Congressional Budget Office

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# The 2016 Long-Term Budget Outlook

*Provided as a convenience, this "screen-friendly" version is identical in content to the principal ("printer-friendly") version of the report. Any tables, figures, and boxes appear at the end of this document; click the hyperlinked references in the text to view them.*

## Notes

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

Unless otherwise indicated, the years referred to in most of this report are federal fiscal years, which run from October 1 to September 30 and are designated by the calendar year in which they end. In Chapters 6 and 7, budgetary values, such as the ratio of debt or deficits to gross domestic product, are presented on a fiscal year basis, whereas economic variables, such as gross national product or interest rates, are presented on a calendar year basis.

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

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

Additional data—including the data underlying the figures in this report, supplemental budget projections, and the demographic and economic variables underlying those projections—are posted along with the report on CBO's website.

# Summary

If current laws governing taxes and spending did not change, the United States would face steadily increasing federal budget deficits and debt over the next 30 years, according to projections by the Congressional Budget Office. Federal debt held by the public, which was equal to 39 percent of gross domestic product (GDP) at the end of fiscal year 2008, has already risen to 75 percent of GDP in the wake of a financial crisis and a recession. In CBO's projections, that debt rises to 86 percent of GDP in 2026 and to 141 percent in 2046—exceeding the historical peak of 106 percent that occurred just after World War II. The prospect of such large debt poses substantial risks for the nation and presents policymakers with significant challenges.

## Why Are Projected Deficits Rising?

In CBO's projections, deficits rise during the next three decades because the government's spending grows more quickly than its revenues do (see Summary Figure 1). In particular, spending grows for Social Security, the major health care programs (primarily Medicare), and interest on the government's debt.

Much of the spending growth for Social Security and the major health care programs results from the aging of the population: As members of the baby-boom generation age and as life expectancy continues to increase, the percentage of the population age 65 or older is anticipated to grow sharply, boosting the number of beneficiaries of those programs. By 2046, projected spending for those programs for people 65 or older accounts for about half of all federal noninterest spending.

The remainder of the projected growth in spending for Social Security and the major health care programs is driven by health care costs per beneficiary, which are projected to increase more quickly than GDP per person (after the effects of aging and other demographic changes are removed). CBO projects that those health care costs will rise—though more slowly than in the past—in part because of the effects of new medical technologies and rising personal income.

The federal government's net interest costs are projected to rise sharply as a percentage of GDP for two main reasons. The first and most important is that interest rates are expected to be higher in the future than they are now, making any given level of debt more costly to finance. The second reason is the projected increase in deficits: The larger they are, the more the government will need to borrow.

Mandatory spending other than spending on Social Security and the major health care programs—such as spending for federal employees' pensions and for various income security programs—is projected to decline as a percentage of GDP, as is discretionary spending. (Mandatory spending is generally governed by provisions of permanent law, whereas discretionary spending is controlled by annual appropriation acts.) The projected decline in the latter stems largely from the caps on discretionary funding that are set in law for the next several years.

The modest projected growth in revenues relative to GDP over the next three decades is attributable to increases in individual income tax receipts. Those receipts are projected to grow mainly because CBO anticipates that income will rise more quickly than the price indexes that are used to adjust tax brackets; as a result, more income will be pushed into higher tax brackets over time. Combined receipts from all other sources are projected to decline as a percentage of GDP.

## How Does CBO Make Its Long-Term Budget Projections?

CBO's long-term projections start with the agency's 10-year projections of spending and revenues, which combine information about many spending programs and tax provisions with data about broader trends in the population and the economy. The 10-year projections follow the assumptions that current laws governing taxes and spending will generally remain the same in the future, but that some mandatory programs will be extended after their authorizations lapse and that spending for Medicare and Social Security will continue as scheduled even if their trust funds are exhausted. CBO makes those assumptions to conform to statutory requirements. Because current laws surely *will* change, CBO's projections are not predictions of what the agency thinks will actually happen. Rather, they give lawmakers a baseline to measure the effects of proposed legislation against. They are therefore called baseline projections.

CBO's detailed long-term projections, produced once each year, follow those assumptions as well. Because they extend the baseline into the following two decades, they are called the extended baseline. Some parts of the extended baseline, such as projections of Social Security spending and individual income taxes, incorporate detailed estimates of how people would be affected by particular elements of programs or the tax code. Other projections reflect past trends and CBO's assessment of how those trends would evolve if current laws generally remained unchanged. Between the annual publications of the detailed analyses, CBO sometimes updates its long-term projections using simplified methods, as it did most recently in January 2016.

CBO's budget projections are built upon its projections of the economy (which incorporate, among many other things, the estimated effects of fiscal policy under current laws). CBO anticipates that if current laws generally did not change, real GDP—that is, GDP with the effects of inflation excluded—would increase by 2.1 percent per year, on average, over the next 30 years. Over the past 50 years, by contrast, the annual increase in real GDP has averaged 2.9 percent. Projected GDP growth is slower than that largely because of retiring baby boomers, falling birthrates, and declining participation in the labor force. Projected growth is also held down by the effects of fiscal policy under current law—above all, by the reduction in private investment that is projected to result from rising federal debt.

## How Have Those Projections Changed Over the Past Year?

The previous edition of this volume, *The 2015 Long-Term Budget Outlook,* was published in June 2015 and showed projections through 2040. CBO now projects debt in 2040 that, measured as a share of GDP, is 15 percentage points higher than it projected last year, mostly because of changes in tax law.

When CBO updated its long-term projections in January 2016, it did so through 2046. The agency's projection of debt in 2046 is now 14 percentage points lower than it was in January, primarily because CBO now expects interest rates to be lower than previously anticipated.

## How Uncertain Are Those Projections?

If current laws governing taxes and spending remained generally the same, CBO estimates, debt would nearly double as a percentage of GDP over the next 30 years. That projection is very uncertain, however, so the agency examined how it would change if four key inputs—labor force participation, productivity in the economy, interest rates on federal debt, and health care costs per person—were different from their levels in the extended baseline. The resulting projections show that debt in 2046, measured as a share of GDP, could be much larger or smaller than it is in the extended baseline, ranging from nearly twice the largest amount recorded in U.S. history to slightly less than that record high. Even at the low end of that range, debt would be higher than it is now.

Other factors, such as an economic depression, a major war, or unexpected changes in fertility, immigration, or mortality rates, could also affect the trajectory of debt. Taking all factors into account, CBO concludes that despite the considerable uncertainty of long-term projections, debt as a percentage of GDP would probably be greater—in all likelihood, much greater—than it is today if current laws remained generally unchanged.

## What Might the Consequences Be If Current Laws Remained Unchanged?

Large and growing federal debt over the coming decades would hurt the economy and constrain future budget policy. The amount of debt that is projected in the extended baseline would reduce national saving and income in the long term; increase the government's interest costs, putting more pressure on the rest of the budget; limit lawmakers' ability to respond to unforeseen events; and increase the likelihood of a fiscal crisis, an occurrence in which investors become unwilling to finance a government's borrowing needs unless they are compensated with very high interest rates.

## What Would the Effects of Illustrative Changes to Current Laws Be?

To show how changes in law would affect the long-term fiscal imbalance, CBO took two approaches. First, it estimated how large changes in spending or revenues would have to be if lawmakers wished to achieve a chosen goal for federal debt held by the public. Second, the agency approached the issue from the other direction, estimating how two illustrative deficit-reduction paths would affect debt in 2046.

If lawmakers wanted to reduce debt in 2046 so that it equaled its average percentage of GDP over the past 50 years (39 percent), one way to achieve that result would be to cut noninterest spending, increase revenues, or do both by a total of 2.9 percent of GDP per year, starting in 2017. That would come to about $560 billion in 2017, or $6.7 trillion from 2017 through 2026. If instead they wanted debt in 2046 to equal its current percentage of GDP (75 percent), the necessary measures would be smaller, totaling 1.7 percent of GDP per year (about $330 billion in 2017 and $4.0 trillion through 2026). The longer lawmakers waited to act, the larger the necessary policy changes would become.

For the two illustrative deficit-reduction paths, CBO assumed that decreases in the deficit would be phased in over time rather than made as equal percentage changes in each year. In one path, cumulative deficits through 2026 would be about $2 trillion lower than under the extended baseline; in another, they would be about $4 trillion lower; and in both paths, deficits in subsequent years would be lower than in the baseline by the same percentage of GDP as in 2026. The first path would result in federal debt equal to 96 percent of GDP in 2046, and the second would result in federal debt equal to 55 percent of GDP in 2046.

## How Is This Report Arranged?

Chapter 1 of this report offers a broad overview of CBO's extended baseline projections, as well as an examination of the consequences of large and growing federal debt. Though the chapter necessarily touches on CBO's projections of spending and revenues, those subjects are explored at greater length in the next four chapters. Specifically, Chapter 2 discusses spending for Social Security, the single largest program in the federal budget; Chapter 3 addresses spending for the major health care programs, which together represent a still larger fraction of federal spending; Chapter 4 deals with other federal noninterest spending; and Chapter 5 discusses revenues.

The report proceeds in Chapter 6 to examine the illustrative budgetary paths mentioned above. Chapter 7 discusses the uncertainty of CBO's projections. And at the close of the report are two appendixes: Appendix A about the economic and demographic projections underlying the extended baseline, and Appendix B about the changes in CBO's long-term projections since June 2015.

# Chapter 1: The Long-Term Fiscal Imbalance

Over the past several years, federal budget deficits have steadily declined as the nation recovers from the financial crisis and 2007–2009 recession. However, the Congressional Budget Office projects that the budget deficit will rise this year. And if current laws generally remain unchanged, budget deficits as a share of the nation's output—its gross domestic product (GDP)—will grow over the next decade. As a result, federal debt held by the public would rise from its already high level—from 75 percent of GDP today to 86 percent by 2026, CBO projects. Beyond the next 10 years, the long-term budget outlook is projected to worsen further, with debt reaching 141 percent of GDP in 2046—the highest ever recorded (see Table 1-1).

The government's spending for Social Security and Medicare is a crucial factor in that outlook. Those programs benefit mostly the elderly, a group that has grown significantly and will continue to do so. Rising health care costs per person also will boost Medicare outlays. Therefore, spending for those programs is projected to rise substantially in the coming decades. By 2046, projected spending for those programs (as well as Medicaid spending) for people 65 or older accounts for about half of all federal noninterest spending. The government's interest costs also are projected to increase significantly, as interest rates rise from their unusually low levels and federal debt grows. Revenues are projected to increase, but much more slowly than spending, leading to larger budget deficits and rising debt.

In this report, CBO presents its projections of federal outlays, revenues, deficits, and debt for the next three decades and describes possible consequences of those projected budgetary outcomes. The projections are consistent with CBO's current 10-year economic projections, released in January 2016, and the agency's March 2016 budget projections.[1] These long-term projections extend most of the concepts underlying that baseline for the rest of the projection period and reflect the macroeconomic effects of fiscal policy over that period; hence, they constitute the *extended baseline*. In a change from last year, the extended baseline spans 30 years rather than 25—consistent with Congressional interest in projections over that period as delineated in the 2016 budget resolution.

CBO's 10-year and extended baseline projections are not meant to be predictions of budgetary outcomes. Rather, they represent CBO's best assessment of future revenues, spending, and deficits on the assumption that current laws generally remain unchanged.

1. For information on the March baseline budget projections, see Congressional Budget Office, *Updated Budget Projections: 2016 to 2026* (March 2016), www.cbo.gov/publication/51384. For information on the January 2016 economic projections, see Congressional Budget Office, *The Budget and Economic Outlook: 2016 to 2026* (January 2016), www.cbo.gov/publication/51129.

## The Budget Outlook for the Next 10 Years

Federal debt held by the public ballooned in the past decade. Debt at the end of 2007 stood at 35 percent of GDP. But large deficits stemming from the 2007–2009 recession and the ensuing policy responses caused that debt to grow sharply over the next five years; by the end of 2015, federal debt had more than doubled, measuring 74 percent of GDP. That amount of debt is very high by historical standards. For comparison, debt held by the public has averaged 39 percent of GDP over the past 50 years. And debt has exceeded 70 percent of GDP during only one other period in U.S. history—from 1944 through 1950, because of the surge in federal spending during World War II (see Figure 1-1).

Although the budget deficit has declined each year since its peak of nearly 10 percent of GDP in 2009, it is on track to rise in relation to the size of the economy this year. CBO estimates that the deficit in 2016 will be nearly 3 percent of GDP. By the end of the year, federal debt held by the public is anticipated to creep up to 75 percent of GDP. Under current law, deficits and debt would remain close to those levels through 2018.

Later in the 10-year baseline period, CBO projects, deficits would be notably larger, approaching 5 percent of GDP if current laws generally remain unchanged. Deficits would rise because spending—particularly mandatory spending and interest costs—would grow faster than revenues.[2] As the population ages, spending on Social Security and Medicare, the two largest mandatory programs, is projected to rise as a percentage of GDP. People age 65 or older will account for 19 percent of the population in 2026, more than twice the share 50 years ago—increasing the number of beneficiaries for those programs. Rising health care costs per person also will drive up Medicare spending as a percentage of GDP. At the same time, interest rates are expected to rise from their present unusually low levels, sharply increasing interest payments on the government's debt. All told, federal spending is projected to rise from about 21 percent of GDP in 2016 to about 23 percent in 2026.

Meanwhile, rising revenues would keep pace with the economy and remain close to 18 percent of GDP over the next 10 years, largely reflecting offsetting movements in individual and corporate income taxes, payroll taxes, and remittances from the Federal Reserve. With a growing gap between spending and revenues, federal debt would rise to 86 percent of GDP by 2026.

2. In general, lawmakers determine spending for mandatory programs by setting eligibility rules, benefit formulas, and other parameters instead of by appropriating specific amounts each year. In that way, mandatory spending differs from discretionary spending, which is controlled by annual appropriation acts.

## The Long-Term Budget Outlook

CBO's extended baseline projections show a substantial imbalance in the federal budget beyond the next 10 years, with revenues falling short of spending by steadily increasing amounts. As a result, federal debt as a share of GDP would reach unprecedented levels if current laws generally remain unchanged. Such high and rising debt would have serious consequences for the nation's budget and economy. Projections that far into the future are uncertain, but under a variety of plausible scenarios discussed later in this report, federal debt in 30 years would be significantly higher than it is today—twice as high under some scenarios.

### The Accumulation of Federal Debt

Debt held by the public represents the amount that the federal government has borrowed in financial markets by issuing Treasury securities to pay for its operations and activities.[3] Measuring debt as a percentage of GDP is useful for comparing amounts of debt in different years. That measure accounts for changes in price levels, population, output, and income—all of which affect the scope of potential budgetary adjustments. Examining whether debt as a percentage of GDP is increasing from its current high level is therefore a simple and meaningful way to assess the budget's sustainability.

Federal debt as a share of GDP is projected to rise over the long term in CBO's extended baseline. Beyond the next 10 years, CBO projects, the population will continue to age and health care costs per person will continue to rise. Consequently, under current law, more would be spent on the two largest federal programs that benefit the elderly: Social Security and Medicare. As interest rates and deficits rise, net interest costs also would increase substantially. As a result, the gap between total spending and revenues would continue to widen, leading to ever larger budget deficits and debt. In 2035, debt would surpass the peak of 106 percent of GDP recorded in 1946. By 2046, federal debt would reach 141 percent of GDP (see Figure 1-2)—more than three and a half times the average over the past five decades. Moreover, the debt would be on track to grow even larger.

Those projections are based on many factors that are hard to predict, which means that actual budgetary outcomes would undoubtedly differ from the projections even if

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

current law did not change. When CBO varies four of those factors together—labor force participation, productivity in the economy, interest rates on federal debt, and health care costs per person—federal debt in 2046 is projected to range from 93 percent of GDP to 196 percent. (Chapter 7 discusses those projections.)

### Consequences of a Large and Growing Federal Debt

Large and growing amounts of federal debt over the coming decades would have negative long-term consequences for the economy and would constrain future budget policy. In particular, the projected amounts of debt would:

- Reduce national saving and income in the long term;
- Increase the government's interest costs, putting more pressure on the rest of the budget;
- Limit lawmakers' ability to respond to unforeseen events; and
- Make a fiscal crisis more likely.

Less National Saving and Lower Income. Large federal budget deficits over the long term would reduce investment, resulting in lower national income and higher interest rates than would otherwise occur. If the government borrowed more, people would use more of their savings to buy Treasury securities rather than for private investment, thereby crowding out investment. Both the government and private borrowers would face higher interest rates to compete for savings, and those rates would strengthen people's incentive to save. However, the increased government borrowing would exceed the rise in saving by households and businesses. Therefore, national saving—total saving by all sectors of the economy—would decline, as would private investment and economic output. (Private investment would decline less than national saving because higher interest rates tend to attract more foreign capital to the United States and induce U.S. savers to keep more of their money at home.) With lower investment in capital goods—factories and computers, for example—workers would be less productive. Because productivity growth is the main driver of compensation growth, decreased investment also would reduce compensation per hour, offering people less incentive to work. CBO's extended baseline incorporates those economic effects of rising deficits (described in Chapter 6) as well as the feedback to the budget from those negative effects on the economy.

CBO estimates that the fiscal policies underlying the rising budget deficits in CBO's extended baseline would have a different effect in the short term. Over the next few years, those policies would boost overall demand for goods and services, thus increasing output and employment from what they would be with smaller deficits (or with no deficits). But the influence of greater demand would be temporary because stabilizing forces in the economy tend to push output back in the direction of its potential (or maximum sustainable) level. Those forces would include the response of

prices and longer-term interest rates to greater demand and actions by the Federal Reserve.

**Pressure on the Budget From Higher Interest Costs.** More federal borrowing and rising interest rates are both projected to push up net interest costs, making it harder to achieve any chosen target for lower budget deficits. (Net interest costs now are a small share of the economy because interest rates are exceptionally low.) CBO projects that as the economy moves back up toward its potential level, interest rates will rise to levels consistent with various factors such as productivity growth, the demand for investment, and federal deficits. Interest costs in the extended baseline are projected to be higher than they would be if deficits were smaller and interest rates were lower.

Because federal spending on net interest is projected to rise, achieving any chosen targets for lower budget deficits and debt would require higher taxes, lower spending on benefits and services, or both. Policies that achieved those goals could affect the economy and people's well-being. For example, if higher taxes came about through higher marginal tax rates (the rates that apply to an additional dollar of income), incentives to work and save would be reduced.[4] Alternatively, if lower spending was achieved at least in part by reducing federal investments, future output and income also would be reduced.[5] As another option, if lower spending was achieved by a reduction in benefits, households might increase their supply of labor to make up for lost income, thus increasing output.

**Reduced Ability to Respond to Domestic and International Problems.** With a relatively small outstanding debt, a government can readily borrow money to address unexpected events, such as recessions, financial crises, natural disasters, or wars. By contrast, with large outstanding debt, a government has less flexibility to address financial and economic crises, which can be costly.[6] A large amount of debt also can compromise a country's national security by constraining military spending in times of international crisis or by limiting the country's ability to prepare for such a crisis.

Before the most recent recession, when federal debt was below 40 percent of GDP, the government had some flexibility to respond to the financial crisis and severe recession with policy changes. Such changes included using taxpayer funds to stabilize the

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4. See Congressional Budget Office, *How the Supply of Labor Responds to Changes in Fiscal Policy* (October 2012), www.cbo.gov/publication/43674.

5. For more information, see Congressional Budget Office, *The Macroeconomic and Budgetary Effects of Federal Investment* (June 2016), www.cbo.gov/publication/51628.

6. See, for example, Carmen M. Reinhart and Vincent R. Reinhart, "After the Fall," *Macroeconomic Challenges: The Decade Ahead* (Federal Reserve Bank of Kansas City, 2010), http://tinyurl.com/lntnp6j (PDF, 1.6 MB); and Carmen M. Reinhart and Kenneth S. Rogoff, "The Aftermath of Financial Crises," *American Economic Review*, vol. 99, no. 2 (May 2009), pp. 466–472, http://dx.doi.org/10.1257/aer.99.2.466. Also see Luc Laeven and Fabian Valencia, *Systemic Banking Crises Database: An Update,* Working Paper 12/163 (International Monetary Fund, June 2012), http://tinyurl.com/p2clvmy.

financial sector, increasing spending, and cutting taxes—even as lower output and income automatically resulted in sharply lower tax revenues and higher spending on income-support programs. All told, as a result of lower tax revenue and higher spending, federal debt as a percentage of GDP more than doubled from its 2007 level. If federal debt stayed the same or increased further in the future, undertaking similar policies in recessions or fiscal crises would be harder. Hence, such developments could have larger negative effects on the economy and on people's well-being. Moreover, the reduced financial flexibility and increased dependence on foreign investors that would accompany high and rising debt could weaken U.S. leadership in the international arena.

**Greater Chance of a Fiscal Crisis.** A large and continuously growing federal debt would make a fiscal crisis in the United States more likely.[7] Specifically, investors might become less willing to finance the government's borrowing unless they were compensated with high interest rates. As a result, interest rates on federal debt would abruptly become higher than the rates of return on other assets, dramatically increasing the cost of future government borrowing. In addition, that increase would reduce the market value of outstanding government bonds. If that happened, investors would lose money. The potential losses for mutual funds, pension funds, insurance companies, banks, and other holders of government debt might be large enough to cause some financial institutions to fail, creating a fiscal crisis. A fiscal crisis also can make private-sector borrowing more expensive because uncertainty about the government's responses can reduce confidence in the viability of private-sector enterprises.

Unfortunately, no one can confidently predict whether or when such a fiscal crisis might occur in the United States. In particular, the debt-to-GDP ratio has no identifiable tipping point to indicate that a crisis is likely or imminent. All else being equal, however, the larger a government's debt, the greater the risk of a fiscal crisis.

The likelihood of such a crisis also depends on economic conditions. If investors expect continued economic growth, they are generally less concerned about the government's debt burden; conversely, substantial debt can reinforce more generalized concern about an economy. Thus, fiscal crises around the world often have begun during recessions—and, in turn, have exacerbated them.

If a fiscal crisis occurred in the United States, policymakers would have only limited—and unattractive—options for responding. The government would need to undertake some combination of three approaches: restructure the debt (that is, seek to modify the contractual terms of existing obligations), use monetary policy to raise inflation above expectations, and adopt large and abrupt spending cuts and tax increases.

7. For more information, see Congressional Budget Office, *Federal Debt and the Risk of a Fiscal Crisis* (July 2010), www.cbo.gov/publication/21625.

## Illustrating the Magnitude of the Long-Term Fiscal Imbalance

One way to measure the severity of the long-term fiscal imbalance is to assess the changes in revenues or non-interest spending that would be necessary to achieve a chosen goal for federal debt. CBO examined the implications of two illustrative goals: Trying to ensure that federal debt in some future year would be at the same percentage of GDP that it is today and trying to make federal debt the same percentage of GDP in some future year that it has been, on average, over the past 50 years. Estimating the effects on federal debt of alternative paths for federal deficits offers another way to show the magnitude of the imbalance.

**The Magnitude of Policy Changes Needed to Meet Various Goals for Federal Debt.** The scale of changes in noninterest spending or revenues would depend on the target level of federal debt. Suppose that lawmakers set out to ensure that debt in 2046 would equal 75 percent of GDP (the current share). Cutting noninterest spending or raising revenues in each year, or both, beginning in 2017, by amounts totaling 1.7 percent of GDP (about $330 billion in 2017, or $1,000 per person) would achieve that result (see Figure 1-3).[8] Those amounts are calculated before macroeconomic feedback is taken into account.

The projected effects on debt include both the direct effects of the specified policy changes and the resulting macroeconomic feedback to both spending and revenues. That feedback reflects the positive economic effects of lowering the debt but no assumptions about the specifics of the policy changes.

Those policy changes, for example, could alter incentives to work and save, which would then affect overall economic output and have feedback effects on the federal budget. If those changes came entirely from revenues or entirely from spending, they would amount, roughly, to a 9 percent increase in revenues or an 8 percent cut in noninterest spending in comparison with the extended baseline.

Increases in revenues or reductions in noninterest spending would need to be larger than 1.7 percent of GDP to reduce debt to the percentages of GDP that are more typical of those in recent decades. Suppose that lawmakers wanted to return the debt to 39 percent of GDP (its average over the past 50 years) by 2046. One way to do so would be to increase revenues or cut noninterest spending (in relation to current law), or do some combination of the two, beginning in 2017 by amounts totaling 2.9 percent of GDP each year. (In 2017, 2.9 percent of GDP would be about $560 billion, or $1,700 per person.) Again, the projected effects on debt include both the direct effects of the specified policy

8. That estimate is similar to the fiscal gap estimated in last year's report. The key differences this year are that the positive macroeconomic effects of lowering the debt have been incorporated and that the period of analysis is now 30 years rather than 25 (see Appendix B in this volume and Congressional Budget Office, *The 2015 Long-Term Budget Outlook*, www.cbo.gov/publication/50250).

changes and the resulting macroeconomic feedback to the budget. That feedback reflects the positive economic effects of lowering the debt but no assumptions about the specifics of the policy changes.

Lawmakers could adopt many combinations of policies to meet that goal, including the following:

- *Increase all types of revenues by equal percentages.* Such changes would represent an increase of about 16 percent, under the extended baseline, for each year in the 2017–2046 period. For households in the middle fifth of the income distribution in 2017, for example, such increases would raise federal taxes per household by about $1,900, on average.

- *Cut all types of noninterest spending by equal percentages.* Such changes would represent a decrease of about 14 percent for each of the next 30 years. For example, for people in the middle fifth of the lifetime earnings distribution who were born in the 1950s and who claimed benefits at age 65, such cuts would lower their initial annual Social Security benefits by about $2,600, on average.

The magnitude of the policy changes needed to achieve a chosen goal for federal debt would depend, in part, on how quickly that goal was expected to be reached (see Box 1-1).

**How Different Amounts of Deficit Reduction Would Affect Federal Debt.** CBO also analyzed the effects of phasing in deficit reduction so that cumulative deficits (excluding interest payments and macroeconomic feedback) would be either $2 trillion or $4 trillion lower through 2026 than under the extended baseline. In later years, deficits would be reduced by the same percentage of GDP as in 2026.

CBO estimates that under those paths—after adjustment for the economic effects of the reduction in debt—federal debt as a share of GDP would still be higher than the nation's historical average. The –$2 trillion path would result in federal debt equal to 96 percent of GDP in 2046, well above today's 75 percent. The –$4 trillion path would result in federal debt amounting to 55 percent of GDP in 2046—lower than today's level but still higher than the historical average. Under both illustrative paths, economic output would be slightly lower over the next few years but higher in 2046 than under the extended baseline. Interest rates on federal debt would be lower in the long term. (Chapter 6 describes those results and the corresponding results for a budget path that adds $2 trillion to the deficit over the next 10 years.)

## Projected Spending Through 2046

Spending for the government's programs and activities, as well as its interest costs, is projected to be a higher percentage of GDP in coming years than it has been over the past several decades. Over the past 50 years, federal outlays (other than those for the government's net interest costs) have averaged 18 percent of GDP. However, since

2009, noninterest spending has been well above that average, both because of underlying demographic trends and because of temporary circumstances (namely, the financial crisis, weak economy, and ensuing policies). Non-interest spending spiked to 23 percent of GDP in 2009 but then declined to about 19 percent by 2014 as the economy recovered. Because of pressures from underlying demographic trends, CBO projects that noninterest outlays would reach almost 20 percent of GDP this year and remain close to that percentage throughout the coming decade. During that time, mandatory spending would generally increase as a share of the economy, whereas discretionary spending would decrease.

After 2026, under the assumptions that govern the extended baseline, noninterest spending would continue to rise in relation to the size of the economy, reaching 22.4 percent of GDP by 2046. (Table 1-2 summarizes CBO's policy assumptions.) That increase would be mostly the result of rising spending for Social Security and the government's major health care programs.

In addition, CBO projects that, under current law, net outlays for interest would jump from 1.4 percent of GDP this year to 3.0 percent 10 years from now as interest rates rise from their unusually low levels and debt accumulates. By 2046, interest costs would be 5.8 percent of GDP, bringing total federal spending to over 28.2 percent of GDP (see Figure 1-4). Only during World War II did federal spending constitute a larger share of the economy, topping 40 percent of GDP for three years.

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

Mandatory programs have accounted for a rising share of the federal government's noninterest spending over the past few decades, exceeding 60 percent for the past several years. Much of the growth has occurred because Social Security and Medicare—the largest mandatory programs—benefit primarily people age 65 or older, a group that has been growing significantly. Federal outlays for those two programs made up almost 40 percent of the government's noninterest spending, on average, during the past 10 years, compared with 16 percent 50 years ago.

**Projected Growth in Spending.** CBO projects that spending for Social Security would increase noticeably as a share of the economy—from 4.9 percent of GDP in 2016 to 6.3 percent in 2046. The agency's projections of federal spending for Social Security incorporate the assumption that the laws governing that program will not change. For these projections, CBO also assumes that Social Security will pay benefits as scheduled under current law regardless of the status of the program's trust funds.[9] That approach

9. The balances of the trust funds represent the total amount that the government is legally authorized to spend for those purposes. CBO currently projects that, under current law, the two Social Security trust funds combined would be exhausted in 2029. For more about the legal issues related to exhaustion of a trust fund, see Noah P. Meyerson, *Social Security: What Would Happen If the Trust Funds Ran Out?* Report for Congress RL33514 (Congressional Research Service, August 28, 2014), available from U.S. House of Representatives, Committee on Ways and Means, *2014 Green Book*, Chapter 1: Social Security, "Social Security Congressional Research Service Reports" (accessed July 8, 2016), http://go.usa.gov/cCXcG.

is consistent with a statutory requirement that CBO's 10-year baseline projections incorporate the assumption that funding for entitlement programs is adequate to make all payments required by law.[10] (For more on Social Security, see Chapter 2.)

In the extended baseline, spending for the major health care programs is projected to grow much faster than the economy. Those programs include Medicare, Medicaid, and the Children's Health Insurance Program, as well as spending on subsidies for health insurance purchased through the marketplaces established by the Affordable Care Act (ACA) and related spending.[11] Total outlays for those programs over the next 30 years, net of offsetting receipts, would increase from 5.5 percent of GDP now to 8.9 percent in 2046.[12] About three-quarters of that increase would come from spending for the Medicare program. CBO projects federal spending for the government's major health care programs for 2016 through 2026 under the assumption that the laws governing those programs will, in general, remain unchanged. As with Social Security, CBO assumes that Medicare will pay benefits as scheduled under current law regardless of the status of the program's trust funds. For projections beyond 2026, considerable uncertainty surrounds the evolution of the health care delivery and financing systems. That uncertainty leads CBO to employ a formulaic approach: CBO combines estimates from the government's health care programs of the number of expected beneficiaries with mechanical estimates of the growth in spending per beneficiary. (Chapter 3 describes the long-term projections for the major health care programs.)

**Causes of Spending Growth.** The aging population and excess cost growth account for the projected rise (with respect to GDP) in spending on Social Security and the major federal health care programs.[13] Without aging or excess cost growth, spending on Social Security and major health care programs as a share of GDP in 2046 would be 0.4 percentage points below today's value of 11.0 percent, CBO projects; in the extended baseline, that spending is projected to be 16.3 percent of GDP (see Figure 1-5).[14] Aging accounts for 3.3 percentage points, or roughly 60 percent of the difference. Excess cost growth accounts for the rest, at 2.3 percentage points.

10. Sec. 257(b)(1) of the Balanced Budget and Emergency Deficit Control Act of 1985, Public Law 99-177 (codified at 2 U.S.C. §907(b)(1) (2012)).

11. Spending related to subsidies for insurance purchased through the marketplaces (formerly called exchanges in CBO's publications) includes spending for subsidies for insurance provided through the Basic Health Program, spending for the risk-adjustment and reinsurance programs that were established by the ACA to stabilize premiums for health insurance purchased by individuals and small employers, and spending to provide grants to states for establishing a marketplace.

12. In particular, unless otherwise specified, Medicare outlays are presented net of offsetting receipts—mostly enrollee-paid premiums, which reduce net outlays for that program.

13. Excess cost growth is the extent to which health care costs per beneficiary, as adjusted for demographic changes, grow faster than potential GDP per capita. For the analysis of causes of spending growth, spending on major health care programs includes gross spending on Medicare, Medicaid, and the Children's Health Insurance Program, as well as subsidies for health insurance purchased through the marketplaces and related programs.

14. Spending under the scenario with no aging or excess cost growth is projected by setting the shares of the population by age at today's proportions and by setting excess cost growth at zero.

*The Aging Population*. The retirement of the baby boomers and continued increases in life expectancy will substantially increase the share of the population that is of retirement age (65 and older). Between 2016 and 2046, that share will increase from 15 percent to 21 percent.

Aging accounts for nearly all the projected long-term increase in Social Security spending as a percentage of GDP.[15] Because of aging, the number of people who are 65 or older would grow as a share of the population, leading to more Social Security beneficiaries and higher federal spending on benefits.

Aging also contributes to the projected increase in spending for major health care programs as a share of GDP—particularly for Medicare, the largest federal health care program. As the population ages, Medicare beneficiaries will make up more of the population. Beneficiaries will be older, on average, and older beneficiaries tend to have higher average spending. Both of those trends would increase Medicare spending. CBO estimates that aging explains just under half of the increase in spending for major health care programs as a share of GDP between 2016 and 2046.

*Rising Health Care Spending per Beneficiary*. Even though growth in health care spending has slowed in recent years, CBO projects that excess cost growth will be greater than zero, on average, over the next 30 years (see Chapter 3). For major health care programs, excess cost growth accounts for just over half of the increase in spending as a share of GDP between 2016 and 2046. That contribution occurs mainly because excess cost growth means that spending per beneficiary grows faster than the potential GDP. Secondarily, such cost growth leads to higher federal debt—which slows the growth of GDP and therefore slightly raises spending as a share of GDP.

### Other Noninterest Spending

In the extended baseline, total federal spending for everything other than Social Security, the major health care programs, and net interest declines to a smaller percentage of GDP than has been the case for more than 70 years. During the past 50 years, such spending has averaged 12 percent of GDP, reaching as much as 15 percent in 1968 and falling to as little as 8 percent in the late 1990s and early 2000s. CBO estimates that other noninterest spending will equal 9.2 percent of GDP in 2016. Under the assumptions used for this analysis, that spending is projected to fall to 7.7 percent of GDP in 2026 and to 7.3 percent of GDP in 2046.

Outlays for discretionary programs as a share of GDP are projected to decline significantly over the next 10 years—from 6.5 percent to 5.2 percent—in part because of the constraints on discretionary funding imposed by the Budget Control Act of 2011.

15. Excess cost growth accounts for a small portion of the difference between those scenarios in spending for Social Security in 2046. Accounting for excess cost growth increases spending on Social Security as a share of GDP slightly because higher spending on federal health care programs leads to higher deficits, slowing the growth of GDP.

After 2026, discretionary spending is assumed to remain roughly constant as a percentage of GDP.

Spending for mandatory programs other than Social Security and the major health care programs also is projected to decline as a share of the economy over the next 10 years. Those mandatory programs include retirement programs for federal civilian and military employees, certain veterans' programs, the Supplemental Nutrition Assistance Program (SNAP), unemployment compensation, and refundable tax credits. That spending accounts for 2.8 percent of GDP today and is projected to fall to 2.5 percent of GDP in 2026, if current laws generally remain unchanged.[16] In CBO's extended baseline, that spending is projected to fall to 2.1 percent of GDP by 2046—lower than at any point at least since 1962, the first year for which comparable data are available. (For more on other noninterest spending, see Chapter 4.)

### Net Interest Costs

The government's net interest costs are projected to more than double as a share of the economy over the next decade—from 1.4 percent of GDP in 2016 to 3.0 percent by 2026. By 2046, those costs would reach 5.8 percent of GDP under the extended baseline. Net interest costs are projected to increase as interest rates rise from unusually low levels and as greater federal borrowing directly leads to greater debt-service costs. In addition, greater federal borrowing is projected to put further upward pressure on interest rates and thus on interest costs. Growth in net interest costs and growth in debt reinforce each other: Rising interest costs push up deficits and debt, and rising debt pushes up interest costs.

CBO projects that interest rates will rise from today's low rates as the economy grows but that they still will be lower than they have been, on average, during the past few decades. Over the long term, interest rates are projected to rise to levels consistent with factors such as labor force growth, productivity growth, the demand for investment, and federal deficits. According to CBO's projections, factors that push interest rates down from their historical levels—such as slower growth of the labor force—would outweigh factors that push interest rates up from their historical levels—such as rising federal debt. For example, in CBO's latest 10-year economic projections, the interest rate on 10-year Treasury notes would rise from 2.2 percent at the end of 2015 to 4.1 percent in 2026. In the extended baseline, the rates on those notes would rise to 4.7 percent in 2046—still below the average of 5.8 percent between 1990 and 2007. (CBO uses the 1990–2007 period for comparison because it featured stable expectations for inflation and no significant financial crises or severe economic downturns.)

16. The law governing CBO's baseline projections (sec. 257(b)(2) of the Deficit Control Act) makes exceptions for some programs, such as SNAP, that have expiring authorizations but that are assumed to continue as currently authorized.

The average interest rate on all federal debt held by the public tends to be lower than the rate on 10-year Treasury notes. (In general, interest rates are lower on shorter-term debt than on longer-term debt; since the 1950s, the average maturity of federal debt has been shorter than 10 years.) On the basis of the agency's projected spreads of interest rates and the term structure of federal debt, beyond 2026, CBO anticipates that the average interest rate on federal debt will be about 0.4 percentage points lower than the interest rate on 10-year Treasury notes. As a result, CBO projects that the rate will rise to 4.4 percent in 2046.

Rising rates will add significantly to interest costs and thus increase federal debt (as a share of the economy) in CBO's extended baseline. Although interest rates are projected to remain notably below their average in recent decades, anticipated increases in rates account for roughly three-quarters of the projected increase in debt as a percentage of GDP by 2046.

## Projected Revenues Through 2046

In CBO's extended baseline, revenues are projected to constitute a larger share of GDP than they have, on average, in recent decades. Over the past 50 years, federal revenues as a share of GDP have averaged 17 percent—fluctuating between 15 percent and 20 percent as a result of changes in tax laws and interactions between tax law and economic conditions.

CBO projects that, under current law, revenues as a share of GDP would be roughly flat over the coming decade—fluctuating between 18.0 percent and 18.2 percent. For years beyond 2026, CBO assumes that the rules for all tax sources will evolve as scheduled under current law.[17] Under those assumptions, revenues would grow slightly faster than GDP beyond 2026. During that time, real bracket creep would continue to push a growing share of income into higher tax brackets because of growth in real (inflation-adjusted) income and the tax system's inter-action with inflation. Also, certain tax increases enacted under the ACA, especially the high-premium excise tax, would generate increasing revenues in relation to the size of the economy. By 2046, total revenues would be 19.4 percent of GDP (see Chapter 5).

Even if lawmakers enacted no future changes in tax law, the effects of the tax system in 2046 would differ substantially from today's. Average taxpayers at all income levels would pay more of their income in taxes than similar taxpayers do now, primarily because more of their income would be taxed in higher brackets. Higher marginal tax rates on both labor and capital would dampen economic activity, reducing overall tax revenue from what it would be otherwise, CBO estimates.

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

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

Through 2026, the economic and demographic projections in this report are the same as the agency's 10-year baseline. For later years, CBO projects economic and demographic conditions according to its assessment of long-term trends. (Appendix A describes CBO's economic and demographic projections). Those economic projections reflect the effects that projected fiscal policies—namely, increased federal borrowing and rising marginal tax rates—would have on the economy. Such effects would result in lower labor supply, a smaller stock of capital, and lower output than would otherwise be the case. (Chapter 6 further describes how CBO assesses the long-term macroeconomic effects of federal tax and spending policies.)

### Economic Projections

Future economic growth will be slower than over the past 50 years, CBO projects, largely because of less growth in the labor force. The labor force is projected to grow by an average of 0.4 percent per year over the next 30 years, compared with 1.5 percent between 1966 and 2015. Contributing factors include the retiring baby boomers, declining birthrates, and declining participation in the labor force. In addition, rising debt would slow the growth of the capital stock and therefore future economic output. CBO also projects that total factor productivity will grow slightly more slowly than its historical average, increasing by 1.3 percent per year, on average, from 2016 to 2046. That average growth rate is about 0.2 percentage points slower than the average annual rate of nearly 1.5 percent since 1950. Taking into account those and other economic variables, CBO projects that, under the extended baseline, real GDP would increase by 2.1 percent per year, on average, over the next 30 years, compared with 2.9 percent between 1966 and 2015.

Another measure of economic growth is gross national product (GNP). Unlike the more commonly cited GDP, GNP includes the income that U.S. residents earn abroad and excludes the income that foreigners earn in this country. GNP is therefore a better measure of the resources available to U.S. households. In the extended baseline, CBO projects that real GNP will increase by 2.0 percent per year, on average, over the next 30 years, compared with 2.9 percent over the past 50 years. Real GNP per person would rise from $58,000 today to $86,000 (in 2016 dollars) in 2046, growing by 1.3 percent per year, on average, over the entire period. That growth rate is slower than the 1.9 percent experienced during the 1966–2015 period.

### Demographic Projections

The size and age profile of the U.S. population affects budgetary and economic outcomes for the nation. The size of the labor force and number of Social Security beneficiaries are two examples. The U.S. population will grow from 328 million at the beginning of this year to 400 million in 2046, CBO projects, expanding by 0.7 percent per year, on average. That rate is slower than the 0.9 percent experienced over the past

50 years. The population's age distribution will continue to shift over the coming decades as well, maintaining a long-standing historical trend. By 2046, 21 percent of the population will be age 65 or older, CBO anticipates, compared with 15 percent today.

To estimate the U.S. population in the coming decades, CBO projects rates of fertility, immigration, and mortality. CBO anticipates an average of 1.9 children born per woman between 2016 and 2046, continuing a decline from the recent peak of 2.1 in 2007. Net immigration will decline from an estimated 4.0 immigrants per thousand people today to 3.7 by 2046, according to CBO's estimates. Mortality rates—the number of deaths per thousand people in the population—for specific age and sex groups are expected to improve, on average, at the same rate each experienced from 1950 to 2012.

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

Each time it prepares long-term budget projections, CBO updates them to incorporate legislative, economic, and technical changes. The projections of federal deficits and resulting debt presented here are generally higher than those published in 2015.[18] Much of that increase stems from reduced corporate and individual income taxes, resulting from the extension of tax provisions by the Consolidated Appropriations Act, 2016. Downward revisions to CBO's economic forecast and technical changes have also, on net, increased projected deficits. (Appendix B describes the key revisions to the budgetary projections since last year.)

Projections in this report incorporate estimates of the macroeconomic effects of the fiscal policy that is projected to occur if current laws generally remained unchanged. That approach represents a departure from last year's report, in which the detailed spending projections and the economic projections presented in Appendix A did not incorporate the macroeconomic effects of fiscal policy after the first 10 years. (Chapter 6 in last year's report described estimates that incorporated the macroeconomic effects of fiscal policy.)

Taken together, legislative, economic, and technical changes affected CBO's view of the long-term outlook for the federal budget in several ways. Under the extended baseline, CBO now projects that debt would reach 122 percent of GDP in 2040, compared with 107 percent projected last year. (Those figures incorporate feedback to the budget from the macroeconomic effects of those paths for federal debt.) Higher deficits in this year's report also mean that larger budgetary changes would be required to make federal debt equal today's level in 25 years (last year's projection period). To ensure that debt in 2041 would equal today's level, lawmakers would have to cut

18. For CBO's long-term projections for the 2015–2040 period, see Congressional Budget Office, *The 2015 Long-Term Budget Outlook* (June 2015), www.cbo.gov/publication/50250.

noninterest spending or increase revenues (or undertake some combination of the two) by roughly 1.7 percent of GDP in each year from 2017 through 2041 (before taking into account macroeconomic feedback). The projected effects on debt include both the direct effects of the specified policy changes and the resulting macroeconomic feedback to the budget. That feedback reflects the positive macroeconomic effects of lowering the debt but no assumptions about the specifics of the policy changes. Without those positive macroeconomic effects, that change would be 2.0 percent of GDP. Last year, for the 2016–2040 period, CBO estimated that doing so would require changes equal to 1.1 percent of GDP (excluding all macroeconomic effects).

# Chapter 2: The Long-Term Outlook for Social Security

Social Security, which was created in 1935, is the largest single program in the federal budget. The program's two components pay benefits to more than 60 million beneficiaries in all. The larger of the two, Old-Age and Survivors Insurance (OASI), pays benefits to retired workers, to their eligible dependents, and to some survivors of deceased workers. The smaller, Disability Insurance (DI), makes payments to disabled workers and to their dependents until those workers are old enough to claim full retirement benefits under OASI. The Congressional Budget Office estimates that the program's mandatory outlays will total $911 billion in fiscal year 2016, accounting for almost one-quarter of all federal spending.[19]

During the program's first five decades, Social Security spending grew from less than 1 percent of gross domestic product (GDP) in the early years to nearly 5 percent of GDP by 1983. That rise was attributable mainly to program expansions, particularly the 1956 creation of the DI program. From 1984 to 2008, Social Security spending averaged 4.2 percent of GDP. During the 2007–2009 recession, GDP shrank, and the number of OASI and DI claimants rose unusually rapidly as the job market deteriorated. That set of conditions, along with the higher-than-average cost-of-living adjustment that was applied to benefits in January 2009, resulted in Social Security's outlays reaching 4.7 percent of GDP in 2009.

For several reasons, spending has remained at about that level since then. The weakness in the economy resulting from the recession was temporary, but the burgeoning rate of retirement among baby-boom generation workers is having a

19. That amount consists of about $906 billion in benefits, about $5 billion in transfers to the Railroad Retirement Board, and less than $1 billion in payments to the Treasury for administrative costs. CBO estimates that another $6 billion—classified as discretionary spending—will be spent to administer the program. In this report, spending for Social Security generally refers to mandatory outlays.

lasting effect. In 2016, CBO estimates that Social Security outlays will be 4.9 percent of GDP.

In coming decades, as more members of the baby-boom generation reach retirement age, a larger proportion of the population will receive benefits; as life expectancy continues to increase, those beneficiaries will collect benefits for a longer time. If full benefits were paid under the formulas specified in current law, CBO projects, Social Security spending would rise steadily, reaching 5.9 percent of GDP in 2026 and 6.3 percent of GDP in 2046 (see Figure 2-1).

## How Social Security Works

Because 72 percent (or 43 million) of its beneficiaries are retired workers or the spouses and children of those recipients, Social Security is often characterized as a retirement program.[20] In general, workers qualify for Social Security retirement benefits if they are age 62 or older and have paid sufficient Social Security taxes for at least 10 years.

Social Security also provides other benefits, including payments to the survivors of deceased workers—currently 10 percent of beneficiaries. In addition, workers who have not reached the full retirement age (FRA) and who are judged unable to perform "substantial" work because of a physical or mental disability can qualify for DI benefits, in many cases after a shorter period of employment than is required to collect retirement benefits. (DI beneficiaries become retired-worker beneficiaries at the FRA with no change in benefit amounts.) Disabled workers and their spouses and children account for 18 percent of beneficiaries.[21] In dollar terms, 71 percent of Social Security benefits are paid to retired workers and their dependents, survivors receive 13 percent, and disabled workers and their spouses and children receive 16 percent.[22]

### Benefits

Retired workers and those who collect disabled worker benefits receive initial benefits that are based on their individual earnings histories, indexed to changes in average annual earnings for the U.S. workforce (including earnings that are not subject to

20. For a more detailed description of the Social Security program, see Congressional Budget Office, *Social Security Policy Options, 2015* (December 2015), www.cbo.gov/publication/51011.

21. See Congressional Budget Office, *Social Security Disability Insurance: Participation and Spending* (June 2016), www.cbo.gov/publication/51443, and *Policy Options for the Social Security Disability Insurance Program* (July 2012), www.cbo.gov/publication/43421.

22. The categorizations of benefits and beneficiaries are not completely consistent—some people receive benefits in more than one category. For instance, in the calculations of the numbers of beneficiaries by category, retired workers who also receive survivors' benefits are counted as retired. But in the calculation of the distribution of benefits, their benefit payments are prorated to the retired-worker and survivor categories.

taxation under Social Security). After the first year of benefit eligibility, a cost-of-living adjustment is applied to account for annual growth in consumer prices.

A worker's birth year determines the age of eligibility to receive full OASI payments. For example, any eligible worker born before 1938 could have claimed full retirement benefits at the age of 65. (Under current law, upon reaching the early eligibility age of 62, any eligible worker may claim reduced benefits.) According to a schedule enacted in the Social Security Amendments of 1983, the FRA is rising incrementally: For workers born between 1938 and 1942, it increased by two months for each successive birth year, reaching 66 for workers who were born between 1943 and 1954. The FRA will continue to rise gradually, starting at 66 and 2 months for workers who were born in 1955 (who will turn 62 in 2017) and eventually reaching 67 for people born after 1959 (the youngest of whom will turn 62 in 2022).

According to CBO's current estimates, the initial average annual benefit for a retired worker born in the 1940s and claiming benefits at age 65 (that is, between 2005 and 2014) was about $17,000 in 2015 dollars. For claimants with at least 20 years of earnings, those benefits replaced, on average, about 43 percent of their preretirement earnings (defined as the average of the final five years of a worker's substantial earnings before age 62).[23] Over time, the real (inflation-adjusted) value of initial benefits for retirees is likely to rise because initial benefits are based on beneficiaries' previous earnings, indexed to average wage growth in the United States, and because over the long term, growth in wages is expected to outpace inflation.

### Taxes

The Social Security program is funded by dedicated tax revenues from two sources. Currently, 96 percent comes from a payroll tax—generally, 12.4 percent of earnings that are subject to that tax. Workers and their employers each pay half; self-employed people pay the entire amount. Earnings up to a maximum annual amount—$118,500 in calendar year 2016—are subject to the payroll tax. That taxable maximum generally increases each year at the same rate as average earnings in the United States, and it has remained a nearly constant proportion of the average wage since the early 1980s. Because earnings have grown more for high earners than for others, the portion of earnings on which Social Security payroll taxes are paid has fallen from 90 percent in 1983 to 82 percent in 2016. CBO expects that disparity in growth in earnings to continue for at least the next decade, causing the portion of earnings that is subject to

23. Earnings are substantial if they amount to at least half of a worker's average indexed earnings. Workers with fewer than 20 years of earnings above 10 percent of average annual earnings for the U.S. workforce are excluded from this calculation. See Congressional Budget Office, *CBO's 2015 Long-Term Projections for Social Security: Additional Information* (December 2015), www.cbo.gov/publication/51047. CBO will publish updated estimates of benefits and replacement rates later in 2016.

the Social Security tax to fall to below 78 percent by 2026 and to remain near that level thereafter.

The remaining share of tax revenues—4 percent—is collected from income taxes on Social Security benefits. Recipients who file individual income tax returns must pay taxes on their benefits if the sum of their non–Social Security income (generally, adjusted gross income plus nontaxable interest income) and half of their benefits exceeds $25,000; the threshold for joint filers is $32,000. Under current law, those thresholds will remain the same over time—no adjustments are made to account for earnings growth or for inflation.

### Trust Funds

Revenues from the payroll tax and the tax on benefits are credited to the Old-Age and Survivors Insurance Trust Fund and the Disability Insurance Trust Fund, which finance the program's benefits. Social Security benefits account for 99 percent of total outlays from those two funds; the remaining 1 percent covers administrative costs. Interest on the balances is credited to the trust funds, but because the interest transactions represent payments from one part of the government (the general fund of the Treasury) to another (the trust funds), they do not affect federal budget deficits or surpluses. Over the history of the trust funds, receipts—tax revenues, interest payments, and occasional transfers from the general fund—have exceeded outlays. The trust funds' balances stood at $2.8 trillion at the end of May 2016.

## The Outlook for Social Security Spending and Revenues

For some time, both the Social Security Administration and CBO have projected that, if full benefits were paid under the formulas specified in current law, the program's spending would rise significantly during the coming decades. Average benefits per recipient are expected to continue to increase because the earnings that are the basis of those benefits will increase. Other things being equal, that relationship would tend to keep total benefits roughly stable as a percentage of GDP. However, as a larger share of the baby-boom generation reaches retirement age and as longer life spans lead to longer retirements, a significantly larger portion of the population will draw benefits. Those developments will combine to cause the total amount of benefits scheduled to be paid under current law to grow faster than the economy. In contrast, total revenues for the program are anticipated to decline slightly as a percentage of GDP. The faster growth projected for total benefits than for total revenues would create a shortfall in the program's finances. The amounts of Social Security benefits received and taxes paid, and the resulting gap between total revenues and benefits, will depend on changes in life expectancy, conditions in the labor market, and other factors.

CBO's extended baseline, which encompasses the period from 2016 through 2046, generally reflects the provisions of current law.[24] In keeping with the rules specified in the Balanced Budget and Emergency Deficit Control Act of 1985, however, CBO's extended baseline incorporates the assumption that scheduled payments will continue to be made in full after a trust fund has been exhausted, although there is no current legal authority to make such payments. The agency's projections for Social Security spending and revenues are based on a detailed micro-simulation model, which starts with data about individuals from a representative sample of the population and projects demographic and economic outcomes for that sample through time. For each individual in the sample, the model simulates birth, death, immigration and emigration, marital status and changes to it, fertility, labor force participation, hours worked, earnings, and payroll taxes, along with Social Security retirement, disability, and dependents' and survivors' benefits.[25]

### Demographic Changes

According to CBO's projections, the number of people who are age 65 or older will increase by 37 percent between now and 2026, and it will increase by 75 percent between now and 2046 as the baby-boom generation ages and life expectancy increases (for more information on CBO's demographic projections, see Appendix A). In comparison, CBO anticipates increases of just 3 percent and 14 percent in the population between the ages of 20 and 64 over those same periods. Today, that older group is one-quarter of the size of the younger group. The proportion is expected to increase to 33 percent by 2026 and to 38 percent by 2046 (see Figure 2-2). If current laws remained in place, more than 78 million people would collect benefits in 2026 and almost 100 million people would do so in 2046; currently, Social Security has more than 60 million beneficiaries.

CBO expects that future increases in life expectancy will be larger for people with higher lifetime earnings; that expectation is consistent with the pattern of past increases.[26]

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24. CBO's Social Security projections extend for 75 years, from 2016 to 2090. However, the agency uses separate methods to make budgetary projections for the periods before and after 2046. Through 2046, the extended baseline accounts for the effects of fiscal policy (notably, rising federal debt and marginal tax rates; see Chapter 6). Projections for the period after 2046 are governed by two assumptions: that federal debt remains constant as a share of GDP and that marginal tax rates remain unchanged from their 2046 values.

25. See Congressional Budget Office, *CBO's Long-Term Model: An Overview* (June 2009), www.cbo.gov/publication/20807.

26. Life expectancy is the number of additional years a person is expected to live at a specified age. For more information on differences in life expectancy among groups with different earnings, see Barry Bosworth, Gary Burtless, and Kan Zhang, "What Growing Life Expectancy Gaps Mean for the Promise of Social Security" (Brookings, accessed July 8, 2016), http://tinyurl.com/ho69udx; Government Accountability Office, *Retirement Security: Shorter Life Expectancy Reduces Projected Lifetime Benefits for Lower Earners*, GAO-16-354 (March 2016), www.gao.gov/products/GAO-16-354; and Julian P. Cristia, *The Empirical Relationship Between Lifetime Earnings and Mortality,* Working Paper 2007-11 (Congressional Budget Office, August 2007), www.cbo.gov/publication/19096.

Retirees with higher lifetime earnings receive larger benefits than do their lower-earning counterparts, so their greater increase in life expectancy will raise total future benefits, all else being equal. Similarly, the greater increase in life expectancy of high earners will boost the ratio of lifetime Social Security benefits to lifetime Social Security taxes for high earners relative to that of low earners, reducing the progressivity of the system.[27]

### Projected Spending and Revenues

If current laws generally remained in place, spending for Social Security would rise from 4.9 percent of GDP in 2016 to 5.9 percent in 2026 and to 6.3 percent in 2046, CBO projects. The share of Social Security spending for disability benefits would fall from 16 percent today to 13 percent in 2046. Most disabled beneficiaries are between age 50 and the FRA. As the baby-boom generation ages, the share of the population in that range will fall, and the share of the population over the FRA, most of whom receive OASI benefits, will rise.

In contrast, taxes credited to the Social Security program would decline slightly as a share of GDP, according to projections in CBO's extended baseline. Because Social Security payroll tax receipts constitute a fixed share of taxable earnings, and because taxable earnings are projected to decline as a share of GDP, payroll taxes also would decline as a share of GDP—from 4.3 percent in 2016 to 4.1 percent in 2046 (see Appendix A). However, CBO projects increases in the number of Social Security recipients whose benefits are subject to taxation, the taxable share of their benefits, and their average income tax rates. (CBO's tax projections are discussed in Chapter 5.) Income taxes on Social Security benefits that are credited to the Social Security trust funds would grow from about 0.2 percent of GDP today to 0.3 percent of GDP in 2046 under those circumstances. By 2046, total Social Security tax revenues—from payroll taxes and taxes on benefits—would equal 4.4 percent of GDP, 0.1 percentage point below the current amount.

In 2010, for the first time since the enactment of the Social Security Amendments of 1983, annual outlays for the program exceeded annual receipts, excluding interest credited to the trust funds. A gap between those amounts has persisted since then, and in 2015, outlays exceeded receipts, excluding interest, by about 8 percent. CBO projects that, as more people in the baby-boom generation retire over the next

27. The ratio of lifetime benefits to taxes in Social Security depends on the number of years that a recipient collects benefits, the annual benefit amounts, the number of years in which that recipient paid Social Security taxes, and the amount of taxes paid each year. In general, payments to beneficiaries with low lifetime earnings replace more of their average lifetime earnings than do payments to higher-earning beneficiaries. But because low earners tend to have a shorter life expectancy than higher earners do, low earners tend to collect benefits for fewer years. All told, lifetime Social Security benefits as a share of lifetime earnings decrease as earnings increase, but estimates of that effect vary and depend on whether disabled and survivor beneficiaries are included, how spousal benefits are accounted for, and how married couples are treated. See, for example, Barry P. Bosworth and Kathleen Burke, *Differential Mortality and Retirement Benefits in the Health and Retirement Study* (April 2014), pp. 5–6, http://tinyurl.com/nqlhpyt.

10 years, that gap would widen. According to CBO's extended baseline projections, Social Security outlays would exceed the program's revenues by 31 percent in 2026 and by 44 percent in 2046.

### Financing of Social Security

A common measure of the sustainability of a program that has a trust fund and a dedicated revenue source is its estimated actuarial balance over a given period—that is, the sum of the present value of projected tax revenues and the current trust fund balance minus the sum of the present value of projected outlays and a year's worth of benefits at the end of the period.[28] For Social Security, that difference is traditionally presented as a percentage of the present value of taxable payroll.[29]

Over the next 75 years, if current laws remained in place, the program's actuarial shortfall would be 4.8 percent of taxable payroll, or 1.6 percent of GDP, CBO projects (see Table 2-1).[30] In other words, it would be possible to pay the benefits prescribed by current law and maintain the necessary trust fund balances through 2090 if payroll taxes were raised immediately and permanently by about 4.8 percent of taxable payroll, scheduled benefits were reduced by an equivalent amount, or some combination of tax increases and spending reductions of equal present value was adopted.[31]

The estimates of the actuarial shortfall do not account for revenues or outlays after the 75-year projection period. A policy that either increased revenues or reduced outlays by the same percentage of taxable payroll each year needed to eliminate the 75-year

28. A present value is a single number that expresses a flow of past and future income (in taxes) or payments (in benefits) in terms of an equivalent lump sum received or paid at a specific time. The value depends on the rate of interest, known as the discount rate, used to translate past and future cash flows into current dollars at that time. To account for the difference between the trust fund's current balance and the balance desired for the end of the period, the balance at the beginning is added to the projected tax revenues and an additional year of costs at the end of the period is added to projected outlays.

29. Taxable payroll is total earnings (wages and self-employment income) for employment covered by Social Security that is below the applicable annual taxable maximum.

30. To be consistent with the 75-year actuarial balance reported by the Social Security trustees, the 75-year projection period used here begins in calendar year 2016 and ends in calendar year 2090. The Social Security trustees have estimated that the program's 75-year actuarial shortfall would be 2.7 percent of taxable payroll, 2.2 percentage points smaller than CBO's projection. The larger shortfall projected by CBO primarily stems from differences in the projections of interest rates and taxable payroll. Differences in projections involving life expectancy, fertility, and growth in the consumer price index also contribute (see Appendix A). For details on the trustees' projections, see Social Security Administration, *The 2016 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds* (June 2016), www.ssa.gov/oact/tr/2016.

31. The calculation of the actuarial balance excludes the effects of any macroeconomic feedback that would result from an increase in taxes or a reduction in benefits.

shortfall would not necessarily place Social Security on a permanently stable financial path. Because shortfalls are smaller earlier in the 75-year projection period than they are later on, such a policy would create surpluses in the next several decades but result in deficits later and leave the system financially unbalanced after calendar year 2090.

The measure of actuarial balance used here is called the 75-year open-group unfunded obligation because, without a change in law, the program would continue to admit new participants. The open-group measure accounts for taxes paid by workers annually until 2090 but does not consider the benefits that would be paid to those workers thereafter. Those new participants would pay much more in taxes over the next 75 years than they would receive in benefits during that period.

An alternative measure—sometimes called the closed-group unfunded obligation—shows the shortfall in the system that would occur if Social Security excluded anyone currently under the age of 15, thereby encompassing future taxes paid and benefits received only by people who are now age 15 or older. (Similar assessments are made of the financial outlook for private pension plans.) CBO estimates that, when measured as a percentage of taxable payroll, the 75-year closed-group shortfall as of 2016 is about two-thirds larger than the 75-year open-group shortfall.

Another commonly used measure of Social Security's sustainability is a trust fund's date of exhaustion. CBO projects that, under current law, the DI trust fund would be exhausted in fiscal year 2022 and the OASI trust fund would be exhausted in calendar year 2030. Because it is a common analytical convention to consider the DI and OASI trust funds as combined, even though legally they are separate, this discussion focuses on them as one entity. In CBO's extended baseline, the combined OASDI trust funds are projected to be exhausted in calendar year 2029.

If a trust fund's balance declined to zero and receipts were insufficient to cover benefits specified in law, the Social Security Administration would no longer have legal authority to pay full benefits when they were due. In the years after a trust fund's exhaustion, annual outlays therefore could not exceed annual revenues. Under those circumstances, all receipts to the trust fund would be used and the trust fund balance would remain essentially at zero.[32]

Social Security benefits can be projected in two ways: as payable benefits, which conform to the limits imposed by a trust fund's balance and annual revenues, or as

32. Noah P. Meyerson, *Social Security: What Would Happen If the Trust Funds Ran Out?* Report for Congress RL33514 (Congressional Research Service, August 2014), available from the U.S House of Representatives, Committee on Ways and Means, *2014 Green Book*, Chapter 1: Social Security, "Social Security Congressional Research Service Reports" (accessed July 8, 2016), http://go.usa.gov/cCXcG. That report notes the entitlement created under the Social Security Act, cites other law that prohibits officials from making expenditures in excess of available funds, and acknowledges that the two create a potential conflict that must be resolved by the Congress or in the courts.

scheduled benefits, which reflect the benefit formulas specified in law, regardless of a trust fund's balance. This report uses the latter approach, which is consistent with a statutory requirement that CBO, in its 10-year baseline projections, assume that funding for entitlement programs is adequate to make all payments required by law.[33] In 2030, the year after the combined trust funds are expected to be exhausted, revenues are projected to equal 71 percent of scheduled outlays. Under those circumstances, payable benefits would be 29 percent less than scheduled benefits.

### Social Security Benefits and Payroll Taxes, Depending on Birth Cohort

The amount people pay in Social Security taxes and the amount they receive in benefits over a lifetime depend on when they were born.[34] Under current law, taxes and benefits alike are anticipated to be higher for people in later birth cohorts because real earnings are projected to continue to rise. Continuing increases in life expectancy also would contribute to growth in lifetime benefits because later cohorts are projected to live to receive Social Security benefits for longer periods.

To compare Social Security benefits and taxes across generations for this analysis, CBO calculated lifetime Social Security benefits and payroll taxes as the present value—discounted to the year in which a beneficiary turns 65 and expressed in 2016 dollars—of all such benefits that workers would receive from the program or all payroll taxes they would pay to the program.[35] CBO measured the present value of benefits or taxes relative to the present value of lifetime earnings, with all values adjusted for inflation (see Figure 2-3). That analysis led to the following conclusions:

- Real average lifetime scheduled benefits as a percentage of lifetime earnings will generally be greater for each birth cohort than for the preceding one because life expectancy is projected to increase. Thus, mean lifetime benefits for people born in the 1950s are projected to be about 11 percent of their lifetime earnings. For people born in the 1980s, that proportion will be 13 percent if they receive scheduled benefits.

- For two reasons, real average lifetime payroll taxes for each birth cohort relative to lifetime earnings will generally be slightly less than those for the preceding cohort: First, under current law, Social Security payroll taxes are a fixed share of earnings

33. Sec. 257(b)(1) of the Balanced Budget and Emergency Deficit Control Act of 1985, Public Law 99-177 (codified at 2 U.S.C. §907(b)(1) (2012)).

34. For analysis of the distribution of Social Security benefits and taxes according to CBO's 2015 long-term projections, see Congressional Budget Office, *CBO's 2015 Long-Term Projections for Social Security: Additional Information* (December 2015), Exhibits 9–14, www.cbo.gov/publication/51047.

35. For this analysis, payroll taxes include the combined shares paid by employers and employees. Benefits are net of income taxes paid on those benefits. They include all benefits except those paid to young widows and children. For a discussion of methods, see Congressional Budget Office, *CBO's 2015 Long-Term Projections for Social Security: Additional Information* (December 2015), Appendix, www.cbo.gov/publication/51047.

below the taxable maximum, and second, the portion of earnings that is subject to Social Security tax is projected to fall. Thus, the mean amount of lifetime payroll taxes for people born in the 1950s is projected to be 10 percent of their lifetime earnings. For people born in the 1980s, that amount will be 9 percent.

# Chapter 3: The Long-Term Outlook for the Major Federal Health Care Programs

Although spending for health care in the United States has grown more slowly in recent years than it did previously, high and rising amounts of such spending continue to pose a challenge, not only for the federal government, but also for state and local governments, businesses, and households. Federal spending for the major health care programs rose from 2.0 percent of gross domestic product (GDP) in 1985 to 5.3 percent in 2015. Over approximately that same period, total national spending on health care services and supplies—that is, health care spending by all public and private sources combined—also increased, from 9.5 percent of GDP in 1985 to 16.6 percent, or about one-sixth of the economy, in calendar year 2014, the most recent year for which such data are available.[36]

One significant factor underlying those trends is that, on a per-person basis, health care spending has grown faster, on average, than the nation's economic output over the past few decades. The Congressional Budget Office estimates that growth in health care spending per person outpaced growth in potential (or maximum sustainable) GDP per person by an average of 1.4 percent per year between calendar years 1985 and 2014.[37] Key factors contributing to that faster growth were the emergence and increasing use of new medical technologies, rising personal income, and (to a lesser extent in recent years) the declining share of health care costs that people paid out of pocket. The effects of those factors were partly offset by those of other developments, including the increased prevalence of managed care plans in the 1990s, the 2007–2009 recession, and various legislated changes in Medicare's payment policies.

Outlays for the major health care programs consist of spending for Medicare, Medicaid, and the Children's Health Insurance Program (CHIP), as well as spending on subsidies for health insurance purchased through the marketplaces established under

36. Centers for Medicare & Medicaid Services, National Health Expenditure Accounts, "National Health Expenditures by Type of Service and Source of Funds, CY 1960–2014" (accessed March 30, 2016), http://go.usa.gov/jmGY.

37. As is explained later in this chapter, CBO derived that estimate after adjusting for demographic changes and giving greater weight to more recent years (to more closely reflect current trends in spending for health care).

the Affordable Care Act (ACA) and related spending.[38] CBO expects that, under current law, federal spending on those programs would continue to rise substantially in relation to GDP.[39] In CBO's extended baseline, net federal spending for those programs grows from an estimated 5.5 percent of GDP in 2016 to 8.9 percent in 2046: Net spending for Medicare amounts to 5.7 percent of GDP that year, and spending on Medicaid and CHIP, combined with outlays for subsidies for insurance purchased through the marketplaces and related spending, equals 3.1 percent.[40]

The extent of growth in federal spending on health care in coming years will depend on many factors, including demographic changes and the behavior of households, businesses, and state and local governments. (It will also depend on federal laws and could thus be influenced by changes in those laws, but CBO's extended baseline projections, which cover the 30-year period ending in 2046, are based on the assumption that current laws generally will not change.) The first 10 years of CBO's extended baseline projections of federal health care spending match its 10-year baseline projections.[41] For the remaining 20 years of the projection period, CBO uses a formulaic approach to project such spending because health care delivery and financing systems could evolve in a number of different ways in the long run. Specifically, the agency combined estimates of the number of people who will receive benefits from those government health care programs with fairly mechanical estimates of the growth of spending per beneficiary:

- The number of people receiving benefits from the major federal health care programs is, under current law, projected to increase during the next few decades. The most important factor contributing to that increase is the aging of the population—particularly of the large baby-boom generation—which will increase the number of people who receive benefits from Medicare by about one-third over the next decade.

38. Spending related to subsidies for insurance purchased through the marketplaces (formerly called exchanges in CBO's publications) includes spending for subsidies for insurance provided through the Basic Health Program, spending for the risk-adjustment and reinsurance programs that were established by the ACA to stabilize premiums for health insurance purchased by individuals and small employers, and spending to provide grants to states for establishing a marketplace.

39. Federal spending on those programs is mandatory; that is, it results from budget authority provided in laws other than appropriation acts. Federal discretionary spending on health care—that is, spending that is subject to annual appropriations—is not included in the budget projections described here; rather, it is included in projections for other noninterest spending (see Chapter 4). Such discretionary spending includes spending for health research and for health care provided by the Veterans Health Administration. Some mandatory spending on health care (for example, spending for health insurance for federal retirees) is included in other noninterest spending; that mandatory spending represents a very small share of the federal budget.

40. Net federal spending for Medicare refers to gross spending for Medicare minus offsetting receipts (mostly premiums paid by beneficiaries to the government), which are recorded in the budget as offsets to spending. Net federal spending for all major federal health care programs refers to gross spending for all those programs minus offsetting receipts for Medicare.

41. The 10-year baseline referred to in this chapter is the one issued in March 2016. See Congressional Budget Office, *Updated Budget Projections: 2016 to 2026* (March 2016), www.cbo.gov/publication/51384.

- The growth of spending per beneficiary relative to the growth of potential GDP per person in most of the major health care programs is generally projected to move from the average rate projected for the years 2024 through 2026 (with certain adjustments) to 1.0 percent in 2046, or about three-quarters of the average from 1985 to 2014. CBO projects that the growth rate will be lower in the future than it has been in the past for two reasons: The agency anticipates that people will limit their spending for health care to maintain their consumption of other goods and services, and it expects that state governments, private insurers, employers, and the Centers for Medicare & Medicaid Services (CMS) will respond to the pressures of rising health care costs by taking steps to slow spending growth.

Those projections are subject to considerable uncertainty (as Chapter 7 explains). One challenge, in particular, is assessing how much of the recent slowdown in the growth of health care spending can be attributed to temporary factors, such as the recession, and how much reflects more enduring developments. Several studies have concluded that the slowdown is not entirely the result of the weak economy, but they differ considerably in their assessment of other factors' importance.[42] CBO's own analysis found no direct link between the recession and slower growth in Medicare spending.[43] Accordingly, over the past several years, the agency has substantially reduced its 10-year and long-term projections of Medicare and Medicaid spending per beneficiary.

## Overview of the Major Federal Health Care Programs

Health care in the United States is financed by a combination of private and public sources, mostly through various forms of health insurance. Many people obtain insurance through government programs such as Medicare, Medicaid, and CHIP. In addition, most private health insurance coverage is subsidized through the federal tax code, which allows employers and employees to exclude their shares of the cost of employment-based coverage from income and payroll taxes, or through refundable tax credits for people who purchase coverage through the health insurance marketplaces established by the ACA.[44] This chapter focuses on federal spending (or outlays) for health insurance; the effects of tax provisions related to health insurance on federal revenues are included in the projections presented in Chapter 5.

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42. See, for example, Amitabh Chandra, Jonathan Holmes, and Jonathan Skinner, "Is This Time Different? The Slowdown in Health Care Spending," *Brookings Papers on Economic Activity* (Fall 2013), pp. 261–323, http://tinyurl.com/zt8w5v2.

43. Michael Levine and Melinda Buntin, *Why Has Growth in Spending for Fee-for-Service Medicare Slowed?* Working Paper 2013-06 (Congressional Budget Office, August 2013), www.cbo.gov/publication/44513.

44. CBO and the Joint Committee on Taxation estimate that the tax preferences that subsidize employment-based coverage for people under age 65 will total about $268 billion in 2016—a sum that is roughly equal to federal spending in that year for Medicaid benefits provided to noninstitutionalized people under age 65. For more information, see Congressional Budget Office, *Federal Subsidies for Health Insurance Coverage for People Under Age 65: 2016 to 2026* (March 2016), www.cbo.gov/publication/51385.

In calendar year 2016, on an average monthly basis, 57 million people will be enrolled in Medicare, 77 million will be enrolled in Medicaid, about 6 million will be enrolled in CHIP, and about 12 million will be covered by insurance purchased through the marketplaces, CBO estimates. Among people who are under age 65, most—about 155 million—will have private health insurance obtained through an employer, roughly 9 million will be covered by a nongroup policy purchased directly from an insurer, and about 27 million (or 10 percent of the under-65 population) will be uninsured, CBO and the staff of the Joint Committee on Taxation (JCT) estimate.[45]

In calendar year 2014, national spending for health care was an estimated $2.9 trillion (see Figure 3-1).[46] Of that amount, 52 percent was initially financed by private sources—34 percent came from private health insurers; 11 percent, from consumers in the form of out-of-pocket spending; and 6 percent, from other sources of private funds, such as philanthropy.[47] The remaining 48 percent of national spending on health care was public: Gross federal spending for Medicare accounted for 22 percent of the total; federal and state spending for Medicaid and CHIP, for 18 percent; and spending on various other programs (including those run by state and local governments' health departments, by the Department of Veterans Affairs, and by the Department of Defense), for 8 percent.

### Medicare

In 2016, according to CBO's estimates, Medicare will provide health insurance to about 57 million people who are at least 65 years old, are disabled, or have end-stage renal disease. Most people become eligible for Medicare when they reach 65; about

45. See Congressional Budget Office, *Federal Subsidies for Health Insurance Coverage for People Under Age 65: 2016 to 2026* (March 2016), www.cbo.gov/publication/51385. The sum of those estimates exceeds CBO's estimate of the total population because some people will have multiple sources of coverage and CBO has not assigned a primary source to such people. For example, currently, about 8.5 million people with Medicaid coverage are also covered by Medicare, which is their primary source of coverage. For information about people eligible for benefits through both programs, see Congressional Budget Office, *Dual-Eligible Beneficiaries of Medicare and Medicaid: Characteristics, Health Care Spending, and Evolving Policies* (June 2013), www.cbo.gov/publication/44308.

46. This report defines national spending for health care as the health consumption expenditures in the national health expenditure accounts maintained by the Centers for Medicare & Medicaid Services. That definition excludes spending on medical research, structures, and equipment but includes administrative costs for insurers and all spending on medical goods and services. With spending for those excluded categories added to the total, national spending for health care was $3.0 trillion in calendar year 2014. For more information, see Anne B. Martin and others, "National Health Spending in 2014: Faster Growth Driven by Coverage Expansion and Prescription Drug Spending," *Health Affairs*, vol. 35, no. 1 (January 2016), pp. 150–160, http://dx.doi.org/10.1377/hlthaff.2015.1194.

47. For the purposes of that analysis, out-of-pocket payments include payments made to satisfy cost-sharing requirements for services covered by insurance as well as payments for services not covered by insurance. They do not, however, include the premiums that people pay for health insurance—because premiums fund the payments that insurers provide, which have already been accounted for.

85 percent of enrollees are 65 or over. Disabled people generally become eligible 24 months after they qualify for benefits under Social Security's Disability Insurance program.[48]

The Medicare program provides a specified set of benefits. Hospital Insurance (HI), or Medicare Part A, covers inpatient hospital services, care provided in skilled nursing facilities, home health care, and hospice care. Part B mainly covers services provided by physicians, other practitioners, and hospitals' outpatient departments. Part D provides a prescription drug benefit, which is administered by private insurance plans.

Most enrollees in Medicare are in the traditional fee-for-service program, in which the federal government pays for covered services under Parts A and B directly, but about 30 percent have opted for Part C of the program, known as Medicare Advantage, in which they receive Medicare benefits through a private health insurance plan. In 2015, gross spending for Medicare was $634 billion, and net spending (that is, gross spending minus offsetting receipts, which mostly consist of beneficiaries' premium payments to the government) was $540 billion.

Parts A, B, and D of the program are financed in different ways. Outlays for Part A are financed by dedicated sources of income credited to a fund called the Hospital Insurance Trust Fund. The primary source is a payroll tax (amounting to 2.9 percent of all earnings); the other sources are a 0.9 percent tax on earnings over $200,000 (or $250,000 for married couples) and a portion of the federal income taxes paid on Social Security benefits.[49] For Part B, premiums paid by beneficiaries cover just over one-quarter of outlays, and the government's general fund covers the rest. Enrollees' premiums under Part D are set to cover about one-quarter of the cost of the basic prescription drug benefit (although many low-income enrollees pay no premiums), and the general fund covers most of the rest. Federal payments to private insurance plans under Part C comprise a blend of funds drawn from Parts A, B, and D. All told, in 2015, about 40 percent of gross federal spending on Medicare was financed by the HI trust fund's dedicated taxes, about 15 percent came from offsetting receipts, and the rest came from other sources (mostly transfers from the general fund), CBO estimates.

In the fee-for-service portion of Medicare, beneficiaries' cost-sharing obligations (that is, what they are obliged to pay out of pocket) vary widely by type of service, and the program does not set an annual limit on the health care costs for which beneficiaries are responsible. However, the great majority of beneficiaries—about 84 percent of

48. People with amyotrophic lateral sclerosis (also known as Lou Gehrig's disease) and those with end-stage renal disease are exceptions: Those with Lou Gehrig's disease become eligible when their Disability Insurance benefits start; those with end-stage renal disease usually become eligible for Medicare on the first day of the fourth month of dialysis treatment.

49. The thresholds for the 0.9 percent tax are not indexed for inflation. Certain people are subject to an additional 3.8 percent tax on unearned income that is officially labeled a Medicare tax even though the revenues are credited to the government's general fund rather than to the HI trust fund.

them in 2011, according to one recent study—have supplemental insurance that covers many or all of the program's cost-sharing requirements.[50] The most common sources of supplemental coverage are plans for retirees offered by former employers, Medicare Advantage plans, individually purchased policies (called medigap insurance), and Medicaid.

The Medicare program includes a number of incentives and mechanisms that could reduce spending growth in the program over time:

- The program's premiums and cost sharing will consume a growing share of beneficiaries' income—because the growth of health care spending in general is projected to outpace the growth of income—and that will constrain demand for some Medicare services.
- The rules governing the annual updates that are made to Medicare's payment rates for health care services will generally cause those updates to be smaller than the increases in the prices of inputs (namely, labor, supplies, capital equipment, and facilities) used to deliver care.
- Changes being made in the structure of Medicare's payments to providers, such as financial incentives to reduce hospital-acquired infections and readmissions, may help hold down federal spending.
- The Center for Medicare & Medicaid Innovation, an arm of CMS, is testing ways to modify rules and payment methods that could reduce costs without impairing the quality of health care; the changes that prove effective may be expanded by the Secretary of Health and Human Services (HHS).
- If the rate of growth in spending per beneficiary is projected to exceed specified targets in certain years, an Independent Payment Advisory Board is required to submit a package of changes in program rules that would reduce Medicare spending in those years, and the Secretary of HHS is required to implement those changes.[51]

### Medicaid

A joint federal-state program, Medicaid pays for health care services, mostly for low-income people. In any given month in 2016, an average of about 77 million people will be enrolled in Medicaid, CBO estimates. Nearly half of Medicaid's current enrollees are children in low-income families, slightly more than one-third are adults

50. Medicare Payment Advisory Commission, *A Data Book: Health Care Spending and the Medicare Program* (June 2015), p. 23, http://go.usa.gov/xqRnk (PDF, 1.7 MB).

51. If the board failed to submit a package of program changes that would achieve the target savings, the Secretary would be required to develop and implement such changes.

under age 65 who are not disabled, and the remaining one-fifth or so are people who are at least 65 or who are disabled. Expenses for beneficiaries who are 65 or older or who have disabilities, many of whom require long-term care, tend to be higher than those for other beneficiaries. In 2015, almost one-quarter of federal spending for Medicaid benefits was for long-term services and supports, a category that includes institutional care provided in nursing homes and certain other facilities as well as care provided in a person's home or in the community. In that year, people age 65 or older and people with disabilities accounted for about half of federal spending for Medicaid benefits.[52]

States administer their Medicaid programs under federal guidelines that mandate a minimum set of services that must be provided to certain categories of low-income people. The required services include inpatient and outpatient hospital services, services provided by physicians and laboratories, comprehensive and preventive health care services for children, nursing home and home health care, and transportation. The required eligibility categories include families that would have met the financial requirements of the Aid to Families With Dependent Children program when it existed, people age 65 or over and disabled people who qualify for the Supplemental Security Income program, and children and pregnant women in families with income below 138 percent of the federal poverty guidelines (also known as the federal poverty level, or FPL).[53]

In addition, under an option created by the ACA, states are permitted but not required to expand eligibility for Medicaid to adults under age 65 whose income is equal to or less than 138 percent of the FPL.[54] By the end of calendar year 2015, 30 states and the District of Columbia had expanded their programs; about half of the people who meet the new eligibility criteria reside in those states, CBO estimates.[55]

As long as they meet federal requirements, state governments have substantial flexibility to determine eligibility, benefits, and payments to providers under Medicaid. They may

52. Congressional Budget Office, "Baseline Projections for Selected Programs: Medicaid" (March 2016), www.cbo.gov/publication/51301.

53. In 1996, the Aid to Families With Dependent Children (AFDC) program, which provided cash assistance to low-income families, was replaced by the Temporary Assistance for Needy Families (TANF) program. Under AFDC rules, recipients generally received Medicaid benefits automatically. When TANF replaced AFDC, TANF recipients did not automatically qualify for Medicaid, but the Congress established a new category under Medicaid whose eligibility criteria matched the former AFDC criteria. The FPL is currently $24,300 for a family of four. See Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, "Poverty Guidelines" (January 2016), https://aspe.hhs.gov/poverty-guidelines.

54. The statute specifies a threshold of 133 percent of the FPL, but an automatic deduction to income equal to 5 percent of the FPL effectively makes the threshold 138 percent of the FPL.

55. Congressional Budget Office, *Federal Subsidies for Health Insurance Coverage for People Under Age 65: 2016 to 2026* (March 2016), www.cbo.gov/publication/51385.

choose to make additional groups of people eligible (such as people who have income above the usual eligibility thresholds but whose medical expenses exceed a certain portion of their income) or to provide additional benefits (such as coverage for prescription drugs and dental services). Moreover, many states seek and receive waivers of federal statutory limitations that allow them to provide benefits and cover groups that would otherwise be excluded.

The federal government's share of spending for Medicaid benefits varies by state. That share averaged about 57 percent for many years, but it has increased in recent years. For those enrollees who were made eligible by the ACA, the federal government will pay all costs through 2016, a slightly declining share of costs each year from 2017 to 2019, and 90 percent of costs in 2020 and beyond.

In 2015, federal spending for Medicaid amounted to $350 billion. Of that amount, $319 billion went to benefits for enrollees, and the remainder covered payments to hospitals that served a disproportionate share of Medicaid patients and uninsured, low-income patients; costs for the Vaccines for Children program; and administrative expenses.[56] States spent $205 billion on Medicaid that year, CBO estimates.[57]

### Children's Health Insurance Program

CHIP, a much smaller joint federal-state program, provides health insurance coverage for children in families whose income, though modest, is too high for them to qualify for Medicaid. States have discretion to determine the income threshold for eligibility, but it generally falls between 138 percent and 300 percent of the FPL. Nearly 6 million people will be enrolled in the program, on average, during 2016. Like Medicaid, CHIP is administered by the states within broad federal guidelines. Unlike Medicaid, however, CHIP has a fixed nationwide limit on federal spending. In 2015, federal spending on CHIP was $9.2 billion.[58] The federal share of CHIP spending varies among the states but usually averages about 70 percent.[59]

56. The Vaccines for Children program helps provide vaccines to those children under age 19 whose parents or guardians may not be able to afford them. The eligible group includes people who are Medicaid-eligible or uninsured.

57. CBO's calculations rely on unpublished data from states' filings of Form CMS-64 for fiscal year 2015. States use that form to report their quarterly spending for Medicaid benefits and administrative activities to CMS.

58. Congressional Budget Office, "Baseline Projections for Selected Programs: Children's Health Insurance Program" (March 2016), www.cbo.gov/publication/51296.

59. For fiscal years 2016 through 2019, the federal share of CHIP spending is expected to average 93 percent, reflecting a temporary 23 percentage-point increase in the federal share of spending for that program.

### Subsidies for Insurance Purchased Through the Health Insurance Marketplaces

Many people can buy subsidized insurance through the marketplaces operated by the federal government, state governments, or partnerships between federal and state governments. There are two kinds of subsidies: tax credits to help pay for premiums and cost-sharing subsidies to reduce out-of-pocket expenses, such as deductibles and copayments. The premium tax credits are refundable: A large portion is paid to taxpayers and categorized as outlays, and a smaller portion reduces taxes paid, which in turn reduces income tax revenues. To qualify for the premium tax credits, a person generally must have household income between 100 percent and 400 percent of the FPL and must not have access to certain other sources of health insurance coverage, including coverage through an employer that meets the law's definition of affordable and coverage from a government program, such as Medicare or Medicaid. To qualify for the cost-sharing subsidies, a person must meet the requirements for the premium tax credits, enroll in what the law defines as a silver plan (which covers about 70 percent of the cost of covered benefits), and have household income below 250 percent of the FPL.

The size of a person's premium tax credit is the difference between the cost of the second-lowest-cost silver plan available to him or her and a specified percentage of his or her household income. For example, for calendar year 2016, the tax credit was set so that people with income between 100 percent and 133 percent of the FPL would pay 2.03 percent of their income to enroll in the second-lowest-cost silver plan, while people with higher income would pay a larger share of their income, up to 9.66 percent for those with income between 300 percent and 400 percent of the FPL. If a person's premium for such a plan is less than the applicable percentage of income, that person receives no tax credit. The amounts that enrollees must pay are indexed so that the subsidies cover roughly the same portion of the premiums over time. After calendar year 2018, however, an additional indexing factor may apply in some years; if that factor applied, the share of the premiums that enrollees paid would increase, and the share of the premiums that the subsidies covered would decline.[60]

Spending related to subsidies for insurance purchased through the marketplaces consists of outlays for the risk-adjustment and reinsurance programs.[61] Those programs were established under the ACA to stabilize premiums in the nongroup and small-group insurance markets by reducing the likelihood that particular health insurers

60. The additional indexing factor will apply in any calendar year after 2018 in which the total costs of the subsidies for health insurance purchased through the marketplaces exceed a specified percentage of GDP. CBO expects that the indexing factor may apply in some years, although the uncertainty of projections of both the subsidies and GDP make the timing unclear. For an explanation of the indexing factor, see Congressional Budget Office, *Additional Information About CBO's Baseline Projections of Federal Subsidies for Health Insurance Provided Through Exchanges* (May 2011), www.cbo.gov/publication/41464.

61. Between 2016 and 2018, spending related to subsidies also includes a small amount of outlays for grants to states for establishing the marketplaces.

would bear especially high costs for having a disproportionate share of less healthy enrollees. The programs make payments to insurers that reflect differences in the health status of each insurer's enrollees and in the resulting costs to insurers. Payments for the risk-adjustment program are financed by collections from insurers with healthier enrollees, and those for reinsurance are funded by an assessment on a broad range of insurers. Those payments are recorded in the budget as mandatory outlays, and the collections are recorded as revenues.

CBO and JCT estimate that during calendar year 2016, an average of about 12 million people will be covered by insurance purchased through the marketplaces each month and that about 10 million of them, on average, will receive subsidies. An additional 1 million people are estimated to participate in the Basic Health Program, which offers subsidies to certain low-income people.[62] In fiscal year 2015, outlays for those subsidies and related spending were about $38 billion, CBO and JCT estimate.[63] (The agencies estimate that the subsidies and related programs also added between $8 billion and $9 billion to revenues that year. That effect consists of an increase in revenues of about $11 billion from payments collected under the risk-adjustment and reinsurance programs, offset in part by a $2 billion to $3 billion reduction in taxes paid resulting from premium subsidies. Those effects on revenues are included in the projections discussed in Chapter 5.)

## CBO's Method for Making Long-Term Projections of Federal Health Care Spending

CBO's extended baseline projections of federal spending on the major health care programs, like the rest of the agency's extended baseline projections, generally reflect the provisions of current law. The first 10 years of projections in the extended baseline match the agency's 10-year baseline projections, which are based on a detailed analysis of the major health care programs. Beyond the coming decade, however, projecting federal spending on health care becomes increasingly difficult because of the considerable uncertainties involved. A wide range of changes could occur—in people's health, in the sources and extent of their insurance coverage, and in the delivery of medical care—that are almost impossible to predict but that could nevertheless have a significant effect on federal health care spending.

Therefore, for the projections beyond 2026, CBO has adopted a formulaic approach—one that combines estimates of the number of people who will receive benefits from

62. The Basic Health Program, which was created under the ACA, allows states to establish a coverage program primarily for people with income between 138 and 200 percent of the FPL. To subsidize that coverage, the federal government provides states with funding equal to 95 percent of the subsidies for which those people would have been eligible if they had instead purchased coverage through a marketplace.

63. See Congressional Budget Office, *Updated Budget Projections: 2016 to 2026* (March 2016), Table 4, www.cbo.gov/publication/51384.

government health care programs with fairly mechanical projections of growth in spending per beneficiary (adjusted to account for demographic changes in the beneficiaries of each program). CBO has estimated such growth by combining projected growth in potential GDP per person and projected excess cost growth for the program in question. (From 2017 to 2026, potential GDP per person is projected to grow at an average rate of about 3.2 percent per year; from 2017 to 2046, the average growth rate is projected to be about 3.5 percent.)

Excess cost growth is the growth rate of health care spending per person (after the effects of demographic changes are removed) relative to the growth rate of potential GDP per person.[64] The *excess* in excess cost growth is not intended to imply that growth in health care spending per person is necessarily excessive or undesirable; the term is simply used to describe the extent to which the growth in such spending *exceeds* the growth in potential output per person. According to CBO's calculations, average rates of excess cost growth for various parts of the health care system have ranged from 0.6 percent to 1.9 percent over different periods of the past several decades (see Table 3-1).[65] Although such rates are quite variable from year to year, they have generally declined. Excess cost growth has been especially low, on average, during two periods—the mid-to-late 1990s and from the mid-2000s to 2014 (the most recent year for which such data are available).

In CBO's extended baseline, the projected rates of excess cost growth for Medicare, Medicaid, and private health insurance premiums slowly converge after 2026, from the rates derived from the detailed 10-year baseline projections toward a rate of 1.0 percent—which is CBO's projection of the rate of excess cost growth for the health care sector 30 years from now. All told, annual rates of excess cost growth from 2017 to 2046 are projected to average 0.9 percent for Medicare, 1.0 percent for Medicaid, and 1.6 percent for private health insurance premiums.

64. CBO uses potential GDP rather than actual GDP in its estimate of excess cost growth to limit the effect of cyclical changes in the economy on its estimate.

65. The historical rates of excess cost growth are a weighted average of annual rates: Twice as much weight was placed on the latest year as on the earliest year. In calculating excess cost growth for Medicare, CBO made adjustments to account for changes in the age distribution of beneficiaries. In calculating excess cost growth for Medicaid, CBO adjusted the rates to account for changes in the program's case mix—that is, the proportions of types of beneficiaries, including children, people at least 65 years old, people with disabilities, and adults who did not fall into any of those categories—rather than for changes in the age distribution of beneficiaries. The rates of excess cost growth that have been adjusted to account for demographic changes reflect changes in spending per person rather than changes in the number or composition of beneficiaries. The introduction of Medicare's Part D drug benefit in 2006 resulted in a onetime shift in some spending from Medicaid to Medicare; to adjust for that shift, CBO assumed that excess cost growth in 2006 for both Medicare and Medicaid was equal to the average of excess cost growth in the two programs for that year.

### Excess Cost Growth During the Next Decade

For 2017 through 2026, the projected rates of excess cost growth for Medicare, Medicaid, and private health insurance premiums in CBO's extended baseline are derived from CBO's 10-year baseline (see Figure 3-2). Those rates are as follows:

- For Medicare, the average annual rate of excess cost growth implicit in CBO's baseline projections is about 0.7 percent, meaning that Medicare spending per beneficiary (adjusted for demographic changes) is projected to grow faster than potential GDP per person over the next 10 years.[66] CBO projects that rate of growth, which is below the average rate since 1985, in part because the agency anticipates that the use of Medicare services will continue to grow at a slow rate, as it has in recent years. In addition, under current law many of the annual updates to Medicare's payment rates will be smaller than they have been in the past. Consequently, excess cost growth in Medicare is projected to be slow during the next few years and then to rise to about 0.9 percent per year by the end of the 10-year period.

- For Medicaid, the average annual rate of excess cost growth implicit in CBO's baseline projections of the federal share of such spending is 1.4 percent, which is above the average rate from 1985 to 2014.[67] That rate is projected to gradually slow to about 0.7 percent by the end of the 10-year projection period. The higher rate of excess cost growth over the next few years can largely be explained by CBO's expectation that some states will expand coverage to include people with income of up to 138 percent of the FPL. That expansion would change the average cost per beneficiary because average spending on new enrollees who are made eligible by

66. Medicare is typically scheduled to make certain payments under Parts C and D on the first of the month. If the day on which payments are due falls on a weekend or holiday, Medicare accelerates those payments to the last business day of the previous month. As a result, Medicare makes 11 or 13, rather than the normal 12, payments in certain years. For example, because October 1, 2023, falls on a Sunday, Medicare will issue payments due on that day on September 29, 2023, meaning that Medicare is scheduled to make 11 monthly payments in fiscal year 2024. CBO made adjustments to the Medicare spending amounts to account for such shifts in the timing of payments. In addition, in calculating the rate of excess cost growth, the effect of sequestration was removed because that cancellation of funding will not affect spending after 2025. In all subsequent discussion, the annual rates of excess cost growth for Medicare between 2017 and 2026 reflect those adjustments.

67. Medicaid spending amounts were adjusted to remove the effect of changes in the federal share of such spending. The number of Medicaid enrollees was adjusted to account for the projected faster growth in the number of beneficiaries known as partial duals than in the number of other types of Medicaid beneficiaries in the 10-year baseline. (Partial duals are Medicare beneficiaries who qualify to have Medicaid pay some of the expenses that they incur under Medicare, such as premiums; Medicaid does not, however, cover additional health care services they might receive, such as long-term services and supports.) That adjustment is necessary because the extended baseline reflects the expectation that the rate of growth in the number of partial duals will be similar to the growth rates of other types of Medicaid beneficiaries after 2026. In all subsequent discussion, the annual rates of excess cost growth for Medicaid between 2017 and 2026 reflect those adjustments.

such an expansion (mostly adults who are not disabled) tends to be higher than average spending on adults who would have been eligible otherwise. (Although measures of excess cost growth reflect an attempt to adjust for policy changes and demographic changes, accounting for the effects of Medicaid expansions can be difficult.) CBO expects that the rate of excess cost growth will moderate later in the decade as the number of Medicaid enrollees who were made eligible by the ACA stabilizes.

- For private health insurance premiums, the average annual rate of excess cost growth implicit in the agency's baseline projections is about 2 percent by the end of the 10-year projection period. (That rate is similar to the average from 1988 to 2014.) CBO uses that average rate to project premiums, a key input in determining spending for the subsidies for insurance purchased through the marketplaces. In addition, the agency's baseline projections of such spending reflect the likelihood that the share of premiums covered by the subsidies will decline over time as a result of the additional indexing factor mentioned above.

### Excess Cost Growth After the Next Decade

Underlying CBO's projections of federal health care spending for 2027 and later years is the assumption that the rates of excess cost growth for Medicare, Medicaid, and private health insurance premiums, all of which are projected to be different in 2027, converge over the subsequent 20 years. In 2027, the rate of excess cost growth specific to each of those three categories equals the average of the specific rates projected for 2024 through 2026. For Medicare, that average rate is 0.9 percent; for Medicaid, it is 0.7 percent; and for private health insurance premiums, it is about 2 percent. After 2027, the excess cost growth rate of each of those three categories moves linearly, by the same fraction of a percentage point each year, from that category-specific rate to a rate of 1.0 percent in 2046 (see Figure 3-2).[68]

CBO projects that the excess cost growth rates for Medicare, Medicaid, and private health insurance premiums will all be the same in 30 years. Because the health care system is integrated to a significant degree, spending growth in all 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. CBO does not have a basis for projecting that the rates of excess cost growth for those three categories would differ in the long term. The agency used a value for excess cost growth three decades from now that is roughly three-quarters of the overall 30-year historical average of 1.4 percent. In determining that overall long-term growth rate, CBO considered each category's growth rate over the past 30 years, recently, and as projected at the end of the coming decade, as well as the flexibility within each category to restrain costs.

68. The approach that CBO used to project long-term excess cost growth for Medicare, Medicaid, and private health insurance premiums is simpler this year than the method that the agency used last year. The change in method is described in Appendix B.

For Medicare, excess cost growth from 1985 to 2014 averaged 1.4 percent, but such growth was slower in recent years, averaging about 0.2 percent from 2008 to 2014. The reasons for that slowdown are not well understood.[69] Nevertheless, the slowdown has been substantial and has continued for several years. CBO has partially incorporated that slower growth into its projections for the next 10 years. In the second and third decades of the extended baseline, excess cost growth is projected to be between 0.9 percent and 1.0 percent, slower than the historical average. Although not a factor in the recent slowdown, one reason why that growth will probably remain below historical rates beyond the next 10 years is that the program now includes a number of institutions, incentives, and mechanisms, such as the Center for Medicare & Medicaid Innovation and the Independent Payment Advisory Board, that could reduce spending growth in the program over time.

For Medicaid, the rate of excess cost growth is projected to be 0.7 percent in 2027 and to rise over the subsequent two decades. In 2046, the rate is projected to gradually return to its 1985–2014 average of 1.0 percent and to match the rates for Medicare and private health insurance premiums. That trajectory of excess cost growth reflects competing pressures that are expected to affect the Medicaid program—gradually boosting the rate between 2027 and 2046, though holding it below the projected rates for Medicare and private health insurance premiums. On the one hand, states are likely to face pressure—stemming from physicians' practice patterns, new technology, and other factors in the broader health care system—to increase payments to health care providers so that they continue to treat Medicaid beneficiaries. On the other hand, as health care costs rise, states are also expected to face pressure to slow the growth of spending for the program through actions—such as constraining payment rates for providers and managed care plans or limiting the optional services that Medicaid covers—that would reduce both state and federal expenditures.

For health insurance premiums in the private sector, the rate of excess cost growth is projected to decline from 2027 to 2046 and to be lower in 2046 than it has averaged historically. (By itself, that rate does not determine projections for subsidies for health insurance purchased through the marketplaces, but it is a key input into them.) Excess cost growth for private health insurance premiums is projected to decline in the long term because CBO expects that pressure to restrain health care costs will mount as

69. The rate of growth in Medicare spending per beneficiary for the elderly fell by nearly one-half from the early 2000s to the end of that decade. In studying that change, CBO could not identify the factors that caused most of the difference and found no evidence directly linking the declining rate of growth to the financial crisis and economic downturn. According to CBO's analysis, nearly one-fifth of that drop was attributable to the following three developments, which together slowed growth in spending for Medicare services: changes in the age and health status of beneficiaries, growth in the proportion of beneficiaries who enrolled only in Part A, and growth in the use of prescription drugs. About 6 percent of the drop stemmed from slower growth in average payment rates, and the remainder was not explained by any of the factors that CBO investigated. See Michael Levine and Melinda Buntin, *Why Has Growth in Spending for Fee-for-Service Medicare Slowed?* Working Paper 2013-06 (Congressional Budget Office, August 2013), www.cbo.gov/publication/44513.

those costs increase and become a greater and greater share of economic activity. When its share of GDP increases, health care spending absorbs a growing share of people's income, forcing them to consume fewer other goods and services, which in turn increases pressure to slow its growth. In the private sector, employers could intensify their efforts to reduce the costs of the insurance plans that they offered, and workers might pressure their employers to offer less expensive plans as health insurance premiums rose. Private insurers could also work to reduce that growth; they have more scope than the federal and state governments have to do so because the starting point of excess cost growth for private health insurance premiums is higher than excess cost growth for Medicare and Medicaid.

### How Spending Is Projected in the Long Term

To generate estimates of total spending for Medicare and Medicaid in the long term, CBO used the projections of program-specific excess cost growth and the number of beneficiaries. For Medicare, CBO estimates that the number of beneficiaries would grow with the size of the population age 65 or over and with the number of recipients of Social Security's Disability Insurance benefits.[70] Such growth is projected to average 1.7 percent per year between 2017 and 2046.

For Medicaid, what decisions states will make about Medicaid eligibility and covered benefits over even the next 10 years is quite uncertain, and that uncertainty grows with time; accordingly, CBO adopted a formulaic approach to generate the number of Medicaid beneficiaries each year after the next decade. That approach takes into account population growth, increasing earnings (which will reduce the number of eligible beneficiaries), and prospective actions by states.[71] (In particular, the projections incorporate the assumption that states would make changes over time in their Medicaid programs that offset roughly half of the effect of earnings growth on eligibility.) Overall, the number of enrollees is projected to remain roughly the same after 2026.

For CHIP, as well as for subsidies for health insurance purchased through the marketplaces and related spending, outlays are projected differently. Under current law, funding for CHIP expires after September 2017. Following statutory guidelines, CBO's baseline spending projections reflect the assumption that funding for the program will amount to $5.7 billion each year from 2018 through 2026.[72] For years after 2026, spending for the program, measured as a share of GDP, is assumed to remain at the 2026 level.

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70. For more information about how CBO projects the number of beneficiaries of Social Security's Disability Insurance program, see Appendix A of this report as well as Congressional Budget Office, *CBO's Long-Term Model: An Overview* (June 2009), www.cbo.gov/publication/20807.

71. For additional discussion, see Congressional Budget Office, *The 2015 Long-Term Budget Outlook* (June 2015), Appendix A, www.cbo.gov/publication/50250.

72. Congressional Budget Office, "Baseline Projections for Selected Programs: Children's Health Insurance Program" (March 2016), www.cbo.gov/publication/51296.

CBO uses two approaches to project the costs of subsidies after the initial 10-year projection period: one for the first year of the long-term projection period and another for the end of that period. For the years in between, CBO uses a blend of those two approaches. For the first year of the projection period, subsidies are projected to grow at the average rate projected for the end of the 2017–2026 period; the agency makes adjustments to account for the increased probability that the additional indexing factor described above will be in effect. For the end of the projection period, the projections of subsidies are based on the rate of excess cost growth for private health insurance premiums and account for the effects of the additional indexing factor and of growth in real (inflation-adjusted) income. The additional indexing factor would limit the growth of the average subsidy, thereby moderating the growth of total spending on subsidies. Growth in real income would further moderate such spending: Although some people who had previously been eligible for Medicaid would become eligible for subsidies as their income increased, other people would move into higher income brackets and become eligible for less generous subsidies or become ineligible for subsidies altogether. (As a share of GDP, other spending related to those subsidies is assumed to remain at the 2026 level.)

## Long-Term Projections of Spending for the Major Health Care Programs

In CBO's extended baseline projections, which generally reflect current law, federal spending on the major health care programs increases significantly as a percentage of the economy over the next 30 years.

### Projected Spending

In 2016, federal spending for the major health care programs will amount to 5.5 percent of GDP, CBO estimates: Medicare spending (net of offsetting receipts) will equal 3.2 percent of GDP and federal spending on Medicaid and CHIP, combined with outlays for the subsidies for health insurance purchased through the marketplaces and related spending, will equal 2.3 percent. In CBO's extended baseline, federal spending for those programs rises to 8.9 percent of GDP in 2046, about 60 percent greater than it is estimated to be in 2016; net Medicare spending accounts for 5.7 percent of GDP, and spending on Medicaid and CHIP, combined with outlays for the marketplace subsidies and related spending, accounts for 3.1 percent (see Figure 3-3).[73] Growth of Medicare spending will account for about three-quarters of the increase in federal spending for the major health care programs as a share of GDP.

73. Gross Medicare spending is projected to increase from 3.8 percent of GDP in 2016 to 7.0 percent in 2046. In all of the projections, the outlays for subsidies for insurance purchased through the marketplaces and related spending are presented in combination with outlays for Medicaid and CHIP; they all constitute federal subsidies for health insurance for low- and moderate-income households.

**Why Projected Spending Grows.** The aging of the population and the expectation that health care costs per beneficiary—for beneficiaries of all ages—will continue to grow faster than potential GDP per capita are the two key factors causing federal spending for the major health care programs to rise in CBO's projections. Those factors contribute to the rise in roughly equal proportions over the next 30 years (see Figure 1-5). Without changes in the age distribution of the population and without any excess cost growth, CBO projects that such spending would stay roughly constant as a share of GDP over time.

In addition to adding to the number of Medicare beneficiaries, the aging of the population is projected to increase spending for the program because the beneficiaries will be older, on average, and older beneficiaries have higher average spending. Among the 65-or-older population, both the portion older than 75 and the portion older than 85 will increase over the next 30 years (see Figure 3-4). Medicare spending has traditionally been higher, on average, for older people within the 65-or-older group. For example, in calendar year 2012, spending in Parts A and B of the fee-for-service portion of Medicare averaged about $5,000 for 66-year-olds, $8,500 for 75-year-olds, and $12,500 for 85-year-olds.[74] CBO expects that pattern to persist.

**Distribution of Spending Among Types of Beneficiaries.** The factors that underlie the projected rise in total federal spending for the major health care programs also affect the amounts of spending that would subsidize care for different types of beneficiaries. Although federal support for health care for people under age 65 has expanded, only about one-fifth of federal spending for the major health care programs in 2026 would, under current law, finance care for able-bodied people under age 65, CBO projects; less than one-fifth would go toward care for people under age 65 who were blind or otherwise disabled, and about three-fifths would go toward care for people who were at least 65 years old. After 2026, according to CBO's estimates, the share of federal spending for the major health care programs that financed care for people age 65 or older would continue to rise because of the aging of the population.

**Uncertainty.** All long-term economic and demographic developments are uncertain, but federal spending on health care programs may be particularly so because both the number of enrollees in those programs and average spending for those enrollees are uncertain. Federal health care programs provide benefits to different socioeconomic groups, so changes in population demographics and economic growth could lead to changes in the number of people eligible for those programs. Uncertainty about those demographic and economic factors, combined with uncertainty about people's

74. Calculating average spending for 65-year-old beneficiaries is not helpful for this comparison because most beneficiaries are enrolled in Medicare for only part of the calendar year in which they turn 65. The amounts reported here include spending under Parts A and B of Medicare averaged among all beneficiaries of a given age in the traditional fee-for-service program who were enrolled in Part A, Part B, or both. The proportion of beneficiaries enrolled in both Parts A and B increases as beneficiaries age.

willingness to enroll in those programs, makes it difficult to project the number of enrollees.

Average spending for those enrollees is also very uncertain. Pharmaceuticals, medical procedures and technology, and the delivery of care all continue to evolve, and average spending for any of the federal health care programs could prove to be much higher or lower than CBO projects—especially as the projection period lengthens. Compounding the uncertainty stemming from those factors are the uncertain responses of beneficiaries and providers to changes in health insurance design, payment arrangements, and federal and state policies, as well as uncertainty about how broader changes in the economy may affect the health care sector. Chapter 7 shows how CBO's projections would differ if the growth of costs per beneficiary in Medicare and Medicaid proved significantly higher or lower than the agency projects in the extended baseline.

Also uncertain is the extent of support from federal spending that beneficiaries of federal health care programs will receive in the future. For example, scheduled updates to Medicare's payment rates will generally be smaller in the future than increases in the prices of inputs, which could cause changes in providers' behavior. If health care providers cannot increase their productivity over time—that is, if they cannot provide the same quantity and quality of treatments and procedures with fewer or less costly inputs—they would respond in other ways, such as by reducing the quality of care, reducing Medicare beneficiaries' access to care (which might reduce spending), or trying to increase revenues by other means (which might increase spending). Providers that are not able to adjust to the constraints imposed by the payment rate updates might merge with more profitable providers or go out of business. If access to providers under the traditional fee-for-service program declined, more enrollees might shift into Medicare Advantage plans, which are not bound by the updates to payment rates that apply to traditional Medicare. Medicare Advantage plans might be able to offer better access to care than the fee-for-service program if they increased the rates that they paid providers, but doing so would probably require enrollees in such plans to pay higher premiums. (Because federal payments to those plans are based largely on costs in the fee-for-service program, it is unclear whether such a shift—if it occurred—would substantially alter the trajectory of Medicare spending.)

### Projected Financing

Spending on the federal government's major health care programs is financed in various ways. For Medicaid and CHIP, states and the federal government share in the financing. The federal share of spending on those programs is funded entirely from the government's general fund, as are the subsidies for insurance purchased through the marketplaces and related spending.

In contrast, Medicare is funded mostly by a mix of dedicated taxes, beneficiaries' premiums, and money from the government's general fund. The relative magnitudes of

those sources of funding have changed significantly over time. As a result, the share of gross Medicare spending financed by dedicated taxes has declined from 67 percent in 2000 to an estimated 39 percent in 2016 (see Figure 3-5). The increase in the share of spending covered by sources other than dedicated taxes is largely the result of an increase in the share of benefits provided by the parts of the program that are financed mainly by premiums and money from the general fund—Part B and, since 2006, Part D.[75] Those shifts are expected to continue: In CBO's extended baseline, receipts from dedicated Medicare taxes provide only 21 percent of gross federal spending for Medicare in 2046, and beneficiaries' premiums and other offsetting receipts account for 18 percent, leaving 62 percent financed by other sources.

Benefits under Part A of Medicare are paid from the Hospital Insurance Trust Fund, which is credited with receipts largely from payroll taxes and from other revenues. A commonly used measure of the sustainability of Part A of Medicare is the timing of the projected exhaustion of the HI trust fund. According to CBO's baseline projections, under current law, the balance of the HI trust fund would increase from $196 billion at the end of fiscal year 2015 to $204 billion at the end of fiscal year 2019. Starting in 2020, CBO estimates, expenditures would outstrip income. The trust fund is projected to become exhausted in 2026.[76]

Once the HI trust fund was exhausted, total payments to health plans and providers for services covered under Part A of Medicare would be limited to the amount of revenues subsequently credited to that trust fund. If that occurred, beneficiaries' access to health care services covered under Part A almost certainly would be reduced as well. Despite that, CBO's projections reflect the statutory requirement that the agency incorporate into its baseline an assumption that full benefits will continue to be paid as scheduled under current law regardless of the status of a trust fund.[77]

75. In 2000, Part B accounted for 41 percent of gross Medicare spending; in 2016, Parts B and D will account for 57 percent of gross Medicare spending, CBO estimates. In 2016, the percentage of benefits covered by premiums and other offsetting receipts would be higher than shown here if the two-thirds of Part D premiums paid directly by beneficiaries to Part D plans and the resulting benefit payments were included; however, they are not recorded in the federal budget.

76. Congressional Budget Office, "Baseline Projections for Selected Programs: Medicare" (March 2016), www.cbo.gov/publication/51302. In contrast, the Supplementary Medical Insurance Trust Fund, which pays for benefits covered under Parts B and D of Medicare, cannot be exhausted because it is financed mainly through premiums and money from the general fund. The amounts of contributions from those sources are set to cover the costs of those benefits.

77. See sec. 257(b)(1) of the Balanced Budget and Emergency Deficit Control Act of 1985, Public Law 99-177 (codified at 2 U.S.C. §907(b)(1) (2012)).

# Chapter 4: The Long-Term Outlook for Other Federal Noninterest Spending

Although Social Security, the major health care programs, and net interest account for most federal spending, more than 40 percent of the federal government's spending in 2016 will go toward other programs and activities. That spending—referred to in this report as other federal noninterest spending—includes outlays for all discretionary programs, which are funded through the annual appropriation process, and outlays for many mandatory programs.[78]

The Congressional Budget Office projects that, under the broad assumptions used for this analysis, other federal noninterest spending would drop from a total of 9.2 percent of gross domestic product (GDP) in 2016 to 7.7 percent in 2026 and then to 7.3 percent in 2046:

- Discretionary spending, which is estimated to equal 6.5 percent of GDP in 2016, would fall to 5.2 percent by 2026. For its extended baseline, CBO assumed that discretionary spending as a percentage of GDP would remain roughly constant after 2026 (see Figure 4-1).
- Mandatory spending other than spending for Social Security and the major health care programs would decrease from 2.8 percent of GDP this year to 2.5 percent in 2026. (That spending includes the refundable portions of tax credits, such as the earned income tax credit, for which payments are made to taxpayers if the credit exceeds their tax liability; those payments are recorded in the budget as outlays.) For its extended baseline, CBO assumed that such spending—other than the portion related to refundable tax credits—would continue to fall in relation to GDP at roughly the same rate that it fell over the 2021–2026 period. All told, other mandatory spending is projected to equal 2.1 percent of GDP in 2046.

## Other Federal Noninterest Spending Over the Past 50 Years

During the past 50 years, federal spending for everything other than Social Security, the major health care programs, and net interest has averaged 12 percent of GDP. Such spending declined from its peak of 15 percent of GDP in 1968 to 9 percent in 2015. Measured as shares of GDP, both discretionary spending and other mandatory spending rose in response to the 2007–2009 recession but declined in recent years.

78. For a description of the activities included in various categories of federal spending, see Congressional Budget Office, *The Budget and Economic Outlook: 2016 to 2026* (January 2016), Box 3-1, www.cbo.gov/publication/51129.

## Discretionary Spending

Since the 1970s, the share of spending that occurs through the annual appropriation process has diminished. Between 1966 and 2015, discretionary spending declined from 67 percent of total federal spending to 32 percent. Measured as a share of the economy, that spending decreased from 11.5 percent of GDP to 6.6 percent.

Defense Discretionary Spending. Spending for national defense, most of which is administered by the Department of Defense (DoD), accounts for about half of discretionary spending. In 2016, DoD's spending falls mostly into three broad categories:

- Operation and maintenance, which supports the day-to-day activities of the military, the training of military units, the majority of costs for the military's health care system, and compensation for most of DoD's civilian employees;
- Military personnel, which covers compensation for uniformed service members, including pay, allowances for housing and food, and related activities, such as moving service members and their families to new duty stations; and
- Acquisition, which includes the procurement, research, development, testing, and evaluation of weapon systems and other major pieces of equipment.

Fifty years ago, in 1966, defense discretionary spending equaled 7.5 percent of GDP; it peaked at 9.1 percent two years later as a result of military operations in Vietnam. In the late 1970s, such spending dropped below 5.0 percent of GDP before rising again during the defense buildup from 1982 to 1986, when it averaged 5.9 percent (see Figure 4-2). After the end of the Cold War, outlays for defense fell again in relation to GDP, reaching a low of 2.9 percent at the turn of the century. Largely as a result of military operations in Iraq and Afghanistan, such outlays climbed again in the 2000s, peaking at 4.7 percent in 2010. Since then, defense spending has declined in relation to the size of the economy; in 2015, it amounted to 3.3 percent of GDP.

Nondefense Discretionary Spending. The rest of discretionary outlays are for nondefense purposes that span a wide array of federal investment and other activities, including the following:

- Education (excluding student loans), training, employment, and social services;
- Transportation, including highway and transit programs as well as airport security;
- Housing assistance;
- Veterans' health care;
- Health-related research and public health programs;

- Administration of justice, including federal law enforcement, criminal justice, and correctional activities;
- International affairs, including international development, humanitarian assistance, peacekeeping, nuclear nonproliferation, and the operation of U.S. embassies and consulates; and
- Activities and programs in other areas, including natural resources and the environment, science, agriculture, and community and regional development.

Nondefense discretionary spending was close to 4 percent of GDP from 1966 through the mid-1970s and averaged almost 5 percent of GDP between 1975 and 1981. From 1984 to 2008, such spending remained between 3 percent and 4 percent of GDP. More recently, funding from the American Recovery and Reinvestment Act of 2009, along with other funding associated with the federal government's response to the 2007–2009 recession, helped push nondefense discretionary spending above 4.0 percent of GDP from 2009 through 2011. Such spending dropped below 4.0 percent of GDP in 2012 and has continued to decline since then, reaching 3.3 percent of GDP in 2015.

### Other Mandatory Spending

Mandatory spending other than that for Social Security and the major health care programs covers the following programs and activities, among others:

- Civilian and military retirement (including benefits paid to retired federal civilian and military employees) and some benefits paid to retired railroad workers;
- Earned income, child, and other refundable tax credits, for which payments are made to taxpayers if the credit exceeds their tax liability;
- Certain veterans' benefits, some of which are available only to veterans (such as housing, readjustment, disability compensation, and life insurance), and others of which are sometimes available to dependents or survivors as well (such as educational assistance, pensions, dependency and indemnity compensation, and burial benefits);
- Food and nutrition programs, including the Supplemental Nutrition Assistance Program, and child nutrition programs;
- Unemployment compensation;
- Supplemental Security Income; and
- Family support and foster care, including grants to states that help fund welfare programs, Temporary Assistance for Needy Families, foster care, and child support enforcement.

Other mandatory spending is net of various offsetting receipts, which are payments collected by government agencies from other government accounts or from the public in businesslike or market-oriented transactions that are recorded in the budget as negative outlays (that is, as credits against mandatory spending). A significant share of offsetting receipts is collected under the Medicare program (mostly in the form of premiums paid by beneficiaries); those receipts are combined with Medicare outlays in this report (see Chapter 3 for more information). Other sources of offsetting receipts include contributions that government agencies make to federal retirement programs, the proceeds from leases to drill for oil and natural gas on the Outer Continental Shelf, and payments made to the Treasury by Fannie Mae and Freddie Mac.

Other mandatory spending has generally remained between 2 percent and 4 percent of GDP since the mid-1960s. However, as a result of the government's response to the recession that began in December 2007, such spending spiked to over 5 percent of GDP in 2009. As the economy improved and federal spending related to the recession waned, other mandatory spending measured as a share of the economy fell sharply. In 2015, that spending was 2.7 percent of GDP.

## Long-Term Projections of Other Federal Noninterest Spending

Combined, discretionary spending and other mandatory spending are projected to be a smaller share of GDP in the coming three decades than such spending has been in the past. Under CBO's extended baseline, federal spending for all programs and activities other than Social Security, the major health care programs, and net interest is estimated to be 9.2 percent of GDP in 2016 and is projected to total 7.7 percent in 2026 and 7.3 percent in 2046. At those levels, other federal non-interest spending as a share of GDP would be lower than it has been since the 1930s.

### Discretionary Spending

Projections of discretionary spending for 2016 through 2026 come from CBO's most recent 10-year baseline budget projections, which were published in March.[79] Through 2021, most discretionary appropriations are constrained by the caps put in place by the Budget Control Act of 2011 (as amended). For 2022 through 2026, CBO's baseline projections incorporate the assumption that those appropriations will equal the 2021 amount, with increases for inflation. Funding for certain purposes, such as war-related activities, is not constrained by the Budget Control Act's caps. In CBO's projections, such funding is assumed to increase each year through 2026 at the rate of inflation, starting from the amounts provided in 2016. Under those assumptions, outlays from discretionary appropriations are projected to decline from 6.5 percent of GDP this year—already well below the 50-year average of 8.7 percent—to 5.2 percent of GDP in

79. See Congressional Budget Office, *Updated Budget Projections: 2016 to 2026* (March 2016), www.cbo.gov/publication/51384.

2026 (see Table 4-1).[80] That year, about half of the outlays would be for national defense and half for nondefense activities. At those levels, total discretionary spending and its defense and nondefense components would account for smaller shares of GDP than they have since at least 1962 (the first year for which comparable data are available). In the extended baseline, such spending measured as a share of GDP remains roughly constant over the subsequent two decades.

Like its baseline, CBO's extended baseline is meant to be a benchmark for measuring the budgetary effects of legislation, so it, too, reflects the assumption that current laws generally remain unchanged. However, after 2021—when the caps established by the Budget Control Act are due to expire—total discretionary spending will not be constrained by current laws but instead will be determined by lawmakers' future actions. With no basis for predicting those actions, CBO based its long-term projections of discretionary spending on a combination of the baseline projections through 2026 and historical experience.

CBO assumed that after 2026 discretionary spending would remain constant as a percentage of GDP before the agency accounted for the effect on the economy of the fiscal policy projected under the extended baseline. CBO estimates that fiscal policy under the extended baseline would dampen economic growth, so its projection of discretionary spending does not grow at precisely the same rate as GDP. (For further discussion, see Chapter 6.)

CBO incorporated the assumption that discretionary spending as a share of GDP would remain at about the 2026 level, 5.2 percent of GDP, through 2046 in its extended baseline after considering the two alternatives—further decreases or future increases relative to GDP. In CBO's judgment, a projection that showed discretionary spending continuing to decline in relation to GDP beyond 2026 would not be the most useful benchmark for analyzing future fiscal policy because the historical evidence suggests that such a decline is very unlikely to continue. Over the past half century or so for which comparable data are available, discretionary spending has always been a larger share of economic output than it is projected to be in 2026. Throughout that period, nondefense discretionary spending has been greater than 3.0 percent of GDP and has not shown a sustained trend, in either direction, in relation to the size of the economy. Defense spending has accounted for at least 2.9 percent of GDP throughout the past five decades and has been between that amount and 4.7 percent of GDP over the past 20 years. The other alternative, projecting discretionary spending to increase in relation to GDP after 2026, would require CBO to select a specific rate at which discretionary spending would grow, and the agency has no clear basis for choosing such a rate.

80. Ibid.

## Other Mandatory Spending

CBO's baseline projections reflect the assumption that mandatory programs will operate as they do under current law, which includes the automatic spending cuts put in place by the Budget Control Act and extended through 2025. In CBO's most recent baseline projections, total mandatory spending excluding that for Social Security and the major health care programs is estimated to amount to 2.8 percent of GDP this year and next.[81] Such spending then declines in subsequent years, falling to 2.5 percent of GDP by 2026.[82] In the extended baseline, such spending measured as a share of GDP continues to fall over the subsequent two decades—declining to 2.1 percent of GDP in 2046. Because some benefits would decline in relation to average income, the benefits available to people many years in the future would be lower, relative to income, than what they are today.

Most of the projected decline through 2026 in other mandatory spending as a share of GDP occurs for two reasons. First, the number of beneficiaries for some of the programs is expected to decline in relation to the size of the population as the economy expands. Second, the average payment per beneficiary measured relative to average income is projected to decrease. For example, income thresholds for eligibility for some large income support programs, such as Supplemental Security Income and the Supplemental Nutrition Assistance Program, generally rise with prices, whereas income usually rises more rapidly than prices—especially when the economy grows stronger. As a result of that strengthening of the economy, the number of beneficiaries in some programs is expected to rise more slowly than the population or even to decrease over the next 10 years. Furthermore, average payments under some large programs are indexed to inflation and therefore tend to grow more slowly than income.

A small part of the decline between 2016 and 2026 stems from a projected reduction in spending relative to GDP for the earned income tax credit, the child tax credit, and the American Opportunity Tax Credit. Outlays for the refundable portions of those credits are projected to decrease from 0.5 percent of GDP in 2016 to 0.4 percent in 2026. The key parameters of those tax credits are either not indexed or indexed only to inflation. Thus, as real income grows faster than inflation, the amounts of various credits that people qualify for decrease in relation to GDP.

For the years after 2026, mandatory spending excluding that for Social Security, the major health care programs, and refundable tax credits was not projected in detail because of the number of programs involved and the variety of factors that influence spending on them. Instead, CBO used an approximate method to project spending for

81. In 2016, outlays for other mandatory spending will be boosted by the shift in timing of some payments from fiscal year 2017 to 2016 (because October 1, 2016, falls on a weekend). If not for that shift, CBO estimates, such outlays would equal 2.7 percent of GDP in 2016.

82. See Congressional Budget Office, *Updated Budget Projections: 2016 to 2026* (March 2016), Figure 4, www.cbo.gov/publication/51384.

those programs as a group; except for the tax credits, such spending was assumed to decline in relation to GDP (excluding any effect that fiscal policy may have on the economy) after 2026 at the same rate at which it is projected to fall between 2021 and 2026 (excluding the decline in spending in the Supplemental Nutrition Assistance Program).[83] CBO projected outlays for the refundable portions of the earned income tax credit, the child tax credit, and the American Opportunity Tax Credit separately, using the methods for its long-term revenue projections (see Chapter 5). CBO estimates that fiscal policy under current law would dampen GDP growth after 2026, so projected spending for those programs as a share of GDP is slightly higher than it would be if fiscal policy did not affect the economy.

# Chapter 5: The Long-Term Outlook for Federal Revenues

Federal revenues come from various sources, including individual and corporate income taxes, payroll (social insurance) taxes, excise taxes, estate and gift taxes, and other taxes and fees. Currently, proceeds from individual income taxes and payroll taxes account for about 80 percent of the federal government's revenues.

For this report, the Congressional Budget Office projected the future path of revenues under an extended baseline. That approach follows the agency's 10-year baseline budget projections through 2026 and then extends most of the concepts underlying those baseline projections for the rest of the long-term projection period. The revenues projected for the 10-year period are the same as those in CBO's March 2016 baseline.[84] The extended baseline incorporates the assumption that the rules governing all tax sources will evolve as specified under current law (including the scheduled expiration of temporary provisions lawmakers have routinely extended before).[85]

83. CBO projects that spending for the Supplemental Nutrition Assistance Program (SNAP) will decline from 0.4 percent of GDP in 2016 to less than 0.3 percent of GDP in 2026 as the economy strengthens. Because CBO does not anticipate that significant decline relative to GDP in outlays for SNAP to continue beyond 2026, such outlays were excluded from the calculation of the rate of decline for the portion of other mandatory spending that excludes the refundable portions of tax credits. In 2027 and later years, CBO projects, outlays for SNAP as a share of GDP will decline at the same rate as other mandatory spending (excluding the refundable tax credits).

84. For details of CBO's March baseline, see Congressional Budget Office, *Updated Budget Projections: 2016 to 2026* (March 2016), www.cbo.gov/publication/51384.

85. The sole exception to the current-law assumption during the baseline period 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 lawmakers have routinely extended them before.

CBO's projections are not intended to predict budgetary outcomes; instead, they represent CBO's assessment of future revenues if current laws remained generally unchanged. (Chapter 6 discusses the consequences of fiscal policies other than those in the extended baseline.) Such projections are particularly difficult because revenues are very sensitive to economic developments, including the impact of rising federal debt on the economy.

Under the extended baseline, federal revenues relative to the size of the economy fluctuate in a narrow band, ranging from 18.0 percent to 18.2 percent of gross domestic product (GDP) from 2016 through 2026. That relative stability over the next 10 years mainly reflects offsetting movements in four sources of revenues:

- Individual income tax receipts are projected to increase by 0.8 percentage points relative to GDP, mainly because of real bracket creep—the pushing of a growing share of income into higher tax brackets as a result of growth in real (inflation-adjusted) income—as well as the interaction of the tax system with inflation, an expected continued increase in the share of wages and salaries earned by higher-income taxpayers, and rising distributions from tax-deferred retirement accounts.

- Remittances by the Federal Reserve System to the Treasury are projected to decline by 0.4 percentage points as a share of GDP to more typical amounts relative to the size of the economy.

- Corporate income tax receipts are projected to decline relative to GDP by 0.2 percentage points, largely because of an expected drop in domestic economic profits relative to the size of the economy.

- Payroll tax receipts are also projected to decline by 0.2 percentage points relative to GDP over the next decade, primarily because of the expected continued increase in the share of wages and salaries earned by higher-income taxpayers.

After 2026, in the extended baseline, revenues rise faster than GDP, largely for two reasons: The effect of real bracket creep would continue, and a new excise tax on certain employment-based health insurance plans would generate a growing amount of revenues relative to the size of the economy. As a result, federal revenues are projected to reach 19.4 percent of GDP by 2046 (see Figure 5-1). By comparison, revenues over the past 50 years have averaged 17.4 percent of GDP.

Without significant changes in tax law, the tax system's effects in 2046 would differ markedly from what they are today. A larger share of each additional dollar of income that households earned would go to taxes, and households throughout the income distribution would pay more of their total income in taxes than households in similar places in that distribution pay today.

## Revenues Over the Past 50 Years

Revenues have varied significantly over the past 50 years because of changes in tax laws and interactions between tax law and economic conditions. Total federal revenues have been as high as 20.0 percent of GDP (in 2000) and as low as 14.6 percent (in 2009 and 2010), with no evident trend (see Figure 5-2). The composition of total revenues during that period has varied as well. Individual income taxes, which account for about half of all revenues now, have ranged from slightly less than 10 percent of GDP (in 2000) to slightly more than 6 percent (in 2010). Payroll taxes, which generate about one-third of total revenues now, have varied from well under 4 percent of GDP to more than 6 percent during the past 50 years. (Those taxes are credited mainly to the Social Security and Medicare Hospital Insurance trust funds.) Corporate income taxes have fluctuated between about 1 percent and 4 percent of GDP since the mid-1960s, and combined revenues from other sources have fluctuated between 1 percent and 3 percent of GDP over that same period.

Some of that variation is the result of legislative changes: In the past 50 years, at least a dozen changes in law have raised or lowered annual revenues by at least 0.5 percent of GDP. But most of the variation in the amounts of revenue generated by different taxes has stemmed from changes in economic conditions and from how those changes interact with the tax code. For example, without legislated tax reductions, real bracket creep tends to cause receipts from individual income taxes to grow relative to GDP, because as taxpayers' income rises faster than inflation a larger share of income is taxed at higher rates. Also, because some parameters of the tax system do not increase with inflation, rising prices alone subject a greater share of income to higher effective tax rates.[86]

Cyclical developments in the economy also affect revenues. During economic downturns, for example, taxable corporate profits generally fall faster than the nation's output, shrinking corporate tax revenues relative to GDP; losses in households' income also tend to push a greater share of total income into lower tax brackets, reducing individual income tax revenues relative to GDP. Thus, total tax revenues as a share of GDP automatically decline when the economy is weak and rise when the economy is strong.

By contrast, revenues derived from excise taxes have declined over time relative to GDP because many excise taxes are levied on the unit quantity of a good purchased (such as a gallon of gasoline) as opposed to a percentage of the price paid. Because those

86. The parameters of the tax system include the amounts that define the various tax brackets; the amounts of the personal exemption, standard deduction, and credits; and tax rates. Although many of the parameters—including the personal exemption, standard deduction, and tax brackets—are indexed for inflation, some, such as the amount of the maximum child tax credit, are not. The effect of price increases on tax receipts was much more significant before 1984, when none of the parameters of the individual income tax were indexed for inflation.

levies are not indexed for inflation, the revenues they generate have declined as a share of GDP as prices have risen.

## Revenue Projections Under CBO's Extended Baseline

During the next decade, under current law, some new provisions of tax law will go into effect and certain provisions will expire. Reflecting those scheduled changes, the extended baseline incorporates the following assumptions:

- A new tax on certain employment-based health insurance plans with high premiums, currently scheduled to go into effect in 2020, will be implemented without further modification.
- Certain tax provisions scheduled to expire over the next decade will do so, even if lawmakers have routinely extended them before. For example, the rules that allow businesses with large amounts of investment to accelerate their deductions for those investments are assumed to phase out, as scheduled, by the end of December 2019.

If current laws remained in place, tax revenues would rise from 18.2 percent of GDP in both 2016 and 2026 to 19.4 percent in 2046, CBO estimates.[87] Increases in receipts from individual income taxes more than account for the projected rise of 1.2 percentage points in total revenues as a percentage of GDP over the next 30 years; receipts from all other sources of revenues, taken together, are projected to decline slightly as a share of GDP.

The projected increase in total revenues reflects several factors: structural features of the income tax system, new and expiring tax provisions, demographic trends, changes in the distribution of income, and other factors (see Table 5-1).

### Structural Features of the Individual Income Tax System

Real bracket creep is the most important structural feature of the tax system contributing to growth in revenues over time. It has two kinds of effects. First, rising real income subjects an ever-larger proportion of income to higher tax rates, and second, it further increases taxes by reducing taxpayers' eligibility for various credits, such as the earned income tax credit and the child tax credit.

Also, some provisions of the tax code are not indexed for inflation, so cumulative inflation boosts receipts relative to GDP. For example, the additional tax on the investment income of individuals that went into effect in 2013 is not indexed for

87. According to CBO and the staff of the Joint Committee on Taxation, extending expiring tax provisions, including the partial expensing of equipment property at a 50 percent rate, and repealing certain postponed taxes related to health insurance would reduce revenues by 0.3 percent of GDP in 2026. For further information, see Table 1-5 of Congressional Budget Office, *The Budget and Economic Outlook: 2016 to 2026* (January 2016), www.cbo.gov/publication/51129.

inflation. The income thresholds for that tax ($200,000 for single individuals and $250,000 for married couples) do not increase as prices rise, so the tax will affect an increasing share of investment income over time, boosting revenues by a small but growing share of GDP.[88] If current laws remained in place, faster growth in people's income than in parameters of the tax code would push up income tax revenues as a portion of GDP by 1.1 percentage points between 2016 and 2046, CBO estimates.

### New and Expiring Tax Provisions

Under the extended baseline, CBO assumes that tax provisions will take effect or expire as specified under current law. Two new tax provisions will begin to raise significant amounts of revenue over the next several years. Certain other provisions are scheduled to expire, also boosting revenues.

The most significant new provision is an excise tax on employment-based health insurance whose value exceeds certain thresholds. The implementation of that new tax, originally scheduled for 2018, was delayed until 2020 by the Consolidated Appropriations Act, 2016 (Public Law 114-113). That tax is expected to increase revenues in two ways:

- First, in those cases in which the tax applied, it would generate additional excise tax revenues.
- Second, many individuals and employers will probably shift to lower-cost health insurance plans to either reduce the excise tax paid or avoid it altogether. As a result, total payments of health insurance premiums for those individuals—and the associated tax-exempt contributions from their employers—will be smaller than they would have been without the tax. However, CBO expects that total compensation paid by employers (including wages and salaries, contributions to health insurance premiums, pensions, and other fringe benefits) will not be affected over the long term.[89] Thus, smaller expenditures for health insurance will mean higher taxable wages and salaries for employees and, as a result, higher payments of income and payroll taxes.[90]

88. An additional Medicare tax of 0.9 percent, paid entirely by the employee, applies to annual earnings (wages and salaries) exceeding $200,000 for single individuals and $250,000 for married couples. Because those thresholds are not indexed for inflation, the tax will apply to an increasing share of earnings over time and thereby raise payroll tax revenues as a share of GDP by larger amounts over time. However, a decline in the share of earnings subject to the Social Security tax will more than offset that effect, CBO projects, because a further slight increase in earnings inequality will cause more earnings to be above the taxable maximum amount for Social Security.

89. In the past, rising premiums have been an important cause of slow wage growth. See Paul Ginsburg, *Alternative Health Spending Scenarios: Implications for Employers and Working Households* (Brookings Institution, April 2014), http://tinyurl.com/ksh9p47.

90. Even if the excise tax caused employers to shift to lower-cost health insurance plans without increasing employees' wages by a corresponding amount, other taxes (such as those on corporate profits) would tend to rise. The resulting revenues would be similar to the amounts projected in CBO's extended baseline.

Thus, regardless of whether individuals and employers decide to pay the excise tax or to avoid it by switching to lower-cost plans, total tax revenues would ultimately rise compared with what they would have been without the tax. Although the thresholds for the tax on high-premium health insurance plans will be adjusted for changes in overall consumer prices, health care costs will grow faster than prices over the long term, CBO projects, causing the tax to affect more people over time. Under the extended baseline, the excise tax is projected to increase total revenues by 0.6 percent of GDP in 2046.

The other new provision that will increase revenues relative to GDP after 2016 penalizes certain employers that do not offer their employees health insurance coverage meeting certain criteria. That provision was implemented in 2015 and will increase revenues starting in 2017, CBO projects.

In addition, several dozen tax provisions are slated to expire over the next decade. The most significant of those is the option for certain businesses to immediately deduct from their taxable income 50 percent of the cost of new investments in equipment. That provision is scheduled to be phased out by the end of 2019.

The scheduled implementation of new tax provisions and the expiration of certain existing tax provisions, taken together, would raise receipts by 0.8 percent of GDP between 2016 and 2046, CBO projects.

### Aging and the Taxation of Retirement Income

During the next few decades, members of the baby-boom generation (people born between 1946 and 1964) will continue to retire. They will withdraw money from retirement accounts—such as 401(k) plans and individual retirement accounts—and receive pension benefits, boosting income tax revenues as a share of GDP. Some or all of the amounts withdrawn will be taxable, depending on the specific characteristics of the retirement plans. Likewise, compensation deferred under employer-sponsored defined benefit plans is taxed when benefits are paid.[91] Thus, the Treasury will receive significant tax revenues that have been deferred for years. Payment of those deferred taxes will boost revenues as a share of GDP by about 0.3 percentage points, CBO projects, between 2016 and 2046. That upward trend is expected to end around 2035, when almost all baby boomers will have reached retirement.

### Changes in the Distribution of Income

Revenues from individual income and payroll taxes also depend on the distribution of income. CBO's projections reflect an expectation that earnings will grow faster for higher-income people than for others during the next decade—as they have over the past several decades—and that the income of all taxpayers will grow at similar rates

91. A defined benefit pension plan is an employment-based plan that promises employees a certain regularly recurring benefit upon retirement. Typically, the benefit is based on a formula that takes into account an employee's length of service and salary.

thereafter. That differential growth will cause a larger share of income to be subject to higher tax rates. For example, the share of wages earned by the top one-fifth of workers is projected to increase by about 4 percentage points, from 57 percent to 61 percent, between 2015 and 2026. That faster growth in earnings for higher-income people would elevate estimated individual income tax revenues relative to GDP by about 0.3 percentage points over the next 10 years.

Partially offsetting that increase in individual income taxes would be a corresponding decrease in payroll tax receipts. Those receipts would decline because greater earnings inequality would cause more earnings to be above the taxable maximum amount for Social Security taxes. The share of covered earnings above the taxable maximum amount is projected to rise to more than 20 percent in 2026, 4 percentage points more than the share in 2015. That effect would reduce payroll tax revenues relative to GDP by about 0.2 percentage points over the next decade, CBO projects. Altogether, if current laws remained in place, faster growth in earnings of higher-income people would increase tax revenues as a portion of GDP by 0.1 percentage point between 2016 and 2026, CBO estimates, and by no additional amount after 2026.

### Other Factors

Under the extended baseline, factors besides those already discussed would cause revenues to decline by a combined 1.0 percent of GDP between 2016 and 2046. More than four-fifths of that decline would occur by 2026. In particular, remittances to the Treasury from the Federal Reserve—which have been very large since 2010 because the central bank's portfolio has grown and changed in composition—are projected to decline to more typical levels and remain constant as a share of GDP after 2026. Corporate income taxes are also expected to decline over the next decade because of a projected decrease in domestic economic profits relative to GDP and an expected increase in the use of certain strategies that some corporations employ to reduce their tax liabilities. (In CBO's extended baseline, corporate income taxes remain constant as a share of GDP after 2026.)

Excluding the excise tax on high-premium health insurance plans, CBO projects that excise taxes would decline as a share of GDP over time. Because many excise taxes are assessed as a fixed dollar amount per unit quantity of a good purchased (not as a percentage of the price paid), receipts from excise taxes as a share of GDP tend to fall as overall prices rise over time. Moreover, payroll taxes for unemployment insurance are expected to decline to more typical levels over the next few years, further reducing receipts as a share of GDP.

## Long-Term Implications for Tax Rates and the Tax Burden

Even if legislators enacted no future changes in tax law, the effects of the tax system that would be in place in the future would differ significantly from the effects of today's tax system. Increases in real income over time would push more income into higher tax

brackets in the individual income tax system, raising people's effective marginal tax rates and average tax rates. (The effective marginal tax rate is the percentage of an additional dollar of income from labor or capital that is paid in federal taxes. The average tax rate is total taxes paid divided by total income.) Moreover, fewer taxpayers would qualify for certain tax credits because rising real income would push taxpayers above the income limits for eligibility. Inflation would also raise tax rates, but to a much lesser extent, because most of the tax code's key parameters are indexed for inflation. Slightly more taxpayers would become subject to the alternative minimum tax (AMT) over time, although the American Taxpayer Relief Act of 2012 greatly limited the share of taxpayers who would pay that tax.[92] Thus, in the long run, people throughout the income distribution would pay a larger share of their income in taxes than people at the same points in the distribution pay today, and many taxpayers would face diminished incentives to work and save.

### Marginal Federal Tax Rates on Income From Labor and Capital

Under CBO's extended baseline, marginal tax rates on income from labor and capital would rise over time. The effective marginal tax rate on income from labor would increase from 30 percent in calendar year 2016 to 33 percent in 2046, CBO projects (see Table 5-2). (The effective marginal tax rate on labor income is calculated by averaging labor income across taxpayers, using weights proportional to their income from labor.) The effective marginal tax rate on capital income (returns on investment) is projected to rise from 14 percent to 18 percent over that period.

The projected increase in the effective marginal tax rate on labor income reflects three primary factors:

- *Real bracket creep under the regular income tax.* As households' inflation-adjusted income rose over time, they would be pushed into higher marginal tax brackets. (Because the thresholds for taxing income at different rates are indexed for inflation, increases in income that just kept pace with inflation would not generally raise households' marginal tax rates.) One consequence is that the share of ordinary income subject to the top tax rate of 39.6 percent would rise from 13 percent in 2016 to 16 percent by 2046, CBO estimates.[93]

92. The AMT is a parallel income tax system with fewer exemptions, deductions, and rates than the regular income tax system. House-holds must calculate the amount they owe under both tax systems and pay whichever is larger. The American Taxpayer Relief Act raised the exemption amounts for the AMT for 2012 and, beginning in 2013, permanently indexed those amounts for inflation. The law also indexed for inflation the income thresholds at which those exemptions phase out and the income threshold at which the second rate bracket for the AMT begins. Although rising real income will gradually subject more taxpayers to the AMT, many of those newly affected taxpayers will owe only slightly more than their regular income tax liability.

93. Ordinary income is all income subject to the income tax except long-term capital gains and dividends.

- *The structure of premium subsidies in the health insurance marketplaces.* Those subsidies are conveyed in the form of tax credits that phase out as income rises over a certain range, increasing taxpayers' marginal rates on income in that range. Under current law, the income range over which the subsidies phase out would expand with inflation, but the subsidies would grow faster than inflation. As a result, over time, for each extra dollar of income someone earned, the subsidy would be reduced by a larger fraction of that dollar, thereby raising that person's effective marginal tax rate.

- *The additional 0.9 percent tax on earnings above certain thresholds that went into effect in 2013.* Over time, that tax would apply to a growing share of labor income because the thresholds are not indexed for inflation.

The effective marginal tax rate on capital income would also rise over the next 30 years, CBO projects. That increase reflects two primary factors:

- *The expiration of certain accelerated depreciation provisions.* The option for certain businesses to immediately deduct from their taxable income 50 percent of the cost of new investments in equipment is scheduled to be phased out by the end of 2019.

- *A declining share of investment income in retirement accounts.* CBO projects that as members of the baby-boom generation continue to retire and draw down the assets in their retirement accounts, the share of investment income earned in those nontaxable accounts will decline relative to the share of investment income earned in taxable accounts.

CBO estimates that real bracket creep would not raise the rate on capital income very much (unlike its effect on the marginal tax rate on labor income) because a large share of capital income is already being taxed at the top rates applicable to ordinary income or to long-term capital gains and dividends.

The increase in the marginal tax rate on labor income would reduce people's incentive to work, and the increase in the marginal tax rate on capital income would reduce their incentive to save. Conversely, the reduced after-tax earnings and savings resulting from those higher taxes would encourage people to work and save more in order to maintain the same amount of after-tax income and savings. Evidence suggests that the former behavioral responses typically prevail and that, on balance, higher marginal tax rates discourage economic activity.[94] (The overall effect of federal taxes on economic activity depends not only on marginal tax rates but also on the amount of revenues raised relative to federal spending and thereby on the resulting federal deficits and debt.)

94. For additional discussion, see Congressional Budget Office, *How the Supply of Labor Responds to Changes in Fiscal Policy* (October 2012), www.cbo.gov/publication/43674, and *Taxing Capital Income: Effective Marginal Tax Rates Under 2014 Law and Selected Policy Options* (December 2014), www.cbo.gov/publication/49817.

### Average Tax Rates for Some Representative Households

Because some parameters of the tax code are not indexed for inflation and most are not indexed for real income growth, average federal tax rates would increase over time under the extended baseline.

The cumulative effect of rising prices would significantly reduce the value of parameters of the tax system that are not indexed for inflation, CBO projects. For example, the amount of mortgage debt eligible for the mortgage interest deduction, which is not indexed for inflation, would fall from $1 million today to about $550,000 in 2046 measured in today's dollars, CBO estimates. And the portion of Social Security benefits that is taxable would increase from about 36 percent now to over 50 percent by 2046, CBO estimates, because the thresholds for taxing benefits are not indexed for inflation. In addition, the maximum values of certain tax credits, such as the child tax credit, are not adjusted for inflation and thus would diminish in value over time.

Under the extended baseline, even tax parameters that are indexed for inflation would lose value over time when compared with income. The thresholds for taxing income at different rates rise with inflation, but because incomes tend to rise faster than inflation, those thresholds still decline relative to income over time. Similarly, according to CBO's projections, the current $4,050 personal exemption amount would double by 2046 because it is indexed for inflation. But income per household will probably almost triple during that period, so the value of the exemption relative to income would decline by almost one-third. That decline would tend to boost average tax rates of lower-income taxpayers, for whom the personal exemption is larger relative to income, by more than those for higher-income taxpayers, for whom the personal exemption is smaller relative to income. And without legislative changes, the proportion of taxpayers claiming the earned income tax credit would fall from 16 percent this year to 12 percent in 2046, CBO projects, as growth in real income made more taxpayers ineligible for the credit.

Those developments and others would cause individual income taxes as a share of income to grow by different amounts for households at different points in the income distribution.

- According to CBO's analysis, a married couple with two children earning the *median total income* of $108,700 (including both cash income and other compensation) in 2016 and filing a joint tax return will pay about 5 percent of their income in individual income taxes (see Table 5-3).[95] By 2046, under current law, a similar couple earning the median income would pay 8 percent of their income in individual income taxes.

95. The examples incorporate the assumption that all income that taxpayers receive is from labor compensation. Furthermore, median income is assumed to grow with average income, so income at each multiple of the median grows at the same rate. For details about the calculations, see Table 5-3.

- For a married couple with two children earning *half the median total income*, the change in individual income taxes as a share of income would be much greater, CBO estimates: In 2016, such a family will typically receive a net payment from the federal government equal to 8 percent of its income in the form of refundable tax credits, but by 2046 the family would become a net taxpayer, paying about 2 percent of its income in income taxes.

- A married couple with two children earning *four times the median total income* would pay 22 percent of their income in individual income taxes in 2046, CBO projects, much higher than the amount paid by families with lower earnings. But the change in that share—up 3 percentage points from 2016—is much smaller than the 10 percentage-point increase in the share of taxes paid by similar families earning half the median total income.

By contrast, under current law, payroll tax rates across the income distribution would differ only slightly in 2046 from what they are today. Those taxes are principally levied as a flat rate on earned income below a certain threshold, which is indexed for both inflation and overall growth in real earnings. Thus, the changes over the next 30 years in the sum of income and payroll taxes as a share of income would be similar to the changes in income taxes as a share of income.

Although rising real income would contribute to rising average tax rates under current law, that real income growth would also mean that future households would have higher after-tax income than similar households at the same point in the income distribution have today. For example, from 2016 to 2046, real after-tax income for a couple earning the median income would grow by more than 75 percent under the extended baseline, CBO projects.

# Chapter 6: The Effects of Illustrative Budgetary Paths on the Long-Term Outlook

This chapter expands on the analysis in the preceding chapters by showing how the federal budget and the nation's economy would evolve under three illustrative budgetary paths that involve changes in the federal deficit and in debt held by the public. The projections in this chapter represent the Congressional Budget Office's assessment of how deficits and the resulting amount of federal borrowing under the illustrative paths would affect the economy and how those macroeconomic effects would, in turn, feed back into the federal budget.

Under the first two illustrative paths, cumulative deficits—excluding interest payments and before macroeconomic feedback is taken into account—would be reduced by $2 trillion and $4 trillion, respectively, over the next 10 years in relation to CBO's extended baseline.[96] Under the third illustrative path, such deficits would exceed those projected in the extended baseline by $2 trillion over the next decade.[97] In later years, the paths would change deficits by the same percentage of gross domestic product (GDP) as in 2026. (CBO also analyzed the effects on the budget and the economy of limiting Social Security benefits to amounts payable from dedicated funding. See Box 6-1.)

In the long term, the paths with smaller deficits and debt would lead to higher output by increasing the amount of money available for private investment. The third path, with larger deficits and debt, would have the opposite effect: It would reduce output by drawing money away from, or crowding out, private investment. In the short term, the paths with lower deficits would reduce overall demand for goods and services by lowering government purchases and disposable income, causing output to be lower than it otherwise would be over the next few years. The path with larger deficits would have the opposite effect, increasing demand and boosting output. Those short- and long-term macroeconomic effects feed back into the federal budget, adding to or subtracting from the paths' direct effects on the deficit, primarily by altering the amount of taxable income and the federal government's interest payments.

When estimating output, CBO focused on effects on gross national product (GNP), which—unlike the more commonly cited GDP—includes the income that U.S. residents earn abroad and excludes the income that foreigners earn in this country. It is therefore a better measure of the resources available to U.S. households.

For the three illustrative paths, CBO's analysis yields the following estimates for macroeconomic and budgetary outcomes:

96. Those paths are identical to the illustrative scenarios analyzed last June in *The 2015 Long-Term Budget Outlook*. For more details, see Congressional Budget Office, *The 2015 Long-Term Budget Outlook* (June 2015), Chapter 6, www.cbo.gov/publication/50250.

97. The third path would increase the deficit by an amount similar to that in the alternative fiscal scenario presented in *The 2015 Long-Term Budget Outlook*. That scenario incorporated several assumptions: that certain policies in place in the summer of 2015 but scheduled to change under current law would continue, that some provisions of law that might be difficult to sustain for a long period would change, and that federal revenues and certain kinds of federal spending would remain at or near their historical shares of gross domestic product. In the fall of 2015, some policies that were assumed in that alternative fiscal scenario were permanently enacted in legislation, meaning that an updated version of that scenario would have a considerably smaller effect on deficits in relation to the extended baseline. Therefore, CBO chose to present the budgetary effects of an illustrative path (with unspecified fiscal policies) that would increase the cumulative deficit (excluding interest payments and before macroeconomic feedback is taken into account) by $2 trillion over the next 10 years in relation to the extended baseline.

- The path that would reduce deficits (excluding interest payments and before macroeconomic feedback is taken into account) by $2 trillion over the next decade would result in federal debt equal to 96 percent of GDP in 2046, greater than the current 75 percent and considerably above the average of 39 percent over the past 50 years (see Figure 6-1). CBO projects that real (inflation-adjusted) GNP in 2046 would be about 3 percent higher under this path than under the extended baseline.

- The path that would reduce deficits by $4 trillion—defined in the same manner as the first path but with decreases in the deficit twice as large in each year—would result in federal debt amounting to 55 percent of GDP in 2046, still well above its historical average but less than the current percentage. CBO projects that real GNP in 2046 would be about 5 percent higher under this path than under the extended baseline.

- The path that would result in larger deficits—defined in the same manner as the first path but with increases in the deficit each year rather than decreases—would result in federal debt equal to 193 percent of GDP in 2046, about five times as large as its average over the past 50 years. CBO projects that real GNP in 2046 would be about 3 percent lower under this path than under the extended baseline.

In addition to their effects over the long term, the three budgetary paths would have significant effects on the economy during the next few years. Those effects occur through changes in overall demand for goods and services, which are better captured by the measure GDP than GNP. CBO estimates that the decrease in deficits, and thus in overall demand, that would occur under the first two paths would cause real GDP in 2017 to be 0.1 percent and 0.3 percent lower, respectively, than it would be under current law. Under the third path, a boost in demand for goods and services would cause real GDP to be 0.1 percent higher in 2017 than is projected under current law.

For simplicity, and to avoid presuming which fiscal policies lawmakers might choose to alter the deficit, CBO analyzed the illustrative paths without specifying the tax and spending policies underlying them. Consequently, the projected outcomes under the paths do not reflect any *direct* changes to incentives to work and save; in particular, CBO assumed that marginal tax rates and transfers to working-age people would be the same as they are under current law. CBO also assumed that federal investment under the illustrative paths, and the contribution that such spending makes to future productivity and output, would be the same as under the extended baseline. Therefore, the estimated macroeconomic effects of the budgetary paths in relation to the extended baseline arise solely from changes in deficits and debt. Because the magnitude of the macroeconomic effects is uncertain, CBO reports not only a central estimate for the outcome of each path but also a range of likely outcomes.[98]

## Long-Term Economic Effects of the Illustrative Paths

The illustrative budgetary paths examined in this chapter would affect the economy in the long-term by changing federal deficits and debt. Because CBO analyzed the illustrative paths without specifying the tax and spending policies underlying them, the projected outcomes under the paths do not reflect any direct changes to incentives to work, save, and invest. It is important to note that it is difficult to identify policies that might significantly alter the course of budget deficits without directly changing such incentives. Those changes would have various other effects on the economy that are beyond the scope of this chapter.

### How Changes in Federal Borrowing Affect the Economy

Changes in federal borrowing affect the economy by altering the amount of money available for private investment. The rest of the discussion in this section focuses on what would happen if federal borrowing increased; decreases would have opposite effects.

Effects on Private Investment. On the basis of existing research on the topic, CBO concludes that increased borrowing by the federal government generally crowds out private investment in productive capital in the long term.[99] Crowding out occurs because the portion of saving that people use to buy government securities is not available to finance private investment. The result is a smaller stock of capital and lower output and income in the long term than would otherwise be the case (all else being equal). Lower income would reduce tax revenues. Federal noninterest spending would also be lower—although the effect would be smaller than that on revenues—if income was lower because Social Security benefits are linked to earnings and because total spending on health care tends to vary with total income over the long term. This analysis incorporates the assumption that changes in income do not affect other noninterest spending.

Two factors offset part of that crowding-out effect: Additional federal borrowing tends to boost private saving, which increases the total funds available to purchase federal securities and finance private investment; and higher interest rates tend to increase net inflows of capital from other countries by attracting more foreign capital to the United States and inducing U.S. savers to keep more of their money at home.

98. For certain key variables in its long-term economic models, CBO has developed ranges of values that are based on research on those variables; each range is intended to cover roughly the middle two-thirds of the likely values for the variable. To calculate the ranges of estimates for the effects of each set of fiscal policies, CBO used the ranges of values for each variable. To calculate the central estimates, it used values for the variables at the midpoints of those ranges.

99. For a review of evidence about the effect of federal deficits and borrowing on private investment, see Jonathan Huntley, *The Long-Run Effects of Federal Budget Deficits on National Saving and Private Domestic Investment*, Working Paper 2014-02 (Congressional Budget Office, February 2014), www.cbo.gov/publication/45140.

Private saving rises because some people anticipate that policymakers will raise taxes or cut spending in the future to cover the cost of paying interest on the additional accumulated debt, so those people increase their own saving to prepare for paying higher taxes or receiving less in benefits. In addition, the decline in investment caused by crowding out increases the productivity of existing capital because more workers make use of each unit of capital—each computer or piece of machinery, for example. That greater productivity raises the return on capital. A higher return on capital boosts the return on other investments (such as interest rates on federal debt) that are competing for private saving. The resulting increase in those returns makes saving more attractive and thus boosts private saving. However, the rise in private saving is generally a good deal smaller than the increase in federal borrowing, so greater federal borrowing leads to less private investment. CBO's central estimate, which is based on existing research on the topic, is that private saving rises by 43 cents for every one-dollar increase in federal borrowing in the long run, leaving a net decline of 57 cents in savings available for private investment.

The additional net inflows of capital from other countries also prevent investment in this country from declining as much as the increase in federal borrowing. CBO's central estimate, again drawn from existing research on the topic, is that, over the long run, net inflows of private capital rise by 24 cents for every one-dollar increase in government borrowing. However, an increase in inflows of capital from other countries also means that more profits and interest payments will eventually flow overseas. Therefore, although flows of capital into the United States can help moderate a decline in domestic investment, part of the income arising from that additional investment does not accrue to U.S. residents. The result is that greater net inflows of capital keep GDP from declining as much as it would otherwise, but they are less effective in restraining the decline in GNP.[100] Thus, other things being equal, increases in debt cause greater reductions in GNP than in GDP, and reductions in debt lead to greater increases in GNP than in GDP.

All told, CBO estimates that when the federal deficit and borrowing go up by one dollar, private saving increases by 43 cents and inflows of foreign capital rise by 24 cents. Those two offsets to the crowding-out effect result in a net decline of 33 cents in domestic investment in the long run, CBO estimates. To reflect the wide range of estimates in the economics literature of how government borrowing affects domestic investment, CBO also uses a range of estimates for those effects: At the low end of that range, for each

100. The difference in the effect of an increase in debt on GDP and on GNP depends, in large part, on the amount of additional capital that foreigners invest in the United States and on the rate of return that they receive on their investments. The increase in the return on capital in this country and the increase in foreigners' net holdings of U.S. assets—both of which imply increases in the amount of income earned by foreign investors—decrease GNP relative to GDP. In CBO's analyses of fiscal policy, the rate of return earned by foreign investors in the United States changes when the rate of return on capital in this country changes. However, on the basis of the United States' experience in recent decades, that response is estimated to be less than one for one.

dollar that deficits rise, domestic investment falls by 15 cents; at the high end of that range, domestic investment falls by 50 cents.

CBO's estimates of the effects of higher federal debt on private saving, net capital inflows, and interest rates are based on historical experience. However, history may not be a good guide to the effects of rising debt in the current environment because a large and persistent increase in the ratio of debt to GDP is an outcome that is unprecedented in the United States; large increases in debt have been temporary, such as those that occurred during and immediately after wars or severe economic downturns. If participants in financial markets came to believe that policymakers intended to allow federal debt as a percentage of GDP to continue to rise, interest rates would probably increase by more than the historical relationship between federal debt and interest rates suggests. In addition, under such conditions, private saving and net capital inflows might not respond to new federal debt as they have in the past, and crowding out could be more severe.

**Effects on the Supply of Labor.** The effect of deficits on investment also reduces the amount of capital each worker uses, thereby lowering workers' productivity and wages. Reductions in the wage rate decrease people's incentive to work because reduced compensation for an additional hour of work makes work less valuable than other uses of a person's time. That phenomenon, known as the substitution effect, tends to reduce the labor supply when the wage rate declines. However, because lower wages also decrease the after-tax income that people earn from the work they are already doing, they will need to work more to maintain their standard of living. That phenomenon, known as the income effect, tends to increase the labor supply. On the basis of CBO's review of research on the topic, the agency concludes, as do most analysts, that the former effect outweighs the latter, meaning that a lower wage rate decreases the labor supply.[101] (A higher wage rate would have the opposite effect.) Fewer hours of work result in lower output and income.

To reflect the high degree of uncertainty about the size of the effect that changes in the wage rate have on the number of hours people choose to work, CBO uses a range of values in its analyses of fiscal policy.[102] The responsiveness of the labor supply to the wage rate is often expressed as the total wage elasticity (the percentage change in total labor income caused by a 1 percent change in after-tax wages). The total wage elasticity equals the substitution elasticity (which measures the substitution effect) minus

101. For details on CBO's estimates of the responsiveness of the labor supply to changes in the after-tax wage rate, see Congressional Budget Office, *How the Supply of Labor Responds to Changes in Fiscal Policy* (October 2012), www.cbo.gov/publication/43674; and for a review of the academic research about the effects of changes in the after-tax wages on the labor supply, see Robert McClelland and Shannon Mok, *A Review of Recent Research on Labor Supply Elasticities*, Working Paper 2012-12 (Congressional Budget Office, October 2012), www.cbo.gov/publication/43675.

102. CBO uses those same values to estimate the effect on the labor supply of changes in after-tax hourly wages.

the income elasticity (which measures the income effect). In this analysis, CBO's central estimate for the change in the labor supply in response to a reduction in the wage rate corresponds to a total wage elasticity of 0.19 (composed of a substitution elasticity of 0.24 minus an income elasticity of 0.05). CBO's range of likely changes in the labor supply is bounded at the low end by a total wage elasticity of about 0.06 (with a substitution elasticity of 0.16 and an income elasticity of 0.10) and at the high end by a value of about 0.32 (with a substitution elasticity of 0.32 and an income elasticity of zero).

**Other Consequences.** As Chapter 1 discusses in greater detail, high and rising federal debt would, in the long term, have several negative consequences in addition to the effects just described:

- Increased borrowing would increase the amount of interest that the government pays to its lenders, all else being equal. Those larger interest payments would make it more difficult to reduce future budget deficits, necessitating larger increases in taxes or reductions in noninterest spending.

- Increased borrowing would restrict policymakers' ability to use tax and spending policies to respond to unexpected challenges, such as economic downturns or financial crises. As a result, those challenges would tend to have larger negative effects on the economy and on people's well-being.

- Increased borrowing would increase the probability of a fiscal crisis in which investors lost so much confidence in the government's ability to manage its budget that the government was unable to borrow at affordable rates. Such a crisis would present policymakers with extremely difficult choices and would probably have a very significant negative impact on the country.

### How CBO Analyzed the Long-Term Effects of Federal Borrowing on the Economy

To analyze medium-term to long-term effects of changes in federal borrowing in the illustrative paths, CBO used an enhanced version of a model originally developed by Robert Solow wherein people base their decisions about working and saving primarily on current economic conditions—especially wage levels, interest rates, and government policies. Their responses to changes in such conditions generally mirror their responses to economic and policy developments in the past; as a result, the responses reflect people's anticipation of future policies in a general way but not their expectations of particular future developments.[103]

103. For details of CBO's model, see Congressional Budget Office, *CBO's Method for Estimating Potential Output: An Update* (August 2001), www.cbo.gov/publication/13250. For a general explanation of how CBO analyzes the effects of fiscal policies, see Congressional Budget Office, *How CBO Analyzes the Effects of Changes in Federal Fiscal Policies on the Economy* (November 2014), www.cbo.gov/publication/49494.

## Long-Term Effects of the Illustrative Paths With Smaller Deficits

The first two illustrative paths would gradually decrease deficits through unspecified increases in tax revenues, cuts in spending, or some combination of the two.[104] In the long run, the reduced federal deficits and debt under those scenarios would cause output and income to be higher and the ratio of federal debt to GDP to be lower than they would be under the extended baseline.

### Deficits

In the two paths that lead to smaller deficits, CBO assumed that the cumulative deficit (excluding interest payments and before macroeconomic feedback is taken into account) between 2017 and 2026 would be $2 trillion or $4 trillion lower than what is projected under current law. The reduction in the deficit in relation to the extended baseline would be comparatively small in 2017 but would increase steadily through 2026; at that point, the reduction in the deficit would be $360 billion, or about 1.3 percent of GDP, under the first path and $720 billion, or over 2.5 percent of GDP, under the second. In each subsequent year, the reduction, measured as a percentage of GDP, would equal the 2026 reduction.

### Output and Interest Rates

Under the first path, which would reduce 10-year deficits by $2 trillion, real GNP would be higher than it would be under the extended baseline by 0.5 percent in 2026 and by about 3 percent in 2046, according to CBO's central estimates (see Table 6-1). According to CBO's ranges of likely values for key variables, the increase in real GNP would probably be between 0.3 percent and 0.8 percent in 2026 and between about 1 percent and 4 percent in 2046. The interest rate on 10-year Treasury securities in 2046 would be about half a percentage point lower under that path than under the extended baseline, according to CBO's central estimate.

Under the second path, which would reduce 10-year deficits by $4 trillion, real GNP would be higher than it would be under the extended baseline by 1 percent in 2026 and by about 5 percent in 2046, CBO estimates. According to CBO's ranges of likely values for key variables, the increase in real GNP would probably be between 0.5 percent and 1.5 percent in 2026 and between about 2 percent and about 8 percent in 2046. The interest rate on 10-year Treasury securities in 2046 would be about three quarters of a percentage point lower under that path than under the extended baseline, according to CBO's central estimate.

104. For a comparison of the estimated budgetary and economic outcomes under similar illustrative paths with those under the paths specified by the Honorable Tom Price, Chairman of the House Budget Committee, and his staff, see Congressional Budget Office, *Budgetary and Economic Outcomes Under Paths for Federal Revenues and Noninterest Spending Specified by Chairman Price, March 2016* (March 2016), www.cbo.gov/publication/51260.

CBO projects that in either case, real GNP per person would be substantially higher in 2046 than in 2016 (see Figure 6-2).

### Budgetary Outcomes

The higher output and lower interest rates under the illustrative paths would improve budgetary outcomes in the long term. According to CBO's central estimates, under the first path, federal debt held by the public in 2046 would stand at 96 percent of GDP—45 percentage points lower than it is projected to be under the extended baseline (see Figure 6-2 and Table 6-2). Under the second path, federal debt held by the public would fall to 55 percent of GDP in 2046, 86 percentage points lower than it is projected to be under the extended baseline; such debt is currently 75 percent of GDP and averaged 39 percent over the past 50 years.

Both paths would limit the other consequences of high and rising federal debt that were discussed above, compared with what is projected under the extended baseline. Although both paths would result in debt that was high by historical standards, the policy changes that would be needed to reduce deficits to a particular level, the constraints on policymakers, and the risk of a fiscal crisis would be smaller under those paths than they would be under the extended baseline, in which the debt-to-GDP ratio is projected to increase substantially.

## Long-Term Effects of the Illustrative Path With Larger Deficits

For comparison with the estimated outcomes under the paths with smaller deficits, CBO analyzed the effects of a third illustrative path that would gradually increase deficits through unspecified decreases in tax revenues or increases in spending. Compared with the extended baseline, increased deficits and debt under that path would reduce output and increase the ratio of federal debt to GDP in the long term.

### Deficits

Under the third path, cumulative deficits between 2017 and 2026 would exceed the deficit under the extended baseline by $2 trillion—that is, by the amount deficits would be reduced under the first illustrative path examined above. CBO assumed that the path would increase deficits steadily over the next decade in relation to what they would be under the extended baseline. In 2026, the deficit, excluding interest payments, would be $360 billion, or about 1.3 percent of GDP, larger than the amount under the extended baseline before macroeconomic feedback is taken into account. After 2026, the increase in such deficits in relation to the extended baseline would continue at the same percentage of GDP as in 2026.

### Output and Interest Rates

The third path's higher deficits and debt would crowd out private investment, thereby causing output to be lower in the long term than under the extended baseline. With

those macroeconomic effects incorporated, real GNP would be lower than it would be under the extended baseline by 0.5 percent in 2026 and 3 percent in 2046, CBO estimates (see Table 6-1). Using the likely ranges for key variables, the agency estimates that real GNP would be between 0.3 percent and 0.8 percent lower in 2026, and between 1 percent and 6 percent lower in 2046 than under the extended baseline. However, even with the negative impact of higher debt, CBO projects that real GNP per person would be considerably higher in 2046 than in 2016 because of continued growth in productivity (see Figure 6-2). As a result of higher federal debt, the interest rate on 10-year Treasury securities would be about half a percentage point higher than under the extended baseline, according to CBO's central estimate.

### Budgetary Outcomes

Under the third path, budgetary outcomes would be worsened by the economic changes that resulted from the path's higher deficits and debt. With the effects of lower output and higher interest rates incorporated, federal debt held by the public under the path would reach 193 percent of GDP in 2046, CBO estimates (see Figure 6-2 and Table 6-2); it is projected to be 141 percent under the extended baseline. Thus, debt would be much higher and would rise much more rapidly than under the extended baseline.

In addition to its effects on output, income, and interest rates, the third path would also bring about many of the other consequences associated with high and rising federal debt that are discussed above; those effects would be especially acute under this path because the debt would be so high and rise so rapidly. Such a path would necessitate much larger policy changes to reduce deficits to a particular level than the first two paths would. In addition, it would impose considerable constraints on policymakers and significantly raise the risk of a fiscal crisis.

## Short-Term Economic Effects of the Illustrative Paths

The budgetary paths whose long-term macroeconomic effects have been analyzed in this chapter would have short-term effects as well. In the short term, policies that increased deficits would boost the overall demand for goods and services, thereby raising output and employment above what they would be otherwise. Similarly, policies that decreased deficits would reduce overall demand, thereby lowering output and employment. In CBO's assessment, those effects are stronger when short-term interest rates are near zero and output is below its potential (maximum sustainable) level, in part because under those conditions the Federal Reserve is unlikely to adjust short-term interest rates to try to offset the effects of changes in deficits.

### Effects of the Paths With Smaller Deficits

Under the two illustrative paths that would reduce deficits, real GDP would be lower over the next few years than is projected under current law, CBO estimates. Because the

agency did not specify the fiscal policies underlying those paths, the estimated macroeconomic effects arise solely from the effect on aggregate demand of differences in overall deficits.[105]

In the first path, which would lower deficits by $2 trillion, the reductions in the deficit (excluding interest payments) would amount to $40 billion in 2017 and $76 billion in 2018 before macroeconomic feedback is taken into account. In the second path, which would lower deficits by $4 trillion, those reductions would be $80 billion in 2017 and $151 billion in 2018. CBO estimates that both paths would reduce overall demand for goods and services, thereby lowering output in the short term. Under the first path, real GDP in 2017 would be 0.1 percent lower than it is projected to be under current law (or it would be equal to or as much as 0.2 percent lower than what it is projected to be under current law, according to CBO's ranges of likely values for key variables; see Table 6-3). In 2018, real GDP would again be 0.1 percent lower (or it would be equal to or as much as 0.3 percent lower than under current law, according to CBO's ranges of likely values). Under the second path, real GDP would be 0.3 percent lower than it is projected to be under current law in both 2017 and 2018 (or between 0.1 percent and 0.5 percent lower in 2017 and equal to or as much as 0.5 percent lower in 2018 than what would occur under current law, according to CBO's ranges of likely values). The paths would most likely continue to reduce real GDP below what it would be under current law for a few years after 2018, but CBO has not estimated the effects for those years.

Because businesses would produce less, they would hire fewer workers. According to CBO's central estimates, the number of full-time-equivalent employees under the first path would be 0.2 and 0.3 million smaller in 2017 and 2018, respectively, than under current law; under the second path, there would be 0.4 million fewer full-time-equivalent employees in 2017 and 0.5 million fewer in 2018 than under current law.[106]

### Effects of the Path With Larger Deficits

Under the illustrative path that would increase deficits, real GDP would be higher in the next few years than is projected under current law, CBO estimates. That path would boost deficits (excluding interest payments) by $40 billion in 2017 and by $76 billion in 2018 before macroeconomic feedback is taken into account—that is, by the same

105. CBO assumed that—when short-term interest rates were at or very near zero and monetary policy was thought to be constrained—each one-dollar change in budget deficits (excluding interest payments) relative to those under current law would change output cumulatively by one dollar over several quarters. That effect is estimated to be smaller when short-term interest rates are higher and monetary policymakers have more flexibility in responding to reductions in aggregate demand. For a similar approach, see Congressional Budget Office, *Budgetary and Economic Outcomes Under Paths for Federal Revenues and Noninterest Spending Specified by Chairman Price, March 2016 (March 2016)*, www.cbo.gov/publication/51260.

106. A year of full-time-equivalent employment is equal to 40 hours of employment per week for one year.

amounts the path with $2 trillion of deficit reduction would shrink them in those years. The resulting boost in overall demand would increase real GDP above what is projected under current law by 0.1 percent in both 2017 and 2018, CBO estimates. According to the agency's ranges of likely values for key variables, real GDP would probably be equal to or as much as 0.2 percent higher in 2017 and up to 0.3 percent higher in 2018 than what is projected under current law.

To produce that additional amount, businesses would hire more workers. As a result, the number of full-time-equivalent employees would be greater than is projected under current law by 0.2 million in 2017 and by 0.3 million in 2018, CBO estimates.

# Chapter 7: The Uncertainty of Long-Term Budget Projections

Budget projections are inherently uncertain. The projections in this report generally reflect current law and estimates of future economic conditions and demographic trends. However, if future policies governing taxes and spending diverge from what is prescribed in current law, budgetary outcomes will differ from those in the Congressional Budget Office's extended baseline, as the preceding chapter shows. Even if laws do not change, the economy, demographics, and other factors will undoubtedly differ from what CBO projects, and those variations will in turn cause budgetary outcomes to deviate from the projections in this report. Those differences could be within the ranges of experience observed in the relevant historical data—which, for the factors that CBO analyzes, cover roughly the past 50 to 70 years—or they might depart from historical experience. Moreover, significant budgetary effects could result from channels that CBO has not attempted to quantify in its analysis.

To illustrate some of the uncertainty associated with long-term budgetary outcomes, CBO constructed alternative projections that show what would happen to the budget if the values for various underlying factors differed from those used in the extended baseline. The alternative projections are based largely on the variation over time in the underlying factors' 30-year averages, as well as on consideration of possible future economic and demographic developments. The agency focused on four factors that are among the most fundamental—and yet most uncertain—inputs into its long-term economic and budget projections. Specifically, CBO quantified the consequences of alternative paths for the following variables:

- The labor force participation rate,
- The growth rate of total factor productivity—that is, the growth of real (inflation-adjusted) output that is not explained by the growth of labor and capital,[107]
- Interest rates on federal debt held by the public, and
- The growth rate of federal spending per beneficiary for Medicare and Medicaid.

Different paths for those four factors would affect the budget in various ways. For example, lower-than-projected labor force participation rates would diminish the size of the labor force and thereby reduce tax revenues. Faster growth in spending per beneficiary for Medicare and Medicaid would boost outlays for those two programs. Either of those changes would increase deficits and debt, which would lead to reduced output and higher interest rates—leading to macroeconomic feedback that would further worsen the budget outlook. By contrast, faster growth in total factor productivity (henceforth referred to in this chapter simply as productivity) or lower interest rates on federal debt held by the public would have the opposite effects on the budget. Those changes would reduce deficits and debt—in the former case, by increasing output and revenues, and in the latter case, by lowering the government's interest payments.

The projected budgetary outcomes under the alternative paths vary widely. In CBO's analysis, when only one factor at a time changes, projections of federal debt held by the public in 2046 range from 103 percent of gross domestic product (GDP) to 192 percent; under the extended baseline, federal debt as a share of GDP is projected to be 141 percent. Among the four factors, the simulated variation in labor force participation rates has much smaller effects on the budget over 30 years than the simulated variations in productivity, interest rates, and spending for Medicare and Medicaid. When all four factors change at once—but by only 60 percent as much as when they vary individually—projections of federal debt in 2046 range from 93 percent to 196 percent of GDP. Those projected levels of debt are all high by historical standards; compared to the peak reached in 1946, when federal debt amounted to 106 percent of GDP, the projections range from slightly less than that record high to nearly twice that amount. Even at the low end of that range, debt would be higher than it is now.

The four factors listed above are not the only ones that could differ from what is projected in CBO's extended baseline and affect budgetary outcomes. For example, higher rates of fertility or greater immigration flows would mean an increase in the ratio of working-age adults to older adults—with increased revenues collected from workers more than offsetting the additional spending resulting from increases in the number of older people receiving benefits. Moreover, changes in earnings inequality could affect the budget relative to CBO's projections through revenues from individual income

107. Total factor productivity is different from labor productivity, which is the amount of goods and services that can be produced per hour of labor.

taxes, spending on means-tested programs, and so on. Similarly, decisions by states about how much they spend on Medicaid could increase or decrease federal spending relative to CBO's projections.

Other types of developments could also have significant effects on the budget that are not quantified in this analysis—for example, an economic depression, such as the one that occurred in the United States in the 1930s; unexpectedly large losses on federal credit or insurance programs, such as those involving mortgage guarantees; a catastrophe or major war; unexpectedly significant effects of climate change; or the development of a previously underused natural resource. Any of those 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's based its analysis. The analytic approach the agency used for this long-term analysis focuses on projecting average outcomes.

Policymakers could address the uncertainty associated with long-term budget projections in various ways. For instance, they might design policies that partly insulated the federal budget from some unanticipated events; however, those policies could have unwanted consequences, such as shifting risk to individuals. Another possibility is that policymakers might aim for a smaller amount of federal debt to provide a buffer against the budgetary impact of adverse events and allow for more flexibility in responding to unexpected crises in the future.

## Long-Term Budgetary Effects of Changes in Four Key Factors

Budgetary outcomes could differ from CBO's projections if values for the four factors mentioned above—labor force participation rates, the growth rate of productivity, interest rates on federal debt, or the growth of federal spending per beneficiary on Medicare and Medicaid—diverged from those underlying the extended baseline projections in this report. Unexpected changes in labor force participation rates would alter the size of the labor force, output, and tax revenues. Changes in productivity would lead to changes in economic output, which would affect both revenues and spending. Changes in the interest rates on federal debt would affect the amount of interest paid by the government. And changes in the growth rate of federal health care spending, one of the largest components of the budget, would have significant implications for overall federal spending.

For CBO's alternative projections, the variation in those four factors over time offers a guide (though an imperfect one) to the amount of uncertainty that surrounds projections of those individual factors over the next 30 years. History is not an indicator of all future uncertainty, however. For that reason, CBO also considered the effects of possible future developments on the ranges used in the alternative projections.

Furthermore, to better capture the overall uncertainty of the combined effects of those individual factors, CBO also constructed two projections in which all four factors

simultaneously varied from their values under the extended baseline. In one of those cases, all of the factors varied in ways that increased the amount of federal debt; in the other, they varied in ways that reduced the amount of the debt.[108]

In CBO's extended baseline, which reflects the expected outcomes of those four factors, federal debt held by the public would equal 141 percent of GDP in 2046. Alternative projections of the factors would lead to the following outcomes:

- If the labor force participation rate was, on average, about 2 percentage points higher or lower over the 2017–2046 period than is projected in CBO's extended baseline, and was about 3.0 percentage points higher or lower in 2046, federal debt held by the public that year would be 137 percent of GDP (if participation was higher) or 144 percent (if participation was lower).

- If productivity grew 0.5 percentage points per year more quickly or more slowly than it does in CBO's extended baseline, federal debt held by the public in 2046 would be 112 percent of GDP (if productivity growth was faster) or 173 percent (if productivity growth was slower).

- If the average interest rate on government debt was 1.0 percentage point lower or higher than that in CBO's extended baseline, federal debt held by the public in 2046 would be 108 percent of GDP (if the rate was lower) or 188 percent (if the rate was higher).

- If spending per beneficiary for Medicare and Medicaid grew 1.0 percentage point per year more slowly or more quickly than it does in CBO's extended baseline, federal debt held by the public in 2046 would be 103 percent of GDP (if spending grew more slowly) or 192 percent (if spending grew more quickly).

- If all four factors deviated from their baseline values in ways that reduced deficits but did so by only 60 percent as much as in the cases specified above, federal debt held by the public in 2046 would be 93 percent of GDP; if all four factors deviated in ways that increased deficits but did so by only 60 percent as much as in the cases described above, federal debt held by the public would be 196 percent of GDP.

108. Another approach to quantifying the uncertainty of budget projections would be to create a distribution of outcomes from a large number of simulations in which factors such as productivity growth, interest rates, and the rate of increase in health care costs varied around an expected outcome. CBO generally uses that approach in its reports on the financial outlook for the Social Security trust funds. See Congressional Budget Office, *CBO's 2015 Long-Term Projections for Social Security: Additional Information* (December 2015), www.cbo.gov/publication/51047, and *Quantifying Uncertainty in the Analysis of Long-Term Social Security Projections* (November 2005), www.cbo.gov/publication/17472. However, the analysis presented here focuses on uncertainty as it relates to the expected outcomes themselves, rather than variation around those outcomes. Determining the appropriate variation in expected outcomes and estimating the distribution of outcomes for the federal budget as a whole would require additional modeling tools that CBO has not yet developed.

Those alternative projections incorporate macroeconomic feedback. For example, increased government borrowing would eventually reduce private investment in productive capital. The result would be a smaller stock of capital and lower output and income in the long term than would otherwise be the case. Lower income would reduce tax revenues. Federal noninterest spending would be lower if income was lower—although the effect would be smaller than that on revenues—because Social Security benefits are linked to earnings and because total spending on health care tends to vary with total income over the long term. CBO assumed that changes in income would not affect other noninterest spending. Therefore, budgetary feedback from increased government borrowing would lead to lower spending and still lower revenues, which would result in increased deficits and federal debt. Budgetary feedback from decreased government borrowing would work in the opposite direction.

### Labor Force Participation

The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are age 16 or older and either working or actively seeking work. That rate reflects people's decisions about the attractiveness of working or searching for work compared with such alternatives as attending school, caring for family members, or retiring. Key determinants include the demographic characteristics of the population and economic conditions. In CBO's extended baseline, labor force participation is projected to decline from about 63 percent in 2017 to about 58 percent in 2046.[109]

The average rate of labor force participation during the 30-year period from 1986 through 2015 was about 6 percentage points higher than it was from 1949 through 1978, the earliest period for which published data are available (see Figure 7-1). That increase was largely driven by long-term increases in women's labor force participation. The rate of participation for women climbed from 33 percent in 1949 to a peak of 60 percent in 1999 before slowly declining to 57 percent in 2015. The increase in women's labor force participation was partially offset by declines in men's rate of participation, which fell from 87 percent in 1948 to 69 percent in 2015.

Variations in labor force participation rates affect the federal budget by changing output and income and by changing the interest rates the federal government pays on public debt.[110] For example, income from higher labor force participation increases tax revenues. With respect to interest rates, higher labor force participation increases the ratio of labor to capital—factories and computers, for example—and thereby makes

109. For more information on CBO's labor force projections, see Appendix A of this report and Congressional Budget Office, *The Budget and Economic Outlook: 2016 to 2026* (January 2016), Chapter 2, www.cbo.gov/publication/51129.

110. To simplify this uncertainty analysis, CBO did not project budgetary effects of changes in labor force participation rates on means-tested programs beyond the agency's estimates of the way potential GDP affects spending for such programs.

capital more productive, which implies a higher rate of return on investment in private capital, all else being equal. According to widely used economic models, if growth in labor force participation increases, that rate of return remains higher over time. Because the federal government competes with private borrowers for investors' money, higher returns from private investment should push up interest rates paid by the federal government.[111]

To assess the budgetary effects of labor force participation rates that differ from CBO's central estimates, the agency projected outcomes if the labor force participation rate grew or shrank each year for 30 years relative to CBO's extended baseline.[112] In CBO's baseline projection, the labor force participation rate is 58 percent in 2046. In the alternative projections, the labor force participation rate over the entire 2017–2046 period is, on average, about 2 percentage points higher or lower than in CBO's baseline, and it is about 3 percentage points higher or lower in 2046. The labor force participation rate could be that high or low for various reasons:

- People who were ages 16 to 24 in the midst of the 2007–2009 recession and during the slow recovery that followed have displayed historically low rates of labor force participation. Because it is uncertain how much those participation rates have been held down for temporary reasons (such as weakness in the labor market) or persistent ones (such as people over age 16 spending a greater proportion of time as full-time students), projections of their future labor force participation are particularly uncertain. If, as members of that group got older, they were to participate in the labor force at higher rates than CBO projects in its extended baseline, the overall rate of participation would rise above 58 percent, the level projected for 2046. Furthermore, it is uncertain whether labor force participation rates for that group foretell the participation rate for future generations. If, over the next 30 years, people turning age 16 increased their labor force participation relative to those who turned 16 over the past decade, the overall labor force participation rate would be higher than projected in CBO's extended baseline. Labor force participation would fall below CBO's projections if, in the future, the participation rate of people over age 16 decreased relative to the baseline as they got older or if they entered the labor force at lower rates than projected in CBO's baseline.

- The structure of the tax system under current law is projected to raise effective tax rates on earnings from labor and thus reduce the amount of labor that workers choose to

111. For example, in the Solow-type growth model that CBO used for this analysis, if labor force participation rates in 2046 were 3 percentage points higher than projected in the extended baseline, the average interest rate on federal debt held by the public that year would be about 0.4 percentage points higher than the baseline value. For details of that model, see Congressional Budget Office, *CBO's Method for Estimating Potential Output: An Update* (August 2001), www.cbo.gov/publication/13250.

112. CBO's central estimates represent expected outcomes when key inputs to the analysis are at the midpoints of their ranges.

supply. Those changes are mainly attributable to the following: the gradual shift of income into higher tax brackets, because income grows faster than prices; and the implementation of a new tax on certain employment-based health insurance plans with high premiums, which is scheduled to go into effect in 2020 and is projected to affect a growing number of people over time. Workers' responses to tax rates could be much stronger or weaker than CBO has projected.[113]

- Social and technological developments, such as changes in the roles of men and women in the rearing of children or the diffusion of a new medical technology that improves the health of the population, could significantly alter labor force participation rates in the future.

CBO estimated likely ranges for the first two of those contributing factors—examining high and low values for the participation rates of cohorts of young workers and high and low values of labor-supply responses to changes in tax rates—and considered effects of the third contributing factor, other potential factors, and their interactions. The resulting alternative projections for labor force participation are about 3 percentage points higher (or lower) in 2046. The alternative labor force projections would lead to the following alternative budget projections:

- If the labor force participation rate was 61 percent in 2046, the resulting higher GDP would lead to more revenues, higher interest rates, smaller budget deficits, and less federal debt. Federal debt held by the public would be 137 percent of GDP in 2046 rather than the 141 percent that CBO projects under the extended baseline (see Figure 7-2).

- If the labor force participation rate was 55 percent in 2046, the slower economic growth would result in larger budget deficits and more debt. That debt would be 144 percent of GDP in 2046.

### Productivity

Productivity is an important determinant of economic output. Its growth stems from a number of sources, such as the introduction and spread of new technology, increases in workers' education and skill levels, and the use of new processes that improve the efficiency of organizations. CBO estimates that the growth of productivity, which has averaged 1.5 percent per year since 1950, has accounted for more than 40 percent of the increase in real (inflation-adjusted) nonfarm business output over that time. Productivity is projected to increase, on average, by 1.3 percent per year in the coming decades in CBO's extended baseline. However, the growth rate of productivity has

113. For further discussion, see Congressional Budget Office, *How the Supply of Labor Responds to Changes in Fiscal Policy* (October 2012), www.cbo.gov/publication/43674; and Edward Harris and Shannon Mok, *How CBO Estimates the Effects of the Affordable Care Act on the Labor Market*, Working Paper 2015-09 (Congressional Budget Office, December 2015), www.cbo.gov/publication/51065.

often varied for extended periods. Periods of rapid growth have generally resulted from major technological innovations. For example, innovations in four critical areas—electricity generation, internal combustion engines, chemicals, and telecommunications—triggered a surge in productivity in the 1920s and 1930s. Another surge occurred in the 1950s and 1960s, spurred by the electrification of homes and workplaces, suburbanization, completion of the nation's highway system, and production of consumer appliances. The latest surge in productivity—a more modest one—began in the 1990s and is attributed to innovations involving computers and other types of information technology.[114] Productivity growth has been relatively weak since the 2007–2009 recession, however, and it is expected to remain weak over the next few years.

A great deal of uncertainty surrounds the future growth rate of productivity. The nation could experience faster growth in productivity than is reflected in CBO's extended baseline, either steadily (as a result of ongoing gains from the integration of information technology into the economy, for example) or more suddenly (from a technological breakthrough, such as the development of a new source of energy). Conversely, the growth of productivity could be slower than is projected in CBO's extended baseline (if, for example, the rate of increase in workers' education levels declined or if technological innovation or the dispersion of previous technological innovations throughout the economy diminished more than expected).

Changes in the rate of productivity growth would affect the federal budget by changing output and income and also, in CBO's assessment, by changing the interest rates the federal government pays on public debt. Higher productivity would increase revenues because of greater output and income. Higher productivity, like greater labor force participation, also indicates that capital is more productive, which implies a higher rate of return from private capital investment, all else being equal. Because the federal government competes with private borrowers for investors' money, higher returns from private investment would push up interest rates paid by the federal government.

Although empirical estimates of the relationship between productivity and interest rates vary, the theoretical relationship is clear enough for CBO to incorporate an effect on interest rates into this analysis.[115]

114. For further discussion, see Robert Shackleton, *Total Factor Productivity Growth in Historical Perspective*, Working Paper 2013-01 (Congressional Budget Office, March 2013), www.cbo.gov/publication/44002.

115. For example, in the Solow-type growth model that CBO used for this analysis, if productivity grew 0.5 percentage points more quickly than it is projected to grow in the extended baseline, the average interest rate on federal debt held by the public in 2046 would be about 0.7 percentage points higher than the extended baseline value. For details of that model, see Congressional Budget Office, *CBO's Method for Estimating Potential Output: An Update* (August 2001), www.cbo.gov/publication/13250.

CBO assessed average productivity growth over the 37 30-year periods that occurred between 1950 and 2015. Beginning with the 1950–1979 period and ending with the 1986–2015 period, average productivity growth varied by about 1 percentage point (see Figure 7-1). CBO therefore projected economic and budgetary outcomes that would occur if productivity grew by either 0.8 percent or 1.8 percent per year over the next 30 years—that is, 0.5 percentage points more slowly or more quickly than the 1.3 percent that is incorporated in the extended baseline.[116]

Those alternative projections for productivity growth would lead to the following alternative budget projections:

- If productivity grew by 1.8 percent annually, 0.5 percentage points more quickly than in the extended baseline, then the greater GDP would result in more revenues, higher interest rates, smaller budget deficits, and less federal debt as a share of GDP. Federal debt held by the public would be 112 percent of GDP in 2046 rather than the 141 percent that CBO projects in the extended baseline (see Figure 7-3).

- If productivity grew by 0.8 percent annually, 0.5 percentage points more slowly than in the extended baseline, the slower economic growth would result in larger budget deficits and more debt as a share of GDP. That debt would be 173 percent of GDP in 2046.

Faster or slower productivity growth could also affect the budget in ways that are not accounted for in this analysis—for example, by changing the shares of the nation's income received by workers (in the form of wages and salaries, for instance) and by the owners of productive capital (in the form of corporate profits, for example). In recent years, technological change appears to have affected productivity in ways that put downward pressure on labor's share of income (for example, by expanding options for using capital in place of labor), a trend that some economists believe will be long-lasting.[117]

### Interest Rates on Federal Debt

Changes in interest rates on federal debt held by the public—or federal borrowing rates—have direct effects on the budget. Federal borrowing rates are currently at historic lows, but CBO projects that they will rise in the coming years, from an average of 1.7 percent in 2015 to 4.4 percent in 2046. As a result of those projected increases and the resulting increase in deficits, interest payments on federal debt, which are

116. Foranother approach to measuring uncertainty in long-run projections of productivity growth, see Ulrich K. Müller and Mark W. Watson, "Measuring Uncertainty About Long-Run Predictions," *Review of Economic Studies* (March 2016),http://dx.doi.org/10.1093/restud/rdw003. Müller and Watson's approach yields a range of uncertainty around productivity growth that is similar in size to the range that CBO calculated.

117. For further discussion, see Congressional Budget Office, *How CBO Projects Income* (July 2013), www.cbo.gov/publication/44433.

currently a little over 1 percent of GDP, are projected to grow to about 6 percent of GDP by 2046. As federal debt grows to 141 percent of GDP in 2046, changes in the federal borrowing rate will have larger impacts on the federal budget.

However, given how much interest rates on federal debt have varied in the past, projections of those rates involve a great deal of uncertainty. CBO estimates that in real terms (that is, with adjustments to exclude the effects of inflation), the interest rate on 10-year Treasury notes averaged about 3 percent in the 1960s, about 1 percent in the 1970s, about 6 percent in the 1980s, about 4 percent in the 1990s, about 2 percent between 2000 and 2007, and about 1 percent over the past eight years.[118]

Many factors affect the real federal borrowing rate. Some of them reflect economic growth and investment flows; some relate to the current amount of federal borrowing and debt; and several others depend on financial conditions. Economic factors include the rate of growth of the labor force, the rate of growth of productivity, private saving, and the amount of inflows of capital from foreign investors (see Appendix A). Federal borrowing rates also depend on the size of deficits and the amount and duration of federal debt. Finally, the federal borrowing rate is affected by financial factors such as changes in investors' appetite for risk, which can vary with changes in portfolio preferences among U.S. and foreign investors, the perception of the underlying risk of private securities relative to federal debt, the response of financial institutions to regulations that require the holding of low-risk assets, and the liquidity of federal government debt relative to that of private securities.

For this analysis, CBO focused on the effects of changes to the federal borrowing rate caused by unexpected changes in financial factors. Changes in interest costs would, in turn, lead to changes in the deficit, which would affect national saving and interest rates and lead to changes in output. By design, changes to the federal borrowing rate that are attributable to unexpected changes in financial factors are not caused by changes in economic conditions or changes in the federal budget.[119] By contrast, in CBO's uncertainty analyses of productivity and labor force participation, federal borrowing rates change in response to economic developments.

Although there are many ways to estimate the extent to which unexplained financial factors contribute to federal borrowing rates, one approach suggests those factors

118. To calculate real interest rates, actual rates were adjusted using changes in the consumer price index. Past values of the consumer price index were adjusted to account for changes over time in the way that the index measures inflation. See Bureau of Labor Statistics, "CPI Research Series Using Current Methods (CPI-U-RS)" (April 13, 2016), www.bls.gov/cpi/cpiurs.htm.

119. Unexpected changes in financial factors are the historical variations in the federal borrowing rate that are not explained by economic and budgetary factors. CBO estimates the historical variations in the federal borrowing rate that are explained both directly and indirectly by economic and budgetary factors; the remaining unexplained historical variation is the contribution of unexpected changes in financial factors.

accounted for approximately 1.0 percentage point of the variation over 30-year periods between 1949 and 2015. Other specifications result in moderately wider or narrower ranges. In addition, the recent large and unexpected changes in the 10-year real interest rates on Treasury notes point to significant uncertainty around CBO's projection of the federal borrowing rate. On the basis of that evidence, CBO constructed its range of uncertainty around federal borrowing rates by raising and lowering the federal borrowing rate by 1.0 percentage point, before accounting for macroeconomic feedback. Incorporating macroeconomic feedback widens the range of uncertainty around federal borrowing rates. For example, if unexpected changes in financial factors caused the average federal borrowing rate over the next 30 years to increase or decrease by 1.0 percentage point, after accounting for macroeconomic feedback, the average 10-year real interest rate over the next 30 years ranges from 1.2 percent to 3.5 percent relative to a projection of 2.3 percent under the extended baseline (see Figure 7-1).

Those alternative projections for the federal borrowing rate on federal debt held by the public would lead to the following alternative budget projections:

- If unexpected changes in financial factors caused the average federal borrowing rate to be 1.0 percentage point lower before accounting for macroeconomic feedback, then net interest would equal 3.1 percent of GDP by 2046 instead of the 5.8 percent projected in the extended baseline.[120] Federal debt held by the public would be 108 percent of GDP in 2046 rather than the 141 percent that CBO projected in that baseline (see Figure 7-4).

- If unexpected changes in financial factors caused the average borrowing rate to be 1.0 percentage point higher before accounting for macroeconomic feedback, then interest would be 10.3 percent of GDP in 2046, CBO projects, and federal debt held by the public would reach 188 percent of GDP.

### Federal Spending on Medicare and Medicaid

The federal government pays for health care through Medicare, Medicaid, and other programs; through subsidies for insurance purchased through the health insurance marketplaces established under the Affordable Care Act; and through tax preferences, especially the exclusion for employment-based health insurance.[121] In CBO's extended

120. The estimated direct effects on budget projections of changes in the government's borrowing rates do not incorporate any changes in remittances by the Federal Reserve or in the relative amounts of different types of taxable income (for example, profits and interest income). Such changes would have additional budgetary implications.

121. Most payments that employers and employees make for health insurance coverage are exempt from income and payroll taxes. For more information, see Congressional Budget Office, *Federal Subsidies for Health Insurance Coverage for People Under Age 65: 2016 to 2026* (March 2016), www.cbo.gov/publication/51385.

baseline, federal spending on health care per beneficiary increases more slowly in the future than it has, on average, in recent decades, although it still outpaces the growth of potential (that is, maximum sustainable) output per capita. Because substantial uncertainty surrounds the future growth of health care costs, the effects of that growth on the federal budget are similarly uncertain. Consequently, CBO assesses those effects by varying the growth rate of costs in the two largest components of federal spending on health care, Medicare and Medicaid.

Many factors will affect Medicare and Medicaid spending per beneficiary in the long term (for further discussion, see Chapter 3). Perhaps the most important factor is the extent to which advances in health care technology will raise or lower costs. New and less expensive medical procedures or treatments could prove effective in helping patients, which could lower costs. But other beneficial procedures and treatments might be more expensive; and even services that are relatively inexpensive could make spending rise quickly if growing numbers of patients used them.[122] In particular, technologies that work to extend the life of Medicare recipients tend ultimately to increase expenditures for the program over time. Other factors that could affect health care costs are changes in the structure of payment systems and innovations in the delivery of health care.

In addition, Medicare and Medicaid spending will be affected by the health of the population. Outlays for Medicare and Medicaid depend in part on the prevalence among beneficiaries of certain medical conditions—for example, cardiovascular and pulmonary disease, diabetes, arthritis, and depression. The prevalence of such conditions could evolve in unexpected ways for various reasons, including changes in behavior (for example, rates of smoking, amounts of physical activity, or dietary patterns), new treatments for various illnesses, new medical interventions that reduce the occurrence or severity of certain conditions or diseases, and the emergence of epidemics.

The measure that CBO examined for this analysis of uncertainty was excess cost growth, which is the growth rate of health care spending per person after removing the effects of demographic changes—most notably, changes in the age distribution of the population—relative to the growth rate of potential GDP per person.[123] Starting with the 1976–2005 period and ending with the 1986–2015 period, average excess cost growth for Medicare and Medicaid over various 30-year periods declined by about 1.0 percentage point, both because of changes in laws and other factors (see Figure 7-1). In assessing possible values for the average rate of excess cost growth over the next 30 years, CBO considered that, if current laws remained unchanged, the 30-year average rate could continue to decline (although probably not as quickly as the

122. See Congressional Budget Office, *Technological Change and the Growth of Health Care Spending* (January 2008), www.cbo.gov/publication/41665.

123. The definition and calculation of excess cost growth are discussed in more detail in Chapter 3.

historical decline that included changes in laws). Conversely, it could revert toward the higher rate observed in the past. CBO also drew upon an alternative approach to measuring uncertainty that uses information about trends and cycles in excess cost growth over time; it produced a potential range for excess cost growth through 2046 that was larger than the range of historical variation.[124] Using those approaches to help determine the extent of the range, CBO analyzed the effects of rates of excess cost growth for Medicare and Medicaid that were 1.0 percentage point above and below the rate of growth for each year in the extended baseline. (CBO focused on Medicare and Medicaid because the projected size of those programs means that variations in their rates of growth would have particularly large effects on the federal budget; for additional discussion of the extended baseline projections for those programs, see Chapter 3.)

Those alternative projections for the growth of health care spending would lead to the following alternative budget projections:

- If Medicare and Medicaid spending per beneficiary rose 1.0 percentage point per year more slowly than in the extended baseline, federal debt held by the public would be 103 percent of GDP in 2046 rather than the 141 percent that CBO projects in the extended baseline (see Figure 7-5).

- If Medicare and Medicaid spending per beneficiary rose 1.0 percentage point per year more quickly than in the extended baseline, federal debt held by the public would be 192 percent of GDP in 2046.

### Multiple Factors

The previous cases illustrated what would happen to the federal budget if a single factor differed from the projections that CBO used in the extended baseline. Undoubtedly, outcomes for multiple factors would differ from CBO's projections. Estimating the budgetary consequences of such a circumstance is more complicated than simply adding together the outcomes of the individual cases. For example, higher-than-projected health care costs would have a larger effect on the budget if interest rates on federal debt were also higher than CBO projects—because the government would have to pay more interest on debt that resulted from the additional health care spending.

The four factors could affect each other directly—for example, higher productivity would lead to higher wages and higher labor force participation rates—or they could be jointly affected by other changes to the economy. To account for such interactions among the key variables, CBO examined two alternative projections in which they were assumed to change together. The agency used only part of the full range for each of

124. See Ulrich K. Müller and Mark W. Watson, "Measuring Uncertainty About Long-Run Predictions," *Review of Economic Studies* (March 2016), http://dx.doi.org/10.1093/restud/rdw003.

the four factors because the chances of federal debt being above or below the estimates when all four factors are at the high and low ends of their ranges is much smaller than when each individual factor is at the high and low end of its range. Specifically, the agency analyzed illustrative cases in which all four factors varied from the baseline by 60 percent of their individual ranges. For example, in the cases discussed above, the range for the rate of productivity growth was 1 percentage point, yielding growth rates that were 0.5 percentage points higher and lower than the values in the extended baseline; but for the combined projections, the range for the rate of productivity growth is 0.6 percentage points, yielding growth rates that are 0.3 percentage points higher or lower than the values underlying the extended baseline.

Although the range for each of the four key factors when considered jointly is 60 percent of the range when they are considered individually, the resulting effects on federal debt as a share of GDP, relative to the extended baseline, turn out to be less than 60 percent of the sum of the estimated effects for the individual factors because of interactions among the factors. For example, simultaneous changes in rates of productivity growth and labor force participation—which individually affect the federal borrowing rate—interact to create an effect on the interest rate that differs from the sum of the individual factors' effects on interest rates. A decrease in productivity lowers the return on capital, as does a drop in the labor force participation rate. Both together lower the return on capital even more than they would if each factor was considered individually and added together. The reduction in the return on capital is reflected in a reduction in federal borrowing rates. That reduction in borrowing rates leads to lower net interest costs than would result from adding together the reductions in interest costs from the four analyses that vary one factor at a time.

Varying the four factors simultaneously so that all four collectively increase or decrease the deficit leads to the following budget projections:

- If labor force participation was about 2 percentage points higher in 2046, productivity grew 0.3 percentage points per year more quickly, unexplained financial factors lowered the federal borrowing rate by 0.6 percentage points, and federal costs per beneficiary for Medicare and Medicaid grew by about 0.6 percentage points per year more slowly than under the extended baseline, federal debt held by the public would be 93 percent of GDP in 2046 rather than the 141 percent that CBO projects under the extended baseline (see Figure 7-6).

- If labor force participation was about 2 percentage points lower in 2046, productivity grew 0.3 percentage points per year more slowly, unexplained financial factors increased the federal borrowing rate by 0.6 percentage points, and federal costs per beneficiary for Medicare and Medicaid grew by about 0.6 percentage points per year more quickly than under the extended baseline, federal debt held by the public would be 196 percent of GDP in 2046.

## Uncertainty Arising From Other Inputs to CBO's Projections

CBO's long-term budget estimates depend on projections of numerous variables in addition to those analyzed above. Although the factors discussed in the previous section are four of the more important ones, they are intended to provide illustrative examples, not to be exhaustive. Every variable has some uncertainty associated with it. For instance, demographics, earnings inequality, and decisions by states about Medicaid are also important, but CBO has not quantified the potential effects on the budget of uncertainty involving all of those factors.

### Changes in Demographics

Demographic factors have significant effects on economic and budgetary outcomes. For instance, GDP depends to a large degree on the size of the labor force, which is related to the number of adults between the ages of 20 and 64, and federal outlays for Medicare, Medicaid, and Social Security are closely linked to the number of people who are at least 65 years old. Higher rates of fertility or greater immigration flows would generally cause federal spending to decrease relative to GDP because they would increase the ratio of adults ages 20 to 64 to older adults (which would increase GDP). Faster improvement in mortality rates would generally cause federal spending to increase relative to GDP because people of all ages would be expected to live longer, which would increase the number of people who received benefits from Social Security, Medicare, Medicaid, and certain other mandatory spending programs and thereby increase federal outlays for those programs.[125]

### Changes in Earnings Inequality

CBO expects that—as has occurred over the past several decades—workers with high earnings will experience faster earnings growth during the next 10 years than will workers with low earnings. Thereafter, CBO expects, the earnings of all workers will grow at the same rate. That is, CBO expects earnings inequality to increase over the next 10 years and to remain near that level thereafter. The significant uncertainty regarding that projection is a source of uncertainty regarding the budget projections in CBO's extended baseline. For example, faster-than-projected earnings growth for those with relatively high earnings and lower-than-projected earnings growth for those with relatively low earnings would lead to higher-than-projected tax revenues and higher-than-projected spending on means-tested transfer programs.

In assessing that uncertainty, CBO considered the way that many factors contributed to the evolution of earnings inequality over the past several decades. Determining the contribution of each of those factors is difficult, and studies of the issue have not

125. For a review of the effects of alternative estimates of future mortality rates on long-term budget projections, see Congressional Budget Office, *The 2015 Long Term Budget Outlook* (June 2015), Chapter 7, www.cbo.gov/publication/50250.

reached consensus about the relative importance of each. Among the economic factors contributing to changes in earnings inequality were increases in the employment of women, the movement of some jobs to other countries, and increases in the immigration of less-skilled workers. In addition, changes in technology that increased the productivity of higher-skilled workers and the slowing growth of the educational attainment of workers have been factors. Changes in federal policy probably also contributed to changes in earnings inequality. For instance, changes in means-tested programs and tax credits, which provide cash payments or assistance in obtaining health care, food, housing, or education to people with relatively low income or few assets, may have affected the incentives of less-skilled people to work. A number of other factors have also had an impact on labor markets and earnings inequality: The federal minimum wage, after adjusting for changes in prices, has not increased substantially over the past several decades; rates of incarceration have increased; the number of workers in unions has declined; the size and structure of firms has changed; and the share of workers in the manufacturing sector has declined as the share of workers in the service sector has increased.

Many of the factors discussed above will continue to affect changes in the distribution of earnings, although some will be less relevant in the future. For instance, although increases in the employment of women were a factor in the changing distribution of earnings over the past several decades, those increases ended in about 2000 and are no longer contributing factors. In addition, the speed with which technology increased the productivity of more highly skilled workers appears to have slowed in recent decades, even as the growth in educational attainment has slowed.

Some other factors will be more relevant. For instance, changes in the size and structure of industries and firms will probably continue to affect the earnings distribution in the future. In CBO's projections, the supply of more-educated workers increases more quickly than the supply of less-educated ones, which could cause the premium paid to more-educated workers to rise more slowly than it has in the past or to stop rising altogether. That process would tend to slow the growth of earnings for high earners and possibly slow the growth of overall earnings inequality in the future.

In the absence of compelling evidence about which factors have contributed the most to rising inequality and how those factors would affect inequality in the future, that disparity in earnings is projected to continue to increase for the first decade of the forecast period, but not thereafter, in CBO's estimation. CBO continues to assess the sources of earnings inequality and their implications for the federal budget.

### Decisions by States About Medicaid

State governments have flexibility in administering their Medicaid programs, and the decisions they make about eligibility, benefits, and payments to providers affect the federal budget because the federal government pays a large share of Medicaid's costs. One source of uncertainty is whether states will make decisions that increase or

decrease spending by providing coverage to more adults, decreasing covered benefits, or changing payments to providers. Decisions by states could significantly decrease or increase federal expenditures for Medicaid relative to the amounts in CBO's projections.

## Potential Developments in the Economy and Their Effects on the Budget

The sources of uncertainty discussed above are not the only ones associated with long-term budget projections. They do not account for other plausible but unpredictable developments that could increase or decrease federal debt relative to CBO's projections. Such possible developments could include a severe economic depression; unexpectedly large losses on federal financial obligations; unexpectedly significant effects of climate change; catastrophes, such as a major natural disaster or world war; or the development of natural resources.

### A Severe Economic Downturn

In general, when economic output rises or falls, the federal budget is automatically affected. For example, economic downturns can reduce revenues significantly and raise some outlays, such as those for unemployment insurance and nutrition assistance.[126] In addition, downturns have historically prompted policymakers to enact legislation that further reduces revenues and increases federal spending—to help people suffering from the weak economy, to bolster the financial condition of state and local governments, and to stimulate additional economic activity and employment. The budgetary effects of the recent recession were particularly large: Federal debt increased from 35 percent of GDP at the end of 2007 to 70 percent at the end of 2012, in large part because of the recession and weak recovery and the policy responses enacted to counter those developments.

The long-term projections of output and unemployment in this report 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.[127] However, the projections do not account for the possibility of a severe economic

126. See Congressional Budget Office, *The Budget and Economic Outlook: 2015 to 2025* (January 2015), Appendix D, www.cbo.gov/publication/49892.

127. Since the end of World War II, the unemployment rate has been about one-quarter of one percentage point higher, on average, than CBO's estimate of the natural rate of unemployment (the rate arising from all sources except fluctuations in aggregate demand). That difference implies that periods of significant economic weakness (such as the 2007–2009 recession and its aftermath) have pushed the unemployment rate above CBO's estimate of the natural rate more than periods of significant economic strength have pushed it below that estimate. Consistent with that finding is CBO's projection that the unemployment rate in the long term will be 5.3 percent, which is about one-quarter of one percentage point higher than CBO's estimate of the natural rate of unemployment in the long term. For further discussion, see Appendix A.

downturn like the Great Depression of the 1930s. Such events are rare; for that reason and others, their magnitude and timing cannot be readily predicted. If such an event occurred in the next 30 years, federal debt would probably be substantially greater than is projected in CBO's extended baseline.

### Losses on Federal Insurance or Credit Programs

The federal government supports a variety of private activities through federal insurance and credit programs that provide loans and loan guarantees.[128] CBO includes the expected losses from those credit and insurance programs in its baseline projections. Significantly greater losses could result from certain unexpected events, such as a major disruption in the financial system or a deep slump in the economy. Alternatively, long periods of financial and economic stability could lead to smaller losses.

Federal insurance and credit programs generate losses when the support provided by the federal government exceeds the money taken in by the programs through fees, loan repayments, interest payments, sales of assets, wage garnishment, and other means. For example, in the wake of the recent housing crisis, widespread defaults on guaranteed mortgages led to substantial outlays by the federal government. Widespread defaults on student loans or the bankruptcy of numerous companies with underfunded pension plans could lead to analogous costs for the federal government in the future.[129] Conversely, long periods of particularly strong economic growth could allow federal insurance and credit programs to collect higher-than-projected repayments and cover lower-than-projected expenses.

Moreover, significant implicit liabilities, apart from the liabilities created by official government programs, could affect the federal government. In the event of a financial crisis, for example, federal policymakers might decide to provide monetary support to the financial system, as they did during the recent financial crisis. Such support could increase federal outlays above the amounts projected in the extended baseline.

128. Federal insurance programs provide coverage for deposits at financial institutions (through the Federal Deposit Insurance Corporation), for workers' pensions (through the Pension Benefit Guaranty Corporation), and for property against damage by floods (through the National Flood Insurance Program), among other things. The largest federal credit programs provide mortgage loan guarantees (through the Federal Housing Administration, Fannie Mae, and Freddie Mac); student loans; and federally backed loans to businesses (through the Small Business Administration, for example). There are a number of smaller programs, including the loan guarantees provided by the Department of Energy and the terrorism risk insurance program administered by the Treasury.

129. For more discussion, see James D. Hamilton, *Off-Balance-Sheet Federal Liabilities*, Working Paper 19253 (National Bureau of Economic Research, July 2013), www.nber.org/papers/w19253.

### Catastrophes or Wars

The federal government also faces implicit obligations in the case of catastrophes and can spend large sums in fighting a major war. Small-scale natural and manmade disasters occur fairly often in the United States; they may seriously damage local communities and economies, but they have rarely had significant, lasting impacts on the national economy. By contrast, a catastrophe could affect budgetary outcomes by reducing economic growth over a number of years, leading to substantial increases in federal spending. For example, the nation could experience a massive earthquake, a pandemic, an asteroid strike, a geomagnetic storm from a large solar flare, or a nuclear meltdown or attack that rendered a significant part of the country uninhabitable. Participation in a major war could also have significant economic and budgetary impacts: The ratio of federal debt held by the public to GDP rose by 60 percentage points during World War II, for instance. Because such events are extremely rare, it is very difficult to estimate the probability of their future occurrence and their possible effects on the budget.

### Climate Change

Substantial uncertainty surrounds any projection that attempts to account for the impact of climate change on the economy or on the budget. Many estimates—based on a range of scenarios about the extent of climate change in the future—suggest that such effects on the nation's economic output, and hence on federal tax revenues, will probably be small over the period covered by CBO's long-term projections and larger, but still modest, in later years.[130] Even under scenarios in which significant climate change is assumed, the projected long-term effects on GDP would tend to be modest relative to underlying economic growth for two primary reasons. First, only a small share of the U.S. economy is directly affected by changes in climate; the largest effects would probably occur in the agricultural sector, which currently represents about 1 percent of total U.S. output. Second, some activities within the agricultural sector—crop production in the northern United States, for example—could experience gains because of climate change. In any event, some of the effects of climate change (such as the loss of biodiversity) neither directly relate to measured economic output nor affect tax revenues.

The uncertainty surrounding such projections arises from several sources: the unpredictability of global economic activity and technology development, both of which affect the amount of emissions in the future; limitations in current data; and the imperfect understanding of physical processes and of many aspects of the interacting components (land, air, water, ice, and all forms of life) that make up the Earth's climate system. CBO continues to monitor research on the effects of climate change on the U.S. economy, to consider how those effects might alter the federal budget outlook and

130. Congressional Budget Office, *Potential Impacts of Climate Change in the United States* (May 2009), www.cbo.gov/publication/41180.

to evaluate federal policies that could lead to lower emissions or mitigate damage from changes in the climate.

For those reasons, CBO's extended baseline does not explicitly incorporate the effects of climate change. It implicitly includes some small effects by reflecting historical spending on such programs as federal crop insurance, federal flood insurance, and the Federal Emergency Management Agency's disaster relief program.[131] Aside from those implicit changes in federal outlays, the extended baseline does not incorporate any budgetary effect that climate change might have; it does not, for example, account for the effect on federal tax revenues that climate change could have if it affected the nation's economic output.

Although CBO has not undertaken a full analysis of the budgetary costs stemming from climate change, it has recently analyzed the potential costs of future hurricane damage caused by climate change and coastal development.[132] Three factors that influence the rate of growth of future hurricane damage are sea levels, the frequency of severe hurricanes, and the amount of development in coastal areas (because the damage caused by hurricanes will depend, in part, on the amount of people and property in harm's way). All told, CBO projects that the increase in the amount of hurricane damage attributable to coastal development and climate change will probably be less than 0.05 percent of GDP in the 2040s. The federal expenditures projected to result from those economic effects would not significantly affect the budget categories in which hurricane-related spending falls.

Although CBO's baseline projections—which incorporate the assumption that current law would generally remain in place—do not capture possible changes in law, changes related to concerns about the effects of climate change could affect the budget if they were to occur. In the future, if weather-related disasters increase in frequency and magnitude, lawmakers could respond by increasing funding above the amounts in CBO's projections. 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. Or lawmakers could amend existing laws to reduce federal spending

131. Some of the programs most affected by weather-related disasters—such as federal crop insurance and flood insurance—fall into the category of other mandatory spending in CBO's long-term projections. In CBO's extended baseline, spending in that category (apart from outlays for refundable tax credits) is projected to continue to decline as a share of GDP after the 10-year baseline projection period. That decline is projected to be at roughly the same rate as that projected for the last 5 years of the baseline. Other programs affected by weather-related disasters—such as the Federal Emergency Management Agency's disaster relief program—are discretionary; spending for those programs is projected to remain roughly constant as a share of GDP in the years following the baseline projection period.

132. Congressional Budget Office, *Potential Increases in Hurricane Damage in the United States: Implications for the Federal Budget* (June 2016), www.cbo.gov/publication/51518.

on weather-related disasters. For instance, the Congress might decide to alter flood insurance or crop insurance programs in a way that provides insured parties with a greater incentive to avoid potential damage.

### Natural Resources

The future discovery and development of productive natural resources may cause federal receipts to increase. For example, recent 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 a decade ago, the development of shale resources has boomed in the United States in recent years, affecting two kinds of federal receipts—federal tax revenues and payments to the government by private developers of federally owned resources. By boosting GDP, shale development has increased tax receipts. Because some of the shale resources being developed are federally owned, developers must make payments to the federal government; however, most of the nation's shale resources are not federally owned, so those payments do not increase federal receipts by a significant amount.[133] Advances in the development of other resources might also contribute to federal receipts by bolstering the economy and making federally owned resources more valuable.

## Implications of Uncertainty for the Design of Fiscal Policy

Policymakers could take uncertainty into account in various ways when making fiscal policy choices.[134] For example, they might decide to design policies that reduced the budgetary implications of certain unexpected events. Policymakers might also decide to provide a buffer against events with negative budgetary implications by aiming for lower debt than they would if such uncertainty did not exist.

Whether or not the federal budget directly bears the risk of uncertain outcomes, all risk is ultimately distributed among individuals—as taxpayers, as beneficiaries of federal programs, or as both. If federal spending for certain programs turned out to be higher than projected, the additional imbalance could be offset only through higher revenues or lower spending for other programs or activities at some point in the future. If the additional imbalance was not offset, then deficits would be larger, resulting in lower future income. Conversely, if spending turned out to be lower or revenues greater than projected, then an opportunity would exist to lower taxes or boost spending; it would also be possible to reduce future deficits, resulting in higher income. Which income groups or generations benefited the most—or bore the largest burden—from

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

134. See Alan J. Auerbach and Kevin Hassett, "Uncertainty and the Design of Long-Run Fiscal Policy," in Auerbach and Ronald D. Lee, eds., *Demographic Change and Fiscal Policy* (Cambridge University Press, 2001), pp. 73–92, http://tinyurl.com/p93enfp.

unexpected budgetary developments would depend on the policies that lawmakers enacted as a result.

### Reducing the Effects of Unexpected Events on the Federal Budget

Fiscal policy cannot eliminate the risk factors that create uncertainty about budgetary outcomes, but it can reduce the budgetary implications of those factors. However, reducing budgetary uncertainty for the federal government could have unwanted consequences, such as shifting risk to individuals. Under current law, for example, growth in Medicare and Medicaid outlays per beneficiary depends in part on the growth of per capita health care costs. Some proposals would instead link growth in federal outlays per beneficiary to measures of overall economic growth or general price inflation.[135] Such a change could affect national spending for health care, the federal budget, individuals' costs, and the budgets of state and local governments. It might greatly reduce uncertainty about future federal outlays for Medicare and Medicaid, but it might also greatly increase uncertainty about the future costs borne by the programs' beneficiaries and by state and local governments.[136]

Similarly, policymakers could reduce the budgetary implications of uncertainty about future life expectancy by indexing the eligibility age for programs such as Social Security or Medicare to average life spans. Under current law, if longevity increased more than expected, outlays for federal health care and retirement programs would exceed projections. If policies were changed so that the age of eligibility for those programs rose automatically with increases in longevity, the budgetary effects of such increases would be dampened. However, people would face greater uncertainty about the timing and size of the benefits that they would receive, and the effects would vary among subgroups of the population.

In addition, policymakers could reduce the budgetary implications of unexpected rises in interest rates by increasing the share of government borrowing that is done through longer-term securities. Using that approach, the Treasury could lock in interest rates for a considerable period. However, interest rates on longer-term debt are typically higher than rates on shorter-term debt, so that approach would probably increase the interest that the federal government paid. Moreover, if interest rates were locked in for a long period, the federal government would benefit less from unexpected declines in interest rates.

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135. For an example of such a proposal, see Congressional Budget Office, *Preliminary Analysis of the Rivlin-Ryan Health Care Proposal* (attachment to a letter to the Honorable Paul D. Ryan, November 17, 2010), www.cbo.gov/publication/21928, and Option 1 in Congressional Budget Office, *Health-Related Options for Reducing the Deficit: 2014 to 2023* (December 2013), www.cbo.gov/publication/44906, pp. 6–14.

136. Most proposed policy changes of that sort would affect both the expected amounts of federal outlays and the uncertainty about those outlays, but those two effects are conceptually distinct.

### Reducing Federal Debt

As an alternative or complementary approach, policymakers could improve the federal government's ability to withstand the effects of events that would significantly worsen the budgetary outlook. In particular, reducing the amount of federal debt held by the public would give future policymakers more flexibility in responding to extraordinary events. For example, a financial crisis in the future might have significant negative economic and budgetary implications, just as the 2007–2009 financial crisis did: The ratio of federal debt held by the public to GDP increased by 35 percentage points between 2007 and 2012. If another financial crisis prompted a similar increase when the ratio of federal debt to GDP was already high (such as its current level of 75 percent), policymakers might be reluctant to accept the initial cost of a proposed intervention in the financial system or the economy, even if they expected to recoup at least part of that cost over time.

In addition, a high ratio of debt to GDP increases the risk of a fiscal crisis in which investors lose confidence in the government's ability to manage its budget and the government in turn loses its ability to borrow at affordable rates.[137] There is no way to predict the amount of debt that might precipitate such a crisis, but starting from a position of relatively low debt would reduce the risk.

# Appendix A: CBO's Projections of Economic and Demographic Trends

The long-term outlook for the federal budget as described in this report was developed on the basis of the Congressional Budget Office's projections for a host of economic and demographic trends for the next three decades. (Average values for 2016 to 2046, the period encompassed by CBO's extended baseline, are shown in Table A-1. A set of annual projections is included in the supplemental data for this report, available online at www.cbo.gov/publication/51580.)

## CBO's Approach to Economic Projections

Through 2026, the economic projections presented in this volume are the same as those that CBO published in its January 2016 forecast (which underlies the agency's most recent 10-year budget projections).[138] For the years beyond 2026, CBO's projections generally reflect historical trends and projected demographic changes.

137. That sort of crisis might be triggered by an adverse event that quickly drove up the ratio of debt to GDP, such as a depression or a war. For further discussion, see Congressional Budget Office, *Federal Debt and the Risk of a Fiscal Crisis* (July 2010), www.cbo.gov/publication/21625.

138. See Congressional Budget Office, *Updated Budget Projections: 2016 to 2026* (March 2016), www.cbo.gov/publication/51384, and *The Budget and Economic Outlook: 2016 to 2026* (January 2016), Chapter 2, www.cbo.gov/publication/51129.

Comparing this year's economic projections with last year's is complicated by a change in CBO's approach. This year, the detailed economic projections account for the macroeconomic effects of fiscal policy; the detailed projections shown in Appendix A of last year's report, *The 2015 Long-Term Budget Outlook*, did not. Instead, the detailed 2015 economic projections were "benchmark" projections, consistent with a constant ratio of debt to gross domestic product (GDP) and constant marginal tax rates. Some of the macroeconomic effects of the fiscal policies embodied in the extended baseline, and their feedback effects on the budget, were presented separately last year.[139]

The result is that the estimates of economic variables presented in this appendix are not strictly comparable to those CBO published last year. Where possible, this year's appendix highlights differences between this year's and last year's projections that incorporate the effects of fiscal policy. Nonetheless, most economic variables reported here are not strongly affected by fiscal policy, and the demographic projections are not affected at all. Where the effects did have a notable influence on CBO's projections, this appendix highlights those effects for this year's projections.

## Economic Variables

The performance of the U.S. economy in coming decades will affect the federal government's tax revenues, spending, and debt accumulation. To estimate those effects, CBO projects trends in such key economic variables as the size and composition of the labor force, the number of hours worked, earnings per worker, capital accumulation, productivity, inflation, and interest rates. The agency also considers ways in which fiscal policy influences economic activity. (Chapter 6 of this volume discusses the economic effects of some alternative paths for deficits and debt accumulation.)

### Gross Domestic Product

CBO projects that a recovery in aggregate demand will spur more rapid growth in real (inflation-adjusted) GDP over the next few years than the economy has experienced, on average, since the recession ended. Thereafter, real GDP is projected to grow at a pace that reflects increases in the supply of labor, capital services, and productivity that are consistent with the changes in marginal tax rates and increases in federal debt that CBO is projecting in its extended baseline.

CBO's projection of real GDP growth—an annual average of 2.1 percent over the 2016–2046 period—is similar to last year's projection. However, the growth rate is significantly slower than the 2.6 percent rate of the past three decades, primarily

139. For a longer discussion of the projections that incorporated effects of fiscal policy under current law, see Congressional Budget Office, *The 2015 Long-Term Budget Outlook* (June 2015), Chapter 6, www.cbo.gov/publication/50250.

because of the anticipated slower growth of the labor force. Moreover, as the labor force grows more slowly than the overall population, per capita real GDP is expected to increase more slowly than it has in the past—at an average annual rate of 1.4 percent over the 2016–2046 period, compared with 1.6 percent for the past 30 years.

Over the long term, total GDP is projected to be one-half of one percent below its potential (maximum sustainable) amount. That projection is based on CBO's estimate that actual GDP was roughly that much lower than potential GDP, on average, from 1961 to 2009 and lower than potential GDP, on average, in each of the past five business cycles. Those outcomes reflect CBO's assessment that actual output has fallen short of potential output during and after economic downturns to a larger extent and for longer periods than actual output has exceeded potential output during economic booms.[140]

### Labor Market

Among the factors accounted for in CBO's labor market projections are the size of the labor force, the unemployment rate, the average number of hours that people work, and various measures of workers' earnings.

**Growth of the Labor Force.** The growth of the labor force has slowed progressively over the past few decades, but particularly since 2007. For the 2016–2046 period, CBO projects that the number of workers will increase by about 0.4 percent per year, on average. That rate is faster than the average since 2007 and similar to the rate CBO projected last year, but less than half the average for the past 30 years.

That slowdown in the pace relative to earlier decades is anticipated to result both from more workers' leaving the labor force (because of the burgeoning retirement of the baby-boom generation, despite the gradual increase in the average retirement age) and from fewer workers' entering it. The drop in new entrants will result from three trends. First, birth rates are declining: The nation's fertility rate has fallen by nearly 50 percent since 1960, to slightly below 2 today (discussed later under "Fertility"). As a result, the annual growth rate of the population between the ages of 20 and 64, which averaged about 1.0 percent over the past 30 years, is projected to slow to about 0.4 percent over the 2016–2046 period. Next, the participation of women in the labor force, which peaked in 1999, has declined slightly since then. (Participation rates among working-age men also have declined.) And finally, CBO estimates, some fiscal policies projected in the extended baseline would tend to reduce incentives to work. Notably, rising federal debt and increasing marginal tax rates (attributable to growth in real income) would limit the growth of after-tax wages, and continued growth in nongroup health insurance coverage under the Affordable Care Act over the next decade would reduce the need for employment-based coverage.

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

CBO expects that those forces will be modestly offset by a pair of trends working in the opposite direction. First, increasing longevity will lead people to work longer: In the coming decades, the average person is likely to work about three months longer for each additional year of life expectancy. Thus, if life expectancy was four years longer for one cohort of workers than for an earlier one, the longer-lived cohort would work about a year longer, all else being equal. Second, the population is becoming more educated, and workers with more education tend to stay in the labor force longer than do people with less education.

The Unemployment Rate. CBO projects that the unemployment rate will decline from 5.0 percent at the end of 2015 to 4.4 percent in 2017, rise again gradually to 5.0 percent by 2020, and then remain at that level through 2026. In the meantime, the natural rate of unemployment (which results from all sources other than fluctuations in overall demand related to the business cycle) will gradually decline from 4.9 percent to slightly less than 4.8 percent.[141] From 2021 onward, CBO projects, the unemployment rate will remain about one-quarter of a percentage point above the natural rate, which is consistent with the historical average relationship between the two measures and with the projected gap of one-half of one percent between actual and potential GDP.

After 2026, the actual and natural rates of unemployment are both projected to decline gradually as a result of changes in demographics and education: Older and more educated workers tend to have lower actual and natural rates of unemployment, so those rates will decline as the labor force ages and becomes increasingly more educated. By 2046, the natural rate is projected to be slightly less than 4.6 percent, and the actual rate is projected to be about 4.8 percent. The adoption of projections of age- and education-specific natural rates of unemployment results in lower rates than CBO published last year, when the agency projected that the natural rate of unemployment would gradually decline to about 5.3 percent by the end of 2017 and to 5.2 percent by the end of 2020 and remain at 5.0 percent from 2027 onward.

Average Hours Worked. Different subgroups of the labor force work different numbers of hours, on average. Men tend to work more hours than women do, and people between the ages of 30 and 40 tend to work more than people between the ages of 50 and 60. CBO's projections are based on the assumption that those differences among groups will remain stable. However, the agency also expects that over the long term, the composition of the labor force will shift toward groups that tend to work less (such as older workers). As a result, the average number of hours worked by the labor force as a whole will decline slightly. CBO estimates that by 2046, the average number of hours per worker will be about 2 percent less than it is today, about the same change in hours per worker that CBO projected last year.

141. That decline reflects the decreasing share of younger workers and the rising share of older workers in the working-age population: Older workers have lower unemployment rates than younger ones, so the changing shares will reduce the overall rate.

**Total Hours Worked.** Total hours worked will increase at an average annual rate of 0.4 percent between 2016 and 2046, CBO estimates, on the basis of projections of the size of the labor force, average hours worked, and unemployment. That estimate matches last year's projection for the 2015–2040 period.

**Earnings as a Share of Compensation.** Workers' total compensation consists of taxable earnings and nontaxable benefits, such as paid leave and employers' contributions to health insurance and pensions. Over the years, the share of total compensation paid in the form of earnings has slipped—from about 90 percent in 1960 to about 81 percent in 2015—mainly because the cost of health insurance has risen more quickly than has total compensation.[142]

CBO expects that trend in health care costs to continue, and that by itself would further decrease the proportion of compensation that workers receive as earnings. However, starting in 2018, the Affordable Care Act will impose an excise tax on some employment-based health insurance plans that have premiums above specified amounts. Some employers and workers will respond by shifting to less expensive plans, thereby reducing the share of compensation consisting of health insurance premiums and increasing the share that consists of earnings. CBO projects that the effects of the tax on the mix of compensation will roughly offset the effects of rising costs for health care for a few decades; after that, the effects of rising health care costs will outweigh those of the excise tax.[143] As a result, the share of compensation that workers receive as earnings is projected to remain near 81 percent through 2046, which is about the same as CBO projected last year. (For more on the projected effects of the excise tax, see Chapter 5; for more on projected changes in health care costs, see Chapter 3.)

**Growth of Real Earnings per Worker.** Trends in prices, the growth of nonwage compensation (such as employment-based health insurance), and average hours worked imply that real earnings per worker will grow by an average of 1.2 percent annually over the 2016–2026 period and by 1.3 percent per year over the 2016–2046 period. Last year, CBO projected that growth in real earnings per worker would average 1.4 percent between 2015 and 2040. The current projection is lower because it accounts for changes in fiscal policy that would result in slower growth of output and earnings; the detailed economic projections published in *The 2015 Long-Term Budget Outlook* did not account for such effects.

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

143. CBO anticipates that the effects of the excise tax on the taxable share of compensation will diminish over time, both because it expects that most people will continue to want a significant amount of health insurance and because the Affordable Care Act set minimum amounts of coverage for health insurance plans. Therefore, the number of additional people moving to less expensive insurance plans will eventually dwindle.

**Share of Earnings Below the Taxable Maximum.** Social Security payroll taxes are levied only on earnings up to a maximum annual amount ($118,500 in 2016). Below that amount, earnings are taxed at a combined rate of 12.4 percent, split between the employer and employee (self-employed workers pay the full amount); no tax is paid on earnings above the cap. The taxable maximum has remained a nearly constant proportion of the average wage since the mid-1980s, but because earnings have grown more for higher earners than for others, the portion of covered earnings on which Social Security payroll taxes are paid has fallen from 90 percent in 1983 to 82 percent now.[144] CBO projects that the unequal growth in earnings will continue for the next decade and then stop: The portion of earnings subject to Social Security taxes is projected to fall below 78 percent by 2026 and to remain near that level thereafter. That share is about 1 percentage point lower than CBO projected last year.

The most recent projections, which reflect a reexamination of recent trends, show an increased rate of growth of wages and salaries for higher-income taxpayers relative to the growth of such income for other taxpayers and also relative to the growth rates that CBO had previously incorporated into its projections. That adjustment pushed more wages and salaries in CBO's projections above the taxable maximum.

### Capital Services

Over the longer term, growth in the nation's stock of capital and in the flow of productive services from that stock will be driven by economic output, private saving, federal borrowing, marginal tax rates, and international flows of financial capital, CBO estimates. In particular, capital services will expand slightly more slowly than output after 2026 because of rising debt and increasing marginal tax rates.

CBO's projection of growth in the flow of real capital services is slightly below the rate it projected last year, largely because the agency improved its method for estimating the productive services that flow from different types of assets. That change led CBO to lower its estimates of historical and projected growth of capital services in the nonfarm business sector even though the historical data that the agency uses to estimate capital services are largely unchanged. In addition, in this year's projection, the greater accumulation of federal debt crowds out investment, further dampening the growth of capital services. As a result, CBO projects the flow of real capital services to grow at an average rate of 2.0 percent per year between 2016 and 2046.

### Total Factor Productivity

The annual growth of total factor productivity (TFP, the average real output per unit of combined labor and capital services) is projected to increase from about 0.5 percent in 2015 to about 1.4 percent in 2022 and then to slow slightly through 2046, yielding an

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

average annual growth rate of 1.3 percent from 2016 to 2046, or about 0.2 percentage points slower than the average annual rate of nearly 1.5 percent since 1950 and about the same as the average rate since 1990.

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

Some developments in particular support such projections for TFP, among them the recent slow growth in labor quality (a measure of workers' skills that accounts for educational attainment and work experience) following a relatively rapid rise over the past few decades. In CBO's judgment, that change results both from a gradual, persistent, long-term slowdown in the increase in average educational attainment and from the burgeoning retirement of a relatively large and skilled portion of the workforce—the baby-boom generation. The decline will be partly offset, however, by the aging of those remaining in the labor force over the next few decades, particularly as better health and longer life expectancy lead people to stay in the workforce longer than did members of previous generations. An older workforce generally has a larger proportion of more highly educated workers because those workers tend to remain in the labor force longer than do workers with less education.

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

Although CBO's projection in 2015 was also for average TFP growth of 1.3 percent, that consistency is the product of offsetting changes. Because TFP reflects the portion of growth in real GDP that is not attributable to changes either in hours worked or in capital services, the downward revision to capital services in earlier years resulted in a corresponding increase in historical TFP. Higher historical growth in TFP in turn suggests higher growth in the future than CBO previously projected. That change, however, was

offset in CBO's projections not only because CBO placed more weight on the considerations discussed above for trends in TFP but also because recent updates and revisions to historical output data led CBO, in developing its projections, to place more weight on the unexpected and persistent recent weakness in TFP growth.

### Labor Productivity

The growth rates projected for the labor supply, the capital stock, and TFP result in CBO's projection of the average growth of labor productivity (real output per hour worked) of 1.7 percent annually over the 2016–2046 period. Last year, that growth was projected to average 1.8 percent between 2015 and 2040. The current projection is lower mainly because this year's estimate accounts for effects of fiscal policy in the extended baseline that would result in slower growth of investment.

### Inflation

CBO projects the rate of inflation in the prices of various categories of goods and services as measured by the annual rate of change in the consumer price index for urban wage earners and clerical workers and in the consumer price index for all urban consumers (CPI-U). CBO projects that inflation will average 2.4 percent over the 2016–2046 period. (In the long term, both indexes are projected to increase at the same rate.) That long-term rate is slightly less than the average rate of inflation since 1990, when growth in the CPI-U averaged 2.5 percent per year, and slightly more than the 2.3 percent average rate that CBO projected last year for the 2015–2040 period. The change reflects the fact that CBO projected—accurately, as it turns out—that the rate of inflation would be particularly low in 2015, a year that is no longer encompassed by the long-term projections.

After 2018, the annual inflation rate for all final goods and services produced in the economy, as measured by the rate of increase in the GDP price index, is projected to average 0.4 percentage points less than the annual increase in the consumer price indexes.[145] The GDP price index grows more slowly than the consumer price indexes because it is based on the prices of a different set of goods and services and because it is based on a different method of calculation. The projected gap between the CPI-U and the GDP price index is unchanged from last year's estimate.

### Interest Rates

CBO makes projections of the interest rates, both real and nominal, that apply to federal borrowing, including the rate on 10-year Treasury notes, the average rate on holdings of the Social Security trust funds, and the average rate on federal debt held by the public.

145. Final goods and services are those purchased directly by consumers, businesses (for investment), and governments, as well as net exports.

After considering several factors, including slower growth of the labor force, CBO expects real interest rates on federal borrowing to be lower in the future than they have been, on average, over the past few decades. The real interest rate on 10-year Treasury notes (calculated by subtracting the rate of increase in the consumer price index from the nominal yield on those notes) averaged roughly 3.1 percent between 1990 and 2007.[146] That rate has averaged 0.8 percent since 2009 and is projected to be 1.7 percent in 2026. In CBO's projections, the rate continues to rise thereafter, reaching 2.3 percent in 2046, 0.7 percentage points lower than its average over the past few decades.

**Factors Affecting Interest Rates.** Analysts who wish to use past trends as a starting point for long-term projections of interest rates must exercise judgment about which periods to examine. Real interest rates were low in the 1970s because of an unexpected surge in inflation; in the 1980s, when inflation declined at an unexpectedly rapid pace, real rates were high.[147] Interest rates fell sharply during the financial crisis and recession that began in 2007.

To avoid using any of those possibly less representative periods, CBO considered average interest rates and their determinants for the 1990–2007 period and then judged how different those determinants might be over the long term.[148] Some factors reduce interest rates; others increase them. In CBO's assessment, over the 2016–2046 period, several factors will probably reduce interest rates on government securities relative to their 1990–2007 average:

- The labor force is projected to grow much more slowly than it has for the past few decades. If everything else remains equal (including the unemployment rate), that

146. Between 1970 and 2007, the real interest rate on 10-year Treasury notes averaged 3.2 percent; the average from 1953 to 2007 was 2.9 percent. Historical inflation rates are taken from the consumer price index, adjusted to account for changes over time in the way that the index measures inflation. See Bureau of Labor Statistics, "CPI Research Series Using Current Methods (CPI-U-RS)" (April 13, 2016), www.bls.gov/cpi/cpiurs.htm.

147. CBO calculates real interest rates by subtracting expected rates of inflation from nominal interest rates. Borrowers and lenders agree to nominal interest rates after accounting for their expectations of what inflation will be. However, if rates are set under the expectation that inflation will be a certain percentage and it ends up being higher, real interest rates will turn out to be lower than anticipated. If inflation ends up lower than expected, the opposite will occur. CBO's approach is based on an assumption that the actual consumer price index, adjusted to account for changes over time in the way that the index measures inflation, is a useful proxy for expectations of inflation. One drawback is that if inflation trends are changing rapidly over time, changes in expectations may lag behind changes in actual inflation. Although CBO's approach could mismeasure expectations of inflation and real interest rates in some years, the way inflation has fluctuated over time suggests that CBO's approach yields useful measurements for 30-year averages.

148. A Bank of England study identified a similar set of determinants that account for the decline in real interest rates over the past 30 years. See Lukasz Rachel and Thomas D. Smith, *Secular Drivers of the Global Real Interest Rate*, Staff Working Paper 571 (Bank of England, December 2015), http://tinyurl.com/z6zqnb7 (PDF, 1.8 MB).

slower growth in the number of workers will tend to increase the amount of capital per worker in the long term, reducing the return on capital and therefore also reducing the return on government bonds and other investments.[149]

- The share of total income received by high-income households is expected to be larger in the future than it has been during the past few decades. Higher-income households tend to save a greater proportion of their income, so the difference in the distribution of income will increase the total amount of savings available for investment, other things being equal. As a consequence, the amount of capital per worker will rise and interest rates will fall.

- TFP will grow slightly more slowly in the future than it has in recent decades, CBO projects. For a given rate of investment, lower productivity growth reduces the return on capital and results in lower interest rates, all else being equal.

- The risk premium—the additional return that investors require to hold assets that are riskier than Treasury securities—will probably remain higher in the future than its average over the 1990–2007 period. Financial markets were already showing less appetite for risk in the early 2000s, resulting in higher risk premiums than in the 1990s. CBO expects the demand for low-risk assets to be further strengthened by the economic fallout from the financial crisis, the slow subsequent recovery, and financial institutions' response to increased regulatory oversight. Moreover, the greater riskiness perceived for investments in countries with emerging market economies is likely to increase demand for U.S. assets (particularly federal debt) that are considered to be relatively risk-free. That rise in demand will lead to lower returns on those assets (that is, to lower interest rates).

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

- Under the extended baseline, federal debt would be much larger as a percentage of GDP than it was before 2007—reaching 86 percent by 2026 and 141 percent by 2046. The latter figure is three and a half times the average of the 1990–2007 period. Higher federal debt tends to crowd out private investment in the long term, reducing the amount of capital per worker and increasing both the return on capital and interest rates.

- Net inflows of capital from other countries will be smaller as a percentage of GDP in the future than they have been, on average, in recent decades, CBO projects. In the 1990s and early-to-middle 2000s, rapid economic growth and high rates of saving in various nations with emerging market economies led to large flows of capital from

149. 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.

those countries to the United States. Two types of developments are likely to affect those flows in the future. On one hand, as those nations' economies continue to grow, their consumption will probably increase relative to saving—because markets for their debt will develop and because average citizens will tend to receive more of the gains from economic growth—and their demand for domestic investment will rise. On the other hand, recent weakness in the outlook for global economic growth suggests that demand for investment abroad will be somewhat restrained. On net, that combination of changes is projected to reduce capital flows to the United States relative to those in the 1990s or early 2000s, decreasing domestic investment and the amount of capital per worker and boosting rates of return. (Those developments are consistent with CBO's projection that the U.S. trade deficit, the gap between its imports and its exports, will be narrower in the future as a percentage of GDP than it has been for the past few decades.)

- The capital share of income—the percentage of total income that is paid to owners of capital—has been on an upward trend for the past few decades, and CBO projects that it will remain higher than its average of recent decades. Although that share is expected to decline somewhat over the next decade from its current, historically high level, the factors that appear to have contributed to its rise (such as technological change and globalization) are likely to persist, keeping it above the historical average. In CBO's estimation, a larger share of income accruing to owners of capital will directly boost the return on capital and thus interest rates.

- The retirement of the baby-boom generation and slower growth of the labor force will reduce the number of workers in their prime saving years relative to the number of older people who are drawing down their savings, CBO projects. The result will be a decrease in the total amount of savings available for investment (all else being equal), which will tend to reduce the amount of capital per worker and thereby push interest rates up. (CBO estimates that this effect will only partially offset the positive effect on savings of increased income inequality, leaving a net increase in savings available for investment.)

CBO also has considered other influences on interest rates but has concluded that they will have relatively small effects.

In addition to its analysis of the factors listed above, CBO relies on information from financial markets in projecting interest rates for the long term. The current rate on 30-year Treasury bonds, for example, reflects market participants' judgments about the path of interest rates on short-term securities for 30 years into the future. That market forecast informs CBO's assessment of market expectations for the risk premium and for investment opportunities in the United States and abroad, and it points to considerably lower interest rates well into the future relative to those of recent decades.

**Projections of Interest Rates.** Some factors mentioned above are easier than others to quantify. For instance, the effect of labor force growth and rising federal debt can be estimated from available data, theoretical models, and estimates in the literature. But the extent to which other factors will affect interest rates is more difficult to compute. A shift in preferences for low- rather than high-risk assets is not directly observable, for instance. And although the distribution of income is observable, neither models nor empirical estimates offer much guidance for quantifying its effect on interest rates. Moreover, current interest rates are not a reliable indicator of investors' expectations about interest rates over the long term, in part because maturities of most of the government's outstanding debt securities are much shorter than the 30-year period that is the focus of CBO's long-term projections. In light of those sources of uncertainty, CBO relied on economic models, the research literature, and other information to guide its assessments of the effects of various factors on interest rates over the long term.

The estimates and assumptions that underlie CBO's extended baseline projections suggest a real interest rate on 10-year Treasury notes that averages about 1.9 percent over the 2016–2046 period. That rate is about 1.2 percentage points lower than the 3.1 percent average recorded for the 1990–2007 period, but it also implies that the real rate will gradually increase from its current unusually low level over the next three decades. In the final decade of the 30-year projection period, the rate is projected to average 2.2 percent.

The average interest rate on all federal debt held by the public tends to be somewhat below the rates on 10-year Treasury notes because interest rates are generally lower on shorter-term than on longer-term debt and because Treasury securities are expected to mature, on average, over periods of less than 10 years. The combination of CBO's projections of the interest rates for assets of different maturities and the average maturity of federal debt for the period beyond CBO's 10-year baseline leads to a 0.4 percentage-point difference between the rate on 10-year Treasury notes and the effective rate on federal debt. That difference is projected to average 0.8 percentage points over the next decade. The difference is larger over that period than is projected for later years because a significant portion of federal debt outstanding during that period was issued at the very low interest rates prevailing in the aftermath of the recession. (The average interest rate on all federal debt is projected to rise more slowly than the 10-year rate because only a portion of federal debt matures each year.) Thus, CBO projects, the average real interest rate on all federal debt held by the public (adjusted for the rate of increase in the CPI-U) will be about 1.4 percent for the 2016–2046 period.

The Social Security trust funds hold special-issue bonds that generally earn interest at rates that are higher than the average rate on federal debt. Therefore, in projecting the balances in the trust funds and calculating the present value of future streams of

revenues and outlays for those funds, CBO used an interest rate that averages 1.9 percent for the 2016–2046 period.[150]

Combining CBO's projections of real interest rates with inflation, as measured by the growth of the CPI-U, yields projected nominal interest rates. CBO projects average nominal rates of 4.3 percent on 10-year Treasury notes and 3.7 percent on all federal debt held by the public for the 2016–2046 period.

**Revisions to Projections of Interest Rates.** The interest rate projections in this year's long-term budget outlook are substantially lower than last year's projections. The real rates on 10-year Treasury notes and the Social Security trust funds are projected to average 1.9 percent over the entire 30-year projection period and 2.2 percent in the final decade of the period. In particular, both rates are projected to be 2.2 percent in 2040 (the final year of the projection in *The 2015 Long-Term Budget Outlook*). Last year, after accounting for the effects of fiscal policy in the extended baseline, CBO projected both rates to be 2.6 percent in 2040.[151]

CBO's downward revisions to its interest rate projections are rooted in several factors. Since last year CBO has revised upward its estimates of the risk premium and of the net inflow of foreign capital relative to GDP. Both changes led to a downward revision in projected interest rates and both are consistent with signals from financial markets that participants expect interest rates to remain low well into the future. In addition, a release last July of revised historical data from the Bureau of Economic Analysis led CBO to revise downward its estimate of the share of income that is generated by capital; the new data showed that the share was lower than reported previously.[152] Finally, CBO expects TFP to grow more slowly relative to the growth experienced during the 1990–2007 period than it anticipated last year. The recent decline in the capital

150. A present value is a single number that expresses a flow of future income or payments in terms of an equivalent lump sum received or paid at a specific point in time; the present value of a given set of cash flows depends on the rate of interest—known as the discount rate—that is used to translate them into current dollars.

151. These comparisons address the economic projections that incorporate the effects of the fiscal policies embodied in the extended baseline. Last year's benchmark projections—that is, the projections consistent with the assumption of a constant ratio of debt to GDP and stable effective marginal tax rates beyond 2025—were different. In last year's benchmark, the real rate on 10-year Treasury notes averaged 2.2 percent over the entire projection period and 2.3 percent in the later years. Although this year's report does not use an economic benchmark, CBO estimated interest rates that are consistent with the assumption of a constant debt-to-GDP ratio and stable effective marginal tax rates beyond 2026. Those projections of 10-year Treasury note rates would be 1.7 percent over the 2016–2046 period, on average, and 1.8 percent in the later years. As a result, the comparable interest rates relative to last year's benchmark projections are revised downward by about 0.5 percentage points.

152. See Stephanie H. McCulla and Shelly Smith, "The 2015 Annual Revision of the National Income and Product Accounts," *Survey of Current Business*, vol. 95, no. 8 (August 2015), pp. 1–31, http://go.usa.gov/x3Fe3 (PDF, 1.5 MB).

share and the slower expected growth in TFP both imply lower returns on capital and, in turn, lower interest rates.

## Demographic Variables

In addition to influencing the overall performance of the economy, the size and composition of the U.S. population affects federal tax revenues and spending. Demographic projections incorporate estimated rates of fertility, immigration, and mortality, and the changes in those variables ultimately will affect the size of the labor force and the number of beneficiaries for such federal programs as Social Security and Medicare.

CBO anticipates that the annual growth rate of the U.S. population will decline gradually from about 0.8 percent in 2016 to about 0.5 percent in 2046 and that the total population will increase from 328 million at the beginning of 2016 to 400 million in 2046. Those values are somewhat below the estimates published in last year's report.

The population is projected not only to grow more slowly but also to become older, on average, than in the past. Because the elderly share of the population is growing and the working-age share is shrinking, the nation will face growing retirement and health care costs as a larger portion of the population receives Social Security and Medicare benefits while a smaller segment pays into the trust funds that support those federal programs.

### Fertility

CBO estimates a total fertility rate of 1.9 children per woman for the 2016–2046 period.[153] (That rate is the average number of children that a woman would have in her lifetime if, at each age of her life, she experienced the birthrate observed or assumed for that year and if she survived her entire childbearing period.) Fertility rates often decline during recessions and rebound during recoveries. However, after the 2007–2009 recession, the U.S. fertility rate (which in 2007 was 2.1) dropped and has remained below 1.9. CBO's projection is consistent with that recommended by the Social Security Advisory Board's 2015 Technical Panel on Assumptions and Methods and slightly below the average rate of 2.0 that CBO projected last year for the 2015–2040 period.[154] The change in projected fertility is the largest factor in this year's projection of slower population growth.

153. Although CBO projects a total fertility rate, in its long-term model, the likelihood that a particular woman will have a child depends on such factors as that woman's education, marital status, immigration status, and childbearing history.

154. See 2015 Technical Panel on Assumptions and Methods, *Report to the Social Security Advisory Board* (September 2015), p. 9, http://go.usa.gov/cJYR5 (PDF, 3.4 MB); and Congressional Budget Office, *The 2015 Long-Term Budget Outlook* (June 2015), www.cbo.gov/publication/50250.

### Immigration

CBO's immigration projections match those underlying its 10-year baseline through 2026. After 2026, net annual immigration (which accounts for all people who either enter or leave the United States in any year) is projected to decline slowly until 2036, when it is expected to equal the rate projected by the Census Bureau.[155] (CBO anticipates that net annual immigration will continue to match the Census Bureau's projections thereafter.) On that basis, the rate of net annual immigration to the United States is projected to be 4.0 per thousand people in the U.S. population in 2026 and 3.7 per thousand people in 2046. Net annual immigration is anticipated to rise from 1.4 million people in 2026 to 1.5 million people in 2046. The current projection is higher than the annual net immigration rate of 3.2 per thousand people after 2025 that CBO used in *The 2015 Long-Term Budget Outlook*. CBO increased its projection for the period after 2026 to be more consistent with the trend it anticipates for the next 10 years.

### Mortality

The mortality rate, which is the number of deaths per thousand people, has generally declined in the United States for at least the past half century. During that period, the mortality rate has generally improved more quickly for younger people than for older people. In particular, a recent review of the data by CBO suggests that the differences in relative improvements in mortality exhibited by various age groups are significant and likely to continue. For example, mortality rates for people below 15 years old declined by about 80 percent between 1950 and 2012, an average drop of more than 2½ percent per year, whereas mortality rates for people over the age of 80 declined by an average of less than 1 percent per year over the same period. CBO projects that mortality rates for each five-year age group will continue to decline at the average pace experienced from 1950 through 2012. In contrast, in *The 2015 Long-Term Budget Outlook,* CBO projected that the rate of decline would be the same for all ages and both sexes. This year's projections show a slower rate of decline in mortality rates for people in older groups than for younger, but no difference by sex.

CBO's projections indicate an average life expectancy at birth of 82.3 years in 2040, compared with 79.2 years in 2016.[156] Similarly, CBO projects that life expectancy at age 65 in 2040 will be 21.2 years, or 1.8 years longer than life expectancy at age 65 in 2016.[157] The life expectancies projected for 2040 this year are a bit shorter than

155. See Census Bureau, "Population Projections, 2014 National Population Projections: Summary Tables," Table 1 (accessed July 8, 2016), http://go.usa.gov/x33DB.

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

157. CBO projects that life expectancy in 2090 will be 87.3 years at birth and 24.6 years at age 65. CBO's projections of life expectancies are longer than those of the Social Security trustees (85.9 and 23.6 years, respectively) but shorter than the projections (88.3 and 25.3 years, respectively) recommended in the report of the 2015 Technical Panel on Assumptions and Methods, *Report to the Social Security Advisory Board* (September 2015), pp. 13–20, http://go.usa.gov/cJYR5 (PDF, 3.4 MB).

those reported last year: In last year's report, life expectancy at birth and at age 65 in 2040 was projected to be 82.6 years and 21.8 years, respectively.

After projecting average mortality rates for men and women in each age group, CBO incorporates differences in those rates on the basis of marital status, education, and lifetime household earnings. (For people under 30, the mortality projections account for age and sex only.) CBO projects a greater life expectancy for people who are married, have more education, and are in higher income groups.[158]

# Appendix B: Changes in Long-Term Budget Projections Since June 2015

The long-term projections of federal revenues and outlays presented in this report differ from the ones that the Congressional Budget Office published in 2015 because of certain changes in law, revisions to some of the agency's assumptions and methods, and the availability of more recent data.[159] (Changes in economic and demographic variables are described in Appendix A.) Additionally, the extended baseline spans 30 years rather than 25—a change consistent with Congressional interest in projections over that period as part of the 2016 budget resolution. Moreover, all of this year's projections beyond 2026 incorporate the effects of fiscal policy under current law. Last year's detailed budget projections did not incorporate those effects.[160] Because most projections in the 2015 report ended in 2040, CBO is only able to compare projections through that year.

With macroeconomic feedback taken into account, debt is projected to rise from about 75 percent of gross domestic product (GDP) this year to 122 percent in 2040 under the extended baseline; last year, CBO projected that debt would rise to 107 percent of GDP in that year (see Figure B-1). That difference stems both from lower projected revenues and lower projected GDP (see Appendix A for details about projections of GDP). As a percentage of GDP, revenues are lower and spending higher than CBO

158. For more information about mortality differences among groups with different earnings, see Congressional Budget Office, *Growing Disparities in Life Expectancy* (April 2008), www.cbo.gov/publication/41681; and Julian P. Cristia, *The Empirical Relationship Between Lifetime Earnings and Mortality*, Working Paper 2007-11 (Congressional Budget Office, August 2007), www.cbo.gov/publication/19096.

159. See Congressional Budget Office, *The 2015 Long-Term Budget Outlook* (June 2015), www.cbo.gov/publication/50250.

160. Projections of total revenues, total spending excluding interest payments, deficits, and debt incorporating the effects of fiscal policy under current law were described in Chapter 6 last year.

projected last year, but the increased spending relative to GDP results almost exclusively from a lower projection of GDP rather than from higher projected spending.

CBO published less detailed long-term budget projections in January 2016.[161] Those projections were not a full update but rather were based on a simplified approach that the agency has used between full updates.[162] In January, CBO projected that federal debt held by the public would reach 155 percent in 2046; it now projects that debt will reach 141 percent of GDP in that year. That change results primarily from lower projected interest rates.

## Changes in Spending and Revenues Under the Extended Baseline Since June 2015

In CBO's extended baseline, noninterest spending exceeds revenues throughout the projection period; that difference is greater in each future year than that projected last year (see Figure B-2). Despite higher deficits, interest costs on the debt through 2040 are about the same as last year's projections as a share of GDP because of lower projected interest rates and lower projected GDP.

### Noninterest Spending

Through 2040, noninterest spending is projected to be higher relative to GDP than CBO projected in 2015. That spending is projected to equal 22.1 percent of GDP in 2040; last year's projection was 21.3 percent. In the 2015 report, CBO also projected noninterest spending that did not reflect the macroeconomic effects of fiscal policy after 2025. Excluding those effects, noninterest spending was projected to reach 21.1 percent of GDP in 2040 (0.2 percentage points lower than that spending would have been including those effects).

CBO did not publish projections for detailed categories of spending that incorporated the macroeconomic effects of fiscal policy after 2025 in *The 2015 Long-Term Budget Outlook*. Because those projections are not available, the comparisons shown below compare this year's projections including the macroeconomic effects of fiscal policy with projections excluding those effects from last year's report. As can be inferred from the 0.2 percentage-point difference between the 2015 projections of overall noninterest spending in 2040 including and excluding the macro-economic effects of fiscal policy, the change in spending resulting from those effects is generally small in comparison with the amount of spending.

161. See Congressional Budget Office, *The Budget and Economic Outlook: 2016 to 2026* (January 2016), www.cbo.gov/publication/51129.

162. For additional information about that simplified approach, see Congressional Budget Office, *Budgetary and Economic Outcomes Under Paths for Federal Revenues and Noninterest Spending Specified by Chairman Price, March 2016* (March 2016), www.cbo.gov/publication/51260.

Spending for Social Security is projected to be about the same relative to GDP compared with the amount CBO projected last year, and spending for the major federal health care programs and other noninterest spending are projected to be higher. Those changes result mainly from the decrease in projected GDP.

**Social Security Spending.** CBO has slightly reduced its projections of outlays for Social Security over the coming decade, compared with the amounts it projected in 2015. Although Social Security spending in CBO's extended baseline has declined in dollar terms, the current projection is about the same as last year's as a percentage of GDP because this year's projections of GDP are lower. Through 2026, changes to Social Security spending mostly reflect lower projections of cost-of-living adjustments. Over the full projection period, they also reflect revised projections of mortality improvements by age group and reductions in projections of participation in Social Security's Disability Insurance program. The revised mortality improvements result in smaller increases in longevity at older ages and hence fewer Social Security beneficiaries (for details, see Appendix A). On the basis of an analysis of recent trends and recommendations by the Social Security Technical Panel on Assumptions and Methods, CBO has reduced its projection of the rate at which people will qualify for disability benefits beyond the coming decade. Specifically, CBO now projects that for each 1,000 people who have worked long enough to quality for disability benefits but who are not yet receiving them, an average of 5.4 people will qualify for the program each year after 2026. Last year, that rate was 5.6.

The 75-year actuarial deficit currently projected for Social Security is 4.8 percent of taxable payroll, which exceeds the 4.4 percent estimated last year (see Table 2-1). Factors that increased the actuarial deficit include lower projected interest rates and taxable payroll amounts, technical changes to education projections and the claiming methodology for Old-Age Insurance, and the effects of the one-year shift in the projection period. Factors that partially offset the growth in the deficit include revised demographic projections and lower rates of disability incidence.

**Major Federal Health Care Spending.** CBO's current long-term projection of federal spending for the major health care programs, measured relative to GDP, is slightly higher than last year's projection. Spending for Medicare net of offsetting receipts is now estimated to amount to 5.3 percent of GDP in 2040, or about 0.2 percentage points higher than what CBO estimated last year. Outlays for Medicaid and the Children's Health Insurance Program, combined with spending on subsidies for health insurance purchased through the marketplaces established under the Affordable Care Act (ACA) and related spending, are projected to total 3.0 percent of GDP in 2040, which is about 0.1 percentage point higher than the sum projected last year.

CBO's projections of spending for the major federal health care programs beyond 2026 are based on projected enrollment and the rates of excess cost growth for each

program (see Chapter 3).[163] Although CBO's general approach has not changed, the agency has adjusted the specifics of its projections for excess cost growth.

- Last year, CBO's long-term projection for excess cost growth for Medicare, Medicaid, and private health insurance premiums depended on three factors: CBO's assessment of the underlying rate of excess cost growth, the rate of excess cost growth implied by baseline projections for the next decade, and a blend of those factors for the 11th through 24th years of the projection period. CBO's estimate of the underlying growth rates in 2014 equaled the historical average rate of excess cost growth for total health care spending—1.4 percent per year over the period from 1985 to 2013. The underlying rate was projected to decline gradually over 75 years to a lower rate that varied by program. The rate after 75 years was 1 percent for Medicare, zero for Medicaid, and zero for private health insurance premiums (an input into projections of subsidies for insurance purchased through the marketplaces and related spending).

- This year, the projected rates of excess cost growth for Medicare, Medicaid, and private health insurance premiums slowly converge to the same rate after 30 years. Through 2026, the rate of excess cost growth for each program matches the rate implied by baseline projections, determined using the same approach as last year. After 2026, excess cost growth for all programs moves toward a rate of 1 percent—which is CBO's estimate of the average rate of excess cost growth for the health care sector 30 years from now (see Chapter 3 for discussion). Thus, CBO projects that Medicare, Medicaid, and private health insurance premiums will all have the same rates of excess cost growth in 30 years. Because the health care system is integrated to a significant degree, spending growth in all parts of the system will be affected by common factors (such as the patterns of practice by physicians and the development and diffusion of new medical technologies). CBO does not have a basis for projecting that the rates of excess cost growth for those three categories would differ in the long term.

As a result of that change in methodology, after the first decade the rate of excess cost growth for Medicare is lower than CBO projected a year ago, whereas excess cost growth rates for Medicaid and private health insurance premiums are similar to last year's projections. The method used to project enrollment in each program is the same as that used in 2015. Spending for those programs as a share of GDP is projected to be slightly higher because of lower projected GDP.

**Other Noninterest Spending.** In this year's projections, total federal spending on everything other than Social Security, the major federal health care programs, and net interest is projected to be higher as a share of GDP than the share CBO projected last

163. Excess cost growth is the extent to which health care costs per beneficiary, as adjusted for demographic changes, grow faster than potential GDP per capita. (Potential GDP is CBO's estimate of the maximum sustainable output of the economy.)

year. The difference in projected spending is small in 2016 but will grow in later years. In 2026, CBO's projection of other noninterest spending is 0.3 percent of GDP higher than last year's projection, and the difference between the projections widens to 0.5 percent of GDP by 2040.

Several factors are driving those changes. Primarily, GDP is projected to be smaller than CBO estimated last year, causing any spending as a share of GDP to be higher than it would be otherwise. Secondarily, projected spending has increased. CBO's projected outlays for refundable tax credits over the next decade increased because of enactment of the Consolidated Appropriations Act, 2016, which permanently extended the American Opportunity Tax Credit and expansions of the earned income and child tax credits that were first enacted in 2009 and that had been set to expire at the end of 2017.

Beyond the coming decade, CBO projects, mandatory spending other than that for Social Security, the major health care programs, refundable tax credits, and net interest will decline more slowly than it did in last year's projections (see Chapter 4). CBO bases projections of such spending on the average rate of decline over the final five years of its 10-year baseline projection; this year, that rate of decline is slower than it was last year. In addition, CBO removed spending for the Supplemental Nutrition Assistance Program (SNAP) from this year's calculation of that rate because spending for SNAP over the next decade is not expected to be representative of spending over the longer term. Spending for SNAP is expected to decline significantly relative to GDP through 2026 but decline more slowly thereafter. Excluding SNAP outlays from the calculation further slowed the rate of decline relative to last year's rate. In addition, outlays for discretionary spending in the extended baseline are projected to be slightly higher than in last year's projections, because of an upward adjustment, on net, to the caps on budget authority for discretionary programs (as part of the Bipartisan Budget Act of 2015) and because of changes to actual and projected appropriations.[164]

### Interest Costs

Because CBO projects a higher cumulative deficit and lower GDP than last year, interest outlays as a percentage of GDP are about the same in this year's analysis despite lower projected interest rates. Interest spending in 2040 is projected to equal 4.8 percent of GDP; last year, that figure was 4.7 percent.

### Revenues

Federal revenues are projected to be lower relative to GDP in coming decades than what CBO projected in 2015. By 2026, revenues are projected to be 18.2 percent of GDP, slightly below last year's estimate of 18.3 percent. Legislative changes—in particular, enactment of the Consolidated Appropriations Act, 2016, which

164. For more information, see Congressional Budget Office, *The Budget and Economic Outlook: 2016 to 2026* (January 2016), Appendix A, www.cbo.gov/publication/51129.

permanently extended certain tax provisions—are the most significant factor causing CBO to lower its forecast of revenues as a percentage of GDP over the next decade.[165]

That difference in revenues is estimated to persist and grow modestly in later years. By 2040, revenues are projected to equal 19.0 percent of GDP, 0.4 percentage points lower than last year's estimate.[166] The lower revenues as a percentage of GDP over later decades also are largely a result of provisions of the Consolidated Appropriations Act, 2016. In addition to the extension of certain tax provisions, that law made two significant changes to a new excise tax on certain employment-based health insurance plans with high premiums, both of which resulted in lower revenues. First, implementation of the tax, originally scheduled for 2018, has been postponed until 2020. And more significantly, the tax will now be an allowable deduction under the corporate income tax. The impact of those changes is relatively small over the next decade but becomes increasingly significant over time. Slower projected economic growth also contributes to lower revenues.

### The Size of Policy Changes Needed to Make Federal Debt Equal Today's Level

CBO's estimate of the size of policy changes needed this year to make federal debt at some future date equal its current 75 percent of GDP differs from the fiscal gap presented in last year's report, for three reasons.[167] First, this year's calculation covers a longer period—30 years instead of 25 (see Chapter 1). Second, the estimate now accounts for the positive macroeconomic effects of deficit reduction. Third, this year's result reflects higher projected deficits and lower projected interest rates.

Higher deficits in this year's report mean that larger policy changes would be required to make federal debt equal its current percentage of GDP in the future. To ensure that debt in 2041—25 years into the future for ease of comparison with last year's estimates—equaled today's level, lawmakers would have to cut noninterest spending or increase revenues by 1.7 percent of GDP each year from 2017 through 2041 (before taking into account macroeconomic feedback). The projected effects on debt include both the direct effects of such policy changes and the resulting macroeconomic feedback to the budget. That feedback reflects the positive macroeconomic effects of lowering the debt but no assumptions about the specifics of the policy changes. If CBO used the same methodology this year as it used last year (namely, estimating the fiscal gap, which excluded the positive macroeconomic effects of lowering the debt) to calculate the size of policy changes needed to ensure that debt in 25 years equaled

165. Ibid., pp. 107–108.

166. Revenue projections as a percentage of GDP in *The 2015 Long-Term Budget Outlook* were the same including and excluding the effects of fiscal policy.

167. The fiscal gap equals the present value of noninterest outlays and other means of financing minus the present value of revenues over the projected period, with adjustments to make the ratio of federal debt to GDP at the end of the period equal to the current ratio. For more on the fiscal gap, see Congressional Budget Office, *The 2015 Long-Term Budget Outlook* (June 2015), Chapter 1, pp. 12–14, www.cbo.gov/publication/50250.

today's level, lawmakers would have to cut noninterest spending or increase revenues by 2.0 percent of GDP from 2017 to 2041. Last year, for the 2016–2040 period, CBO estimated that changes equaling 1.1 percent of GDP (excluding all macroeconomic effects) would be required.

## Changes in the Sources of Growth for Spending on Social Security and the Major Federal Health Care Programs

CBO changed how it identifies the causes of projected spending growth for Social Security and the major federal health care programs. Last year, CBO estimated the growth in spending attributable to three factors: aging, excess cost growth, and the increased number of recipients of subsidies for health insurance purchased through the marketplaces and of Medicaid benefits attributable to the ACA. This year, CBO has not separately identified the contribution from that third factor, which has less of an effect on spending growth beyond 2016. Growth in spending attributable to the ACA's coverage provisions was much more significant between 2013 and 2016 than it is projected to be after 2016. In this year's analysis, the amount of spending in 2016 is higher than it would have been without the ACA's coverage provisions. But the contribution to the growth in spending from those coverage provisions between 2016 and 2046 is small as a share of GDP in CBO's projections, so it was not reported separately.

CBO's change in analytic approach has very little effect on the projected shares of spending growth attributable to the first two factors—aging and excess cost growth—over the next 25 years. Using this year's approach, CBO projects that aging will account for about 60 percent of the spending growth for both Social Security and the major federal health care programs, and about 50 percent of the spending growth for the major federal health care programs alone between 2016 and 2041. Those shares are very similar to the results CBO presented last year.

## Changes in Alternative Fiscal Paths

Last year, CBO projected spending and revenues under an alternative fiscal scenario. That scenario incorporated several assumptions: that certain policies in place last summer but scheduled to change under current law at that time would continue, that some provisions of law that might be difficult to sustain for a long period would change, and that federal revenues and certain kinds of federal spending would remain at or near their historical shares of GDP. Under those assumptions, the 10-year cumulative deficit increased last year by about $2 trillion (excluding interest costs and macroeconomic effects) over amounts in the extended baseline.[168] In the fall of 2015, some policies assumed in that alternative fiscal scenario were permanently enacted in legislation, so using an updated version of that scenario this year would have resulted in deficit increases that were considerably smaller than those projected in last year's

168. Ibid., Chapter 6.

report relative to deficits under the extended baseline. Instead, to show the effects of higher deficits relative to those under current law, CBO has chosen a different approach: presenting the budgetary effects of an illustrative path that, with unspecified fiscal policies, increases the cumulative deficit (excluding interest costs and macroeconomic effects) by $2 trillion over the next 10 years compared with deficits under the extended baseline.

## Changes in Analyzing Uncertainty

CBO has changed one of the factors it varies in its analysis of uncertainty. This year, CBO has not analyzed changes in the decline in mortality rates because the effects on the federal budget are small over the 30-year projection period. Instead, CBO analyzed the effects of varying the labor force participation rate, although it turns out to have small effects over that time horizon as well.

In addition, CBO now believes that a wider range is appropriate for its alternative projections of interest rates and the growth rate of spending per beneficiary for Medicare and Medicaid.

- This year, CBO estimated the effects of average interest rates on government debt that are 1.0 percentage point higher or lower than in the extended baseline; in 2015, that difference was 0.75 percentage points. CBO estimated that range last year by looking at the historical spread between government and private-sector borrowing rates and considered the reasons those historical outcomes might not fully reflect uncertainty about future outcomes. This year, CBO undertook an empirical analysis of some of the sources of unexpected movements in government borrowing rates that are not caused by changes in the economy or federal borrowing. That analysis suggested a larger range of uncertainty.

- Also this year, CBO estimated the effects of spending per beneficiary for Medicare and Medicaid that grows 1.0 percentage point per year more slowly or more quickly than under the extended baseline; last year, that difference was 0.75 percentage points. Last year, CBO considered the range of average growth in spending over 25-year periods for the health care system as a whole. This year, in assessing possible values for the average rate of excess cost growth for Medicare and Medicaid, CBO considered that if current laws remained unchanged, that average could continue to decline or could revert toward the higher rates observed in the past. Additionally, CBO drew upon an alternative approach to measuring uncertainty that uses information about trends and cycles in excess cost growth over time; that approach produced a potential range for excess cost growth through 2046 that was larger than the range based on historical variation.[169] The combination of those two approaches led CBO to increase the range of growth rates.

169. See Ulrich K. Müller and Mark W. Watson, "Measuring Uncertainty About Long-Run Predictions," *Review of Economic Studies* (March 2016), http://dx.doi.org/10.1093/restud/rdw003.

## Changes in Long-Term Budget Projections Since January 2016

In January 2016, CBO published updated long-term projections, which were not a full update of CBO's June 2015 results but rather reflected a simplified approach. Those projections followed the January 2016 baseline projections from 2016 to 2026 and then, for years after 2026, used the interest rates and growth rates for spending, revenues, and GDP from the extended baseline in *The 2015 Long-Term Budget Outlook*. The fully updated long-term projections in this report, by contrast, use the March 2016 baseline projections from 2016 to 2026 and then use updated long-term economic and budget projections for years after the first decade. Therefore, differences in the long-term projections between the January report and this report reflect changes to 10-year baseline projections between January and March 2016 as well as updates to long-term assumptions and projections since June 2015.

Federal debt held by the public is now projected to reach 141 percent of GDP in 2046; in January, CBO projected it would reach 155 percent in that year. That change primarily reflects lower projections of interest rates and thus lower projections of interest costs. Both revenues and spending for the major health care programs are projected to grow more slowly in the long term than CBO projected in January 2016. In total, the effect of lower projected interest rates dominates the effects of the changes in revenue and spending growth.

# About This Document

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

Prepared with guidance from Ed Harris, Julie Topoleski, and Jeff Werling, the report represents the work of many analysts at CBO. Stephanie Hugie Barello wrote Chapter 1. Marina Kutyavina wrote Chapter 2. Xiaotong Niu wrote Chapter 3. Charles Pineles-Mark wrote Chapter 4. Joshua Shakin wrote Chapter 5. Devrim Demirel wrote Chapter 6, and Jonathan Huntley wrote Chapter 7. Robert Shackleton and Michael Simpson wrote Appendix A. Geena Kim wrote Appendix B. Jessica Banthin, Susan Yeh Beyer, Linda Bilheimer, Barry Blom, Tom Bradley, Chad Chirico, Sheila Dacey, Molly Dahl, Terry Dinan, Philip Ellis, Katherine Fritzsche, Edward Gamber, Holly Harvey, Jeffrey Holland, Lori Housman, Kim Kowalewski, Sarah Masi, Noah Meyerson, Eamon Molloy, Andrea Noda, Benjamin Page (formerly of CBO), Sam Papenfuss, Kevin Perese, Dan Ready, Felix Reichling, Emily Stern, and Robert Stewart made valuable contributions.

Michael Simpson developed the long-term budget simulations, with assistance from Stephanie Hugie Barello, Geena Kim, Marina Kutyavina, Xiaotong Niu, and Charles Pineles-Mark. Devrim Demirel and Jonathan Huntley prepared the macroeconomic simulations. Ed Harris coordinated the revenue simulations, which were prepared by Paul Burnham, Peter Huether, Shannon Mok, Kurt Seibert, and Joshua Shakin. Stephanie Hugie Barello, Benjamin Layton, Justin Lee, Kyle Redfield, and Adam Staveski fact-checked the report. Also, the report builds on the 10-year projections of the economy and budget that CBO released earlier this year and that reflected the contributions of more than 100 people at the agency.

Wendy Edelberg, Jeffrey Kling, and Robert Sunshine reviewed the report. Christine Bogusz, Kate Kelly, Loretta Lettner, Bo Peery, Benjamin Plotinsky, and Gabe Waggoner edited the report, and Maureen Costantino, Jeanine Rees, and Gabe Waggoner prepared it for publication. Stephanie Hugie Barello and Michael Simpson prepared the supplemental data, with assistance from Jeanine Rees.

The report is available on CBO's website (www.cbo.gov/publication/51580).

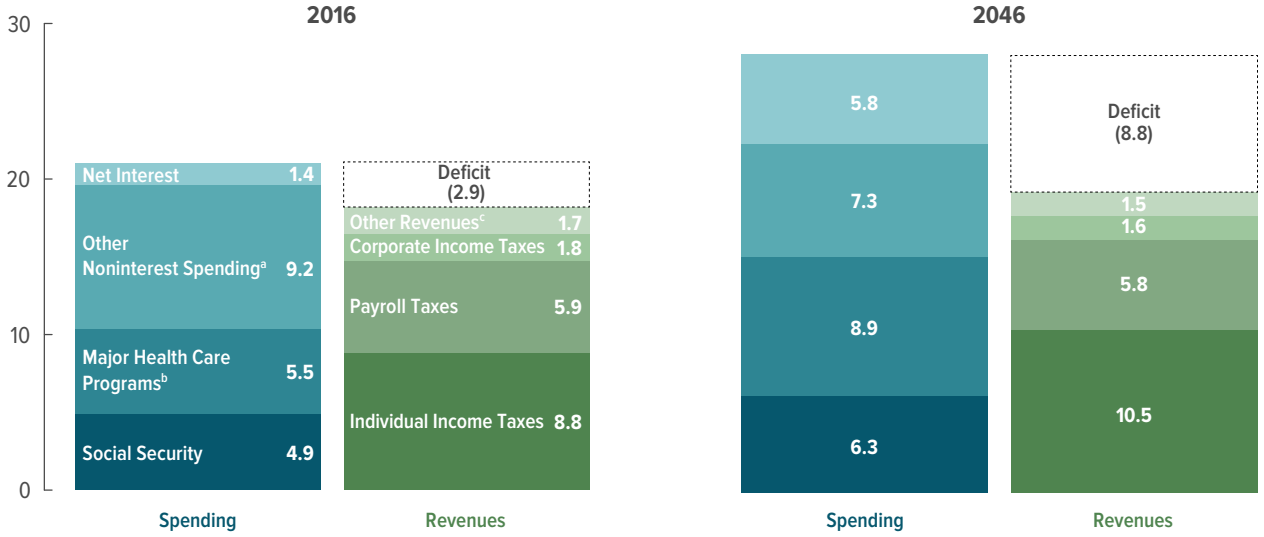
Keith Hall Director

July 2016

Summary Figure 1. Return to Reference

## The Federal Budget Under the Extended Baseline

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

a. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.

b. Consists of spending on Medicare (net of offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

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

Table 1-1. Return to Reference

## Key Projections in CBO's Extended Baseline

Percentage of Gross Domestic Product

| | 2016 | Projected Annual Average 2017–2026 | 2027–2036 | 2037–2046 |
|---|---|---|---|---|
| Revenues | | | | |
| Individual income taxes | 8.8 | 9.3 | 9.9 | 10.3 |
| Payroll taxes | 5.9 | 5.8 | 5.8 | 5.8 |
| Corporate income taxes | 1.8 | 1.7 | 1.6 | 1.6 |
| Other[a] | 1.7 | 1.3 | 1.3 | 1.4 |
| **Total Revenues** | **18.2** | **18.1** | **18.5** | **19.1** |
| Outlays | | | | |
| Mandatory | | | | |
| Social Security | 4.9 | 5.4 | 6.2 | 6.3 |
| Major health care programs[b] | 5.5 | 6.0 | 7.3 | 8.4 |
| Other | 2.8 | 2.6 | 2.4 | 2.1 |
| Subtotal | 13.2 | 14.0 | 15.8 | 16.9 |
| Discretionary | 6.5 | 5.6 | 5.2 | 5.2 |
| Net interest | 1.4 | 2.4 | 3.6 | 5.1 |
| **Total Outlays** | **21.1** | **22.0** | **24.7** | **27.2** |
| **Deficit** | **-2.9** | **-3.9** | **-6.2** | **-8.1** |
| **Debt Held by the Public at the End of the Period** | **75** | **86** | **110** | **141** |
| **Memorandum:** | | | | |
| Social Security | | | | |
| Revenues[c] | 4.5 | 4.4 | 4.4 | 4.4 |
| Outlays[d] | 4.9 | 5.4 | 6.2 | 6.3 |
| Contribution to the Federal Deficit[e] | -0.4 | -1.0 | -1.8 | -2.0 |
| Medicare | | | | |
| Revenues[c] | 1.5 | 1.6 | 1.5 | 1.5 |
| Outlays[d] | 3.8 | 4.1 | 5.5 | 6.6 |
| Offsetting Receipts | -0.6 | -0.7 | -0.9 | -1.2 |
| Contribution to the Federal Deficit[e] | -1.7 | -1.9 | -3.0 | -3.9 |
| Gross Domestic Product at the End of the Period (Trillions of dollars) | 18.5 | 27.7 | 41.3 | 62.3 |

Source: Congressional Budget Office.

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

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

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.

b. Consists of spending on Medicare (net of offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

c. Includes payroll taxes for the program other than those paid by the federal government on behalf of its employees (which are intragovernmental transactions). Also includes income taxes paid on Social Security benefits, which are credited to the trust funds.

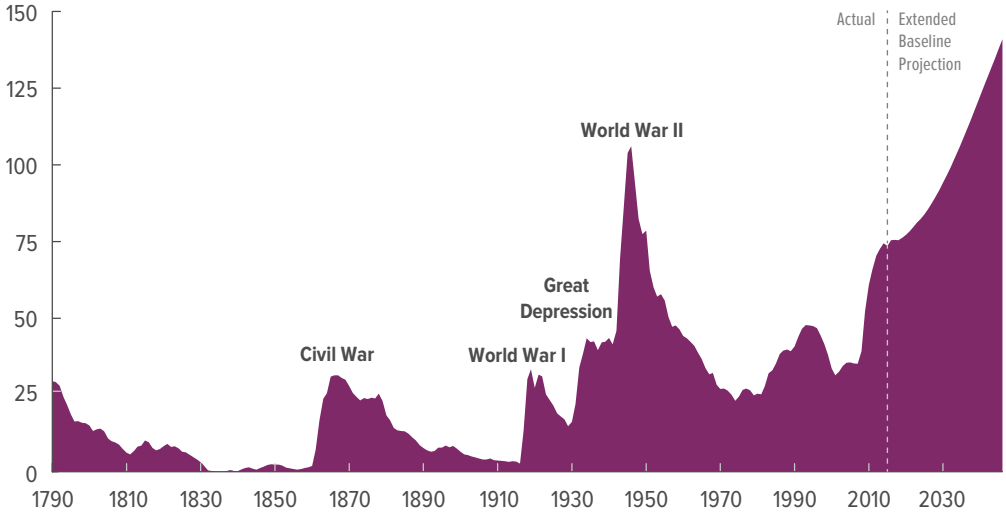
d. Does not include outlays related to administration of the program, which are discretionary.

e. 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, and outlays related to administration of the program.

**Figure 1-1.** Return to Reference

## Federal Debt Held by the Public

Percentage of Gross Domestic Product




High and rising federal debt would reduce national saving and income in the long term; increase the government's interest payments, thereby putting more pressure on the rest of the budget; limit lawmakers' ability to respond to unforeseen events; and increase the likelihood of a fiscal crisis.

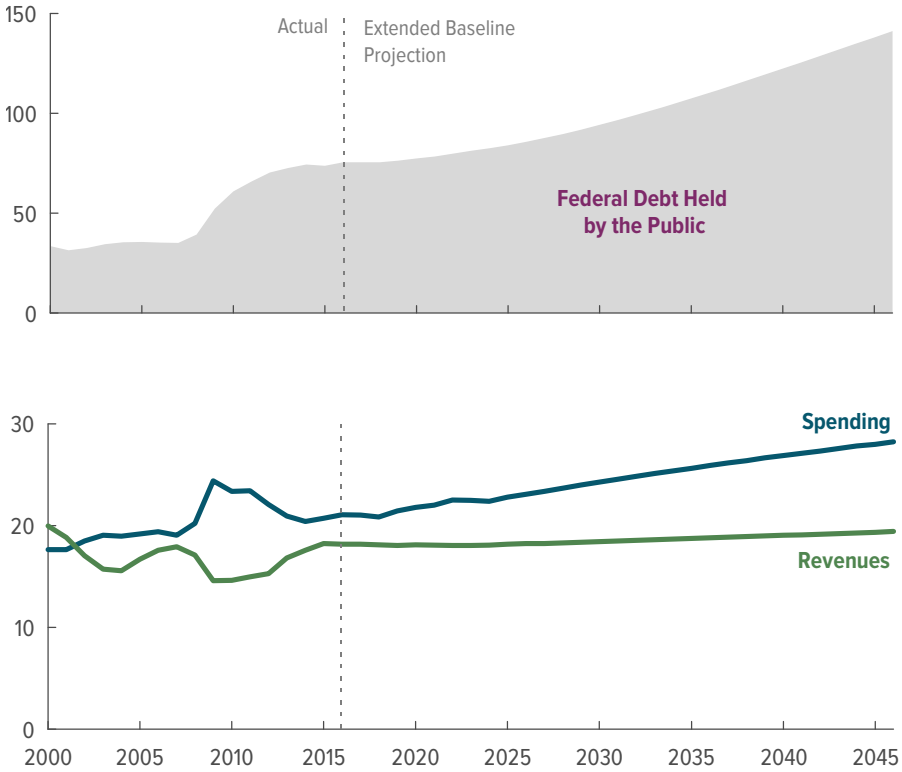
Source: Congressional Budget Office. For details about the sources of data used for past debt held by the public, see Congressional Budget Office, *Historical Data on Federal Debt Held by the Public* (July 2010), www.cbo.gov/publication/21728.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Figure 1-2. Return to Reference

## Federal Debt, Spending, and Revenues

Percentage of Gross Domestic Product




In CBO's extended baseline, **debt held by the public** rises . . .

. . . because growth in **total spending** outpaces growth in **total revenues**, resulting in larger budget deficits.

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

GDP = gross domestic product.

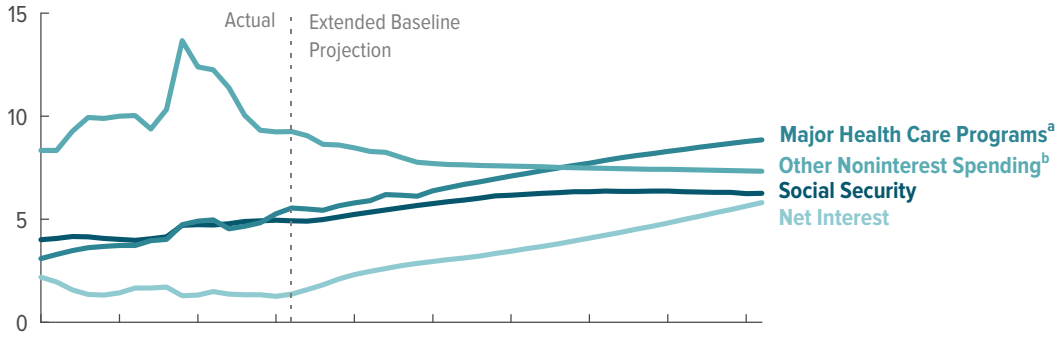
Continued

Figure 1-2. Continued

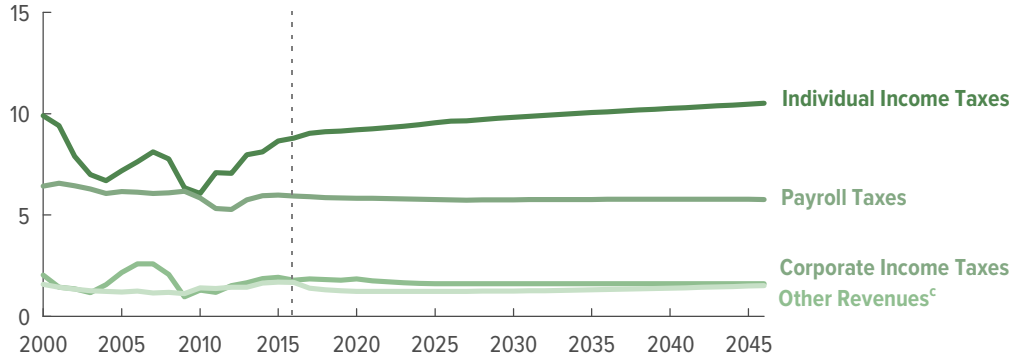
## Federal Debt, Spending, and Revenues

Percentage of Gross Domestic Product

Certain **components of spending**—Social Security, the major health care programs, and net interest—are projected to rise in relation to GDP; other spending, in total, is projected to decline.




A projected boost in one **type of revenues**—individual income taxes—accounts for the rise in total revenues in relation to GDP. Receipts from all other sources, taken together, are projected to decline.




a. Consists of spending on Medicare (net of offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

b. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.

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

Figure 1-3.

Return to Reference

## The Size of Policy Changes Needed to Make Federal Debt Meet Two Possible Goals in 2046

If lawmakers aimed for debt in 2046 to equal . . .

| 39% of GDP (Its 50-year average) | 75% of GDP (Its current level) |
|---|---|

Each year, they would need to **increase revenues** or **reduce noninterest spending** by . . .

| | |
|---|---|
| 2.9% of GDP, which is equal to a 16% increase in revenues or a 14% cut in spending | 1.7% of GDP, which is equal to a 9% increase in revenues or an 8% cut in spending |

In 2017, that would amount to . . .

| | |
|---|---|
| $560 billion, which is equal to $1,700 per person | $330 billion, which is equal to $1,000 per person |

If the changes were increases (of equal percentage) in all types of revenues, one effect in 2017 is that **taxes per household** would be higher than under current law by . . .

| | |
|---|---|
| $1,900 | $1,100 |

Values are for households in the middle fifth of the income distribution. Under current law, their taxes are projected to average $12,200.

If the changes were cuts (of equal percentage) in all types of noninterest spending, one effect in 2017 is that **initial Social Security benefits** would be lower than under current law by . . .

| | |
|---|---|
| $2,600 | $1,500 |

Values are averages for people in the middle fifth of the lifetime earnings distribution who were born in the 1950s and who would claim benefits at age 65. Under current law, their benefits are projected to be $18,700.

Source: Congressional Budget Office.

In this figure, the indicated sizes of policy changes are relative to CBO's extended baseline. The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period. The policy changes shown above are calculated before macroeconomic feedback is taken into account. The projected effects on debt include both the direct effects of the specified policy changes and the resulting macroeconomic feedback to both spending and revenues. That feedback reflects the positive economic effects of lowering the debt but no assumptions about the specifics of the policy changes.

GDP = gross domestic product.

Box 1-1. Return to Reference

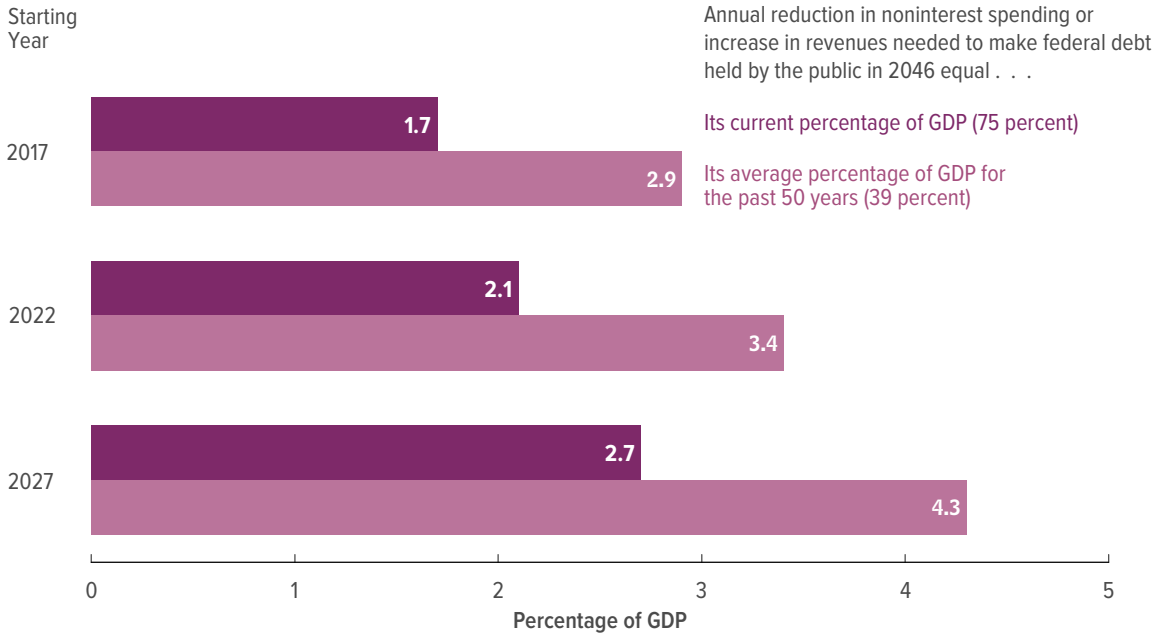
## The Timing of Policy Changes Needed to Meet Various Goals

In deciding how quickly to implement policies to put federal debt on a sustainable path—regardless of the chosen goal for federal debt—lawmakers face trade-offs. Reducing the deficit sooner would have several benefits—less accumulated debt, smaller policy changes required to achieve long-term outcomes, and less uncertainty about what policies lawmakers would adopt. However, if lawmakers implemented spending cuts or tax increases quickly, people would have little time to plan and adjust to the policy changes. Those changes also would weaken the economic expansion over the next two years or so. By contrast, waiting several years to reduce federal spending or increase taxes would mean more accumulated debt over the long run, which would slow long-term growth in output and income. Also, reaching any chosen target for debt would require larger policy changes. However, waiting several years would affect the economy less over the next few years than if lawmakers implemented policy changes immediately.

In addition, faster or slower implementation of policies to reduce budget deficits would tend to impose different burdens on different generations. Reducing deficits sooner would probably require today's older workers and retirees to sacrifice more and would benefit today's younger workers and future generations. By contrast, reducing deficits later would require smaller sacrifices by older people and greater sacrifices by younger workers and future generations.

CBO shows that collection of trade-offs in two ways. First, CBO estimated how the size of policy adjustments would change if deficit reduction was delayed. For example, suppose that lawmakers sought to return debt as a percentage of GDP to its historical 50-year average. But if the associated policy changes did not take effect until 2022, they would need to amount to 3.4 percent rather than the 2.9 percent of GDP that would accomplish that goal if the policy changes were made in 2017 (see the figure). Waiting five more years would require even larger changes, amounting to 4.3 percent of GDP.

**How Timing Affects the Size of Policy Changes Needed to Make Federal Debt Meet Two Possible Goals in 2046**




Source: Congressional Budget Office.

GDP = gross domestic product.

Continued

Box 1-1. Continued

## The Timing of Policy Changes Needed to Meet Various Goals

Second, CBO studied how waiting to resolve the long-term fiscal imbalance would affect various generations of the U.S. population. In 2010, CBO compared economic outcomes under two policies. One would stabilize the debt-to-GDP ratio starting in a particular year; the other would wait 10 years to do so.[1] That analysis suggested that generations born after the earlier implementation date would be worse off under the second option. People born more than 25 years before that earlier implementation date, however, would be better off with delayed action—largely because they would partly or entirely avoid the policy changes needed to stabilize the debt. Generations born between those two groups could either gain or lose from delayed action, depending on the details of the policy changes.[2]

Even if lawmakers waited several years to implement policy changes to reduce deficits in the long term, making decisions about them sooner would offer advantages. With decisions reached sooner, people would have more time to prepare for the time when changes would be implemented. Also, policy changes that reduced future debt would hold down longer-term interest rates, reduce uncertainty, and enhance businesses' and consumers' confidence. Therefore, output and employment in the next few years would increase.

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

2. Those conclusions do not incorporate the possible negative effects of a fiscal crisis or effects that might arise from the government's reduced flexibility to respond to unexpected challenges.

Table 1-2. Return to Reference

## Assumptions About Spending and Revenues That Underlie CBO's Extended Baseline

| | |
|---|---|
| | **Assumptions About Spending** |
| Social Security | As scheduled under current law[a] |
| Medicare | As scheduled under current law through 2026; thereafter, projected spending depends on the estimated number of beneficiaries and health care costs per beneficiary (for which excess cost growth is projected to move smoothly to a rate of 1.0 between 2027 and 2046)[a] |
| Medicaid | As scheduled under current law through 2026; thereafter, projected spending depends on the estimated number of beneficiaries and health care costs per beneficiary (for which excess cost growth is projected to move smoothly to a rate of 1.0 between 2027 and 2046) |
| Children's Health Insurance Program | As projected in CBO's baseline through 2026; remaining constant as a percentage of GDP thereafter |
| Subsidies for Health Insurance Purchased Through the Marketplaces | As scheduled under current law through 2026; thereafter, projected spending depends on the estimated number of beneficiaries, an additional indexing factor for subsidies, and excess cost growth for private health insurance premiums (which is projected to move smoothly to a rate of 1.0 between 2027 and 2046) |
| Other Mandatory Spending | As scheduled under current law through 2026; 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 2021 and 2026[b] |
| Discretionary Spending | As projected in CBO's baseline through 2026; remaining roughly constant as a percentage of GDP thereafter[c] |
| | **Assumptions About Revenues** |
| Individual Income Taxes | As scheduled under current law |
| Payroll Taxes | As scheduled under current law |
| Corporate Income Taxes | As scheduled under current law (remaining constant as a percentage of GDP after 2026) |
| Excise Taxes | As scheduled under current law[d] |
| Estate and Gift Taxes | As scheduled under current law |
| Other Sources of Revenues | As scheduled under current law (remaining constant as a percentage of GDP after 2026) |

Source: Congressional Budget Office.

For CBO's most recent 10-year baseline projections, see Congressional Budget Office, *Updated Budget Projections: 2016 to 2026* (March 2016), www.cbo.gov/publication/51384.

GDP = gross domestic product.

a. Assumes the payment of full benefits as calculated under current law, regardless of the amounts available in the program's trust funds.

b. In that projection, GDP includes the macroeconomic effects of the policies underlying the extended baseline. If it did not, the rest of other mandatory spending after 2026 would decline at precisely the same rate at which it is projected to decline between 2021 and 2026.

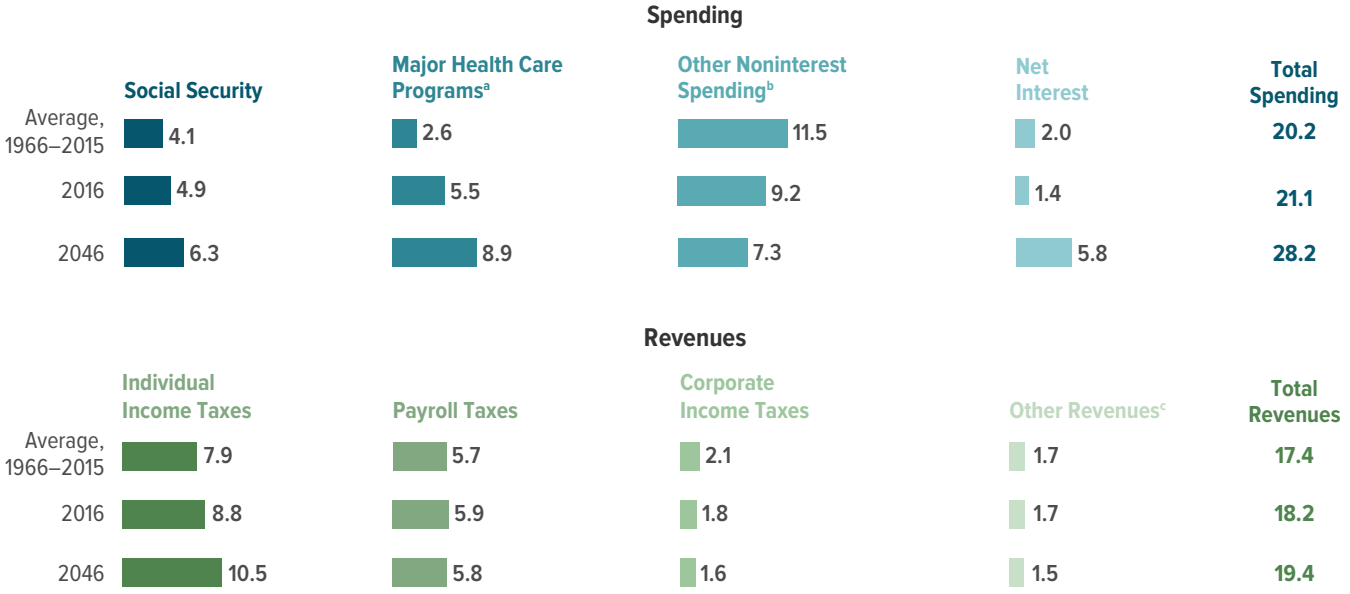
c. In that projection, GDP includes the macroeconomic effects of the policies underlying the extended baseline. If it did not, discretionary spending after 2026 would remain precisely the same (measured as a percentage of GDP) as projected for 2026.

d. The sole exception to the current-law assumption applies to expiring excise taxes dedicated to trust funds. The Balanced Budget and Emergency Deficit Control Act of 1985 requires CBO's baseline to reflect the assumption that those taxes would be extended at their current rates. That law does not stipulate that the baseline include the extension of other expiring tax provisions, even if they have been routinely extended in the past.

Figure 1-4. Return to Reference

## Spending and Revenues in the Past and Under CBO's Extended Baseline

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

a. Consists of spending on Medicare (net of offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

b. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.

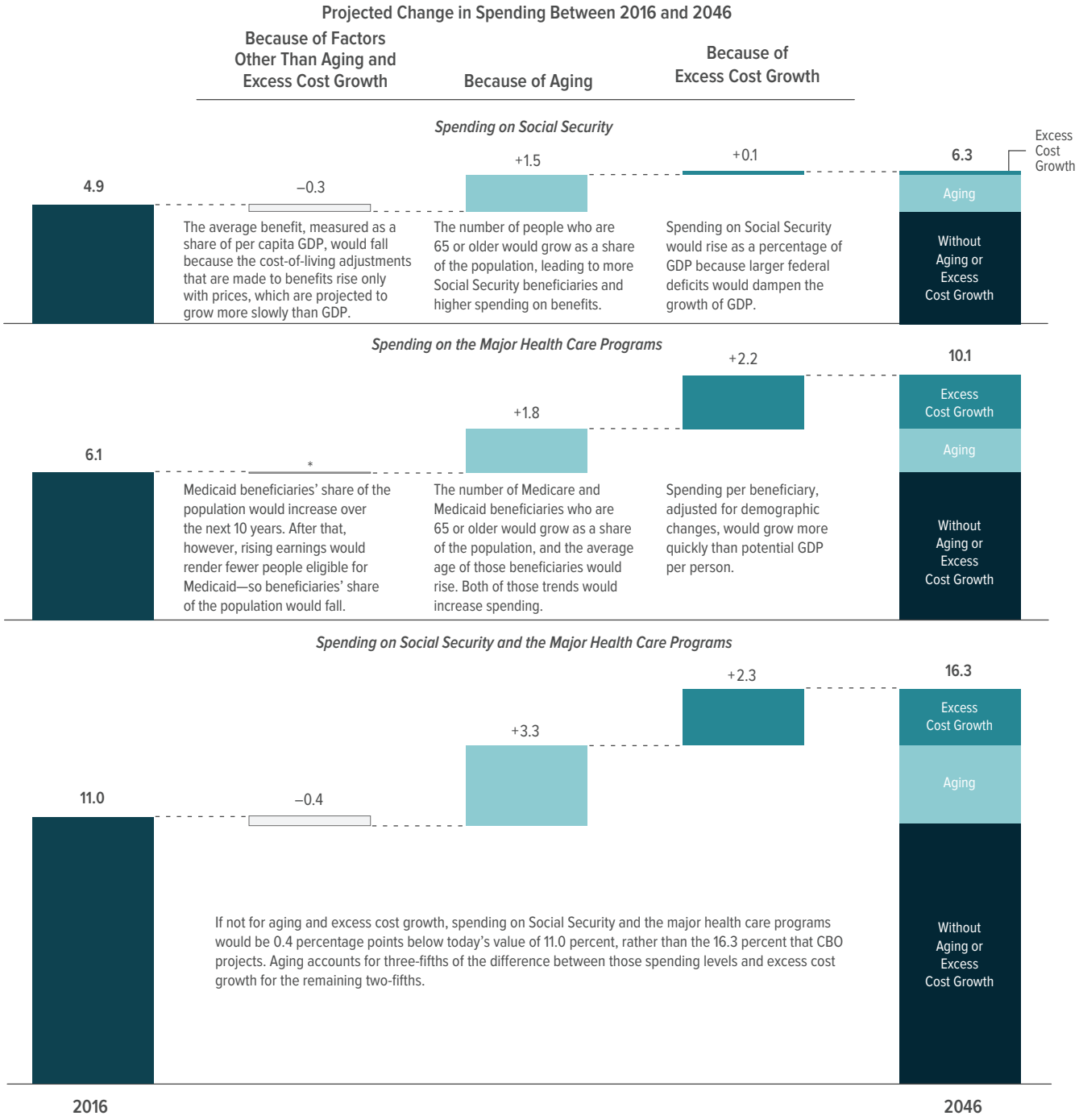
c. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

Figure 1-5.

Return to Reference 1, 2

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

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

Outlays for the major health care programs consist of gross spending for Medicare (which does not account for offsetting receipts that are credited to the program), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

Excess cost growth is defined as the extent to which the growth of health care costs per beneficiary, adjusted for demographic changes, exceeds the growth of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.)

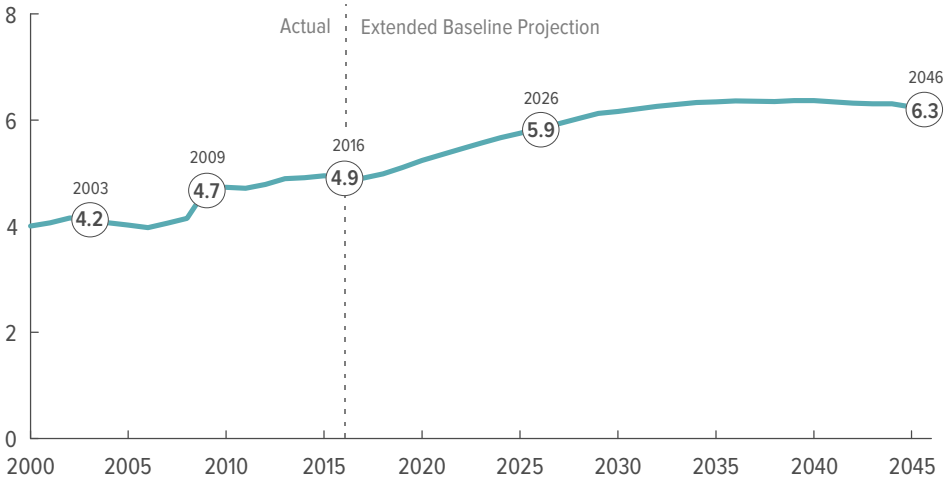
This figure highlights the most important effects of aging and excess cost growth. Other effects, such as the effect of aging on the number of Social Security Disability Insurance beneficiaries, are smaller.

GDP = gross domestic product; * = between zero and -0.1 percent.

Figure 2-1. Return to Reference

## Spending for Social Security

Percentage of Gross Domestic Product



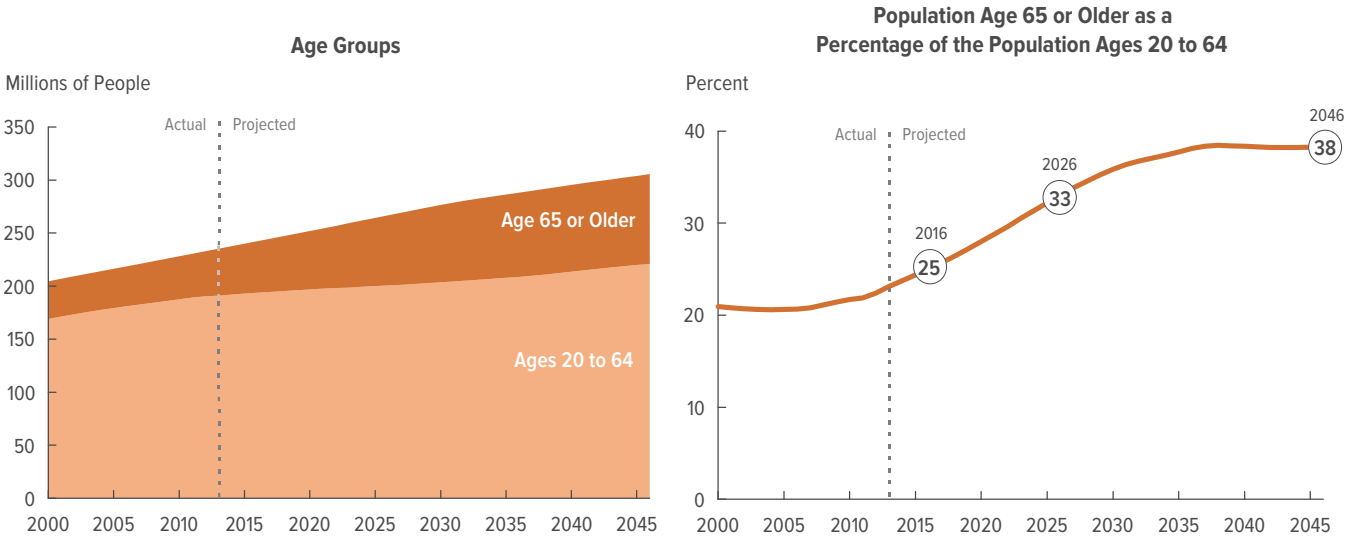

Spending for Social Security rose during the 2007–2009 recession. The baby boomers' retirement and increased life expectancy will lead to still higher outlays as a percentage of gross domestic product.

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period. The extended baseline incorporates the assumption that spending for Social Security continues as scheduled even if its trust funds are exhausted.

Figure 2-2. Return to Reference

## Population, by Age Group




Source: Congressional Budget Office.

This figure shows actual data through calendar year 2013, the most recent year for which such data are available.

Table 2-1. Return to Reference 1, 2

## Financial Measures for Social Security

| Projection Period (Calendar years) | Income Rate | Cost Rate | Actuarial Balance (Difference) |
|---|---|---|---|
| | | **As a Percentage of Taxable Payroll** | |
| 25 Years (2016 to 2040) | 14.8 | 18.0 | -3.2 |
| 50 Years (2016 to 2065) | 14.0 | 18.3 | -4.2 |
| 75 Years (2016 to 2090) | 13.8 | 18.6 | -4.8 |
| | | **As a Percentage of Gross Domestic Product** | |
| 25 Years (2016 to 2040) | 5.0 | 6.1 | -1.1 |
| 50 Years (2016 to 2065) | 4.7 | 6.1 | -1.4 |
| 75 Years (2016 to 2090) | 4.6 | 6.2 | -1.6 |

Source: Congressional Budget Office.

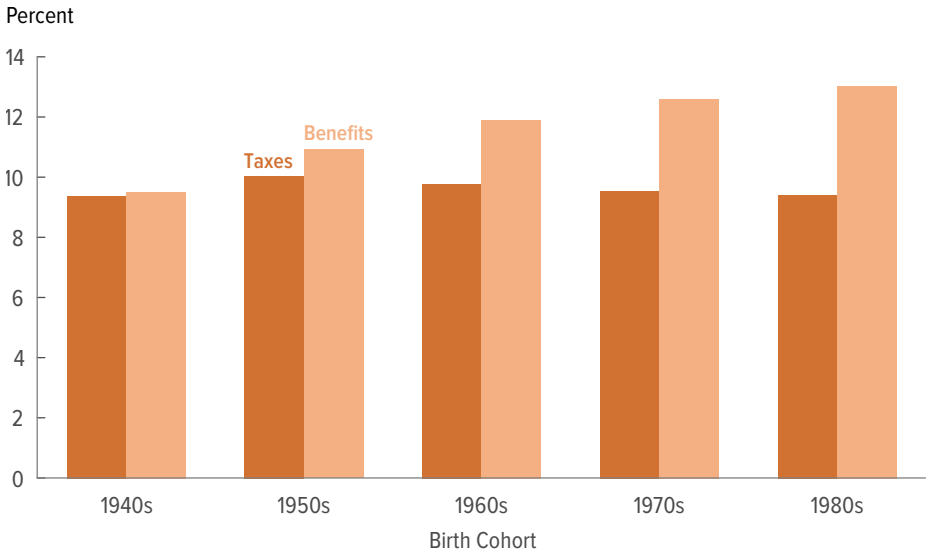
These projections incorporate the assumption that spending for Social Security continues as scheduled even if its trust funds are exhausted. Through 2046, the projections incorporate macroeconomic feedback caused by rising federal debt and marginal tax rates. After 2046, they do not account for such feedback.

Over each projection period, the income rate is the present value of annual tax revenues plus the initial trust fund balance, and the cost rate is the present value of annual outlays plus the present value of a year's worth of benefits as a reserve at the end of the period, each divided by the present value of taxable payroll or gross domestic product. (The present value of a flow of revenues or outlays over time is a single number that expresses that flow in terms of an equivalent sum received or paid at a specific time. The present value depends on a rate of interest, known as the discount rate, that is used to translate past and future cash flows into current dollars.) The actuarial balance is the difference between the income and cost rates.

To be consistent with the approach used by the Social Security trustees, the 25-, 50-, and 75-year projection periods for the financial measures reported here include 2016 and end in 2040, 2065, and 2090, respectively.

Figure 2-3. Return to Reference

## Mean Lifetime Social Security Taxes and Scheduled Benefits as a Percentage of Lifetime Earnings




Because increased life expectancy leads to longer retirements, people in later birth cohorts will receive more from Social Security over a lifetime than those born earlier, even though they will generally contribute a smaller share of their earnings to payroll taxes.

Source: Congressional Budget Office.

This analysis includes only people who live at least to age 45. Payroll taxes consist of the employer's and employee's shares combined.

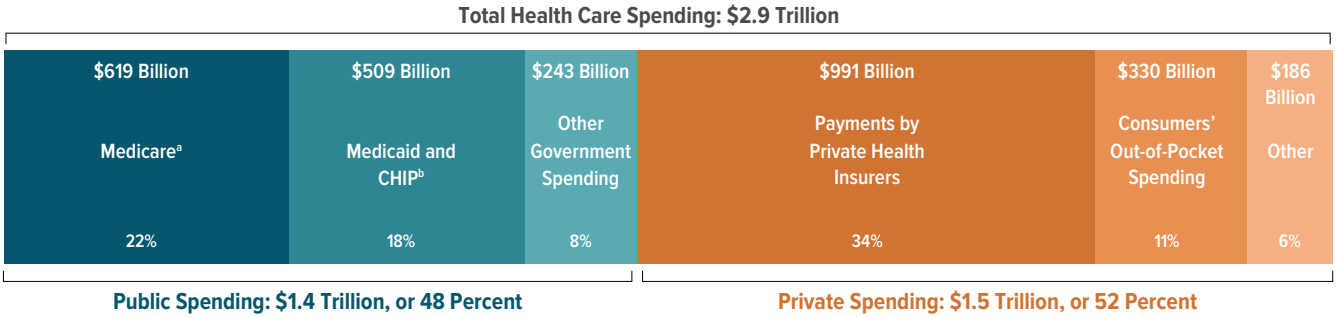
Lifetime Social Security benefits are net of income taxes paid on those benefits. They include all benefits except those paid to young widows and children.

Scheduled benefits are benefits calculated under the Social Security Act, regardless of the balances in the program's trust funds.

Figure 3-1. Return to Reference

## National Spending for Health Care, 2014

Total health care spending amounted to $2.9 trillion in calendar year 2014, about half of which was private spending. The federal government subsidizes a substantial part of that private spending, primarily through the tax exclusion for employment-based health insurance.




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

CHIP = Children's Health Insurance Program.

a. Refers to gross spending for Medicare, which does not account for offsetting receipts that are credited to the program. Those offsetting receipts are mostly premium payments made by beneficiaries to the government.

b. Includes federal and state spending.

Table 3-1. Return to Reference

## Average Annual Rates of Excess Cost Growth in Spending for Health Care

Percent

| | Medicare | Medicaid | Other[a] | Overall[b] |
|---|---|---|---|---|
| 1975 to 2014 | 1.9 | 1.7 [c] | 1.8 | 1.8 |
| 1980 to 2014 | 1.6 | 1.4 | 1.7 | 1.6 |
| 1985 to 2014 | 1.4 | 1.0 | 1.5 | 1.4 |
| 1990 to 2014 | 1.2 | 0.6 | 1.3 | 1.2 |

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

Excess cost growth refers to the extent to which the growth rate of nominal health care spending per person—adjusted for demographic characteristics of the relevant populations—exceeds the growth rate of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.) The historical rates of excess cost growth are weighted averages of annual rates: Twice as much weight is placed on the latest year as on the earliest year.

GDP = gross domestic product.

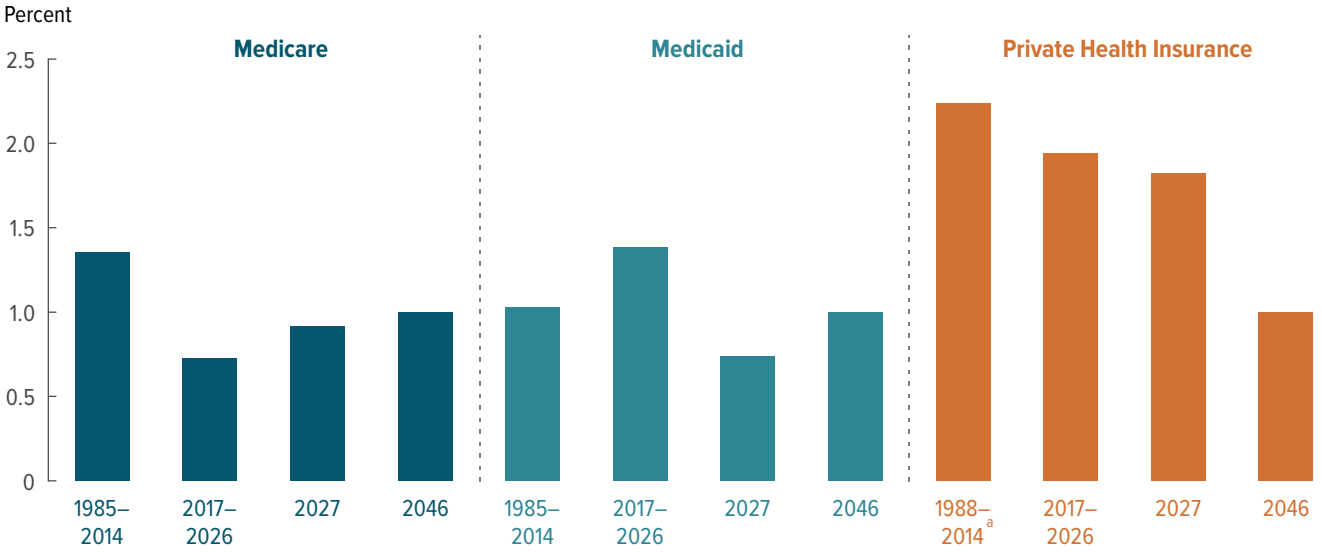
a. To calculate these values, CBO began with overall excess cost growth and removed the effects of excess cost growth for Medicare and Medicaid. The values therefore include the excess cost growth of payments by private health insurers and of other health care spending, such as consumers' out-of-pocket spending and spending financed by other private and public sources.

b. Refers to the excess cost growth of national spending for health care—specifically, to the excess cost growth of the health consumption expenditures in the national health expenditure accounts maintained by the Centers for Medicare & Medicaid Services.

c. Shows the average rate from 1976 to 2014 because data for 1975 are unavailable.

Figure 3-2. Return to Reference 1, 2

## Estimated and Projected Rates of Excess Cost Growth in Spending for Health Care




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

Excess cost growth refers to the extent to which the growth rate of nominal health care spending per person—adjusted for demographic characteristics of the relevant populations—exceeds the growth rate of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.) The historical rates of excess cost growth are weighted averages of annual rates: Twice as much weight is placed on the latest year as on the earliest year.

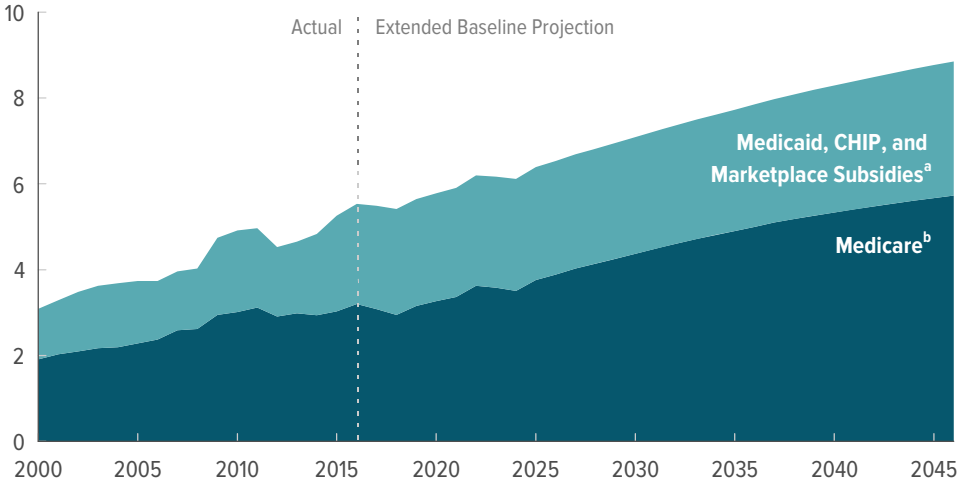
GDP = gross domestic product.

a. Shows excess cost growth beginning in 1988 because data for earlier years are unavailable.

Figure 3-3. Return to Reference

## Federal Spending on the Major Health Care Programs, by Category

Percentage of Gross Domestic Product




The projected rise in federal spending for the major health care programs results from the aging of the population and the expectation that health care costs per person will continue to grow more quickly than potential GDP per person.

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Potential GDP is the maximum sustainable output of the economy.

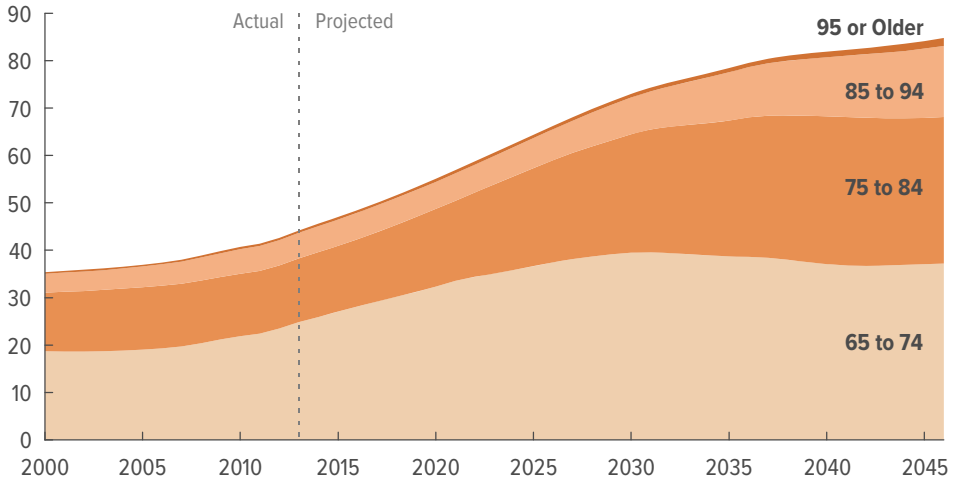
CHIP = Children's Health Insurance Program; GDP = gross domestic product.

a. "Marketplace Subsidies" refers to outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act, as well as spending to subsidize insurance provided through the Basic Health Program and spending to stabilize premiums for insurance purchased by individuals and small employers.

b. Refers to net spending for Medicare, which accounts for offsetting receipts that are credited to the program. Those offsetting receipts are mostly premium payments made by beneficiaries to the government.

Figure 3-4. Return to Reference

## Number of People Age 65 or Older, by Age Group



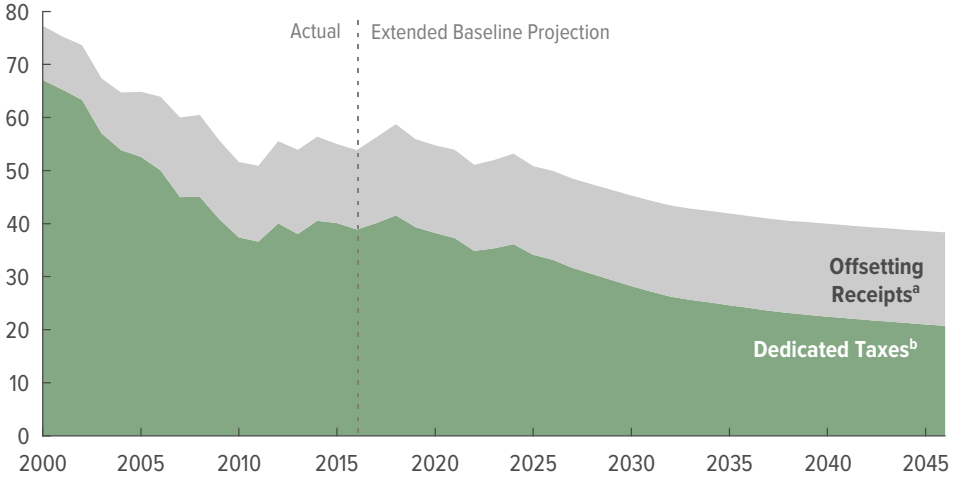

Medicare spending per person tends to be higher for older beneficiaries than for younger ones. Therefore, it is projected to rise as the average age of beneficiaries increases.

Source: Congressional Budget Office.

This figure shows actual data through calendar year 2013, the most recent year for which such data are available.

Figure 3-5. Return to Reference

## Medicare's Dedicated Taxes and Offsetting Receipts as a Percentage of Medicare Spending




Since 2000, the share of Medicare spending funded by dedicated taxes and premiums has dropped. The share funded by the government's general fund has consequently grown.

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period. The extended baseline incorporates the assumption that spending for Medicare continues as scheduled even if its trust funds are exhausted.

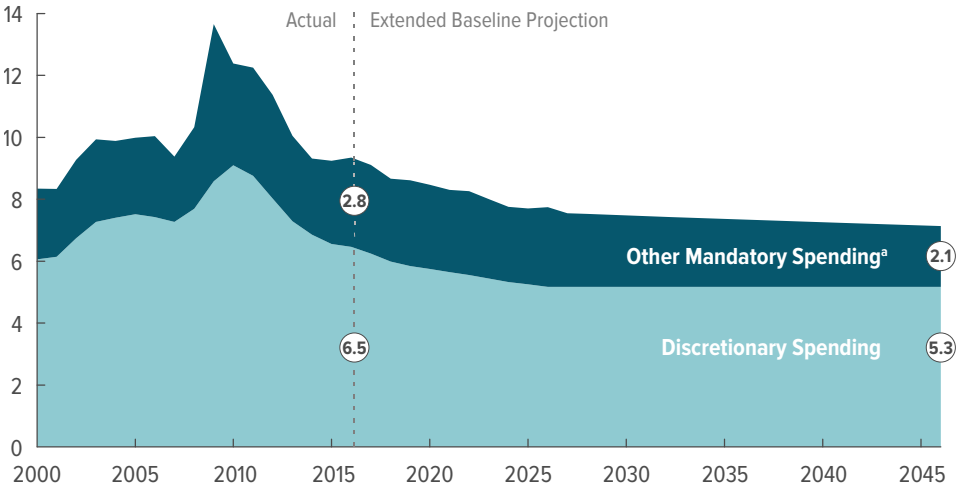
a. Mostly premium payments made by beneficiaries to the government.

b. Payroll taxes and a portion of the federal income taxes paid on Social Security benefits.

Figure 4-1. Return to Reference

## Other Federal Noninterest Spending

Percentage of Gross Domestic Product




Measured as a percentage of economic output, other federal noninterest spending in CBO's extended baseline falls by a fifth between 2016 and 2046. The majority of that drop stems from a projected decline in discretionary spending over the next decade.

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

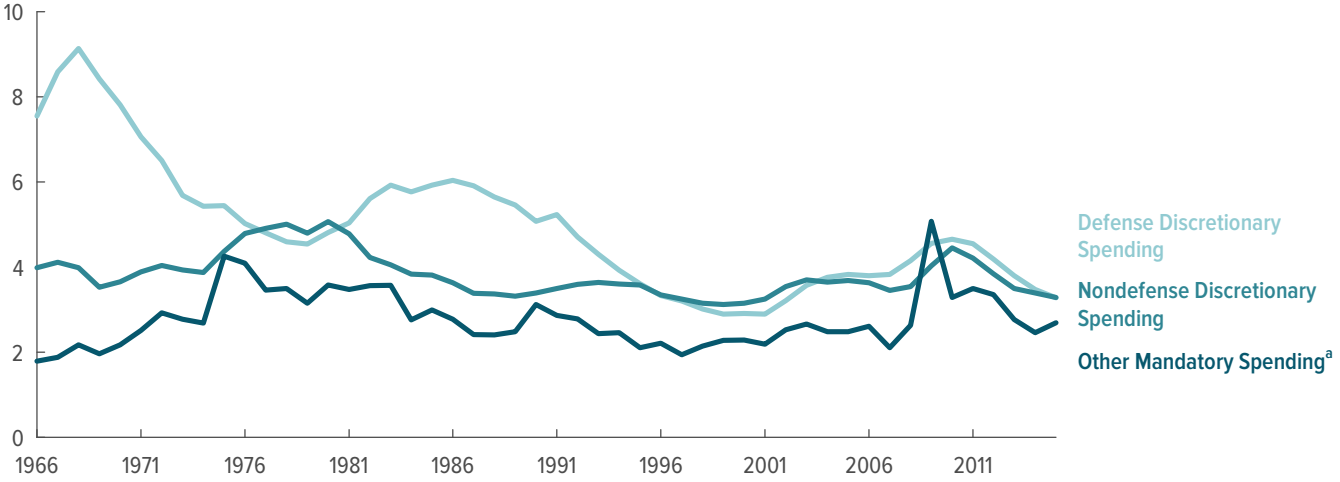
a. Other mandatory spending is all mandatory spending other than that for Social Security and the major health care programs. It includes the refundable portions of the earned income and child tax credits and of the American Opportunity Tax Credit.

Figure 4-2. Return to Reference

## Other Federal Noninterest Spending, by Category, 1966 to 2015

In total, other federal noninterest spending is now about a third lower, measured as a percentage of gross domestic product, than it was in 1966. Most of that reduction has taken place in defense discretionary spending, which is less than half its former size.

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

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

Table 4-1. Return to Reference

## Other Federal Noninterest Spending Under CBO's Baseline

Percentage of Gross Domestic Product

| | 2016 | 2026 |
|---|---|---|
| Discretionary Spending | | |
| Defense | 3.2 | 2.6 |
| Nondefense | 3.3 | 2.6 |
| **Total** | **6.5** | **5.2** |
| Other Mandatory Spending | | |
| Civilian and military retirement | 0.9 | 0.8 |
| Nutrition programs | 0.5 | 0.4 |
| Refundable tax credits[a] | 0.5 | 0.4 |
| Veterans' benefits | 0.6 | 0.5 |
| Unemployment compensation | 0.2 | 0.2 |
| Supplemental Security Income | 0.3 | 0.3 |
| Offsetting receipts | -0.7 | -0.5 |
| Other | 0.5 | 0.4 |
| **Total** | **2.8** | **2.5** |
| **Total, Other Federal Noninterest Spending** | **9.2** | **7.7** |

Source: Congressional Budget Office.

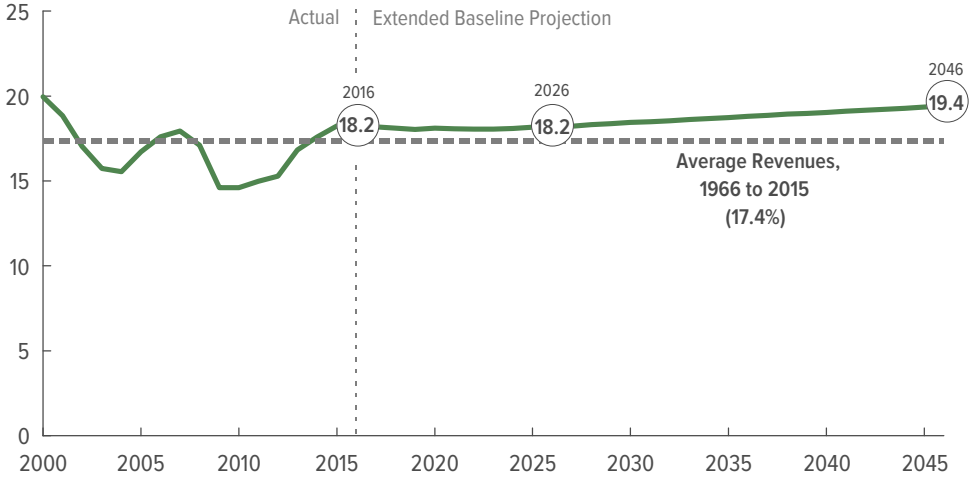
Other federal noninterest spending is all spending other than that for Social Security, the major health care programs, and net interest.

a. The earned income and child tax credits and the American Opportunity Tax Credit.

Figure 5-1. Return to Reference

## Total Revenues

Percentage of Gross Domestic Product




Under CBO's extended baseline, revenues rise slowly after 2026 mainly because of real bracket creep and an excise tax on employment-based health insurance that is scheduled to take effect in 2020.

Source: Congressional Budget Office.

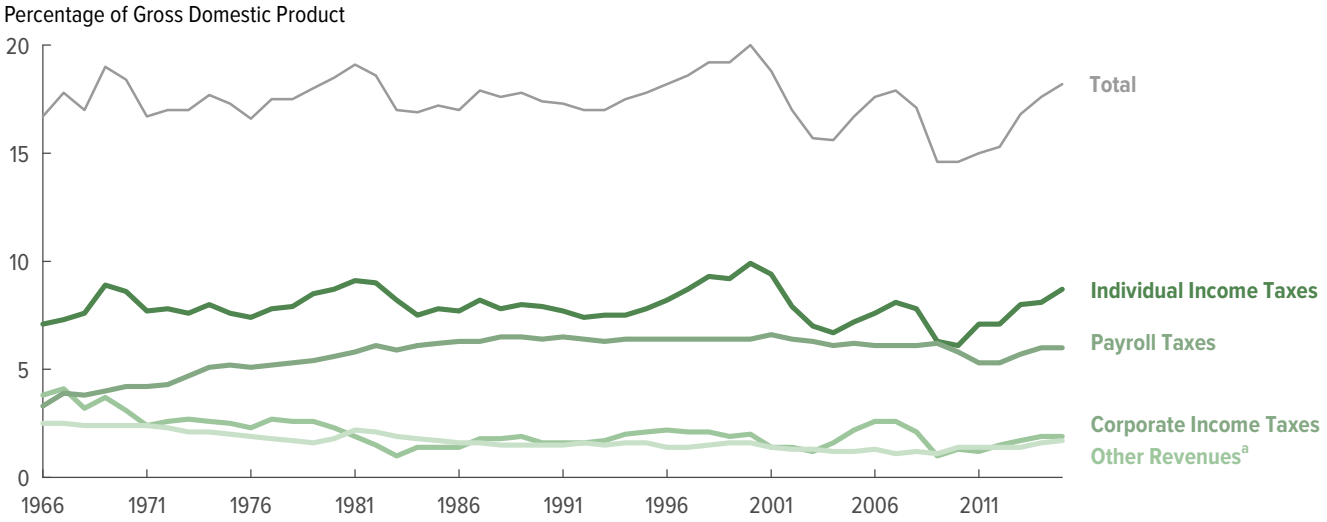
The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Real bracket creep refers to the process in which, as real (inflation-adjusted) income rises, an ever-larger proportion becomes subject to higher tax rates.

Figure 5-2. Return to Reference

## Revenues, by Source, 1966 to 2015

Over the past 50 years, movement in individual income tax receipts has accounted for most of the variation in total revenues.




Source: Congressional Budget Office.

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.

Table 5-1. Return to Reference

## Sources of Growth in Total Revenues Between 2016 and 2046 Under CBO's Extended Baseline

| Source of Growth | Percentage of GDP |
|---|---|
| Structural Features of the Individual Income Tax (Including real bracket creep)[a] | 1.1 |
| New and Expiring Tax Provisions | 0.8 |
| Aging and the Taxation of Retirement Income | 0.3 |
| Changes in the Distribution of Income | 0.1 |
| Other Factors | -1.0 |
| **Growth in Total Revenues Between 2016 and 2046** | **1.2** |

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

GDP = gross domestic product.

a. Real bracket creep refers to the process in which, as real (inflation-adjusted) income rises, an ever-larger proportion becomes subject to higher tax rates.

Table 5-2. Return to Reference

## Effective Marginal Federal Tax Rates Under CBO's Extended Baseline

Percent

| | 2016 | 2026 | 2046 |
|---|---|---|---|
| Marginal Tax Rate on Labor Income | 29.7 | 31.0 | 33.1 |
| Marginal Tax Rate on Capital Income | 14.4 | 17.5 | 18.2 |

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

The effective marginal tax rate on labor income is the share of an additional dollar of such income that is paid in federal individual income taxes and payroll taxes, averaged among taxpayers with weights proportional to their labor income. 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. Rates are calculated for different assets and industries and then averaged over all assets and industries with the shares of total asset values used as weights.

Table 5-3. Return to Reference 1, 2

## Individual Income and Payroll Taxes as a Share of Total Income Under CBO's Extended Baseline

| | Income (2016 dollars) | | Taxes as a Share of Total Income (Percent) | |
|---|---|---|---|---|
| | Cash[a] | Total[b] | Income Taxes[c] | Income and Payroll Taxes[d] |
| | | **Taxpayer Filing a Single Return** | | |
| Half the Median Total Income | | | | |
| 2016 | 11,600 | 18,800 | -1 | 9 |
| 2046 | 19,900 | 37,100 | 2 | 10 |
| Median Total Income | | | | |
| 2016 | 29,100 | 37,600 | 6 | 18 |
| 2046 | 50,100 | 69,700 | 7 | 18 |
| Twice the Median Total Income | | | | |
| 2016 | 64,000 | 75,200 | 10 | 23 |
| 2046 | 110,500 | 134,700 | 12 | 25 |
| Four Times the Median Total Income | | | | |
| 2016 | 134,800 | 150,400 | 15 | 27 |
| 2046 | 233,800 | 265,300 | 16 | 28 |
| | | **Married Couple (With Two Children) Filing a Joint Return** | | |
| Half the Median Total Income | | | | |
| 2016 | 35,400 | 54,400 | -8 | 2 |
| 2046 | 58,800 | 104,000 | 2 | 10 |
| Median Total Income | | | | |
| 2016 | 85,900 | 108,700 | 5 | 17 |
| 2046 | 145,400 | 197,200 | 8 | 19 |
| Twice the Median Total Income | | | | |
| 2016 | 186,900 | 217,400 | 11 | 25 |
| 2046 | 318,500 | 384,400 | 15 | 28 |
| Four Times the Median Total Income | | | | |
| 2016 | 398,100 | 435,500 | 19 | 29 |
| 2046 | 681,900 | 758,700 | 22 | 31 |

Source: Congressional Budget Office, using data from the March 2015 Current Population Survey.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

CBO converted income amounts for 2046 into 2016 dollars by using the price index for personal consumption expenditures. All income amounts have been rounded to the nearest $100.

Underlying these calculations are several assumptions: that premiums for employment-based health insurance in 2046 will not exceed the excise tax threshold in the Affordable Care Act; that taxpayers itemize their deductions if those deductions are greater than the standard deduction; that their deduction for state and local taxes equals 9 percent of their wages; that their other deductions equal 12 percent of their wages; and that in each example involving a married couple, the spouses earn the same amount.

a. Cash income consists of a taxpayer's wages.

b. Total income consists of a taxpayer's cash income, the costs that the taxpayer's employer pays for employment-based health insurance, and the employer's share of payroll taxes.

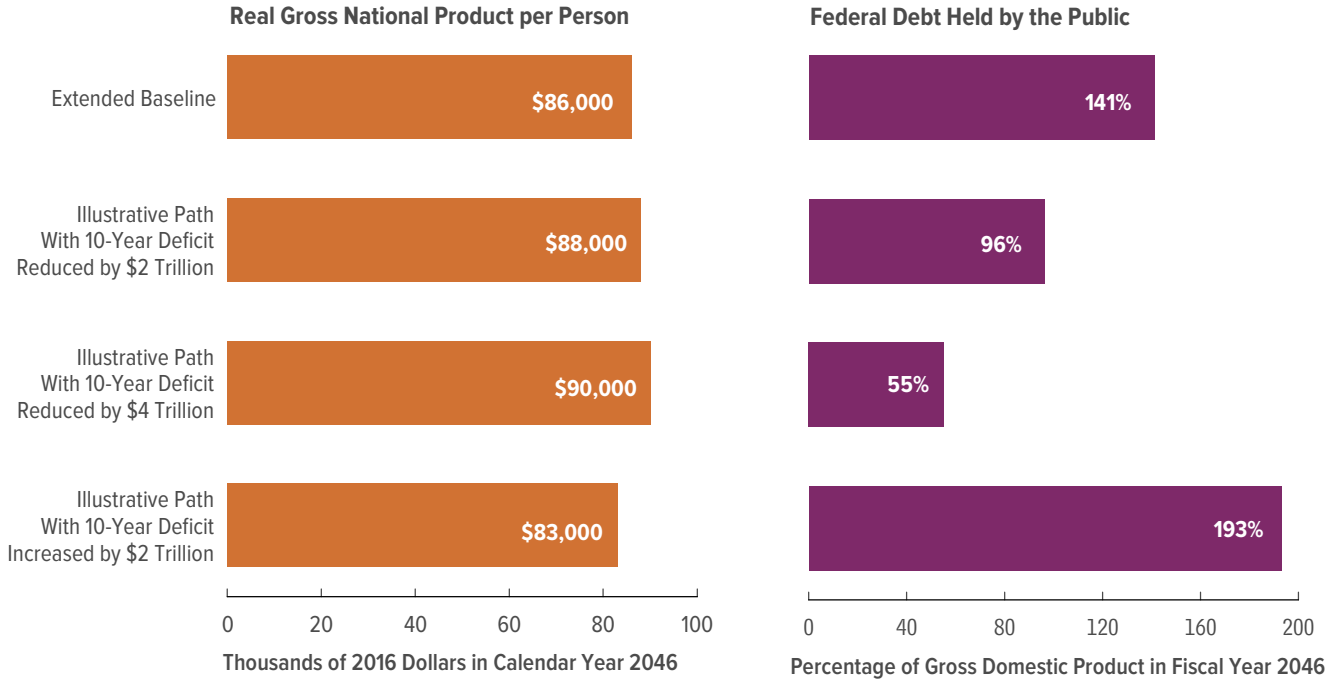
c. Negative tax rates result when the people in an income group receive more in refundable tax credits, such as the earned income and child tax credits, than they owe in taxes.

d. Payroll taxes include the share paid by employers.

Figure 6-1.

Return to Reference

## Output per Person and Debt in 2046 Under CBO's Extended Baseline and Illustrative Budgetary Paths




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

The $2 trillion and $4 trillion changes in the illustrative paths represent cumulative changes in deficits relative to CBO's baseline between 2017 and 2026, excluding interest payments on federal debt and before macroeconomic feedback is taken into account.

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

The estimates of federal debt held by the public include macroeconomic feedback.

Table 6-1. Return to Reference 1, 2

## Long-Term Effects on Real GNP Under CBO's Illustrative Budgetary Paths

Percentage Difference From Level in the Extended Baseline

| | 2026 | 2046 |
|---|---|---|
| Illustrative Path With 10-Year Deficit Reduced by $2 Trillion | | |
| Central estimate | 0.5 | 3 |
| Range | 0.3 to 0.8 | 1 to 4 |
| Illustrative Path With 10-Year Deficit Reduced by $4 Trillion | | |
| Central estimate | 1.0 | 5 |
| Range | 0.5 to 1.5 | 2 to 8 |
| Illustrative Path With 10-Year Deficit Increased by $2 Trillion | | |
| Central estimate | -0.5 | -3 |
| Range | -0.8 to -0.3 | -6 to -1 |

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

The $2 trillion and $4 trillion changes in the illustrative paths represent cumulative changes in deficits relative to CBO's baseline between 2017 and 2026, excluding interest payments on federal debt and before macroeconomic feedback is taken into account.

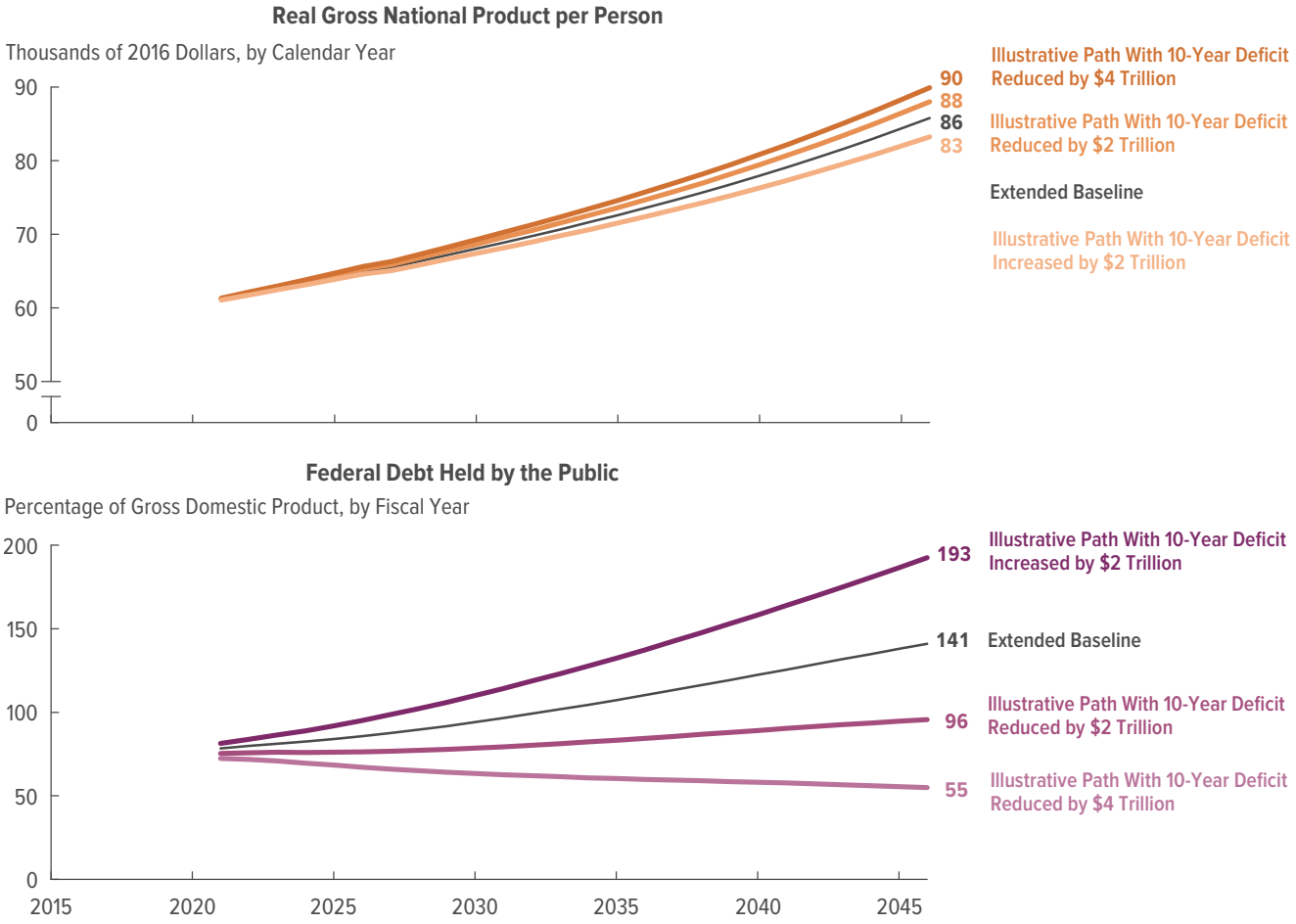
Gross national product differs from gross domestic product, the more common measure of the output of the economy, by including the income that U.S. residents earn abroad and excluding the income that nonresidents earn in this country.

The central estimates and ranges reflect alternative assessments of two factors: how much deficits crowd out investment in capital goods such as factories and computers (because a larger portion of private saving is being used to purchase government securities); and how much people respond to changes in after-tax wages by adjusting the number of hours they work.

GNP = gross national product.

Figure 6-2. Return to Reference 1, 2, 3, 4

## Output per Person and Debt Under CBO's Extended Baseline and Illustrative Budgetary Paths




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

The $2 trillion and $4 trillion changes in the illustrative paths represent cumulative changes in deficits relative to CBO's baseline between 2017 and 2026, excluding interest payments on federal debt and before macroeconomic feedback is taken into account.

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

The estimates of federal debt held by the public include macroeconomic feedback.

This figure displays only long-term effects. Results over the next few years are discussed later in this chapter.

Table 6-2. Return to Reference 1, 2

## Long-Term Deficits and Debt Under CBO's Extended Baseline and Illustrative Budgetary Paths

Percentage of Gross Domestic Product

| | 2026 | 2046 |
|---|---|---|
| | **Deficit (-) or Surplus, Excluding Interest Payments** | |
| Extended Baseline | -1.8 | -3 |
| Illustrative Path With 10-Year Deficit Reduced by $2 Trillion | -0.4 | -1 |
| Illustrative Path With 10-Year Deficit Reduced by $4 Trillion | 1.0 | * |
| Illustrative Path With 10-Year Deficit Increased by $2 Trillion | -3.2 | -5 |
| | **Total Deficit (-) or Surplus** | |
| Extended Baseline | -4.9 | -9 |
| Illustrative Path With 10-Year Deficit Reduced by $2 Trillion | -3.1 | -5 |
| Illustrative Path With 10-Year Deficit Reduced by $4 Trillion | -1.4 | -2 |
| Illustrative Path With 10-Year Deficit Increased by $2 Trillion | -6.6 | -13 |
| | **Federal Debt Held by the Public** | |
| Extended Baseline | 86 | 141 |
| Illustrative Path With 10-Year Deficit Reduced by $2 Trillion | 76 | 96 |
| Illustrative Path With 10-Year Deficit Reduced by $4 Trillion | 67 | 55 |
| Illustrative Path With 10-Year Deficit Increased by $2 Trillion | 95 | 193 |

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

The $2 trillion and $4 trillion changes in the illustrative paths represent cumulative changes in deficits relative to CBO's baseline between 2017 and 2026, excluding interest payments on federal debt and before macroeconomic feedback is taken into account.

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

* = between zero and 0.5 percent.

Table 6-3. Return to Reference

## Short-Term Effects on Output and Employment Under CBO's Illustrative Budgetary Paths

| | Inflation-Adjusted GDP (Percentage difference from level in the extended baseline) | | Full-Time-Equivalent Employment[a] (Difference in millions from level in the extended baseline) | |
|---|---|---|---|---|
| | 2017 | 2018 | 2017 | 2018 |
| Illustrative Path With 10-Year Deficit Reduced by $2 Trillion | | | | |
| Central estimate | -0.1 | -0.1 | -0.2 | -0.3 |
| Range | -0.2 to 0 | -0.3 to 0 | -0.4 to -0.1 | -0.4 to -0.1 |
| Illustrative Path With 10-Year Deficit Reduced by $4 Trillion | | | | |
| Central estimate | -0.3 | -0.3 | -0.4 | -0.5 |
| Range | -0.5 to -0.1 | -0.5 to 0 | -0.7 to -0.1 | -0.9 to -0.1 |
| Illustrative Path With 10-Year Deficit Increased by $2 Trillion | | | | |
| Central estimate | 0.1 | 0.1 | 0.2 | 0.3 |
| Range | 0 to 0.2 | 0 to 0.3 | 0.1 to 0.4 | 0.1 to 0.4 |

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

The $2 trillion and $4 trillion changes in the illustrative paths represent cumulative changes in deficits relative to CBO's baseline between 2017 and 2026, excluding interest payments on federal debt and before macroeconomic feedback is taken into account.

The central estimates and ranges reflect alternative assessments of three factors: how much changes in overall demand affect output in the short term; how much deficits crowd out investment in capital goods such as factories and computers (because a larger portion of private saving is being used to purchase government securities); and how much people respond to changes in after-tax wages by adjusting the number of hours they work.

GDP = gross domestic product.

a. Full-time-equivalent employment is calculated by dividing the total number of hours gained or lost during a year by 2,080, the annual number of hours worked by a full-time employee.

Box 6-1. Return to Reference

## Long-Term Effects of Limiting Social Security Benefits to Amounts Payable From Dedicated Funding

The Congressional Budget Office projects that, without legislative action, the worsening shortfall in the Social Security program's finances would cause the program's combined trust funds to be exhausted in calendar year 2029 (see **Chapter 2**).[1] After exhaustion, trust fund balances would no longer be available to make up the gap between benefits specified in current law and annual trust fund receipts. The manner in which that situation was resolved would have important implications for the federal budget. CBO's extended baseline incorporates one set of assumptions about that resolution, and the agency also analyzed a scenario incorporating an alternative set.

The extended baseline reflects the assumption that the Social Security Administration will pay benefits as scheduled under current law regardless of the status of the program's trust funds—an assumption that is consistent with a statutory requirement that CBO, in its 10-year baseline projections, assume that funding for entitlement programs is adequate to make all payments required by law.[2] However, if the trust funds' balance declined to zero and current revenues were insufficient to cover benefits specified in law, the Social Security Administration would no longer be permitted to pay beneficiaries the full amounts to which they were entitled when payments were due because other laws prohibit officials from making expenditures in excess of available funds. The potential conflict would have to be resolved by the Congress or in the courts.[3]

If benefits were limited to the amounts payable from dedicated funding, benefits would be reduced by 29 percent in 2030 and by greater percentages in later years in relation to the amounts in CBO's extended baseline. Although it is unclear how much the specific amounts for beneficiaries would be reduced under that scenario, this analysis incorporates the assumption that each recipient's annual benefit would be reduced by the percentage necessary for outlays to match revenues in each year after the trust funds were exhausted.

In CBO's assessment, the reduction in benefits would lower deficits (including debt service) by 1 percent of gross domestic product (GDP) in 2030 and by a much larger 4 percent of GDP in 2046. (In CBO's extended baseline, the projected deficit in 2046 is 9 percent of GDP.)

The reduction in benefits would cause some affected workers to choose to remain in the labor force longer than they would have otherwise, which would increase the supply of labor and thus the economy's output in the long term. Lower deficits and debt would also lead to higher output and lower interest rates than what CBO projects in the extended baseline. With payable benefits, gross national product in 2046 would be 3 percent higher and interest rates 0.4 percentage points lower than under the extended baseline, CBO estimates.

The higher output and lower interest rates would improve budgetary outcomes. With those macroeconomic effects incorporated into its analysis, CBO estimates that the ratio of federal debt held by the public to GDP in 2046 would stand at 101 percent, which is 40 percentage points lower than under the extended baseline. The other consequences of high and rising debt would also be diminished: The policy changes necessary to reduce deficits to a particular level, the constraints on policymakers, and the risk of a fiscal crisis would be smaller than under the extended baseline.

CBO's estimates of the macroeconomic and budgetary outcomes with payable benefits are based on the assumption that people would not change their decisions regarding consumption, saving, and work in anticipation of lower Social Security benefits. In CBO's assessment, if people responded to the prospect of lower benefits, they would increase their saving by cutting consumption and working more, both of which would help reduce the impact that lower future benefits would have on their future income and consumption. That increase in saving and in the labor supply would boost the capital stock and GDP, thereby raising taxable income and revenues and further lowering deficits. As a result, the ratio of federal debt held by the public to GDP in 2046 would probably be less than 101 percent, the amount CBO estimates that ratio would be if people did not change their consumption, saving, or work decisions in anticipation of lower Social Security benefits.

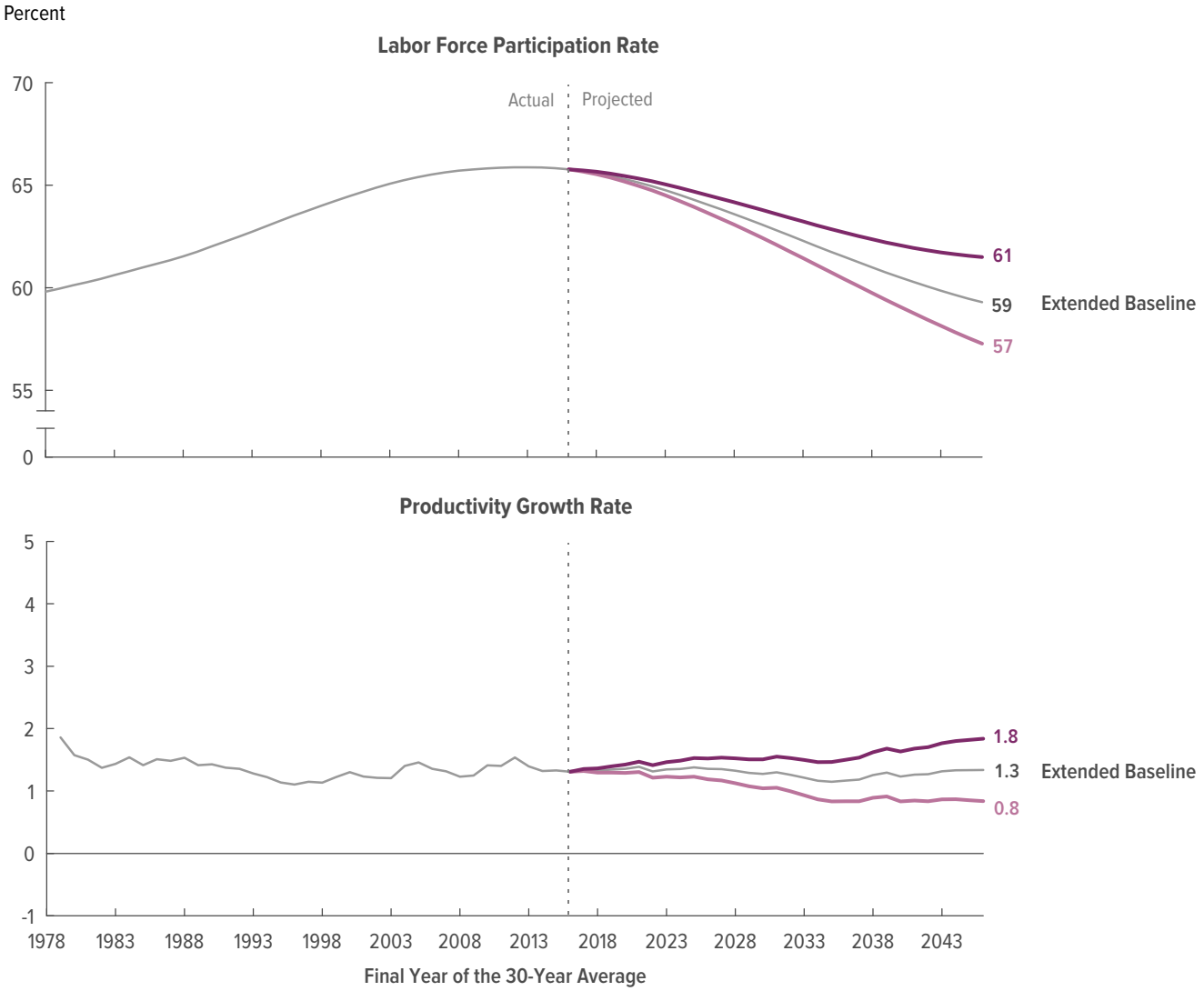
1. Although the two trust funds are legally separate, in this report, CBO follows the common analytical convention of considering them to be combined. For a detailed discussion of various Social Security policy options, see Congressional Budget Office, *Social Security Policy Options, 2015* (December 2015), www.cbo.gov/publication/51011.

2. See sec. 257(b)(1) of the Balanced Budget and Emergency Deficit Control Act of 1985, Public Law 99-177 (codified at 2 U.S.C. §907(b)(1) (2012)).

3. Noah P. Meyerson, *Social Security: What Would Happen If the Trust Funds Ran Out?* Report for Congress RL33514 (Congressional Research Service, August 2014), available from the U.S House of Representatives, Committee on Ways and Means, *2014 Green Book*, Chapter 1: Social Security, "Social Security Congressional Research Service Reports" (accessed July 8, 2016), http://go.usa.gov/cCXcG.

Figure 7-1. Return to Reference 1, 2, 3, 4

## The 30-Year Averages CBO Used to Illustrate Uncertainty in Long-Term Budget Projections




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

To illustrate some of the uncertainty associated with long-term budgetary outcomes, CBO constructed alternative projections that show what would happen to the budget if four underlying factors differed from the values that were used to construct the extended baseline. This figure shows the projected variation in those factors, which is based largely on the historical variation in the factors' 30-year averages and begins in 2017.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

The 30-year average for a given year is the average of the data value for that year and the values for the preceding 29 years. For example, the 30-year average for productivity growth in 2015 is the average of the growth of productivity in years 1986 through 2015.

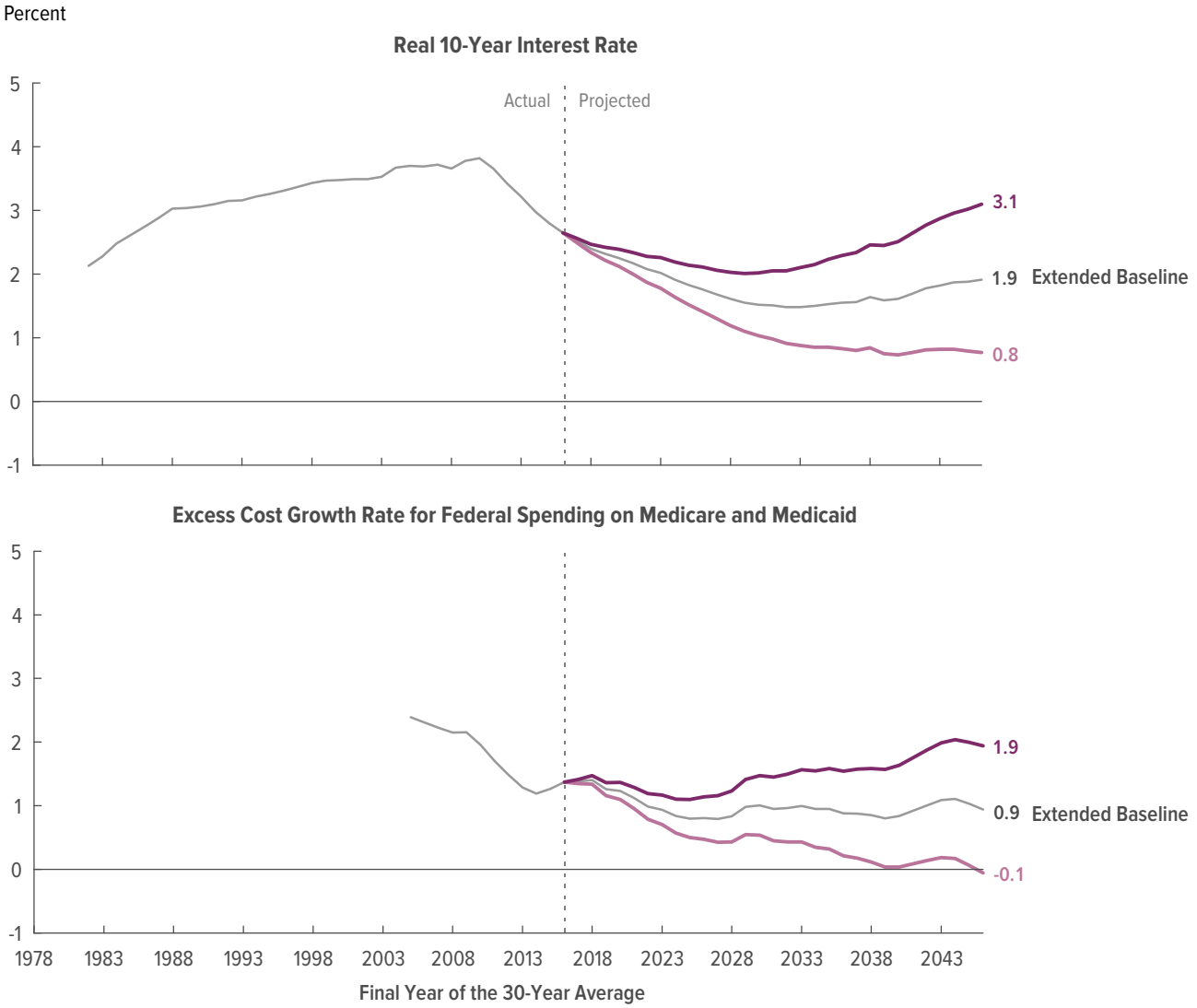
The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are age 16 or older and either working or actively seeking work.

Productivity growth is the growth of total factor productivity—that is, the growth of real (inflation-adjusted) output that is not explained by the growth of labor and capital.

Continued

Figure 7-1. Continued

## The 30-Year Averages CBO Used to Illustrate Uncertainty in Long-Term Budget Projections



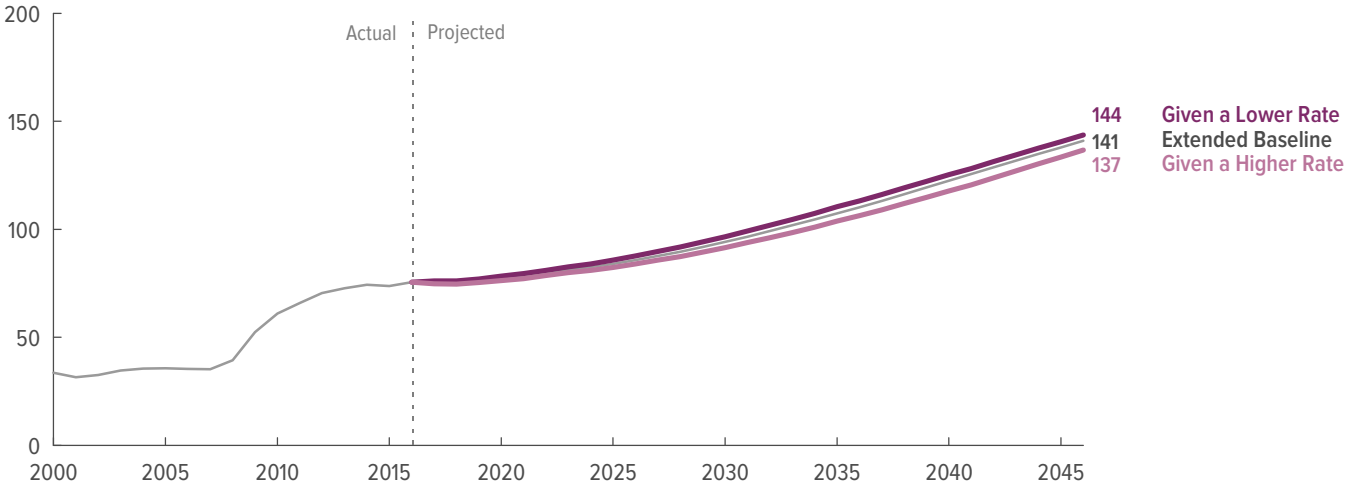

Excess cost growth refers to the extent to which the growth rate of nominal health care spending per person—adjusted for demographic characteristics of the relevant populations—exceeds the growth rate of potential gross domestic product per person. (Potential gross domestic product is the maximum sustainable output of the economy.)

The different periods shown for actual data reflect the availability of those data.

Figure 7-2. Return to Reference

## Federal Debt Given Different Labor Force Participation Rates

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Federal debt refers to debt held by the public. Values are CBO's central estimates from ranges determined by alternative assessments of two factors: how much deficits crowd out investment in capital goods such as factories and computers (because a larger portion of private saving is being used to purchase government securities); and how much people respond to changes in after-tax wages by adjusting the number of hours they work.

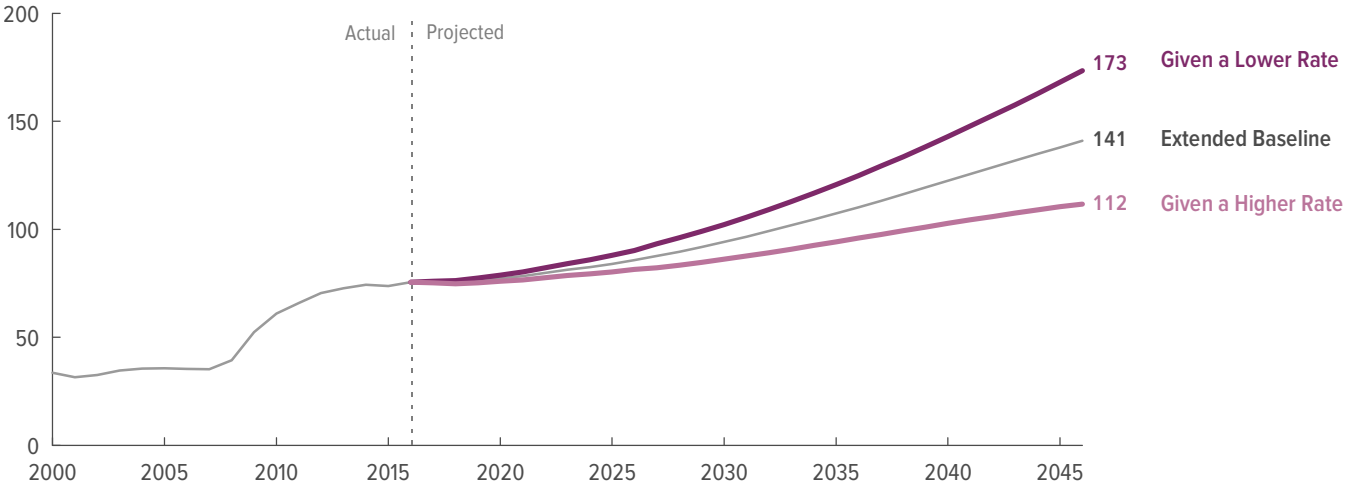
The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are age 16 or older and either working or actively seeking work.

The alternative projections of labor force participation rates begin in 2017. In 2046, they are about 3 percentage points higher and lower than they are in the extended baseline.

Figure 7-3. Return to Reference

## Federal Debt Given Different Productivity Growth Rates

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Federal debt refers to debt held by the public. Values are CBO's central estimates from ranges determined by alternative assessments of two factors: how much deficits crowd out investment in capital goods such as factories and computers (because a larger portion of private saving is being used to purchase government securities); and how much people respond to changes in after-tax wages by adjusting the number of hours they work.

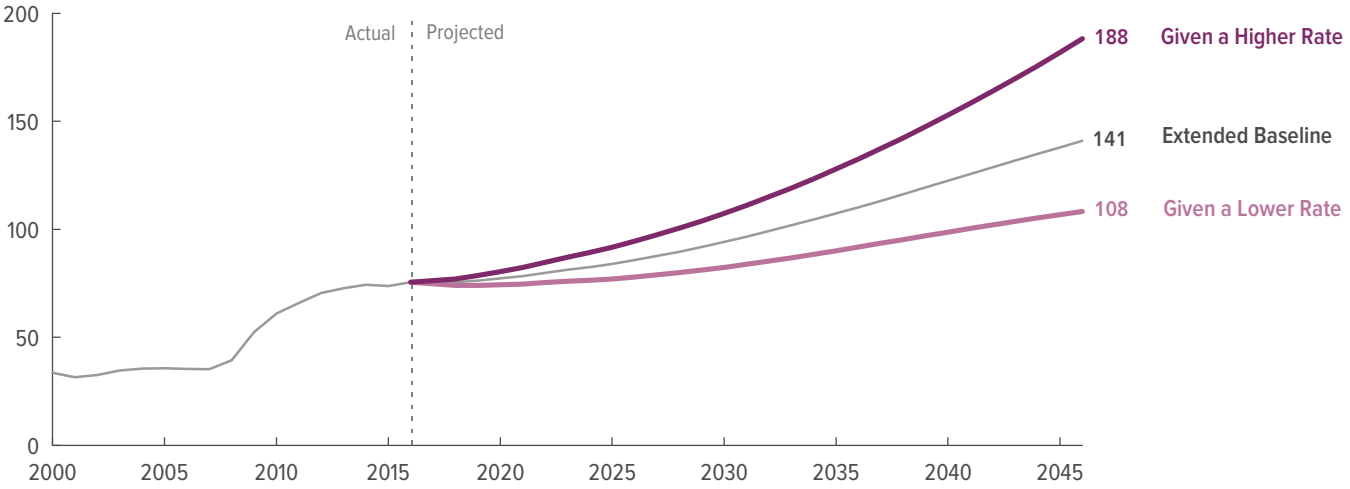
Productivity growth is the growth of total factor productivity—that is, the growth of real (inflation-adjusted) output that is not explained by the growth of labor and capital.

The alternative projections of productivity growth rates begin in 2017. Through 2046, the higher productivity growth rate is 0.5 percentage points higher, and the lower productivity growth rate is 0.5 percentage points lower, than the annual rate of 1.3 percent used for each year in the extended baseline.

Figure 7-4. Return to Reference

## Federal Debt Given Different Federal Borrowing Rates

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

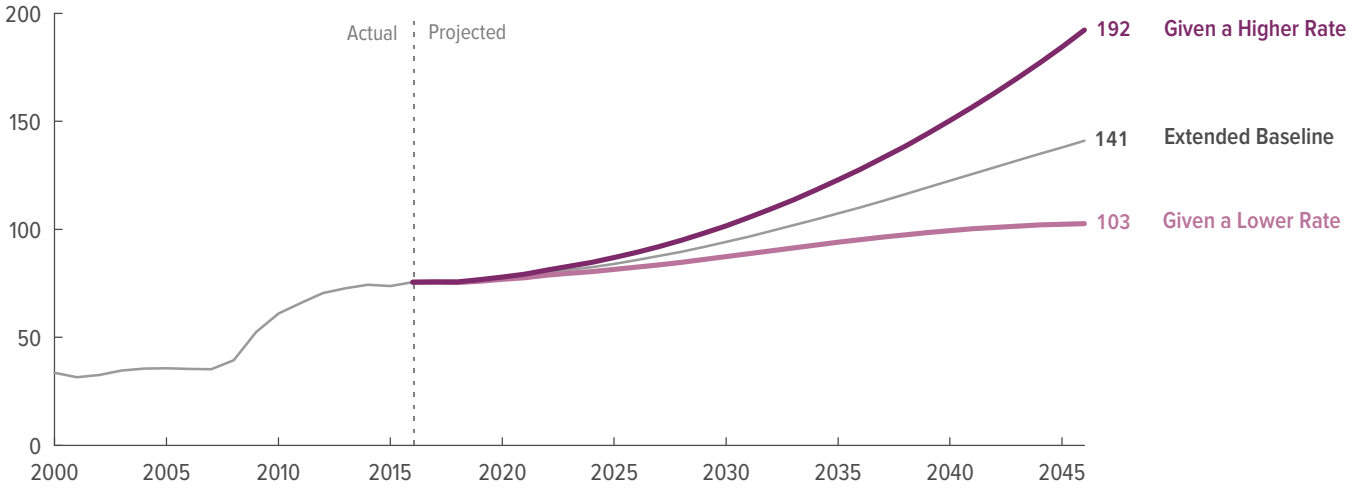
Federal debt refers to debt held by the public. Values are CBO's central estimates from ranges determined by alternative assessments of two factors: how much deficits crowd out investment in capital goods such as factories and computers (because a larger portion of private saving is being used to purchase government securities); and how much people respond to changes in after-tax wages by adjusting the number of hours they work.

The federal borrowing rate is the interest rate on federal debt. The alternative projections of federal borrowing rates begin in 2017. Through 2046, the higher borrowing rate is 1.0 percentage point higher, and the lower borrowing rate is 1.0 percentage point lower, than the rate used for each year in the extended baseline. The borrowing rate is not the same measure as the interest rate on 10-year Treasury notes that is shown in Figure 7-1.

Figure 7-5. Return to Reference

## Federal Debt Given Different Rates of Excess Cost Growth for Federal Spending on Medicare and Medicaid

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

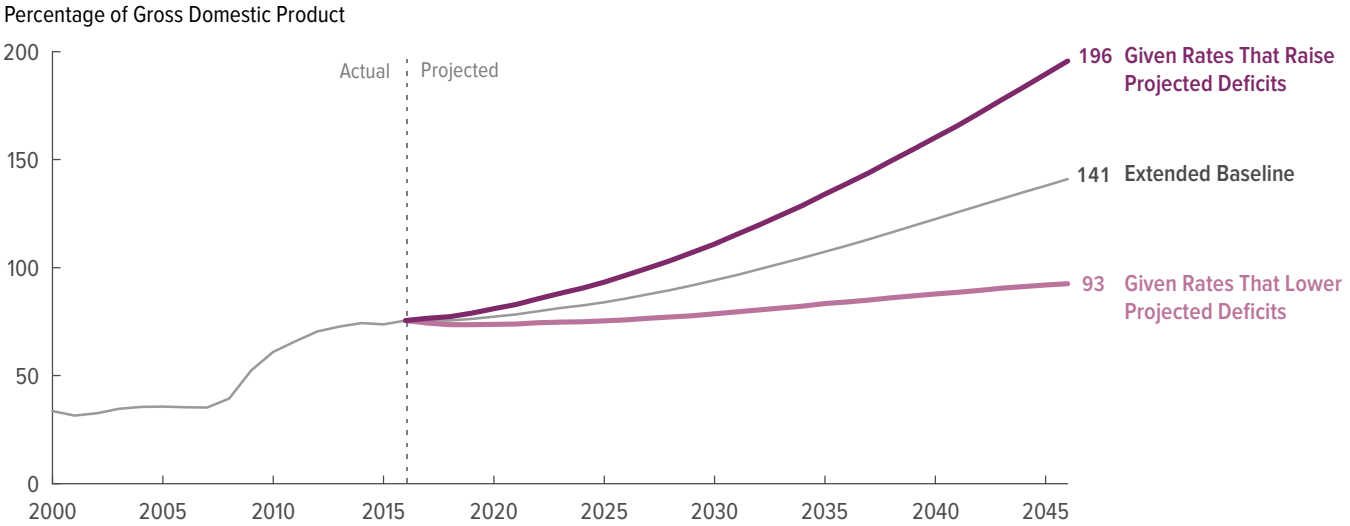
Federal debt refers to debt held by the public. Values are CBO's central estimates from ranges determined by alternative assessments of two factors: how much deficits crowd out investment in capital goods such as factories and computers (because a larger portion of private saving is being used to purchase government securities); and how much people respond to changes in after-tax wages by adjusting the number of hours they work.

Excess cost growth refers to the extent to which the growth rate of nominal health care spending per person—adjusted for demographic characteristics of the relevant populations—exceeds the growth rate of potential gross domestic product per person. (Potential gross domestic product is the maximum sustainable output of the economy.)

The alternative projections of rates of excess cost growth begin in 2017. Through 2046, the higher rate of excess cost growth is 1.0 percentage point higher, and the lower rate is 1.0 percentage point lower, than the rate used for each year in the extended baseline.

Figure 7-6. Return to Reference

**Federal Debt Given Different Labor Force Participation Rates, Productivity Growth Rates, Federal Borrowing Rates, and Rates of Excess Cost Growth for Federal Spending on Medicare and Medicaid**




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Federal debt refers to debt held by the public. Values are CBO's central estimates from ranges determined by alternative assessments of two factors: how much deficits crowd out investment in capital goods such as factories and computers (because a larger portion of private saving is being used to purchase government securities); and how much people respond to changes in after-tax wages by adjusting the number of hours they work.

The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are age 16 or older and either working or actively seeking work.

Productivity growth is the growth of total factor productivity—that is, the growth of real (inflation-adjusted) output that is not explained by the growth of labor and capital.

Excess cost growth refers to the extent to which the growth rate of nominal health care spending per person—adjusted for demographic characteristics of the relevant populations—exceeds the growth rate of potential gross domestic product per person. (Potential gross domestic product is the maximum sustainable output of the economy.)

For this figure, CBO used values for the four factors whose deviation from the extended baseline was about 60 percent as large as the deviation used for the individual cases shown in Figures 7-2 to 7-5. The alternative projections of the four factors begin in 2017.

Table A-1. Return to Reference

## Average Annual Values for Economic and Demographic Variables That Underlie CBO's Extended Baseline

| | 2016–2026 | 2027–2036 | 2037–2046 | Overall, 2016–2046 |
|---|---|---|---|---|
| | | Economic Variables (Percent) | | |
| Growth of GDP | | | | |
| Real GDP | 2.1 | 2.0 | 2.1 | 2.1 |
| Nominal GDP | 4.1 | 4.1 | 4.2 | 4.1 |
| Growth of the Labor Force | 0.6 | 0.3 | 0.4 | 0.4 |
| Unemployment | | | | |
| Unemployment rate | 4.9 | 5.0 | 4.8 | 4.9 |
| Natural rate of unemployment | 4.8 | 4.7 | 4.6 | 4.7 |
| Growth of Average Hours Worked | -0.1 | -0.1 | * | -0.1 |
| Growth of Total Hours Worked | 0.5 | 0.3 | 0.4 | 0.4 |
| Earnings as a Share of Compensation | 81 | 81 | 81 | 81 |
| Growth of Real Earnings per Worker | 1.2 | 1.3 | 1.3 | 1.3 |
| Share of Earnings Below the Taxable Maximum | 80 | 77 | 77 | 78 |
| Growth of Capital Services | 2.4 | 1.8 | 1.9 | 2.0 |
| Growth of Productivity | | | | |
| Total factor productivity | 1.3 | 1.3 | 1.3 | 1.3 |
| Labor productivity | 1.6 | 1.7 | 1.8 | 1.7 |
| Inflation | | | | |
| Growth of the CPI-U | 2.3 | 2.4 | 2.4 | 2.4 |
| Growth of the GDP price index | 2.0 | 2.0 | 2.0 | 2.0 |
| Interest Rates | | | | |
| Real rates | | | | |
| On 10-year Treasury notes and the OASDI trust funds | 1.6 | 1.9 | 2.2 | 1.9 |
| On all federal debt held by the public | 0.8 | 1.5 | 1.9 | 1.4 |
| Nominal rates | | | | |
| On 10-year Treasury notes and the OASDI trust funds | 3.9 | 4.3 | 4.6 | 4.3 |
| On all federal debt held by the public | 3.1 | 4.0 | 4.3 | 3.7 |
| | | Demographic Variables | | |
| Growth of the Population (Percent) | 0.8 | 0.7 | 0.5 | 0.7 |
| Fertility Rate (Children per woman) | 1.9 | 1.9 | 1.9 | 1.9 |
| Immigration Rate (Per 1,000 people in the U.S. population) | 3.9 | 3.9 | 3.8 | 3.8 |
| Life Expectancy at Birth, End of Period (Years)[a] | 80.6 | 81.8 | 83.0 | 83.0 |
| Life Expectancy at Age 65, End of Period (Years)[a] | 20.2 | 20.9 | 21.6 | 21.6 |

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

CPI-U = consumer price index for all urban consumers; GDP = gross domestic product; OASDI = Old-Age, Survivors, and Disability Insurance (Social Security); * = between -0.05 percent and zero.

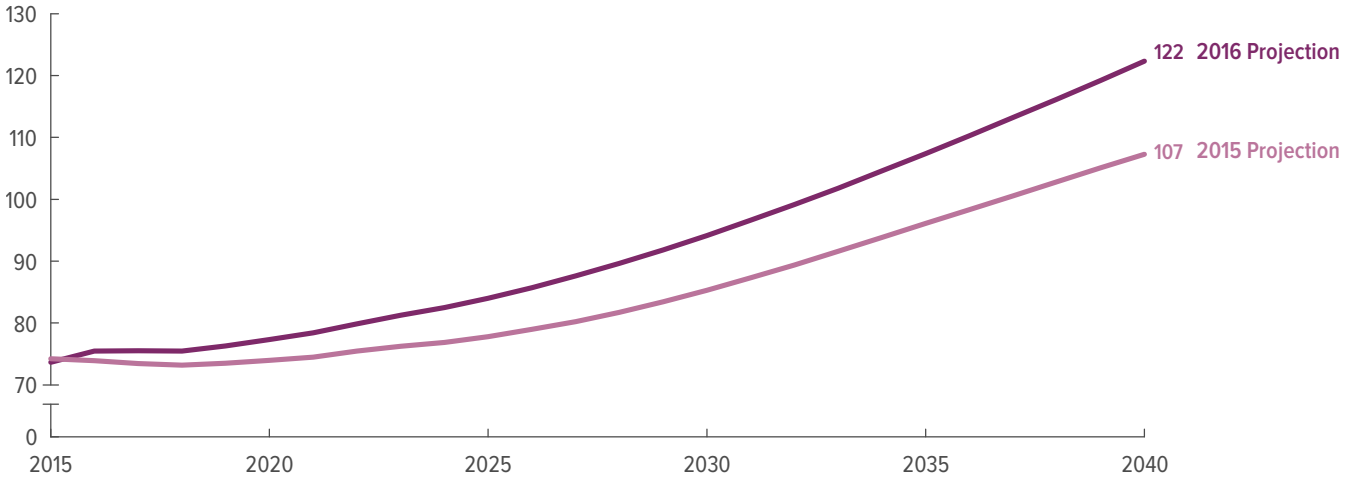
a. Life expectancy as used here is period life expectancy, which is the amount of time that a person in a given year would expect to survive beyond his or her current age on the basis of that year's mortality rates for various ages.

Figure B-1.

Return to Reference

## Comparison of CBO's 2015 and 2016 Projections of Federal Debt Held by the Public Under the Extended Baseline

Percentage of Gross Domestic Product



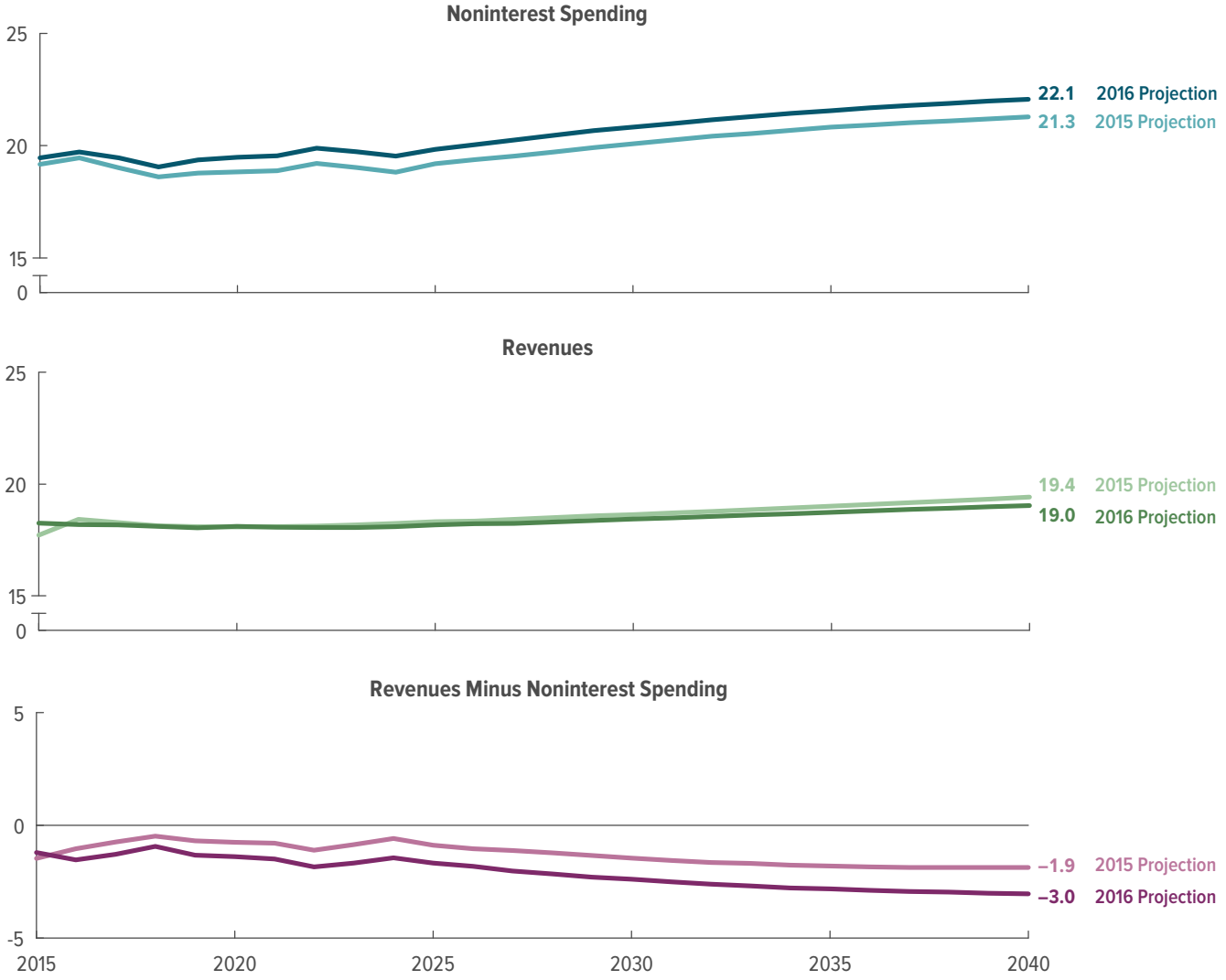

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Figure B-2. Return to Reference

## Comparison of CBO's 2015 and 2016 Projections of Spending and Revenues Under the Extended Baseline

Percentage of Gross Domestic Product




Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2026 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.