sup>b</sup>	Third Path <sup>c</sup>
Revenues	19.1	19.1	18.0	17.3
Outlays, Excluding Interest Payments	23.0	24.1	24.2	24.3
Primary Deficit	3.9	5.0	6.2	7.0
Total Deficit	11.1	13.9	15.8	18.2
Federal Debt Held by the Public	185	218	233	262

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

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 an additional 20 years.

The estimates of debt include macroeconomic feedback.

- In the first path, discretionary outlays equal 7.0 percent of GDP—their value in 2022—over the entire projection period.
- In the second path, noninterest outlays are about the same as they are in the first path, and revenues are the same as they are in the extended baseline projections through 2026. Thereafter, revenues remain at 18.0 percent of GDP through the rest of the projection period.
- In the third path, noninterest outlays are about the same as they are in the first path, and revenues are the same as they are in the extended baseline projections through 2025. In 2026, revenues return to their 50-year average of 17.3 percent of GDP, where they remain through the rest of the projection period.

Debt held by the public would reach 233 percent of GDP in 2052, 48 percentage points higher than it is in CBO's extended baseline projections. That year, real GNP would be 2.7 percent lower than it is in the agency's baseline projections, and real GNP per person would be about \$3,000 lower (in 2022 dollars).

Under the third illustrative budgetary path, in which discretionary spending equals 7.0 percent of GDP for the entire projection period and revenues remain at 17.3 percent of GDP after 2025, the primary deficit in 2052 would be 3.2 percent of GDP larger than it is in the agency's baseline projections, and the total deficit for that year would be 7.1 percent of GDP larger than the baseline amount. Debt held by the public would reach 262 percent of GDP in 2052, 77 percentage points higher than it is in CBO's extended baseline projections. That year, real GNP would be 4.4 percent lower than the baseline projection, and real GNP per person would be about \$4,900 lower (in 2022 dollars).

**How CBO Analyzed Outcomes Under the Illustrative Budgetary Paths**

Fiscal policy underlying the three illustrative budgetary paths would differ significantly from fiscal policy under current law. For simplicity—and to avoid presuming which fiscal policies lawmakers might implement to alter the deficit—CBO analyzed the paths without specifying

the tax and spending policies underlying them. In particular, CBO assumed that under all paths, transfer payments to people would be the same as they are under current law and that spending on federal investment would make the same contribution to future productivity and output that it makes in the agency's baseline projections. Under the paths in which revenues are lower, the effective marginal tax rates on labor and capital income are assumed to move proportionally for all households as revenues change to meet the specified targets.

Those changes in fiscal policy are projected to have effects on the economy that would feed back into the budget. CBO has not analyzed every way in which those changes would affect the economy in the long term. Instead, for the simplified analysis presented in this report, CBO considered these three effects:

- Effective marginal tax rates on labor income would be lower under the two paths in which revenues are reduced than they are in the extended baseline projections. Those lower rates would encourage people to work and save more and thus increase output.<sup>6</sup>

6. The effective marginal tax rate on labor income is the share (averaged among all taxpayers by assigning them weights proportional to their labor income) of an additional dollar of such income that is paid in federal individual income taxes and payroll taxes.

- Effective marginal tax rates on income from most types of capital would also be lower under the paths in which revenues are reduced. Those lower rates would encourage saving and investment and thus further increase output.<sup>7</sup>
- Federal debt would be greater under all three paths than it is in the extended baseline projections. The increase in federal borrowing would draw money away from investment in capital goods and services and thus reduce the stock of private capital and output.

In addition to those three effects, CBO's analysis accounts for the short-term effects that the illustrative

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7. The effective marginal tax rate on capital income is the share of the return on an additional dollar of investment made in a particular year that will be paid in taxes over the life of that investment.

budgetary paths would have on the economy. Policies that increased spending or reduced revenues would boost overall demand for goods and services over the next few years, thereby increasing output and employment in the short term.

Changes to fiscal policy could also alter people's incentives in other ways, possibly resulting in significant long-term changes to the economy. For example, changes to tax policy might alter businesses' choices about how they were structured, and those choices might, in turn, alter the effective marginal tax rate on capital income. Similarly, changes in the tax treatment of mortgage debt would affect households' decisions about how much to save. Because this analysis is simplified, it does not account for any changes in individuals' or businesses' incentives or activities that might result from particular policy changes.



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# Appendix A: Assumptions and Methods Underlying CBO’s Long-Term Budget Projections

The Congressional Budget Office’s long-term budget projections are consistent with the baseline budget projections and economic forecast for 2022 to 2032 that the agency published in May 2022.<sup>1</sup> The long-term projections extend most of the concepts underlying the 10-year projections for an additional 20 years. Together, those projections constitute the agency’s *extended baseline* projections.

CBO’s extended baseline projections give lawmakers a point of comparison from which to measure the effects of policy options or proposed legislation. The projections are not predictions of budgetary outcomes. Rather, they represent the agency’s 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—are nevertheless extended after their authorizations lapse;
- Spending on Medicare and Social Security continues as scheduled regardless of the amounts in those programs’ trust funds; and
- Discretionary spending follows the agency’s baseline projection through 2032, after which time it transitions (over a five-year period) to grow at the rate of nominal gross domestic product. (For a summary of the assumptions about outlays and revenues that underlie CBO’s extended baseline projections, see Table A-1.)

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1. See Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), [www.cbo.gov/publication/57950](http://www.cbo.gov/publication/57950).

For years beyond 2032, the agency used a model with the following four components to integrate its demographic, economic, and long-term budget projections.<sup>2</sup>

- A *demographic model* was used to project the size of the population by age and sex.
- A *microsimulation model* was used to project annual changes in demographic characteristics and economic outcomes for a representative sample of the population and to project Social Security outlays beyond CBO’s standard 10-year budget period.
- A *long-term budget model* was used to project federal outlays (except those for Social Security), revenues, deficits, and debt beyond CBO’s standard 10-year budget period.
- A *model of economic growth* was used to simulate how demographic changes, economic factors, and fiscal policy would affect the U.S. economy and, in turn, the federal budget.<sup>3</sup>

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 budget projections in the extended baseline projections reflect those economic effects.

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2. 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).

3. See Congressional Budget Office, “CBO’s Policy Growth Model” (April 2021), [www.cbo.gov/publication/57017](http://www.cbo.gov/publication/57017); and Robert W. Arnold, Chief, Projections Unit, Macroeconomic Analysis Division, Congressional Budget Office, “CBO’s 10-Year Economic Forecast and How It Is Produced” (presentation at a seminar of the Congressional Research Service, April 26, 2018), [www.cbo.gov/publication/53792](http://www.cbo.gov/publication/53792).

Table A-1.

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

Assumption	
Outlays	
Social Security	As scheduled under current law <sup>a</sup>
Medicare	As scheduled under current law through 2032; thereafter, projected spending depends on the estimated growth rates of the number of beneficiaries, health care costs per beneficiary, potential GDP per person, and additional cost growth for Medicare (which is projected separately for various parts of the program and, by 2052, moves smoothly up to a rate of 0.1 percent for Part A, down to a rate of 0.2 percent for Part B, and down to a rate of 0.6 percent for Part D) <sup>a</sup>
Medicaid	As scheduled under current law through 2032; thereafter, projected spending depends on the estimated growth rates of the number of beneficiaries, health care costs per beneficiary, potential GDP per person, and additional cost growth for Medicaid (which is projected to move smoothly down to a rate of 0.6 percent by 2052)
Children's Health Insurance Program	As projected in CBO's baseline through 2032; thereafter, projected spending remains constant as a percentage of GDP
Subsidies for Health Insurance Purchased Through the Marketplaces	As scheduled under current law through 2032; thereafter, projected spending depends on the estimated growth rates of the number of beneficiaries and potential GDP per person, an additional indexing factor for subsidies, and additional cost growth for subsidies for health insurance purchased through the marketplaces (which is projected to move smoothly down to a rate of 1.0 percent by 2052)
Other Mandatory Spending	As scheduled under current law through 2032; 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 projections published in March 2020 (those projections are the most recent projections that exclude the effects of the coronavirus pandemic)
Discretionary Spending	As projected in CBO's baseline through 2032; beyond that year, after a five-year transition period, discretionary spending would grow at the rate of nominal GDP
Revenues	
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 2032; constant as a percentage of GDP thereafter

Data 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 an additional 20 years.

For CBO's most recent 10-year baseline projections, see Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), [www.cbo.gov/publication/57950](http://www.cbo.gov/publication/57950).

Additional cost growth (which was called excess cost growth in CBO's past reports) is the amount by 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.



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# Appendix B: CBO's Projections of Economic Variables

## Overview

The Congressional Budget Office develops its assessment of the long-term outlook for the federal budget on the basis of its projections of economic variables over the next three decades.<sup>1</sup> The projections presented in this report are consistent with the baseline budget projections and the economic forecast for the 2022–2032 period that CBO published in May 2022.<sup>2</sup> Those projections reflect the assumption that current laws governing federal taxes and spending generally remain unchanged. (The agency's annual projections of economic variables through 2052 are included in this report's supplemental data, which are available at [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).)

Projections of federal budgetary outcomes depend on many economic variables. In this appendix, CBO describes and explains the projected growth of gross domestic product (GDP); labor force participation and labor force growth; other labor market outcomes (unemployment, average weekly hours worked, total hours worked, earnings as a share of compensation, the growth of inflation-adjusted earnings per worker, and the distribution of earnings among workers); capital accumulation and productivity; inflation; and interest rates.

CBO's projections of those variables reflect the agency's assessment of various economic and demographic developments, as well as the effects of monetary and fiscal policy on economic activity.

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1. In previous versions of this report, the agency discussed projections of demographic trends along with its discussion of economic trends. This year, the demographic trends are instead covered in a companion report. See Congressional Budget Office, *The Demographic Outlook: 2022 to 2052* (July 2022), [www.cbo.gov/publication/57975](http://www.cbo.gov/publication/57975).
  2. See Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), [www.cbo.gov/publication/57950](http://www.cbo.gov/publication/57950).

## Gross Domestic Product

In CBO's projections, the average annual growth of real GDP (that is, GDP adjusted to remove the effects of inflation) slows from 1.9 percent in the first decade of the projection period (2022 to 2032) to slightly less than 1.6 percent in the second decade (2033 to 2042) to just over 1.5 percent in the third decade (2043 to 2052); see Table B-1. Those rates of growth are 0.6 to 0.9 percentage points lower than the average growth rate of 2.5 percent that has occurred for the past three decades. In the agency's current projections, real GDP grows slightly faster over the 2021–2051 period than the agency projected last year.

Real GDP per person is expected to increase at an average annual rate of 1.4 percent over the 2022–2052 period. Over the past 30 years, that measure has increased at an average annual rate of 1.5 percent. In the agency's projections, the average annual growth of real GDP per person falls from 1.5 percent in the first decade of the projection period to 1.2 percent in the second decade. In the third decade, growth in real GDP per person rises to 1.3 percent as population growth slows more than real GDP.

Nominal GDP is projected to grow at an average annual rate of 3.9 percent over the next 30 years, which is slower than the average growth rate over the past 30 years (4.5 percent). CBO projects that average annual growth in nominal GDP will slow from 4.4 percent over the first decade to 3.7 percent in the second decade and to 3.5 percent in the third decade. In the agency's current projections, nominal GDP grows faster over the 2021–2051 period than the agency projected last year.

## Real GDP

The long-term growth of real GDP in CBO's forecasts is driven by the growth rate of real potential GDP (that is, the maximum sustainable output of the economy, adjusted to remove the effects of inflation). Over the next three decades, the growth of real potential GDP is

Table B-1.

## Average Annual Growth Rates for Economic Variables That Underlie CBO's Extended Baseline Projections, by Calendar Year

Percent

	1992–2021	2022–2032	2033–2042	2043–2052	Overall, 2022–2052
<b>GDP</b>					
Real GDP	2.5	1.9	1.6	1.5	1.7
Real potential GDP <sup>a</sup>	2.4	1.8	1.6	1.5	1.7
Potential labor force	0.9	0.4	0.3	0.3	0.3
Potential labor force productivity	1.5	1.5	1.3	1.2	1.3
Nominal GDP	4.5	4.4	3.7	3.5	3.9
Real GDP per person	1.5	1.5	1.2	1.3	1.4
Labor Force Participation Rate (Average annual value)	65.1	61.8	61.0	60.7	61.2
Labor Force	0.8	0.5	0.3	0.3	0.4
Unemployment (Average annual value)					
Unemployment rate	5.9	4.2	4.4	4.2	4.2
Noncyclical rate of unemployment <sup>b</sup>	5.0	4.4	4.1	3.9	4.1
Average Weekly Hours Worked	*	*	*	*	*
Total Hours Worked	0.8	0.6	0.3	0.3	0.4
Earnings as a Share of Compensation (Average annual value)	81	82	81	80	81
Real Earnings per Worker	1.4	0.7	0.9	0.9	0.8
Productivity					
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
Inflation					
CPI-U	2.3	2.8	2.3	2.3	2.4
GDP price index	2.0	2.4	2.0	2.0	2.2
Interest Rates (Average annual value)					
Real rates					
On 10-year Treasury notes and the OASDI trust funds	1.7	0.7	1.7	2.3	1.5
Nominal rates					
On 10-year Treasury notes and the OASDI trust funds	4.0	3.4	4.0	4.5	4.0
On all federal debt held by the public (By fiscal year) <sup>c</sup>	4.2	2.5	3.4	4.0	3.3

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

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 an additional 20 years.

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

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 zero.

- Potential GDP is the maximum sustainable output of the economy. 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 have jobs or who are available for work and are actively seeking jobs) adjusted to remove the effects of fluctuations in the business cycle. Potential labor force productivity is the ratio of real potential GDP to the potential labor force. The sum of growth in the potential labor force and growth in potential labor force productivity is equal to growth in real potential GDP.
- The noncyclical rate of unemployment is the rate that results from all sources except fluctuations in aggregate demand. It reflects the normal turnover of jobs and mismatches between the skills of available workers and the skills necessary to fill vacant positions.
- 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.

expected to decelerate. Starting from an average annual rate of growth of 1.8 percent in the first decade of the projection period, that measure declines to slightly less than 1.6 percent in the second decade and then inches down to just over 1.5 percent in the third decade.

That deceleration reflects a gradual slowing of growth in the potential labor force (the labor force adjusted for fluctuations in the business cycle) and slower growth in potential labor force productivity (potential output per member of the potential labor force). Growth in potential labor force productivity is, in turn, driven by two key factors; total factor productivity, or TFP (real output per unit of combined labor and capital inputs in the nonfarm business sector), and capital accumulation per worker. Over the 30-year projection period, capital accumulation slows, primarily owing to the effect of increased federal borrowing on private investment.

In CBO's current 10-year economic forecast, the level of real GDP exceeds that of real potential GDP for several years, but then the growth rate of real GDP slows in relation to the growth rate of real potential GDP, in part because monetary policy gradually tightens. As a result, the level of real GDP falls below that of real potential GDP in 2026. By 2028, real GDP is 0.5 percent below real potential GDP, and that gap persists through 2052 and beyond.<sup>3</sup> Therefore, over the second and third decades of the projection period, real GDP and real potential GDP grow at the same annual rate in the agency's projections.

### Nominal GDP

In CBO's forecast, growth in nominal GDP is determined by the growth of the GDP price index and the growth of real GDP. Projected growth in the GDP price index falls from an average annual rate of 2.4 percent in the first decade to 2.0 percent in the second and third decades. Slower growth in both the GDP price index

3. That output gap reflects the agency's assessment that GDP falls short of potential GDP to a greater extent and for longer periods during and after economic downturns than actual output exceeds potential output during economic expansions. A recent study explains the existence of a persistent output gap by examining asymmetric fluctuations of the unemployment rate around the noncyclical rate of unemployment (that is, the rate that results from all sources except fluctuations in aggregate demand). 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/1njkmzfk>. CBO assessed the persistent output gap in an earlier report; 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).

and real GDP leads to a significant decline in the average growth of nominal GDP from the first decade to the second decade. Slowing growth of GDP between the second and third decades, however, is almost entirely because of lower growth in real GDP.

### Changes in Projections of GDP Since Last Year

CBO's current projections of real GDP and nominal GDP are higher than last year's projections throughout the 30-year period. Faster growth of real GDP over the first two decades results from levels of investment that are projected to be stronger than CBO previously estimated and that lead to a larger stock of productive capital. For the third decade, the agency's projections of growth in nominal GDP, real GDP, and real potential GDP are similar to last year's projections, because a slight decrease in the growth of TFP offsets the effect of the larger stock of capital. In 2031, the level of real GDP is projected to be 1.1 percent higher in this year's projections than in last year's. By 2051, the level of real GDP is projected to be 1.8 percent greater than CBO expected last year. Compared with last year's projections of real GDP per person over the next three decades, this year's projections grow faster because real GDP grows slightly faster and growth in the U.S. population is slightly slower.

The agency's projections of nominal GDP are higher this year because CBO now expects much higher inflation in the GDP price index over the next few years and slightly faster growth in real GDP and real potential GDP in the first and second decades of the projection period. (For details, see Box C-1 on page 53.) By 2051, the level of nominal GDP is projected to be 9.3 percent higher than the agency projected last year.

### Factors Affecting Projections of Potential GDP

The growth of potential GDP is determined by the growth of the potential labor force and of potential labor force productivity. Projected growth in potential labor force productivity, in turn, is determined by projections of various trends. Among those economywide trends are average weekly hours worked; investment and the accumulation of capital, such as structures and equipment, intellectual property products, and residential housing; and the growth of TFP in the nonfarm business sector.

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

In CBO's projections, the size of the labor force depends on the rates at which people in different demographic

groups participate in the labor market and on the number of people in those groups. Since the mid-2000s, the overall rate of labor force participation (the rate for people age 16 or older) in the United States has declined substantially, driven predominantly by the aging of the population.<sup>4</sup> Because that aging is likely to continue, CBO expects the decline in participation to persist during the first half of the 30-year projection period before stabilizing in the second half of the period. As a result, the labor force is expected to grow more slowly than the number of people age 16 or older for the first two decades of the period and at roughly the same pace as the number of people age 16 or older in the third decade.

The agency's projections of the labor force participation rate (LFPR) and the size of the labor force are important factors for CBO's projections of other economic outcomes. For example, faster growth of the labor force would directly boost GDP growth. It would also cause private capital to accumulate faster, which would further boost the growth of GDP.

### The Labor Force Participation Rate

The labor force participation rate is generally projected to decline as the effects of the aging population become more prominent in relation to the short-term effects of the expanding economy. The LFPR falls from 61.8 percent, on average, in the first decade to 61.0 percent in the second decade. As demographic shifts slow over time, the LFPR is expected to stabilize, averaging 60.7 percent in the third decade of the projection period.

### Labor Force Growth

The labor force is expected to grow from 164 million people in 2022 to 181 million people in 2052. Growth in the labor force slows in CBO's projections, from 0.5 percent per year, on average, from 2022 to 2032 to 0.3 percent per year, on average, from 2043 to 2052. That change represents a significant slowdown from the pace of growth in earlier periods: For example, the average annual growth rate of the labor force was 1.2 percent during the 1990–2006 period and 0.6 percent during the 2010–2019 period.

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

### Changes in Projections of the Labor Force Participation Rate and Labor Force Growth Since Last Year

CBO's current projections of the labor force participation rate are higher than last year's throughout the projection period. Even though lingering health concerns and issues related to the availability of child care and other in-home care (stemming from the coronavirus pandemic) reduced the agency's labor force projections in the near term, upward revisions to the agency's projection of the size of the prime-age population (people ages 25 to 54) more than offset those factors throughout the projection period.<sup>5</sup>

As a result of those upward revisions to the agency's projections of the prime-age population and labor force participation rates, CBO's current projections of the size of the labor force are about 0.5 percent larger, on average, for 2023 to 2051, compared with last year's projections.

### Factors Affecting Projections of the Labor Force Participation Rate and Labor Force Growth

The projected decline in the overall labor force participation rate in the coming decades stems mainly from the aging of the population: People age 65 or older tend to participate in the labor force at lower rates than younger people do. In 2019, for example, the average participation rate was 82.5 percent among the civilian noninstitutionalized population ages 25 to 54, and it was 20.1 percent among those age 65 or older.<sup>6</sup> As members of the baby-boom generation started to turn 65 in the early 2010s, the share of people age 65 or older in the civilian noninstitutionalized population increased rapidly, growing from 16.3 percent in 2010 to 20.4 percent in 2019. (The baby-boom generation encompasses people born between 1946 and 1964.) In CBO's projections, the percentage of people age 65 or older continues to rise (reaching 25.2 percent by 2032) and averages 27.1 percent during the third decade of the projection period.

5. Technical adjustments made in response to recent data from the Census Bureau account for most of the revisions to the population ages 25 to 54 since last year. See Bureau of Labor Statistics, *Adjustments to Household Survey Population Estimates in January 2022* (February 2022), <https://go.usa.gov/xuDH6> (PDF, 73 KB).

6. The civilian noninstitutionalized population excludes people who are younger than age 16, members of the armed forces on active duty, and people in penal or mental institutions or in homes for the elderly or infirm.

To assess the importance of aging in CBO's projections of the labor force participation rate, the agency calculated what the rate would be if the age-and-sex composition of the population remained the same in each year of the projection period as it was in 2022. That adjusted LFPR would increase from 61.9 percent in 2022 to 64.6 percent in 2052. Because the sex composition of the population is projected to change only slightly over the next three decades, the analysis implies that the effect of the aging of the population is roughly equal to the difference between the unadjusted and adjusted rates.<sup>7</sup> The adjusted LFPR in 2052 (64.6 percent) is 3.9 percentage points higher than the unadjusted LFPR in that year (60.7 percent). Therefore, aging accounts for more than the 1.2 percentage-point decline in the unadjusted rate that CBO projects from 2022 to 2052.

In contrast to the aging of the population, CBO expects two long-term trends to boost 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 until increasingly older ages.

CBO expects those two trends to be mostly offset by other trends that will put downward pressure on the labor force participation rate:

- Members of each generation (particularly men) that followed the baby boomers—Generation X and the Millennial Generation—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 women age 34 or younger, who participate in the labor force at higher rates than did 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.

7. The share of men and women in the population in 2022 is 49 percent and 51 percent, respectively.

In addition to the effects of those demographic trends, as people's income rises faster than inflation, more of their income is pushed into higher tax brackets through a process known as real bracket creep, raising their effective tax rates. Scheduled increases in tax rates and real bracket creep are projected to decrease participation in the labor force because people would earn less return on their labor.

## Other Labor Market Outcomes

In addition to the rate of labor force participation and the size and growth of the labor force, CBO projects the unemployment rate, the average and total number of hours that people work, and various measures of workers' earnings. CBO regularly updates those projections to reflect revisions in historical data, reassessments of economic and demographic trends, and changes to the agency's analytic methods.

### Unemployment

The unemployment rate is projected to gradually rise over the next few years. By 2028, it is projected to reach 4.5 percent, surpassing the noncyclical rate of unemployment.<sup>8</sup> From 2029 to 2052, the unemployment rate is expected to remain roughly one-quarter of one percentage point above the noncyclical rate of unemployment, a difference that is consistent with both the average historical relationship between the two measures and the projected gap of one-half of one percent between actual and potential GDP.

In CBO's projections, the noncyclical rate of unemployment declines gradually to 4.3 percent in 2032 and to 3.9 percent in 2052. That slow decline reflects the continuing shifts in the composition of the workforce toward older workers, who tend to have lower rates of unemployment (when they participate in the labor force), and away from less-educated workers, who tend to have higher ones. As the noncyclical rate of unemployment decreases, the actual unemployment rate also declines. By 2052, the actual rate is projected to reach 4.1 percent.

### Average Weekly Hours Worked

Workers tend to work a different number of hours each week depending on their industry: For example,

8. The noncyclical rate of unemployment is the rate that results from all sources except fluctuations in aggregate demand, including normal turnover of jobs and mismatches between the skills of available workers and the skills necessary to fill vacant positions.



workers in manufacturing put in more than 40 hours per week, on average, whereas those in service industries typically work about 32 hours per week. Over the past few decades, as the share of workers employed in manufacturing has decreased and the share employed in service industries has increased, 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 substantially affect the economywide number of average hours worked.

Some incentives under current tax law are projected to influence the average number of hours worked. Higher tax rates on individual income are set to take effect when, under current law, certain provisions of the 2017 tax act expire at the end of 2025. In CBO's projections, those higher rates slightly reduce the average number of hours worked beginning in 2026. In addition, effective tax rates on individual income are projected to rise because of real bracket creep. Given economic trends and current laws, CBO expects the average number of hours worked to decline slightly over the next 30 years. By 2052, the average worker is projected to work roughly half an hour less per week than he or she does today.

### Total Hours Worked

Total hours worked are calculated on the basis of projections of the growth of the labor force, average hours worked, and unemployment. CBO estimates that total hours worked will increase at an average annual rate of 0.4 percent between 2022 and 2052—about half the average annual increase in total hours worked over the past three decades (0.8 percent). The deceleration in the growth of total hours worked mainly occurs because the working-age 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 0.6 percent in the first decade and 0.3 percent in the second and third decades.

### 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). Since 1960, the share of total compensation paid in the form of wages and salaries has declined—from 91 percent in that year

to 82 percent in 2021—mainly because health insurance premiums have risen more quickly than total compensation.<sup>9</sup> Because CBO expects that the cost of health insurance will continue to rise faster than wages and salaries, the portion of compensation that workers receive as earnings is projected to decline, on average, to 81 percent over the 2022–2052 period, reaching 80 percent in 2052.

### Growth of Real Earnings per Worker

Projections of prices, capital services (that is, the flow of productive services from the stock of capital assets), TFP, the amount of nonwage compensation (such as employment-based health insurance), and the average number of hours worked imply that real earnings per worker will grow by an average of 0.8 percent annually over the 2022–2052 period. That rate is less than the 1.4 percent average annual growth of real earnings per worker over the past 30 years.

### Distribution of Earnings

In CBO's projections, earnings grow faster for high earners than for low earners, but the rate of growth for high earners is projected to be slower than it was in the past. The share of earnings accruing to workers in the top 10 percent of the earnings distribution, for example, increases at an average rate of 0.1 percentage point per year from 2022 to 2052. That growth is less than it was between 1978 and 2019, when the share of earnings accruing to workers in the top 10 percent of the distribution increased by 0.2 percentage points per year.

The distribution of earnings affects revenues from income taxes and payroll taxes (particularly Social Security taxes). 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.

Social Security payroll taxes are levied only on earnings up to a certain annual amount (called the taxable maximum, which is \$147,000 in 2022), so they also are affected by the earnings distribution. 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

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

1983 to 84 percent in 2019.<sup>10</sup> The portion of earnings subject to Social Security taxes is projected to be 82 percent, on average, in the first and second decades of the projection period. It falls to 81 percent, on average, in the third decade and equals 81 percent in 2052. That decline in the share of covered earnings below the taxable maximum reduces CBO's projection of Social Security payroll taxes.

### Changes in Projections of Other Labor Market Outcomes Since Last Year

Some of this year's projections are close to last year's. CBO's current projections of real earnings per worker grow at roughly the same rate as last year's projections over the 2021–2051 period, for instance. Other projections differ. For the unemployment rate, for example, CBO's current projections are substantially lower over the next five years and higher over the following five years than the rates the agency projected last year.

The near-term revision to the unemployment rate is mainly because recent data on unemployment indicate a much stronger labor market recovery than the agency anticipated, driven primarily by stronger economic growth, compared with last year's projected pace of recovery. Revisions for the latter part of the first decade stem from CBO's expectation that GDP will return to its historical relationship with potential output sooner than the agency forecast last year. As a result, the unemployment rate is expected to rise toward CBO's estimate of the noncyclical rate of unemployment sooner as well. That earlier rise in the unemployment rate accounts for the slight upward revision to the average unemployment rate over the 2027–2032 period. For the second and third decades, the unemployment rate is projected to be roughly the same as CBO projected last year.

In CBO's current projections, earnings as a share of compensation are slightly higher for the 30-year period than the agency projected last year. The higher projection is because the increase in taxable earnings relative to last year's projected amount is larger than the increase in nontaxable benefits.

10. 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 of workers—mostly in state and local government jobs or in the clergy—are exempt. Earnings above the taxable maximum are also exempt from payroll taxes, and no additional Social Security benefits accrue to people who have those excess earnings.

CBO's projections of the earnings distribution also differ from last year's. The top 10 percent of earners in 2051 are now projected to make 45.7 percent of all earnings, slightly more than last year's projected amount (45.0 percent). CBO refined its method for calculating the distribution of earnings, leading to a larger share of earnings accruing to high-wage earners over the long run.

### Capital Accumulation and Productivity

In addition to the labor force, two other factors directly affect CBO's projections of output. One is the accumulation of capital, which contributes a flow of services to production over a given time period. The second factor is growth in total factor productivity. In CBO's projection method, economywide growth is driven mainly by growth in the nonfarm business sector; for that reason, the productivity measure that contributes the most to economywide growth is TFP in the nonfarm business sector.

The combined effect of capital accumulation and productivity on real GDP can be accounted for by measuring growth in real GDP that is not attributable to growth in total hours worked. Growth in real GDP per hour worked is a measure of economywide productivity that CBO uses to calculate the combined effect of growth in capital and growth in productivity on real GDP growth.

#### Capital Accumulation

Accumulation of private capital depends primarily on growth of the labor force, private saving, international flows of capital, and federal borrowing. Over the next 30 years, CBO projects, private saving as a percentage of GDP will rise. In the agency's projections, however, those effects are more than offset by an increase in federal borrowing, which rises as a percentage of GDP over the same period, pushing up interest rates, reducing growth in private investment, and slowing the growth of the stock of private capital. The average annual real interest rate on 10-year Treasury notes (calculated by subtracting the rate of increase in the consumer price index from the nominal yield on those notes) is projected to be 1.5 percent in 2032, rising to 2.4 percent by 2052.

#### Total Factor Productivity

The annual growth of TFP in the nonfarm business sector is projected to average 1.1 percent through 2052. That projected growth rate is about 0.3 percentage points slower than the average annual rate of growth since

1950 (1.4 percent) and 0.2 percentage point slower than the average rate since 1990.

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

### Real GDP per Hour Worked

Given the projected slowdown in growth of the capital stock and TFP, average annual growth in real GDP per hour worked is expected to fall from 1.4 percent over the first decade of the projection period to 1.3 percent over the second decade and to 1.2 percent over the third decade. Potential labor force productivity is expected to follow a similar decline over the next 30 years.

### Changes in Projections of Capital Accumulation and Productivity Since Last Year

CBO's projections of capital accumulation and growth of capital services over the 2022–2051 period are higher this year than last year, reflecting the agency's upward revision, on average, to its projections of fixed investment in nearly all types of capital. That revision was the result of updates to historical data on investment made over the past year.

CBO's projections of TFP growth in the nonfarm business sector are slightly lower over the 30-year period, reflecting modest revisions to historical trends in TFP growth that influence the agency's judgment about the potential for future growth. Stronger projected growth of capital services outweighs weaker projected growth of TFP, though, so CBO's projection of real GDP per hour worked is higher over the 30-year period than it was last year.

### Factors Affecting Capital Accumulation and Productivity

Over the long term, in CBO's view, growth of the nation's stock of private capital (or the flow of private investment) will be driven by the growth of the labor force, private saving, international flows of direct foreign investment and financial capital, and federal borrowing. Private saving tends to move in the same direction as growth in the labor force, and both 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. In the agency's view, increased federal borrowing reduces the amount of funds available for private investment and puts upward pressure on interest rates. CBO's projections of private investment and the rate of return on investment are consistent with its projections of federal borrowing and interest rates on 10-year Treasury notes, which increase over the 30-year period.

Several developments support CBO's projections of slower growth in nonfarm business TFP over the next 30 years (at an average annual rate of 1.1 percent) relative to its average growth rate over the past 30 years (1.3 percent). One is improvement in labor quality—an aggregate measure of workers' skills that accounts for educational attainment and work experience—which CBO expects to slow over the next three decades. That measure is implicitly included in CBO's measure of TFP. The slower improvement in labor quality is expected to be partly offset by improvements in health and increases in life expectancy that will lead people (particularly highly educated people) to continue working past the ages at which previous generations retired, thus boosting the total stock of experience in the workforce.

Another development that affects nonfarm business TFP is federal investment in physical capital (such as transportation infrastructure and water and power projects), education and training, and research and development; that investment produces income and other benefits (higher productivity and greater efficiency, for example) for private businesses. In CBO's projections, federal discretionary spending declines to a much smaller percentage of GDP over the next decade than it has constituted in past decades. If federal investment spending generally remained unchanged as a share of discretionary spending, and if discretionary spending declined as a percentage of GDP, then federal investment spending also would decrease as a share of GDP. In CBO's assessment, such a reduction in federal investment spending would dampen TFP growth.<sup>11</sup>

11. For more details about how CBO estimates the macroeconomic effects of federal investment, see Congressional Budget Office, *Effects of Physical Infrastructure Spending on the Economy and the Budget Under Two Illustrative Scenarios* (August 2021), [www.cbo.gov/publication/57327](http://www.cbo.gov/publication/57327), and *The Macroeconomic and Budgetary Effects of Federal Investment* (June 2016), [www.cbo.gov/publication/51628](http://www.cbo.gov/publication/51628).

A third development that underlies slower growth in CBO's projections of nonfarm business TFP is climate change. In at least two ways, climate change affects CBO's projections of economic growth in future decades. First, climate change has had an effect on recent productivity trends, in the agency's assessment. Because those recent trends are used to project future trends, CBO's projections thus account for a portion of the effects of climate change. Second, the agency explicitly estimates a certain amount of additional impact from future changes in climate, which are projected to affect the growth of nonfarm business TFP. By CBO's estimate, TFP growth over the 2022–2052 period will be lower by about 0.02 percentage points per year, on average, owing to climate change; as a result, TFP will be about 0.7 percent less and GDP about 0.5 percent less in 2052 than they would have been without those additional effects.<sup>12</sup>

## Inflation

CBO projects rates of inflation for two categories: prices of consumer goods and services and GDP prices (the prices of all goods and services included in GDP). Those rates affect nominal interest rates and, consequently, nominal interest payments on federal debt. They also affect income and the indexation of income tax brackets, thereby influencing tax revenues and federal expenditures. In this year's projections, inflation is notably higher in the first few years of the forecast than it was in last year's projections, though inflation over the longer term is about the same.

### 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 2022–2052 period, that measure of inflation averages 2.4 percent in CBO's projections. That long-term rate is roughly the same as the average rate of inflation since 1992.

Using a chained measure of CPI-U inflation, CBO projects that prices will grow at a rate that is about 0.3 percentage points less than the annual increase in the traditional CPI-U, on average. The chained consumer

price index for all urban consumers 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 goods and services with similar but cheaper alternatives when prices go up. 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 to compute 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 difference between the two measures.

### GDP Prices

Over the 2022–2052 period, inflation in GDP prices, as measured by the annual rate of increase in the GDP price index, is projected to average 2.2 percent. That rate is slightly higher than the average annual growth in the GDP price index over the past 30 years (2.0 percent). The increase is mainly attributable to higher projected price growth over the next few years. The GDP price index grows at a different rate than the CPI-U because it is based on the prices of a different set of goods and services and is calculated using a different method.

### 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 higher from 2022 to 2025 than CBO projected last year. Data show that prices have been increasing more rapidly in many sectors of the economy than the agency had expected—largely because the combination of strong demand and restrained supply has created tighter markets for goods, services, and labor than the agency anticipated—and CBO has revised its projections upward as a result. CBO did not significantly revise its projections for 2026 to 2051, though. After 2025, inflation is projected to remain close to its long-term average. From 2032 to 2051, CBO projects, the CPI-U and the GDP price index will grow at roughly the same rates as the agency projected last year.

### Factors Affecting Inflation

The Federal Reserve sets an explicit goal for the long-run average rate of inflation: 2.0 percent for the personal consumption expenditures (PCE) price index. From 2025 to 2052, the PCE price index is projected to grow at rates that are consistent with that goal. In CBO's projections, other rates of inflation, such as the CPI-U

12. CBO has drawn 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 more-intense storms and rising sea levels. For more information, 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).



and the GDP price index, maintain growth rates that are consistent with those indexes' long-run relationship with the PCE price index. Over the 2026–2052 period, in CBO's projections, inflation in the CPI-U returns to a rate of growth that is slightly higher than that of the PCE price index, and inflation in GDP prices is roughly the same as inflation in the PCE price index.

## 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 and the balances of the trust funds.

### Interest Rates on Notes, Bonds, and Debt

In CBO's projections, real interest rates on federal borrowing are lower in the future than they were, on average, between 1995 and 2004.<sup>13</sup> That historical period was chosen for comparison because it was a time when expectations of inflation were stable, when there were no severe economic downturns or significant financial crises, and when, according to CBO's estimates, monetary policy was, on average, neutral (that is, the real federal funds rate, which is the interest rate that financial institutions charge each other for overnight loans of their monetary reserves, was, on average, consistent with the economy's operating at full employment during that period).

The agency expects several factors, including slower growth of the labor force and slower growth of TFP relative to its pace in that historical period, to continue to put downward pressure on interest rates through 2052. That downward pressure is expected to be partly mitigated by upward pressure on interest rates from other factors, such as federal debt that is rising in relation to GDP.

The nominal interest rate on 10-year Treasury notes is projected to average 4.0 percent over the 2022–2052 period and to reach 4.6 percent in 2052. The real interest rate on those notes has averaged 0.5 percent since 2009; it is projected to be 1.5 percent in 2032 and to rise thereafter, reaching 2.4 percent in 2052. That

projection for 2052 is 0.6 percentage points below the average real interest rate on 10-year Treasury notes over the 1995–2004 period (3.0 percent).

For all federal debt held by the public, the nominal interest rate averages 3.3 percent over the 2022–2052 period, in CBO's projections, and reaches 4.2 percent in 2052. The rate on that debt tends to be lower than the rate on 10-year Treasury notes because many of the Treasury's other securities—which, in addition to the 10-year notes, constitute the securities used to finance federal debt—mature over a shorter period and thus often have a lower interest rate. For example, the rate on 3-month Treasury bills is projected to be 1.2 percentage points lower, on average, than the rate on 10-year Treasury notes over the next decade. The average nominal interest rate on federal debt over the 2022–2052 period is projected to be 0.7 percentage points lower, on average, than the rate on 10-year Treasury notes. That difference is smaller than the projected gap of 0.9 percentage points between the two rates over the 2022–2032 period. The difference between the rates is larger before 2032 because federal debt up to that time includes more Treasury securities that were issued in the wake of the 2020 recession, when the Federal Reserve kept interest rates low to support the economic recovery.

The Social Security trust funds hold special-issue bonds that generally earn interest at higher rates than the average rate of interest on federal debt. Because interest rates have been low for most of the past decade, CBO projects that the average interest rate earned by all bonds held by the Social Security trust funds will be 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 interest those bonds earn for the trust funds, is projected to average 2.4 percent from 2022 to 2032, which is the year before the combined Social Security trust funds are projected to be exhausted.

### Changes in Projections of Interest Rates Since Last Year

CBO's projections of interest rates are higher this year than they were last year. For 10-year Treasury notes and for newly issued bonds held in the Old-Age, Survivors, and Disability Insurance trust funds, nominal interest rates are projected to average 4.0 percent over the 2022–2051 period, up from last year's projection of 3.6 percent; real interest rates are projected to average 1.5 percent over the same period, slightly higher than last

13. For further details on the factors affecting CBO's interest rate projections, see Edward N. Gamber, *The Historical Decline in Real Interest Rates and Its Implications for CBO's Projections*, Working Paper 2020-09 (Congressional Budget Office, December 2020), [www.cbo.gov/publication/56891](http://www.cbo.gov/publication/56891).



year's projected rate of 1.3 percent. For federal debt, the average nominal interest rate is projected to be 3.3 percent over that period, 0.2 percentage points higher than last year's projection. (For a description of the changes in the method CBO uses to calculate the average interest rate on debt, see Appendix D.)

For the first decade of the projection period, CBO expects real interest rates to be higher than it did last year. That is because the agency now anticipates that, in response to recent inflation that was higher than expected, the Federal Reserve will raise the target range for the federal funds rate more rapidly than CBO previously projected. Short-term interest rates will rise in response to that more aggressive tightening of monetary conditions. Long-term rates, which partly reflect the expected path of short-term rates, will also be higher than CBO projected last year.

Because the agency raised its projections of inflation less than it raised its projections of the rate on 10-year Treasury notes (particularly after 2025), this year's projections of real interest rates are significantly higher over the 2022–2031 period—averaging 0.8 percent, compared with last year's projection of 0.1 percent for the same period. The upward revision to CBO's projections of real interest rates falls off sharply after 2027 and is mostly eliminated by the middle of the second decade of the projection period. For the latter two decades of the projection period, real interest rates average 2.0 percent and are roughly the same, on average, as in last year's projections.

### Factors Affecting Interest Rates

Interest rates are determined by many factors. To project those rates, CBO compares how the values of factors that affect them are expected to differ in the long term from their average values over the 1995–2004 period (the period CBO uses for historical comparisons).

In CBO's projections for the 2022–2052 period, several factors tend to reduce interest rates on government securities below their average from 1995 to 2004.

- The labor force is projected to grow more slowly than it did from 1995 to 2004. 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, decreasing the return on government bonds and other investments.<sup>14</sup>

- The share of total earnings received by higher-earning households is expected to be larger in the future than it was during the 1995–2004 period. Higher-income households tend to save a greater portion of their income, so the difference in the distribution of earnings is projected to increase the total amount of savings available for investment, all 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 in the nonfarm business sector is projected to grow more slowly in the future than it did from 1995 to 2004. 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.

At the same time, in CBO's projections, several factors tend to boost interest rates on government securities above their average over the 1995–2004 period—but not enough to offset the factors pushing rates downward.

- In CBO's baseline projections, federal debt is much larger as a percentage of GDP than it was before 2004, reaching 110 percent by 2032 and 185 percent by 2052. The latter figure is nearly five times the average amount of debt over the 1995–2004 period. Greater federal borrowing tends to crowd out private investment in the long term, reducing the amount of capital per worker and increasing interest rates and the return on capital over time.
- Before the onset of the pandemic in 2020, the percentage of total income that is paid to owners of capital (known as capital's share of income) had been rising for the past three decades. That share is projected to decline from its current percentage over the next decade but to remain greater than its average in decades before 2020. 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 its average from 1995 to 2004. In CBO's estimation, a larger share of income accruing to owners of capital would directly

14. 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).

boost the return on capital and thus would increase interest rates.

- The ongoing retirement of members of the baby-boom generation and slower growth in the size of the labor force mean that there will be fewer workers in their prime saving years relative to the number of older people who are drawing down their savings. As a result, CBO estimates, the total amount of savings available for investment will be less than it otherwise would be (all else being equal), and that decrease is expected to reduce the amount of capital per worker and thereby push up interest rates. (CBO estimates that the effect of that decrease will only partially offset the positive effect of the larger share of earnings received by higher-income households, leaving a net increase in savings available for investment.)
- CBO anticipates that other countries will attract a greater share of global investment in coming decades than they did in the 1995–2004 period. As those countries recover from the global economic downturn caused by the pandemic, they will become

increasingly attractive destinations for foreign investment. CBO projects that the increased appeal of investing in those countries will put upward pressure on interest rates in the United States.

Some of those factors are easier to quantify than others. For instance, the effects of labor force growth and rising federal debt on interest rates 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. For example, the effect on interest rates of changes in the distribution of earnings is 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.

# Appendix C: Changes in CBO’s Long-Term Budget Projections Since March 2021

## Overview

The Congressional Budget Office’s current budget projections for the 2022–2051 period differ from those it published in March 2021.<sup>1</sup> In both cases, the 30-year *extended baseline* projections follow the agency’s 10-year projections and then extend most of the concepts underlying them for an additional 20 years. CBO’s extended baseline projections are not predictions of budgetary outcomes. Rather, they give lawmakers a point of comparison from which to measure the effects of policy options or proposed legislation.

In CBO’s current projections:

- *Spending* as a percentage of gross domestic product (GDP) is higher through 2034 and lower thereafter than it was in last year’s projections.
- *Revenues* as a percentage of GDP are higher throughout the 2022–2051 period than they were in last year’s projections.
- *Total deficits* as a percentage of GDP are generally larger through 2031 and smaller thereafter, compared with deficits in last year’s projections. *Primary deficits* (that is, total deficits excluding net outlays for interest) as a percentage of GDP are now smaller throughout the projection period than they were last year.
- *Federal debt held by the public* rises from 98 percent of GDP in 2022 to 180 percent in 2051 (see Figure C-1). Such debt is lower in most years than the

agency projected last year: 4 percentage points lower for 2022 and 22 percentage points lower for 2051.

CBO also changed its projections of amounts in the two Social Security trust funds—the Old-Age and Survivors Insurance (OASI) Trust Fund and the Disability Insurance (DI) Trust Fund. In current projections, those trust funds are exhausted later than was estimated last year.

## Changes in Projected Spending

In CBO’s extended baseline projections, total spending, which includes net outlays for interest, is higher as a percentage of GDP in 2022 than it was in last year’s projections; such spending remains higher through 2034 but is lower from 2035 to 2051.<sup>2</sup> Noninterest spending as a percentage of GDP is higher in 2022 than it was in last year’s projections but is generally the same thereafter.<sup>3</sup>

Projected spending on the major health care programs, measured as a percentage of GDP, is now less throughout most of the projection period than was estimated last year, mainly because of changes in the agency’s method of developing projections for those programs and increases in its estimates of nominal GDP. Higher estimates of inflation account for most of the increase in CBO’s current projections of nominal GDP (see Box C-1). (For a discussion of changes in the method underlying the agency’s projections of federal spending on Medicare, see Appendix D.)<sup>4</sup>

1. See Congressional Budget Office, *The 2021 Long-Term Budget Outlook* (March 2021), [www.cbo.gov/publication/56977](http://www.cbo.gov/publication/56977). Because most of last year’s projections ended in 2051, this appendix generally makes comparisons only through that year. For changes in projections of economic factors since 2021, see Appendix B of this report. For changes in projections of demographic factors since 2021, see Congressional Budget Office, *The Demographic Outlook: 2022 to 2052* (July 2022), [www.cbo.gov/publication/57975](http://www.cbo.gov/publication/57975). For further information about budgetary projections for the next decade, see Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), [www.cbo.gov/publication/57950](http://www.cbo.gov/publication/57950).

2. For an additional discussion of recent changes in CBO’s budget projections for the first decade of the projection period, see Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), pp. 109–123, [www.cbo.gov/publication/57950](http://www.cbo.gov/publication/57950).

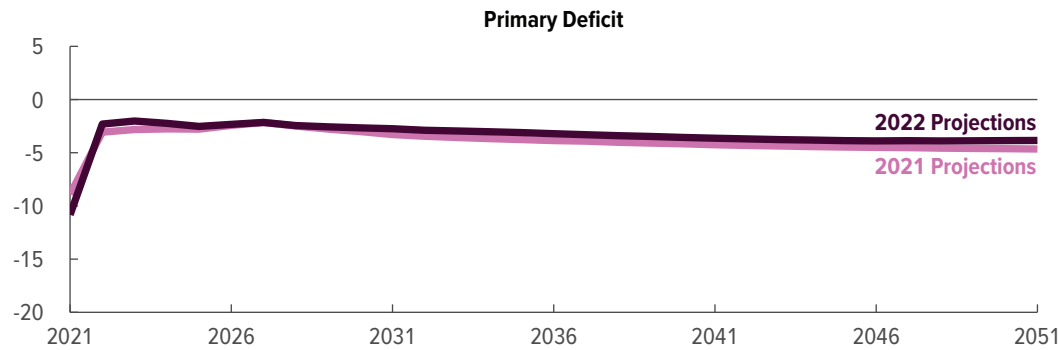
3. Noninterest spending, measured as a share of GDP, was 4 percentage points higher in 2021 than CBO projected it would be last year.

4. Spending on the federal government’s major health care programs consists of spending on Medicare, 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.

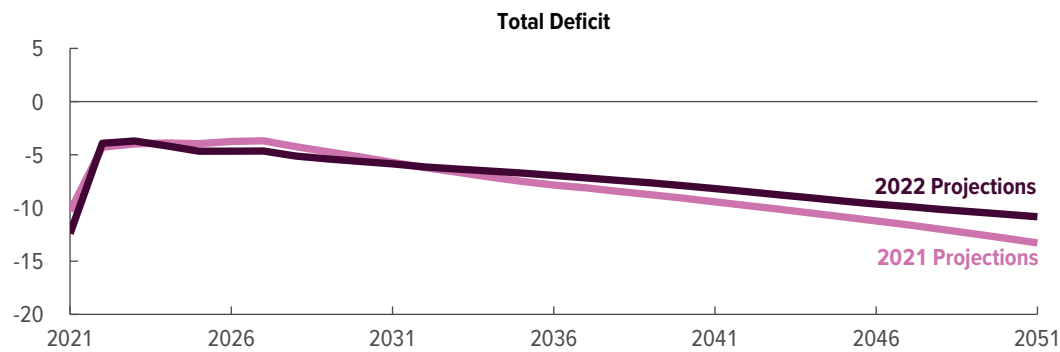
Figure C-1.

## CBO's 2021 and 2022 Extended Baseline Projections of Deficits and Federal Debt Held by the Public

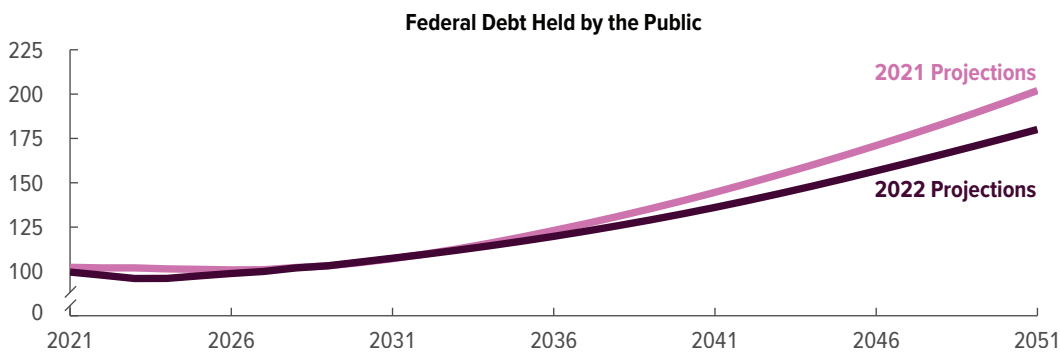
Percentage of GDP



In CBO's current projections, primary deficits as a percentage of GDP are smaller by 0.6 percentage points, on average, over the 2021–2051 period than in last year's projections.



CBO has generally increased its projections of total deficits in the near term but has decreased them over the long term.



Measured as a percentage of GDP, federal debt is now projected to be lower in most years than CBO projected last year.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

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 an additional 20 years.

Primary deficits exclude net outlays for interest.

GDP = gross domestic product.



## Box C-1.

**How Estimates of Inflation Affected CBO's Budget Projections**

In the Congressional Budget Office's current projections, inflation, as measured by growth in either the consumer price index for all urban consumers or the gross domestic product (GDP) price index, is considerably higher from 2022 to 2025 than was projected last year. The agency did not significantly revise its projections of inflation for 2026 to 2051. Nevertheless, the effects of that higher projected inflation in the near term on the level of nominal GDP, revenues, and spending persist after 2025, when projected inflation falls to the rates in last year's projections. Those higher estimates of inflation also increased nominal interest rates paid on federal debt and net interest payments. (See Appendix B for an additional discussion of changes in CBO's economic forecast since last year.)

In CBO's assessment, higher projections of inflation in this year's economic forecast contributed to the decrease in current projections of federal debt held by the public, measured as a percentage of GDP, compared with last year's projections of such debt. It is, however, difficult to quantify the effects of those higher projections of inflation because inflation affects spending and revenues as well as the level of nominal GDP.

Higher estimates of inflation increased CBO's current projections of nominal GDP—which also reflect the faster growth of real GDP (that is, GDP adjusted to remove the effects of inflation)—compared with such projections last year. Nominal GDP is now 7.9 percent higher in 2022 and 9.3 percent higher in 2051 than was projected last year. For 2051, GDP prices (the prices of all goods and services included in GDP) are 7.2 percent higher, and real GDP is 1.8 percent higher, than the agency projected last year. The higher levels of nominal

GDP mean that any amount of spending, revenues, deficits, or debt represents a smaller percentage of GDP than it otherwise would; thus, all else being equal, higher nominal GDP holds down the amount of debt in relation to the nation's output.

CBO did not analyze the effects of higher estimates of inflation on projections of revenues and spending for this report.<sup>1</sup> However, all else being equal, higher estimates of inflation led to higher estimates of taxable income, thereby increasing projections of tax revenues. Higher estimates of inflation also increased projections of noninterest spending, largely because the estimates raised cost-of-living adjustments for certain benefit programs (for example, Social Security) and increased prices for purchases of goods and services. Those changes counteract each other, but the net result is uncertain.

Higher estimates of inflation in the near term increased nominal interest rates in CBO's current projections, which elevated net interest costs in dollars. All else being equal, those higher net interest costs would result in larger budget deficits, pushing the debt that the Treasury issues to the public higher than was estimated in CBO's previous budget projections. Because higher inflation also increases nominal GDP, the effect of inflation on interest payments in relation to the size of the economy is unclear.

1. In March 2022, CBO provided an illustrative estimate of the effects of higher inflation and interest rates on its budget projections. In that example, revenue increases were roughly as large as increases in noninterest spending, so the resulting primary deficit did not differ much from the agency's projections. See Congressional Budget Office, *Budgetary Effects of Higher Inflation and Interest Rates* (March 2022), [www.cbo.gov/publication/57868](https://www.cbo.gov/publication/57868).

Projected discretionary spending, measured as a percentage of GDP, is now higher than estimated last year, mainly because newly enacted legislation increased the agency's projections of such spending over the first 10 years of the projection period; those projections establish the level of discretionary spending in the second and third decades of the projection period.<sup>5</sup>

5. Discretionary spending encompasses an array of federal activities that are funded through or controlled by appropriation acts. 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.

In current projections, spending on Social Security as a percentage of GDP is slightly lower in all years than was projected last year. That lower spending is the result of offsetting factors: Although projections of nominal outlays are slightly higher than before (largely driven by the projected size of annual cost-of-living adjustments (COLAs) and increased projections of average wages), they are more than offset by higher projections of GDP. Projections of other mandatory spending are now slightly higher over the short term. Neither the projections of spending on Social Security nor the projections of other

Table C-1.

## CBO's 2021 and 2022 Projections of Revenues, Outlays, Deficits, and Federal Debt Held by the Public in Selected Years

Percentage of Gross Domestic Product

	2022	2033	2043	2051
<b>Revenues</b>				
Individual income taxes				
2021 projections	8.8	9.4	9.9	10.3
2022 projections	10.6	9.8	10.3	10.7
Payroll taxes				
2021 projections	5.9	5.8	5.7	5.7
2022 projections	5.9	5.9	5.8	5.7
Corporate income taxes				
2021 projections	1.1	1.2	1.2	1.2
2022 projections	1.6	1.4	1.3	1.3
Other <sup>a</sup>				
2021 projections	1.5	1.1	1.2	1.3
2022 projections	1.4	1.2	1.3	1.3
<b>Total Revenues</b>				
<b>2021 projections</b>	<b>17.3</b>	<b>17.6</b>	<b>18.0</b>	<b>18.5</b>
<b>2022 projections</b>	<b>19.6</b>	<b>18.2</b>	<b>18.7</b>	<b>19.1</b>
<b>Outlays</b>				
Mandatory				
Social Security				
2021 projections	5.2	6.1	6.3	6.3
2022 projections	4.9	6.0	6.2	6.3
Major health care programs <sup>b</sup>				
2021 projections	5.7	7.3	8.6	9.4
2022 projections	5.8	7.0	8.2	8.7
Other <sup>c</sup>				
2021 projections	2.5	2.1	2.0	1.9
2022 projections	4.3	2.1	2.0	1.9
Subtotal, Mandatory				
2021 projections	13.4	15.6	16.9	17.6
2022 projections	14.9	15.1	16.5	17.0
Discretionary				
2021 projections	7.0	5.6	5.5	5.5
2022 projections	7.0	6.1	6.0	6.0
Net interest				
2021 projections	1.2	3.1	5.8	8.6
2022 projections	1.6	3.4	5.0	7.0
<b>Total Outlays</b>				
<b>2021 projections</b>	<b>21.6</b>	<b>24.2</b>	<b>28.2</b>	<b>31.8</b>
<b>2022 projections</b>	<b>23.5</b>	<b>24.6</b>	<b>27.4</b>	<b>29.9</b>

Continued

mandatory spending changed significantly over the long term since last year (see Table C-1).<sup>6</sup>

6. Other mandatory 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, and all other mandatory programs aside from Social Security and the health care programs described above.

Net outlays for interest total 1.6 percent of GDP in 2022—0.4 percentage points higher than in last year's projections because of higher interest rates. Such outlays remain higher through 2034 than was estimated last year, but for most of the second decade and for all of the third decade of the projection period, they are lower than previously estimated (see Figure C-2). That is because primary deficits are now projected to be smaller



Table C-1.

Continued

## CBO's 2021 and 2022 Projections of Revenues, Outlays, Deficits, and Federal Debt Held by the Public in Selected Years

Percentage of Gross Domestic Product	2022	2033	2043	2051
<b>Deficit</b>				
2021 projections	-4.3	-6.6	-10.1	-13.3
2022 projections	-3.9	-6.3	-8.8	-10.8
<b>Federal Debt Held by the Public</b>				
2021 projections	102	113	155	202
2022 projections	98	112	144	180
<b>Memorandum:</b>				
Noninterest Spending				
2021 projections	20.4	21.1	22.4	23.2
2022 projections	21.9	21.2	22.4	22.9
Primary Deficit <sup>d</sup>				
2021 projections	-3.1	-3.6	-4.4	-4.6
2022 projections	-2.3	-3.0	-3.8	-3.8

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

- 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 on 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 the refundable portions of the earned income tax credit, the child tax credit, and the American Opportunity Tax Credit.
- Excludes net outlays for interest.

throughout the period, and the average interest rate on federal debt is now projected to be lower after 2034. (For a discussion of changes in the method underlying the agency's projections of the average interest rate on federal debt, see Appendix D.)

### Changes in Projected Revenues

Compared with revenues in last year's projections, current projections of federal revenues as a percentage of GDP are higher throughout the 2022–2051 period—by 2.3 percentage points in 2022 and 0.6 percentage points in 2051 (see Figure C-3).<sup>7</sup> The major sources of revenues—that is, individual income taxes, payroll taxes, and corporate income taxes—are generally higher as a percentage of GDP throughout the projection period than was estimated last year.

The largest increases are in the projections of receipts of individual and corporate income taxes, whereas payroll tax receipts increased only slightly. In the near term, the increase in projected individual income tax receipts is a result of their recent unexplained strength; in the

longer term, the increase is attributable to an upward revision to the agency's estimate of corporate business income taxed at the individual level. Projected receipts of individual income taxes and payroll taxes were also higher measured in nominal dollars, because of increases in estimates of factors that affect the size of the economy, including wages and salaries, proprietors' income, and corporate profits. Those changes had less of an impact on receipts as a percentage of GDP because they affected both revenues and GDP. CBO also increased its estimate of revenues from corporate income taxes as a percentage of GDP in the near term because recent receipts from such taxes have been stronger than expected. The agency has updated its modeling of corporate taxes and now estimates that a greater share of corporate profits will be taxable over the longer term.

### Changes in Projected Deficits and Debt

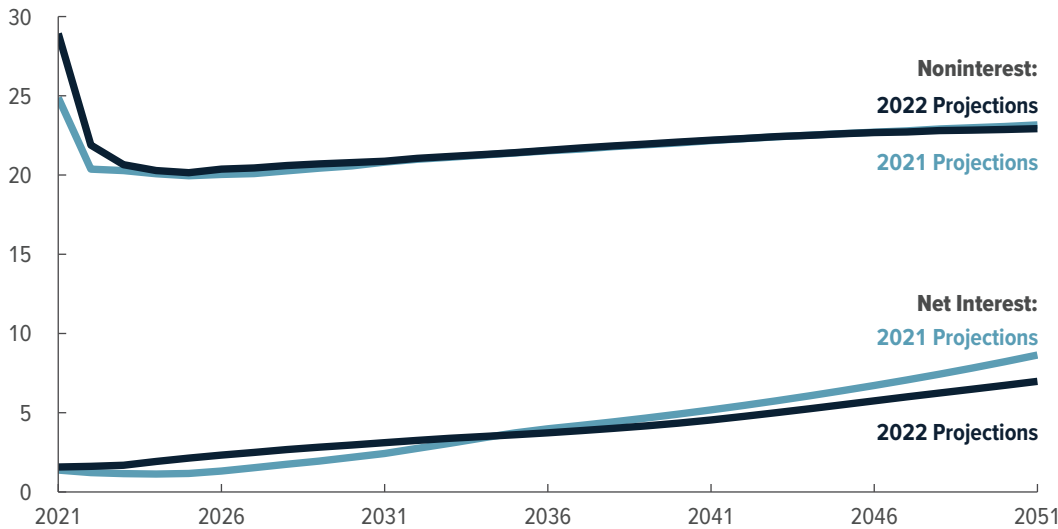
As a result of the changes to CBO's projections of spending, revenues, and GDP, projections of primary deficits as a percentage of GDP are now smaller throughout the projection period than they were last year. The current estimate of the primary deficit for 2022 is 2.3 percent of

7. Revenues, measured as a percentage of GDP, were 2.1 percentage points higher in 2021 than CBO projected they would be last year.

Figure C-2.

## CBO's 2021 and 2022 Extended Baseline Projections of Outlays

Percentage of GDP



In CBO's current projections, noninterest spending as a percentage of GDP is higher for 2022 than it was in last year's projections. Projections of such spending are generally the same after that year.

Net outlays for interest, measured as a percentage of GDP, are higher through 2034 than in last year's projections and lower thereafter.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

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 an additional 20 years.

GDP = gross domestic product.

GDP, which is 0.8 percentage points smaller than it was last year.<sup>8</sup> Projected primary deficits now average 2.4 percent of GDP from 2023 to 2031 and 3.5 percent from 2032 to 2051—0.3 percentage points and 0.6 percentage points smaller, respectively, than their averages over those periods in last year's projections.

However, as a result of upward revisions to net interest costs in the first decade of the projection period, projected total deficits as a percentage of GDP are now generally larger through 2031. Although the current estimate of the total deficit for 2022—3.9 percent of GDP—is 0.4 percentage points smaller than was projected last year, total deficits now average 4.9 percent of GDP from 2023 to 2031—0.5 percentage points larger than their average over that period in last year's projections.

As a percentage of GDP, total deficits are smaller in the long term than was projected last year. They average 8.4 percent of GDP over the 2032–2051 period—1.3 percentage points less than in last year's projections. The total deficit in 2051 is now estimated to be 10.8 percent of GDP—2.5 percentage points less than last year's estimate. Higher revenues, less spending on the major

health care programs, and lower net outlays for interest in relation to the size of the economy pushed deficits lower as a percentage of GDP. Those changes were partially offset by higher projections of discretionary spending.

The factors that caused smaller projected deficits than CBO estimated last year also caused lower projections of federal debt held by the public. Measured as a percentage of GDP, such debt is projected to be lower in most years than the agency estimated last year. In current projections, that debt rises from 98 percent of GDP in 2022 to 180 percent in 2051; last year, CBO projected it would rise from 102 percent of GDP in 2022 to 202 percent in 2051.

### Changes in Projected Amounts in the Social Security Trust Funds

CBO projects that if current laws governing the Social Security program's taxes and benefits did not change, the OASI trust fund would be exhausted in calendar year 2033, and the DI trust fund would be exhausted in calendar year 2048.<sup>9</sup> Those dates are later than the

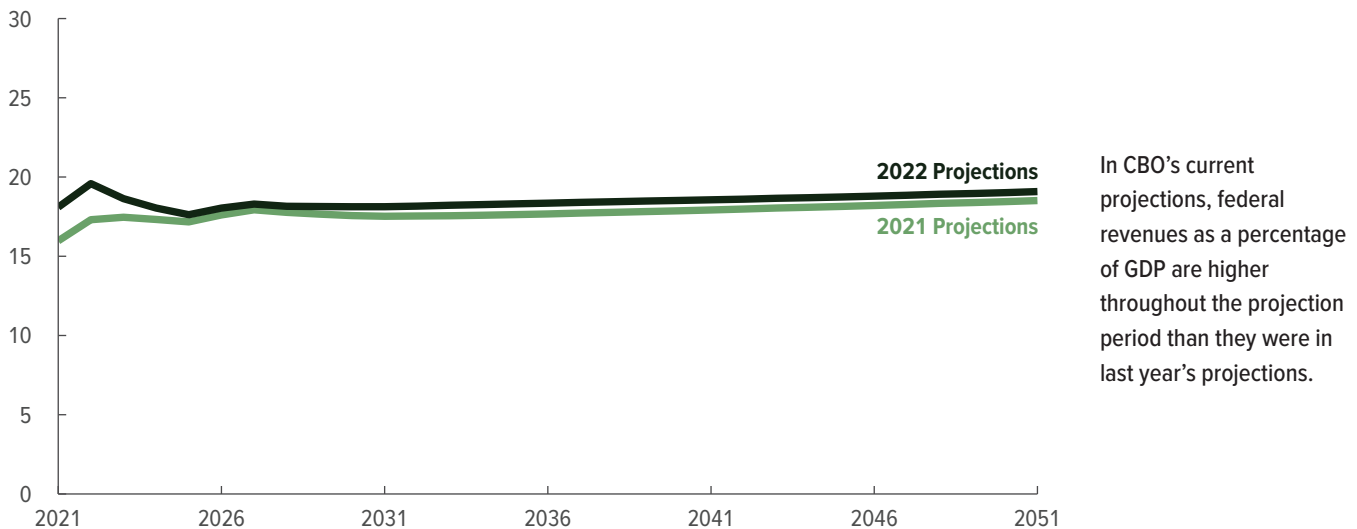
8. The primary deficit, measured as a share of GDP, was 1.9 percentage points larger in 2021 than CBO projected last year.

9. CBO expects to publish information later this year about its projections of outlays and income for Social Security over the next 75 years. For last year's long-term projections for Social Security, see Congressional Budget Office, *CBO's 2021 Long-Term Projections for Social Security: Additional Information* (July 2021), [www.cbo.gov/publication/57342](http://www.cbo.gov/publication/57342).

Figure C-3.

### CBO's 2021 and 2022 Extended Baseline Projections of Revenues

Percentage of GDP



Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

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 an additional 20 years.

GDP = gross domestic product.

agency projected last March, by 1 year and by 13 years, respectively. If the balances of the OASI and DI trust funds were combined, the funds would be exhausted in calendar year 2033, which is 1 year later than CBO projected last year.

Since last year, CBO has increased its estimates of income credited to the OASI trust fund from 2022 until the fund is exhausted in 2033 by 8.6 percent. The increase is mainly attributable to higher revenues from payroll taxes associated with the higher nominal GDP reflected in current projections. However, the agency has also increased its estimated expenditures from the fund, which are now 5.8 percent higher over that period than they were last year. Those increases stem primarily from higher estimates of COLAs through 2024 and higher projections of average wages, which offset the effect of fewer OASI beneficiaries through 2033 and slightly lower estimates of COLAs, on average, from 2025 through 2031. The projected increases in income more than offset the projected increases in expenditures from the fund, leading to the later estimate of when it would be exhausted.

In this year's projections, income credited to the DI trust fund from 2022 until it is exhausted in 2048 is higher by

12.7 percent than was estimated last year, mainly because of higher projected revenues from payroll taxes. The projected expenditures from the DI trust fund are lower from 2022 through 2035—in total, by 3.3 percent—than the agency estimated last year. CBO revised those projections of expenditures downward mainly because far fewer new beneficiaries have begun receiving benefits in recent months than was previously estimated, which led the agency to reduce its projection of the number of DI beneficiaries. Those downward revisions to the number of beneficiaries are partially offset by higher estimates of COLAs through 2024 and higher projections of average wages. The projections of increased income and (through 2035) decreased expenditures led to the later estimate of when the DI trust fund would be exhausted.

All told, CBO's projections of income credited to the combined OASDI trust funds are 8.8 percent higher over the 2022–2033 period than they were last year, and projections of expenditures are 4.6 percent higher. Because the increases in estimated income exceed the increases in estimated expenditures, CBO now anticipates that the combined trust funds would be exhausted 1 year later than the agency projected last year.



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# Appendix D: Changes to Methods Underlying Selected Long-Term Budget Projections

## Overview

The Congressional Budget Office has changed the way it develops its long-term budget projections since publishing them last year; two of the changes have significant budgetary effects.<sup>1</sup> CBO refined its method of projecting the average nominal interest rate on federal debt held by the public in the second and third decades of the 30-year projection period. The agency also refined its estimate of a key parameter in the final year of the projection period (2052, in this year's projections)—specifically, the estimate of the growth in federal spending on health care above and beyond that attributable to demographic changes and to growth in potential gross domestic product (GDP) per person.<sup>2</sup> Refining that estimate, in turn, affects projections of federal spending on health care throughout the second and third decades of the projection period.

## Projections of the Average Interest Rate on Federal Debt

In the past, to project the average nominal interest rate on federal debt beyond the standard 10-year budget period, CBO first calculated the difference between that rate and the nominal interest rate on 10-year Treasury notes as projected within that period. That difference was then held constant in the second and third decades of the projection period. (In last year's projections, the difference was calculated using rates from the 10th year of the projections underlying the agency's January 2020 forecast—the most recent forecast that excludes the effects of the coronavirus pandemic.) CBO developed that method when its only projections of nominal interest rates beyond the 10-year budget period were of

rates for 10-year Treasury notes; now, the agency also projects nominal interest rates for Treasury securities of other maturities in the second and third decades of the projection period.

The method CBO now uses to project the average nominal interest rate on federal debt held by the public beyond the 10-year budget period is similar to the method it uses for projections within that period, but with some notable differences.<sup>3</sup> Projected interest payments *within* the 10-year budget period are generally based on the agency's projections of primary deficits (which exclude net outlays for interest), the stock of outstanding Treasury securities at the beginning of the projection period, the issuance of Treasury securities of different maturities, and interest rates on those securities of different maturities. Those projections reflect monthly calculations of interest rates. In the new method, projections of the average interest rate on federal debt *beyond* the 10-year budget period are based on those factors as well, but they reflect calculations that use quarterly data, and they do not include details about Treasury securities that mature in less than three months.

Using similar methods to project the average interest rate on federal debt for all three decades of the projection period makes the agency's projections of that rate more consistent throughout the period. Furthermore, when using the new method, debt issued in the past, which is subject to certain interest rates, is replaced with debt subject to the interest rates that CBO projects would occur in the future—a factor that the old method did not account for, because it used information from the 10th year of the projection period as the basis for the average interest rate on federal debt over the longer term.

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1. For last year's projections, see Congressional Budget Office, *The 2021 Long-Term Budget Outlook* (March 2021), [www.cbo.gov/publication/56977](http://www.cbo.gov/publication/56977).

2. Potential GDP is the maximum sustainable output of the economy.

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3. For a discussion of CBO's method of projecting interest rates in the first 10 years of the projection period, see Congressional Budget Office, *Federal Net Interest Costs: A Primer* (December 2020), [www.cbo.gov/publication/56780](http://www.cbo.gov/publication/56780).

Compared with the old method (all else being equal), the new one has resulted in lower projections of the average interest rate on federal debt, lower net outlays for interest as a share of GDP, and lower debt as a share of GDP in the second and third decades of the projection period. Accordingly, in CBO's current projections, the average interest rate on federal debt reaches 4.2 percent in 2052 instead of 4.6 percent using the old method. Net outlays for interest are 7.2 percent of GDP that year instead of 7.9 percent (see Figure D-1). And the current projection of federal debt held by the public in 2052 is 185 percent of GDP instead of 194 percent.

## Projections of Federal Spending on Health Care

CBO's new method of projecting federal spending on health care beyond the 10-year budget period is similar to the method used last year but with two important differences. First, the agency refined its estimate of additional cost growth at the end of the 30-year projection period. (Additional cost growth is the amount by 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.)<sup>4</sup> That new estimate consequently leads to changes in projections of spending on Medicare in the last two decades of the projection period. Second, the estimates of additional cost growth in Medicare Parts A and B now reflect CBO's expectation that certain provisions of current law will cause federal spending on various aspects of health care to grow more slowly than spending on health care overall.<sup>5</sup>

### Estimate of Additional Cost Growth in Health Care Overall

In the past, CBO developed its long-term estimate of additional cost growth in the health care sector, and in Medicare more narrowly, by choosing a parameter for the end of the projection period on the basis of historical patterns. To refine that estimate in this year's projections,

the agency separately assessed the effects of three factors on the growth of spending on health care in 2052.<sup>6</sup>

- *Growth in real national income per person* has been—and, in CBO's estimation, will continue to be—the most significant factor in the growth of spending on health care. The agency projects that in 2052, that factor would account for just over half of the rate of additional cost growth in the health care sector.
- *Increasing medical prices* have been—and, in CBO's estimation, will continue to be—another significant factor in the growth of spending on health care. The agency projects that in 2052, such increases would account for slightly less than half of the rate of additional cost growth in the health care sector.
- *Changes in out-of-pocket spending for health care* have historically been an important factor in the growth of spending on health care. However, CBO projects that, under current law, the out-of-pocket share of national health expenditures would not change over the 30-year projection period. That is, the agency does not expect changes in out-of-pocket spending to affect additional cost growth in the health care sector in 2052.

CBO reduced its estimate of additional cost growth in federal spending on health care because of its assessment of historical trends. Although the growth rate of such spending has varied over time, it has generally been declining, the agency estimates. For instance, additional cost growth in Medicare averaged 1.1 percent from 1985 to 2017 but averaged about -0.1 percent from 2005 to 2017.

CBO's estimate of additional cost growth in health care overall in 2052 is 0.6 percent. As they have in previous extended baseline projections, the rates of additional cost growth in this year's projections move linearly from their rates at the end of the 10-year budget period—as determined by the method of projecting such rates in

4. In CBO's past reports, the term "excess cost growth" was used instead of "additional cost growth" to describe the increase in such spending.

5. Medicare is the most significant contributor to growth in federal spending on health care over the 2032–2052 period. This appendix therefore focuses on a discussion of the agency's projections of spending on Medicare in the extended baseline. For a discussion of the agency's projections of spending on Medicare for the 2022–2032 period, see Congressional Budget Office, *The Budget and Economic Outlook: 2022 to 2032* (May 2022), [www.cbo.gov/publication/57950](https://www.cbo.gov/publication/57950).

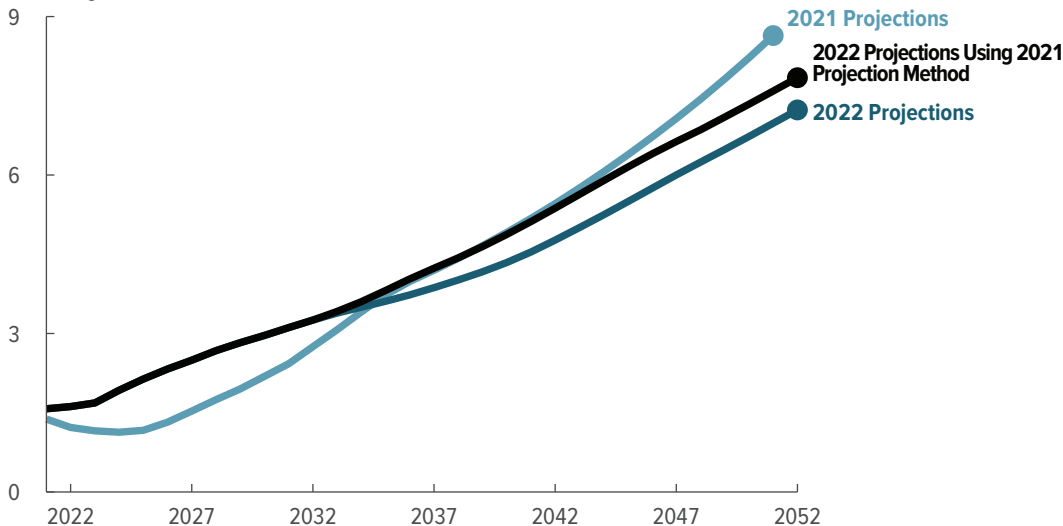
6. To refine its estimate of additional cost growth in the health care sector, CBO essentially used the same method that the Centers for Medicare & Medicaid Services' Office of the Actuary uses to produce the 75-year projections of Medicare spending for its annual report to the Congress. Within that framework, CBO uses its own estimates of key parameters: an income-technology elasticity of 1.27, an insurance elasticity of -0.20, and a price elasticity of -0.55. For a discussion of the methods underlying projections by the Office of the Actuary, see Centers for Medicare & Medicaid Services, "The Long-Term Projection Assumptions for Medicare and Aggregate National Health Expenditures" (accessed May 16, 2022), <https://tinyurl.com/msfx6te> (PDF, 1.3 MB).



Figure D-1.

## Net Outlays for Interest Using Old and New Projection Methods, 2021 to 2052

Percentage of Gross Domestic Product



CBO's current projection of net outlays for interest in 2052 is 0.6 percentage points lower than it would have been had the agency not refined its method of estimating the average nominal interest rate on federal debt held by the public.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](https://www.cbo.gov/publication/57971#data).

that period—to estimated rates at the end of the 30-year projection period.

### Estimate of Additional Cost Growth in Medicare Part D

In CBO's current projections for 2052, additional cost growth in Medicare Part D is 0.6 percent; in last year's projections, it was 1.0 percent at the end of the 30-year projection period.<sup>7</sup> (CBO estimates that additional cost growth in spending on Medicaid and private health insurance premiums would also be 0.6 percent in 2052, down from 1.0 percent in last year's projections.) In the agency's view, additional cost growth in Medicare Part D at the end of the 30-year projection period would be the same as such growth in the health care sector overall. That is because the health care system in the United States will be integrated to such a degree over the long term that spending growth in most parts of the system will be affected by common factors, such as changes in physicians' practices and the development and diffusion of new medical technologies.

7. Part D is Medicare's optional prescription drug benefit, which is delivered through private-sector companies. Part A primarily covers services provided by hospitals and other facilities, and Part B covers physicians' and other outpatient services. Part C of Medicare (known as Medicare Advantage) specifies the rules under which private health care plans can assume responsibility for, and be paid for, providing benefits covered under Parts A and B.

### Estimates of Additional Cost Growth in Medicare Parts A and B

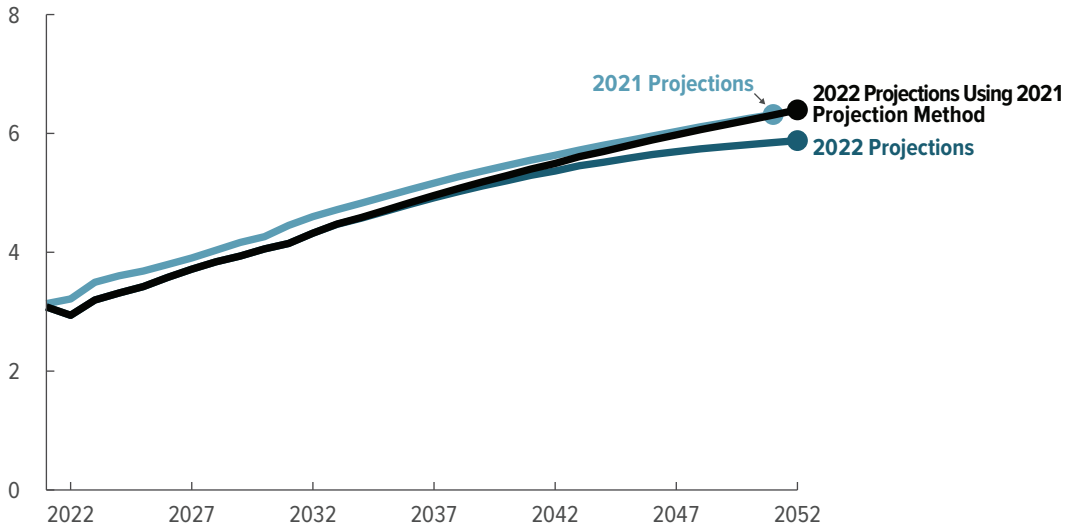
In CBO's current projections for 2052, additional cost growth is 0.1 percent in Medicare Part A and 0.2 percent in Medicare Part B. In last year's projections, both of those rates were 1.0 percent at the end of the 30-year projection period. The agency expects additional cost growth in Medicare Parts A and B to be lower than such growth in Medicare Part D (and in the health care sector overall) because of the way prices in Parts A and B are determined. Under current law, in Parts A and B, the prices of labor, goods, and services are adjusted to account for gains in private nonfarm business productivity (the ability to produce the same output using fewer inputs, such as hours of labor).<sup>8</sup> Because of expected gains in productivity, the increase in prices paid to providers would be less than they otherwise would be. In the agency's assessment, that would slow the growth in the use of Medicare Parts A and B by a small amount. That expectation largely stems from the agency's view that lower prices would cause some providers to decline to treat patients insured under Parts A or B and might also reduce providers' incentives to adopt innovative services and technologies.

8. See Centers for Medicare & Medicaid Services, *Methodology for Projecting Total Factor Productivity for the Private Nonfarm Business Sector* (March 2022), <https://tinyurl.com/36c4d654> (PDF, 144 KB).

Figure D-2.

## Spending on Medicare Using Old and New Projection Methods, 2021 to 2052

Percentage of Gross Domestic Product



CBO's current projection of federal spending on Medicare in 2052 is about one-half of one percentage point lower than it would have been had the agency not refined its method of estimating additional cost growth in that program.

Data source: Congressional Budget Office. See [www.cbo.gov/publication/57971#data](http://www.cbo.gov/publication/57971#data).

Additional cost growth is the amount by 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 gross domestic product (GDP) per person. Potential GDP is the maximum sustainable output of the economy.

### Changes in Projections Attributable to the New Method of Estimating Additional Cost Growth

The new method of estimating additional cost growth in Medicare results in lower projections of federal spending on that program from 2037 to 2052 (see Figure D-2). In CBO's current projections, spending on Medicare (net of offsetting receipts, which are mostly premiums paid by enrollees) reaches 5.9 percent of GDP in 2052—lower than the 6.4 percent that would have resulted from using estimates of additional cost growth derived from the agency's previous method. The current projection of

federal spending on health care overall in 2052 (comprising spending on Medicare, net of premiums and other offsetting receipts, and on Medicaid, the Children's Health Insurance Program, and marketplace subsidies) is also lower than it would have been using the previous estimate of additional cost growth: 8.8 percent of GDP instead of 9.4 percent. And the current projection of federal debt held by the public in 2052 is 185 percent of GDP instead of 190 percent that would result from using the previous method.

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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. It builds on the 10-year budget and economic projections that CBO released on May 25, 2022. 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, John Kitchen (formerly of CBO), John McClelland, Julie Topoleski, and Jeffrey Werling, the report represents the work of many analysts at CBO. Jordan Trinh prepared the visual summary. Molly Dahl wrote Chapter 1 in collaboration with John Kitchen and with contributions from Daniel Crown, Sebastien Gay, Joseph Kile, Kerk Phillips, and John Seliski. Molly Dahl wrote Chapter 2 in collaboration with Kathleen Burke and with contributions from Xinzhe Cheng and Jordan Trinh. Aaron Betz wrote Chapter 3 with contributions from Edward Gamber, Chandler Lester, Jeffrey Schafer, and Robert Shackleton (formerly of CBO). Daniel Crown wrote Chapter 4 in collaboration with Kerk Phillips and with a contribution from Damir Cosic. Molly Dahl compiled Appendix A. Aaron Betz authored Appendix B with contributions from Damir Cosic, Daniel Crown, Edward Gamber, Chandler Lester, Jeffrey Schafer, and Robert Shackleton. Molly Dahl and Charles Pineles-Mark prepared Appendix C. Molly Dahl prepared Appendix D with contributions from Yiqun Gloria Chen (formerly of CBO), Michael Cohen, Grace Hwang, Kyoung Mook Lim, Michael McGrane, and Jordan Trinh.

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Daniel Crown developed the population projections.

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Mark Doms, Jeffrey Kling, and Robert Sunshine reviewed the report. Christine Bogusz, Scott Craver, and Bo Peery edited it, and Casey Labrack and R. L. Rebach prepared the text for publication and created the graphics. Nicholas Abushacra, Grace Berry, Daniel Crown, Kyoung Mook Lim, Jordan Trinh, and Lucy Yuan prepared the supplemental information files. The report is available at [www.cbo.gov/publication/57971](http://www.cbo.gov/publication/57971).

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

A handwritten signature in black ink, appearing to read "Phillip L. Swagel". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

Phillip L. Swagel  
Director  
July 2022