



How Changes in Economic Conditions Might Affect the Federal Budget: 2024 to 2034

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The Congressional Budget Office's budget projections are subject to uncertainty for many reasons. Some of that uncertainty is related to demographic trends, possible actions by federal agencies, the extent of participation in federal programs, and a variety of other factors. In addition, significant uncertainty stems from the fact that the federal budget is sensitive to economic conditions, which are difficult to accurately forecast. If conditions differed noticeably from those in CBO's economic forecast, budgetary outcomes could diverge from those in the agency's baseline budget projections.

To show how variations in economic conditions might affect its budget projections, CBO analyzed how revenues, outlays, and deficits might change if the values of key economic variables differed from those in the agency's forecast.¹ To do so, CBO generated four economic scenarios that would result in larger budget deficits. In isolation, each of those scenarios would cause cumulative deficits to be larger than the amounts projected in CBO's baseline by between \$142 billion and \$324 billion over the 2025–2034 period. (The total deficit projected for that period is \$20.0 trillion.)

The four scenarios that CBO analyzed are as follows:

- **Slower productivity growth.** If productivity grew at a rate that was 0.1 percentage point slower each year than it is in the agency's economic forecast, economic growth would slow, which would reduce income and, in turn, federal revenues. Although some of that decrease in revenues would be offset by reductions in

outlays, annual deficits would be larger than projected by amounts that would reach \$71 billion in 2034, CBO estimates. The cumulative deficit for the 2025–2034 period would be \$304 billion larger than it is in CBO's baseline budget projections.

- **Slower growth of the labor force.** If the labor force grew at a rate that was 0.1 percentage point slower each year than the rate in CBO's economic forecast, and if the unemployment rate remained unchanged, economic growth would slow, and annual deficits would be larger than those in the agency's baseline budget projections by amounts that would reach \$33 billion in 2034.² The cumulative deficit for the 2025–2034 period would be \$142 billion larger than it is in the agency's baseline projections.
- **Higher interest rates.** If all interest rates—including those on 3-month Treasury bills and 10-year Treasury notes—were 0.1 percentage point higher each year than they are in CBO's economic forecast, the government's net interest costs would grow progressively over the projection period. If other variables were held constant, higher-than-forecast interest rates would cause deficits to exceed the agency's baseline projections by \$50 billion in 2034 and by \$324 billion over the 2025–2034 period.
- **Higher inflation and interest rates.** If all wage and price indexes grew at a rate that was 0.1 percentage point faster each year than the rate in CBO's economic forecast, but real (inflation-adjusted) values for gross domestic product (GDP), interest rates, and other variables affected by inflation were the

1. This analysis is based on the agency's most recent baseline budget and economic projections. See Congressional Budget Office, *The Budget and Economic Outlook: 2024 to 2034* (February 2024), www.cbo.gov/publication/59710.

2. The unemployment rate is the percentage of people in the labor force who are not working but who are available for work and are either seeking work or expecting to be recalled from a temporary layoff.

same as those underlying CBO's baseline, annual deficits would be larger than projected by amounts that would climb to \$41 billion in 2034.³ With real GDP held constant, higher inflation would push up nominal GDP, resulting in more taxable income. But higher inflation would also increase benefit payments from certain programs. And with real interest rates held constant, higher inflation would increase nominal interest rates. As in the previous scenario, those higher nominal interest rates would drive up interest payments on federal debt. The cumulative deficit for the 2025–2034 period would be \$263 billion larger than projected.

Those scenarios and the resulting budgetary and economic effects are referred to as CBO's rules of thumb. Although budget deficits are larger in each scenario than they are in the agency's baseline, actual economic outcomes may result in deficits that are smaller. Because the rules of thumb are roughly symmetrical, if productivity or the labor force grew 0.1 percentage point more quickly than projected, or if interest rates or inflation were 0.1 percentage point lower than projected, deficits would be smaller than they are in the agency's baseline budget projections by about the same amounts.

Background

When economic conditions differ from those in the agency's forecast, actual budgetary outcomes are likely to differ from CBO's projections because economic conditions affect federal revenues and outlays in several ways.

- Revenues depend on the total amount of income that is subject to taxation, including wages and salaries, other income received by individuals, and corporate profits. Those types of income generally rise or fall (though not necessarily proportionally) in response to changes in economic growth and inflation.
- The Treasury regularly refinances portions of the government's outstanding debt and issues more debt to finance new deficits at market interest rates. Thus, the amount that the federal government spends to pay interest on its debt is directly tied to those interest rates.
- Spending for many mandatory programs—that is, programs whose spending is governed by laws other

than appropriation acts—is affected by economic growth and inflation, either directly (for example, through cost-of-living adjustments) or indirectly (for example, through the number of beneficiaries).

- Although actual spending for discretionary programs—programs whose spending is controlled by appropriation acts—is determined by lawmakers, CBO's projections of such spending are affected by changes in inflation.⁴

Economic conditions are uncertain and difficult to foresee and, therefore, could differ from those in CBO's forecast for a variety of reasons. For example, inflation in 2021 and 2022 was much higher than CBO and other forecasters had anticipated.⁵ Future changes in policy could also cause economic outcomes to differ from CBO's projections. Changes in immigration policy, for instance, could significantly affect the growth of the labor force. Even the economic effects of policy changes that are already set in law and reflected in the baseline are subject to considerable uncertainty and may diverge from CBO's projections. Finally, some changes in economic conditions, such as turning points in the business cycle, cannot be accurately predicted from available information.

The Economic Variables That CBO Examined

CBO examined how differences in four key economic variables would affect its budget projections. In all four scenarios, the values of the economic variables differ from those in the agency's forecast by 0.1 percentage point each year starting in January 2024.⁶ In the first two scenarios—those that involve slower productivity growth and slower labor force growth—real GDP growth is slower, which affects many other variables that interact with the budget more directly, such as wages and salaries

3. Wage and price indexes include the gross domestic product price index, the consumer price index for all urban consumers (CPI-U), the chained CPI-U, and the employment cost index for wages and salaries of workers in private industry.

4. For nearly all discretionary spending, the measure that CBO uses to project funding for future years is a weighted mixture of the GDP price index and the employment cost index for wages and salaries of workers in private industry. The weights are determined using data from the Office of Management and Budget that indicate how much of a program's funding is spent on compensation for federal employees and how much is spent for other purposes.

5. Congressional Budget Office, *CBO's Economic Forecasting Record: 2023 Update* (June 2023), www.cbo.gov/publication/59078.

6. CBO based its economic projections on information that was available as of December 5, 2023.

and interest rates.⁷ In the third and fourth scenarios—those that involve higher interest rates and higher inflation—variables that are related to labor and productivity or that are measured in real terms remain unchanged by design.

For simplicity, CBO constructed the scenarios so that the values for the key economic variables differ from those in the agency’s forecast by 0.1 percentage point in a direction that would worsen budget deficits. CBO has produced an interactive workbook that allows users to create their own alternative scenarios for the key variables, including scenarios that would reduce deficits.⁸

The scenarios are not intended to indicate how actual economic conditions might differ in either direction from CBO’s projections; those differences might be greater than 0.1 percentage point. For example, in CBO’s projections, real GDP grows by 1.5 percent in calendar year 2024 (measured from fourth quarter to fourth quarter) and by 2.1 percent in calendar year 2027. However, the agency estimates that there is a two-thirds chance that the rate of real GDP growth will be between –0.2 percent and 2.9 percent in calendar year 2024 and between zero and 4.1 percent in calendar year 2027.

Similarly, CBO projects that the rate of inflation (as measured by the price index for personal consumption expenditures from fourth quarter to fourth quarter) will

be 2.1 percent in calendar year 2024 and 2.0 percent in calendar year 2027. However, the agency estimates that there is a two-thirds chance that the actual rate of inflation will be between 1.1 percent and 3.1 percent in 2024 and between 0.6 percent and 3.3 percent in 2027.

The agency also estimates that there is a two-thirds chance that the average interest rate on 10-year Treasury notes will be within 0.7 percentage points of the forecast rate of 4.6 percent in calendar year 2024 and within 1.1 percentage points of the forecast rate of 3.8 percent in calendar year 2027.

Productivity Growth. In this scenario, productivity growth is 0.1 percentage point slower each year than it is in CBO’s economic forecast, causing real GDP to be 1.4 percent lower in 2034 than the agency forecasts (see Table 1). Slower productivity growth, in turn, would affect other economic variables, such as wage rates and interest rates.

Labor Force Growth. In the second scenario, the labor force’s growth is 0.1 percentage point slower each year than it is in the agency’s economic forecast, causing real GDP to be 0.7 percent lower than forecast in 2034. If the population grew at the rate that CBO projects, the slower growth of the labor force would cause the labor force participation rate to fall below the agency’s current estimates.⁹ That difference would grow by a roughly equal amount each year until the labor force participation rate was 1.1 percentage points lower at the end of 2034 than forecast. Like slower productivity growth, slower labor force growth would affect other economic variables.

Interest Rates. In the third scenario, interest rates are 0.1 percentage point higher each year than those in CBO’s forecast. Inflation is held equal to the forecast rate, so this rule of thumb shows the effects of higher real interest rates. Unlike the other scenarios, this scenario does not include any changes to the projected amounts of interest payments made or received by individuals or businesses.

Inflation and Interest Rates. In the fourth scenario, inflation and interest rates are 0.1 percentage point higher each year than they are in the agency’s economic forecast. All economic indicators that are measured as nominal values, such as GDP and taxable income,

7. The two scenarios in which real GDP differs from amounts in the baseline are produced by incorporating alternative economic conditions into CBO’s incomes model, which is used to project many components of income. All four scenarios are then used to calibrate CBO’s budgetary feedback model. See Congressional Budget Office, “Assessing the Budgetary Implications of Economic Uncertainty With CBO’s Incomes Model and Budgetary Feedback Model” (January 2023), www.cbo.gov/publication/58885. The budgetary feedback model, like the rules of thumb, was constructed to approximate how the federal budget would respond to changes in the economy. However, that model provides a more detailed and unified framework to quantify budgetary feedback from macroeconomic changes that are more complicated than those in the simplified rules of thumb. For more on the budgetary feedback model, see Nathaniel Frenzt and others, *A Simplified Model of How Macroeconomic Changes Affect the Federal Budget*, Working Paper 2020-01 (Congressional Budget Office, January 2020), www.cbo.gov/publication/55884.

8. Congressional Budget Office, “Workbook for *How Changes in Economic Conditions Might Affect the Federal Budget: 2024 to 2034*” (interactive tool, April 2024), www.cbo.gov/publication/60074.

9. The labor force participation rate is the percentage of the civilian noninstitutionalized population age 16 or older that is in the labor force.

Table 1.

Differences Between the Illustrative Scenarios and CBO's Economic Forecast in 2034

Percent

| | Level of real GDP | Level of nominal GDP | Size of the labor force | Interest rate on 10-year Treasury notes (percentage points) | Level of the GDP price index | Level of the employment cost index ^a |
|-------------------------------------|-------------------|----------------------|-------------------------|---|------------------------------|---|
| Slower productivity growth | -1.4 | -1.4 | -0.2 | -0.1 | 0 | -1.2 |
| Slower labor force growth | -0.7 | -0.7 | -1.0 | -0.1 | 0 | 0.4 |
| Higher interest rates | 0 | 0 | 0 | 0.1 | 0 | 0 |
| Higher inflation and interest rates | 0 | 1.1 | 0 | 0.1 | 1.1 | 1.1 |

Data source: Congressional Budget Office. See www.cbo.gov/publication/60072#data.

In the scenario for each rule of thumb, economic variables differ by 0.1 percentage point from those in CBO's economic forecast in the direction that would worsen the budget outlook, but those variables could be higher or lower than forecast.

Each rule of thumb is roughly symmetrical. If, for example, productivity growth was 0.1 percentage point faster than projected, real (inflation-adjusted) GDP would increase by about the same amount that it decreases in the table.

GDP = gross domestic product.

a. The employment cost index for wages and salaries of workers in private industry.

increase in response to higher inflation, and all interest rates are 0.1 percentage point higher than they are in the economic forecast, as in the third scenario. Indicators that are measured as real values, such as real GDP, real income, and real interest rates, are the same as they are in CBO's economic forecast. Although real interest rates remain unchanged in this scenario, the interactive workbook allows users to change inflation and interest rates independently, thus allowing real rates to differ.

Applying the Rules of Thumb

CBO's rules of thumb provide an approximate idea of how changes in those economic variables would affect the federal government's revenues and outlays if current laws generally remained unchanged. The rules of thumb are roughly symmetrical and scalable, which means they can be used to analyze scenarios in which values for those variables differ from the ones presented here, with some caveats.

Symmetry. Each rule of thumb is roughly symmetrical. Thus, if the growth of productivity or the labor force was 0.1 percentage point faster than in CBO's baseline budget projections, or if interest rates or inflation were 0.1 percentage point lower than in CBO's baseline projections, the effects would be about the same as those shown here, but with the opposite sign.

Scalability. In addition to being symmetrical, the rules of thumb are roughly scalable—that is, an increase or decrease in the value of a given economic variable will

produce a roughly proportional increase or decrease in the resulting budgetary effects. For example, if productivity growth was 0.2 percentage points slower each year than it is in CBO's economic forecast rather than 0.1 percentage point slower, as it is in the scenario discussed here, the effects on the cumulative deficit would be roughly double.

The Range of Deviations From CBO's Baseline. The scalability of the rules of thumb is limited. The more the values of economic variables differ from those in CBO's forecast, the less accurate estimates produced using the rules of thumb are likely to be. Although the productivity and labor force scenarios incorporate a broad set of interactions among several economic variables, all four rules of thumb are nevertheless simplified and do not account for more complex interactions among variables—such as the interactions among real GDP growth, inflation, and the unemployment rate.

That limitation becomes more pertinent as the difference between the value of an economic variable in a given scenario and in CBO's forecast increases. Certain elements of the tax code and some provisions of law related to mandatory programs also make it likely that, as such differences increase, estimates produced using the rules of thumb will become less accurate.

Year-by-Year Differences in Deviations From CBO's Baseline. The rules of thumb are based on scenarios in

which the values of variables differ from the values in CBO's economic forecast by the same amount each year. The rules of thumb can be used to estimate the effects of scenarios in which the differences vary slightly from year to year, but they cannot be used to accurately estimate the effects of significant variations in those differences over the 2025–2034 period.

For example, if the rate of labor force growth differed from the value in CBO's forecast by 0.5 percentage points in 2034 but was the same as the forecast value in all other years, the average annual difference would be a little less than 5 basis points (that is, 0.05 percentage points).¹⁰ But CBO's estimate of the budgetary effects over the same period would not be one-half the amount shown in the scenario for slower labor force growth (in which labor force growth is 0.1 percentage point slower each year than it is in the agency's forecast), nor would the agency's estimate of the budgetary effect in 2034 be five times the value for 2034 in that scenario. Both estimates would be considerably smaller than those ratios. The interactive workbook associated with this report reflects how different annual deviations from CBO's economic forecast would affect budgetary outcomes.

Reasonable Ranges for Deviations. To assess the scalability of the rules of thumb, CBO compared estimates produced from the simplified calculations in its online workbook with estimates made from a broader set of models that the agency uses to assess the effects of economic changes on the budget. CBO found that scaling the four rules of thumb, within certain limits, produced reasonable approximations of the estimates generated by CBO's economic and budget models. Specifically, the rules of thumb were scalable as long as the annual differences from the forecast values were within the following ranges:

- For productivity growth, between –0.5 percentage points and 0.5 percentage points;
- For labor force growth, between –0.75 percentage points and 0.75 percentage points;
- For interest rates, between –1.0 percentage point and 1.0 percentage point; and
- For inflation and interest rates, between –1.0 percentage point and 1.0 percentage point.

10. One basis point is equivalent to one one-hundredth of a percentage point, or 0.01 percentage point. Basis points are commonly used as a unit of measure for differences of less than 1 percentage point.

In general, differences outside of those ranges in any given year would generate budgetary effects that could not be reasonably approximated by the rules of thumb and, therefore, would require a more detailed analysis.

Caveats. If economic conditions changed in such a way that they reflected the changes incorporated in two or more of the simplified scenarios, the budgetary effects would most likely differ from the sum of the effects in the individual rules of thumb. For example, if productivity growth and labor force growth were both slower than they are in CBO's economic forecast, the two effects would interact and could lower output growth by more or less than would be suggested by simply adding them.

The rules of thumb capture the budgetary effects of specified changes in the economy, but they do not account for the source of those changes, which could include changes in policy. For example, proposed legislation might call for an increase in government spending that would affect inflation. The rule of thumb for inflation approximates the budgetary effects that would result from the estimated changes in inflation—but it does not incorporate the budgetary effects of the increased spending itself, nor does it encompass other effects on the economy besides a change in inflation.

In addition, some changes in policy could alter how changes in the economy affect the federal budget. For example, a new tax policy that changed tax rates would probably affect the relationship between changes in the economy and revenues. Thereafter, changes in the economy would have budgetary effects different from those that would be estimated using the rules of thumb.

Changes in Productivity Growth and Labor Force Growth

The growth of productivity and the growth of the labor force are important determinants of real GDP growth. Faster productivity growth and faster labor force growth both lead to greater economic growth and thus reduce budget deficits. Slower productivity growth and slower labor force growth both reduce the growth of GDP, thereby worsening budget deficits.¹¹

11. For further discussion about how changes in the labor force participation rate—which lead to changes in labor force growth—and changes in productivity affect GDP, as well as about the uncertainty of such projections, see Congressional Budget Office, *The 2016 Long-Term Budget Outlook* (July 2016), Chapter 7, www.cbo.gov/publication/51580.

Table 2.

How Changes in Productivity Growth and Labor Force Growth Might Affect CBO's Baseline Budget Projections

Billions of dollars

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | Total | |
|---|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| | | | | | | | | | | | | 2025–2029 | 2025–2034 |
| Productivity growth is 0.1 percentage point slower each year | | | | | | | | | | | | | |
| Changes in revenues | -5 | -8 | -14 | -22 | -30 | -41 | -54 | -67 | -81 | -95 | -111 | -115 | -524 |
| Changes in outlays | | | | | | | | | | | | | |
| Mandatory | * | * | -1 | -1 | -2 | -3 | -4 | -5 | -6 | -7 | -9 | -8 | -38 |
| Net interest | | | | | | | | | | | | | |
| Lower interest rates | -6 | -9 | -10 | -11 | -14 | -17 | -21 | -25 | -30 | -34 | -39 | -60 | -208 |
| Debt service | * | * | * | * | 1 | 1 | 2 | 3 | 5 | 6 | 8 | 2 | 27 |
| Subtotal, net interest | -6 | -9 | -10 | -11 | -13 | -16 | -19 | -22 | -25 | -28 | -31 | -58 | -182 |
| Total change in outlays | -6 | -9 | -11 | -12 | -15 | -19 | -22 | -26 | -31 | -35 | -40 | -66 | -220 |
| Increase (-) in the deficit | 1 | 1 | -4 | -10 | -14 | -23 | -32 | -41 | -50 | -60 | -71 | -50 | -304 |
| Labor force growth is 0.1 percentage point slower each year | | | | | | | | | | | | | |
| Changes in revenues | -2 | -3 | -5 | -7 | -10 | -14 | -19 | -24 | -29 | -34 | -40 | -38 | -184 |
| Changes in outlays | | | | | | | | | | | | | |
| Mandatory | * | * | * | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 4 | 25 |
| Net interest | | | | | | | | | | | | | |
| Lower interest rates | * | -1 | -2 | -3 | -5 | -7 | -8 | -10 | -13 | -15 | -17 | -18 | -81 |
| Debt service | * | * | * | * | * | 1 | 1 | 2 | 2 | 3 | 4 | 2 | 14 |
| Subtotal, net interest | * | -1 | -2 | -3 | -4 | -6 | -7 | -9 | -10 | -12 | -13 | -16 | -67 |
| Total change in outlays | * | -1 | -2 | -2 | -3 | -4 | -5 | -6 | -6 | -7 | -7 | -12 | -42 |
| Increase (-) in the deficit | -2 | -2 | -3 | -5 | -7 | -10 | -14 | -18 | -23 | -28 | -33 | -27 | -142 |

Data source: Congressional Budget Office. See www.cbo.gov/publication/60072#data.

The rules of thumb capture the budgetary effects of specified changes in the economy, but they do not account for the source of those changes. The source of such changes in the economy could be a change in fiscal policy, which would have additional budgetary effects. In addition, such a change in fiscal policy would probably have broader economic effects than those underlying the budgetary estimates shown here.

Each rule of thumb is roughly symmetrical. If, for example, productivity growth was 0.1 percentage point faster each year than projected, deficits would shrink by about the same amount that they grow each year in the table.

* = between -\$500 million and \$500 million.

Slower Productivity Growth

The first rule of thumb illustrates the budgetary effects of productivity growth that is slightly weaker than CBO currently anticipates.¹² Specifically, if productivity grew at a rate that was 0.1 percentage point slower each year than the rate in the agency's economic forecast, annual deficits would be larger than projected by amounts that would reach \$71 billion in 2034, CBO estimates. The cumulative deficit for the 2025–2034 period would be \$304 billion larger than it is in CBO's baseline budget projections (see Table 2).

In this scenario, slower-than-anticipated productivity growth leads to slower GDP growth because both labor and capital produce less per unit than projected in CBO's current economic forecast. If workers produced less, the average hourly wage rate would be lower; therefore, the supply of labor would decline slightly in relation to the agency's baseline. As a result, total labor income would be lower. Meanwhile, if capital produced less output, the returns on that capital would decline, further decreasing total taxable income. Lower returns on capital would also drive down private investment. And because Treasury securities compete with other investments for investors' money, those lower rates of return on private investments imply that rates on Treasury securities would also be lower. Other variables, such as the

12. The measure of productivity underlying this rule of thumb is total factor productivity, calculated as the average real output per unit of combined labor and capital services.

unemployment rate and inflation, could be affected as well; however, this simplified scenario does not include the effects of changes in those variables.

If actual productivity growth was 0.1 percentage point slower each year than it is projected to be, GDP and total income would be 1.4 percent lower in 2034 than they are in the current forecast, CBO estimates. Interest rates on Treasury securities would decrease in relation to the rates in the agency's baseline every year. In 2034, interest rates would be 0.1 percentage point lower than the rates in CBO's baseline (see Table 1 on page 4).

Effects on Tax Revenues. If the rate of economic growth in each year was lower than CBO projects as a result of slower productivity growth, taxable income would also grow more slowly than projected. Consequently, tax revenues would fall below CBO's baseline budget projections by increasing amounts over time, resulting in a shortfall of \$111 billion in 2034. From 2025 to 2034, the drop in revenues stemming from the slower growth of income would cause deficits to grow by a total of \$524 billion.

Effects on Mandatory Spending. Over the 2025–2034 period, slower income growth would also lead to a \$38 billion net decrease in mandatory outlays for programs whose spending is either directly or indirectly linked to wage growth. Outlays for Medicare, Medicaid, unemployment insurance, and Social Security would decrease by \$45 billion; that decrease would be partially offset by a \$6 billion increase in outlays for the refundable portions of the earned income tax credit, the child tax credit, and the American Opportunity Tax Credit.¹³

Effects on Net Interest Costs. Because slower productivity growth would push interest rates down, the amount of interest that the federal government would pay on the debt projected for 2025 through 2034 in CBO's baseline would decrease by \$208 billion. However, the net growth in deficits stemming from the above changes to revenues and outlays would require the federal government to borrow more. That additional borrowing would add \$27 billion to interest costs between 2025 and 2034. Together, those effects result in cumulative net interest outlays that would be \$182 billion less

than the amount in the agency's baseline projections for the 2025–2034 period.¹⁴

Slower Labor Force Growth

The second rule of thumb illustrates the budgetary effects of the labor force's growing more slowly than CBO anticipates. Specifically, if the annual growth of the labor force was 0.1 percentage point slower than it is in CBO's economic forecast and the unemployment rate remained unchanged, annual deficits would be larger than those in the agency's baseline budget projections by amounts that would grow each year, reaching \$33 billion in 2034, CBO estimates. The cumulative deficit for the 2025–2034 period would be \$142 billion larger than it is in the agency's baseline projections (see Table 2 on page 6). The budgetary effects in this scenario would be considerably smaller than those in the scenario involving slower productivity growth because the resulting economic effects would be smaller (see Table 1 on page 4).

In this scenario, slower-than-projected growth in the labor force would push the average wage rate above CBO's current estimate. Higher wage rates would bring about a small boost in labor income and in the supply of labor, which would partially offset the effects of the decline in labor force growth. Nevertheless, total labor income would be less than it is in CBO's baseline. Meanwhile, the number of workers using a given amount of capital would fall below the number projected in CBO's economic forecast, so the returns on that capital would decline as well. As described above, the resulting decline in the rates of return on private investment would imply that interest rates on Treasury securities would be lower than they are in CBO's economic forecast. Other variables—including the unemployment rate, inflation, the distribution of labor income, and rates of retirement—could also be affected, but this rule of thumb does not reflect the effects of such changes.

In CBO's estimation, if the growth of the labor force was 0.1 percentage point slower than anticipated, GDP growth would also be slower in each year. In 2034, GDP and labor income would be 0.7 percent lower than they are in CBO's forecast (see Table 1 on page 4). Interest rates would also be lower, as in the productivity scenario, but the effects would be smaller; rates on

13. Tax credits reduce a taxpayer's income tax liability. If a refundable credit exceeds a taxpayer's liability, all or a portion of the excess is refunded to the taxpayer and recorded as an outlay in the budget.

14. Changes in interest rates could affect federal credit programs, the budgetary effects of which are calculated following the procedures specified in the Federal Credit Reform Act of 1990. Those effects are complicated and are not included in the rules-of-thumb scenarios.

Treasury securities would end up 5 basis points below the rates projected in CBO's baseline.

Effects on Tax Revenues. The slower economic growth would cause taxable labor income and profits to grow more slowly than projected, resulting in tax revenues that were less than the amounts in CBO's baseline budget projections. That shortfall would increase over time, reaching \$40 billion in 2034 and totaling \$184 billion over the 2025–2034 period.

Effects on Mandatory Spending. The higher-than-projected wage rates and the smaller-than-projected number of workers would, on net, add a total of \$25 billion to mandatory outlays between 2025 and 2034. Social Security benefits are based on beneficiaries' wages, and Medicare and Medicaid pay for health care services that become more costly as wages rise. Higher wages would therefore boost mandatory outlays from those programs by \$33 billion. But because there would be fewer workers and higher wages, \$8 billion of that amount would be offset by a decrease in outlays for unemployment insurance benefits and for the refundable portions of the earned income tax credit, the child tax credit, and the American Opportunity Tax Credit.

Effects on Net Interest Costs. From 2025 to 2034, the lower interest rates that resulted from the slower growth of the labor force would reduce the amount of interest that the federal government would pay on the debt projected in CBO's baseline by \$81 billion. However, the reduction in revenues and the slight increase in mandatory spending would result in deficits larger than those in CBO's baseline, requiring the federal government to borrow more than projected. That additional borrowing would add \$14 billion to interest costs. Overall, CBO estimates that net interest outlays over the 2025–2034 period would be \$67 billion less than they are in the agency's baseline budget projections.

Changes in Interest Rates and Inflation

Changes in interest rates and inflation affect the federal budget. All else being equal, higher interest rates would increase the flow of interest payments to and from the federal government. Higher inflation and interest rates would raise both revenues and outlays, though the effects on outlays would be larger. Lower interest rates and inflation would have the opposite effects.

Higher Interest Rates

The third rule of thumb illustrates the budget's sensitivity to an increase in interest rates when all other economic

variables are left unchanged, including the amounts of interest paid and received by individuals and businesses. In this scenario, all interest rates—including the rate on 3-month Treasury bills and the rate on 10-year Treasury notes—are 0.1 percentage point higher each year than they are in CBO's economic forecast. In this scenario, in CBO's estimation, deficits would exceed those in CBO's baseline budget projections by amounts that would grow each year, reaching \$50 billion in 2034. The cumulative deficit for the 2025–2034 period would be \$324 billion larger than it is in the agency's baseline projections (see Table 3).

Effects on Interest Costs. Most of the growth in deficits resulting from higher interest rates would arise because the government's costs of borrowing would be greater. As the Treasury replaced maturing securities and increased its borrowing to cover future deficits, the budgetary effects of higher interest rates would mount. CBO estimates that in this scenario, the added costs of higher interest rates on the federal debt projected in the baseline would reach \$42 billion in 2034 and would total \$279 billion for the 2025–2034 period, after accounting for a small increase in additional interest payments received by the government.

The larger deficits generated by an increase in interest rates and by the small reduction in revenues discussed below would require the Treasury to borrow more than it is projected to borrow in CBO's baseline. That additional borrowing would raise the cost of servicing the debt by amounts that would increase each year, reaching \$10 billion in 2034. From 2025 to 2034, the additional borrowing would add a total of \$47 billion to the cost of servicing the federal debt.

Effects on Revenues. As part of conducting monetary policy, the Federal Reserve buys and sells Treasury and other securities. The Federal Reserve also pays interest on reserves (deposits that banks hold at the central bank). The interest the Federal Reserve earns on its portfolio of securities and the interest it pays on reserves affect its remittances to the Treasury, which are counted as revenues.

If all interest rates were 0.1 percentage point higher than CBO projects, the Federal Reserve's remittances over the next few years would be smaller than projected because higher interest payments on reserves would outstrip the additional earnings from interest on its portfolio. Over time, however, the current holdings in the portfolio would mature and be replaced with higher-yielding investments; as a result, after 2028, the Federal Reserve's remittances

Table 3.

How Changes in Interest Rates and Inflation Might Affect CBO’s Baseline Budget Projections

Billions of dollars

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | Total | |
|---|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|
| | | | | | | | | | | | | 2025–2029 | 2025–2034 |
| Interest rates are 0.1 percentage point higher each year | | | | | | | | | | | | | |
| Changes in revenues | -3 | -3 | -2 | -1 | * | * | 1 | 1 | 2 | 2 | 3 | -7 | 2 |
| Changes in outlays | | | | | | | | | | | | | |
| Higher interest rates ^a | 5 | 12 | 16 | 20 | 24 | 27 | 30 | 33 | 36 | 39 | 42 | 99 | 279 |
| Debt service | * | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 | 10 | 47 |
| Total change in outlays | 5 | 12 | 17 | 22 | 26 | 31 | 35 | 39 | 43 | 48 | 52 | 109 | 326 |
| Increase (-) in the deficit | -8 | -15 | -20 | -23 | -27 | -31 | -34 | -38 | -41 | -45 | -50 | -116 | -324 |
| Inflation and interest rates are 0.1 percentage point higher each year | | | | | | | | | | | | | |
| Changes in revenues | 1 | 6 | 12 | 18 | 25 | 32 | 39 | 47 | 55 | 64 | 73 | 93 | 370 |
| Changes in outlays | | | | | | | | | | | | | |
| Mandatory | * | 2 | 6 | 10 | 14 | 18 | 24 | 29 | 35 | 42 | 49 | 50 | 229 |
| Discretionary | 0 | * | 1 | 2 | 6 | 7 | 9 | 10 | 11 | 13 | 14 | 17 | 73 |
| Net interest | | | | | | | | | | | | | |
| Higher interest rates | 5 | 12 | 16 | 20 | 24 | 27 | 30 | 33 | 36 | 39 | 42 | 99 | 279 |
| Higher inflation | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 8 | 16 |
| Debt service | * | 1 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 8 | 37 |
| Subtotal, net interest | 7 | 14 | 19 | 23 | 27 | 31 | 35 | 39 | 43 | 47 | 52 | 115 | 332 |
| Total change in outlays | 7 | 17 | 26 | 35 | 47 | 57 | 68 | 78 | 90 | 102 | 114 | 182 | 634 |
| Increase (-) in the deficit | -6 | -11 | -14 | -17 | -22 | -25 | -29 | -31 | -35 | -38 | -41 | -89 | -263 |

Data source: Congressional Budget Office. See www.cbo.gov/publication/60072#data.

The rules of thumb capture the budgetary effects of specified changes in the economy, but they do not account for the source of those changes. The source of such changes in the economy could be a change in fiscal policy, which would have additional budgetary effects. In addition, such a change in fiscal policy would probably have broader economic effects than those underlying the budgetary estimates shown here.

Each rule of thumb is roughly symmetrical. If, for example, inflation was 0.1 percentage point lower each year than projected, deficits would shrink by about the same amount that they grow each year in the table.

* = between -\$500 million and \$500 million.

a. Estimates exclude minor changes to Medicare’s payments resulting from changes to the market baskets that those payments are based on. The market baskets are indexes that reflect a weighted-average price of goods and services used in providing health care; some include the cost of interest. The effects of higher interest rates on the market baskets would increase Medicare’s outlays by less than \$200 million over the 2024–2034 period.

would be larger. Overall, rates that were 0.1 percentage point higher than those in CBO’s economic forecast would (all else being equal) cause revenues from the Federal Reserve’s remittances over the 2025–2034 period to be \$2 billion greater than projected.¹⁵

15. The Federal Reserve’s deferred assets could affect when changes to its income and costs are reflected in changes in the amount of remittances. Those effects are not reflected in the estimates presented here. For more information about the Federal Reserve’s remittances and deferred assets, see Congressional Budget Office, “Recent Changes to CBO’s Projections of Remittances From the Federal Reserve” (February 2023), www.cbo.gov/publication/58913.

Higher Inflation and Interest Rates

The fourth rule of thumb illustrates the budgetary effects of inflation and nominal interest rates that are 0.1 percentage point higher each year than they are in CBO’s baseline. All economic variables that are measured as nominal values, such as GDP, taxable income, and wage rates, increase by the same percentage in response to higher inflation. As a result, those that are measured as real values, such as real GDP and real interest rates, remain unchanged. In this scenario, all wage and price indexes grow 0.1 percentage point faster each year than they do in CBO’s economic forecast, and all interest rates



are 0.1 percentage point higher each year, as they are in the third rule of thumb. As a result, higher inflation would increase both revenues and outlays, although the effect on outlays would be greater, resulting in larger budget deficits, on net.

In this scenario, total revenues from 2025 to 2034 would be \$370 billion more than they are in the agency's baseline budget projections, and total outlays would be \$634 billion more, CBO estimates. The cumulative deficit for the 2025–2034 period would be \$263 billion larger than projected (see Table 3 on page 9).

Effects on Revenues. Larger increases in prices and wage rates generally lead to greater labor income, profits, and other income, which in turn generate larger collections of individual income taxes, payroll taxes, and corporate income taxes. Many provisions in the individual income tax system—including the income thresholds for the tax brackets—are adjusted, or indexed, for inflation. Therefore, the share of taxpayers' income that is taxed at certain rates does not change much when income increases because of higher inflation, so tax collections tend to rise roughly proportionally with income under those circumstances. However, not all parameters of the individual income tax system are indexed for inflation. For example, the income thresholds for the surtax on investment income are fixed in nominal dollars, so if income rose because of inflation, the surtax would apply to a larger share of taxpayers' income.

For payroll taxes, rates are mostly the same for all income levels, and the maximum amount of earnings subject to the Social Security tax rises with average wages in the economy. Higher nominal wages would therefore lead to a roughly proportional increase in payroll tax revenues. Similarly, nearly all corporate profits are taxed at a single statutory rate—21 percent. Consequently, an increase in profits resulting from higher inflation would generate a roughly proportional increase in corporate tax revenues. Finally, higher nominal interest rates would first reduce and then increase revenues from the Federal Reserve's remittances to the Treasury. All told, inflation that was 0.1 percentage point higher than forecast each year would add \$370 billion in revenues to the amounts in the agency's baseline budget projections between 2025 and 2034.

Effects on Mandatory Spending. Higher inflation would also increase the cost of a number of mandatory programs, adding \$229 billion to projected spending over the 2025–2034 period, CBO estimates. Benefits for many mandatory programs, including Social Security,

are automatically adjusted each year to reflect increases in prices. Specifically, those benefits are adjusted for changes in the consumer price index, one of the index's components, or another measure of inflation. Many of Medicare's payment rates are also adjusted annually for inflation. Spending for some other programs, such as Medicaid, is not formally indexed to changes in prices but nevertheless tends to grow with inflation because the costs of providing benefits under those programs increase as nominal wages and prices rise. In addition, to the extent that benefit payments in retirement and disability programs are linked to participants' preenrollment wages, increases in nominal wages resulting from higher inflation would boost future outlays for those programs.

Effects on Discretionary Spending. Higher inflation would raise CBO's projections of discretionary spending, although most programs in this scenario would not be affected until after 2025. The Fiscal Responsibility Act of 2023 imposed caps on most discretionary budget authority through 2025, and CBO's baseline incorporates the effects of those caps.¹⁶ Higher inflation would not alter the caps and, therefore, would not affect CBO's projections of spending that is constrained by those limits. However, for later years—when, under current law, the caps will no longer be in place—CBO's baseline projections reflect the assumption that the discretionary funding currently subject to the caps will increase with inflation from the amount projected for 2025. (Because projected funding for defense programs falls below the cap in 2025, defense funding is projected to increase with inflation from the 2024 amount in CBO's baseline.) As a result, inflation that was 0.1 percentage point higher each year than the rates in CBO's economic forecast would boost projected outlays over the 2026–2034 period by a total of \$69 billion.

Although the caps on discretionary appropriations are not indexed for inflation, higher inflation would diminish the amount of goods that could be acquired and the benefits and services that could be provided under those caps. If higher inflation led lawmakers to adjust the discretionary caps, the effect on spending and deficits would be greater.

Some discretionary funding is not constrained by the caps. Higher inflation would increase CBO's projections of discretionary outlays stemming from such funding in each year of the 2025–2034 period. By law, the caps

16. For more information about the caps and how they affect CBO's baseline projections, see Congressional Budget Office, *The Budget and Economic Outlook: 2024 to 2034* (February 2024), www.cbo.gov/publication/59710.

are adjusted to accommodate appropriations for certain purposes, and certain other funding is excluded from the caps. For 2024, CBO's baseline incorporates adjustments and exclusions of \$99 billion for funding designated as an emergency requirement, \$20 billion for disaster relief, \$3 billion for wildfire suppression efforts, \$2 billion for certain funding derived from the Harbor Maintenance Trust Fund, \$2 billion for initiatives aimed at enhancing program integrity, and nearly \$500 million for certain programs under the 21st Century Cures Act.¹⁷ Because funding for those activities is not constrained by the caps in 2025, it is projected to increase with inflation starting in that year. As a result, if inflation was 0.1 percentage point higher each year than forecast, CBO's projections of such outlays for the 2025–2034 period would increase by a total of \$4 billion.

All told, CBO's projections of discretionary outlays through 2034 would be \$73 billion greater than the amounts in the agency's current baseline budget projections.

Effects on Net Interest Costs. Higher inflation would increase net outlays for interest, primarily because all interest rates would be 0.1 percentage point higher each year. Higher inflation would also increase the cost to the government of inflation-indexed securities.¹⁸ The direct effect of such higher interest rates and inflation would add \$295 billion in interest costs to CBO's baseline projections of outlays. Moreover, the effects of higher inflation on noninterest spending (net of the effects on revenues) would increase federal debt, boosting interest costs by an additional \$37 billion over the 2025–2034 period

How the Rules of Thumb Have Changed Since Last Year

The previous edition of this report, describing rules of thumb based on the same four scenarios, was published in April 2023.¹⁹ The rules of thumb reported this year and last year differ because of changes in CBO's assessment of how the economy and the budget would respond in each scenario and because of changes in the underlying economic forecast and budget projections.

17. The extent to which the discretionary caps can be adjusted for the funding of disaster relief, wildfire suppression, and program integrity efforts is limited by other statutory provisions.

18. The principal of inflation-indexed securities is adjusted for changes in the CPI-U (unadjusted to account for seasonal differences). The adjustments are made daily but are not paid until maturity.

19. Congressional Budget Office, *How Changes in Economic Conditions Might Affect the Federal Budget: 2023 to 2033* (April 2023), www.cbo.gov/publication/58605.

Those changes caused CBO to revise its estimates of how much the cumulative deficit would increase over the budget window (2024 to 2033 in the previous report and 2025 to 2034 in this one) in each of the four scenarios:

- For the scenario involving slower productivity growth, the estimated increase in the deficit over the budget window was \$261 billion in last year's report and is \$304 billion in this year's;
- For the scenario involving slower growth of the labor force, the estimated increase in the deficit over the budget window was \$110 billion in last year's report and is \$142 billion in this year's;
- For the scenario involving higher interest rates, the estimated increase in the deficit over the budget window was \$303 billion in last year's report and is \$324 billion in this year's; and
- For the scenario involving higher inflation and nominal interest rates, the estimated increase in the deficit over the budget window was \$307 billion in last year's report and is \$263 billion in this one.

Those differences are partly explained by changes to the models that CBO uses to produce its economic forecast. Since publishing last year's rules of thumb, CBO has revised the models it uses to produce its long-term forecast of the labor supply. Those revisions caused economic changes in the latter half of the budget window to be larger in each scenario than they were in last year's report. Those larger economic changes had correspondingly larger effects on revenues, causing larger decreases in revenues in the slower-productivity-growth and slower-labor-force-growth scenarios. CBO also revised its estimates of how income responds to the economic changes induced by changes in the labor force.

CBO's economic forecast, which underlies its rules of thumb, has also changed since last year. The economy is larger this year than it was last year, and therefore projections of the size of the economy over the budget window are also larger. The increased size of the economy increases the size of the budgetary effects in each scenario.

The effects on revenues are larger in this year's report than they were in last year's in all but the interest-rates-only scenario because the budget window now includes an additional year after various provisions of the 2017 tax act (Public Law 115-97) are set to expire. In CBO's estimation, after 2026, increases in effective marginal tax rates under current law will cause changes in the economy to have a larger effect on revenues.

The estimated effects of changes in interest rates are larger in all four scenarios, chiefly because debt is larger in CBO's most recent baseline. The projected mix of securities underlying CBO's projections of net outlays for interest also have shorter-term maturities in this year's baseline than they did in last year's; as a result, the effects of higher interest rates manifest faster, on average.

Finally, higher-than-forecast inflation has a smaller effect on deficits in this year's report than it did in last year's. That difference is largely explained by the Fiscal Responsibility Act's caps on discretionary funding in 2025, which attenuate the effect of inflation on CBO's projections of discretionary spending.

This report supplements *The Budget and Economic Outlook: 2024 to 2034*, which is available on the Congressional Budget Office's website at www.cbo.gov/publication/59710. In keeping with CBO's mandate to provide objective, impartial analysis, the report makes no recommendations.

Dan Ready prepared the report with assistance from Nathaniel Frentz and Matthew Wilson and with guidance from Barry Blom, John McClelland, and Jaeger Nelson. Jeffrey Kling and Robert Sunshine reviewed the report. Christine Browne edited it, and R. L. Rebach created the tables and prepared the text for publication. The report is available at www.cbo.gov/publication/60072.

CBO seeks feedback to make its work as useful as possible. Please send comments to communications@cbo.gov.



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