

How Changes in Economic Projections Might Affect Budget Projections

The federal budget is highly sensitive to economic conditions. Revenues depend on the 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 with overall economic activity, although not necessarily in proportion. In addition, 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 for interest on its debt is directly tied to those rates. And spending for many mandatory programs is affected by inflation, either explicitly through cost-of-living adjustments or in other ways.

To show how the economic outlook can affect projections of the federal budget, the Congressional Budget Office has constructed simplified “rules of thumb.” The rules provide a rough sense of how differences in individual economic variables, taken in isolation, would affect the budget totals. Changes in any single variable, however, would quite likely affect many other variables in ways that would depend crucially on the cause of the original change and on the general economic conditions prevailing at the time. Estimating that full set of effects would require a more comprehensive analysis that could not be summarized in a simple rule.

The rules of thumb have been developed for three variables:

- Growth of real (inflation-adjusted) gross domestic product (GDP),
- Interest rates, and
- Inflation.

All three rules of thumb reflect alternative assumptions about economic conditions beginning in January 2016.

CBO’s rule of thumb for the growth of real GDP shows the effects of growth rates that are 0.1 percentage point lower each year than the rates that underlie the agency’s baseline budget projections. (The budget projections are summarized in Chapter 1, and the economic projections are described in Chapter 2.) The rule of thumb for interest rates shows the effects of rates that are 1 percentage point higher each year than the rates used in the baseline; because inflation is held equal to its baseline projection in this rule of thumb, the results show the effects of higher real interest rates. Finally, the rule of thumb for inflation shows the effects of inflation that is 1 percentage point higher each year than is projected in the baseline.

Each rule of thumb is roughly symmetrical. Thus, if economic growth was 0.1 percentage point higher than in CBO’s baseline, or if interest rates or inflation were 1 percentage point lower, the effects would be about the same as those shown here, but with the opposite sign.¹

In addition to being symmetrical, the rules are also roughly scalable for moderate differences in growth rates. For example, a difference in economic growth of 0.2 percentage points in each year, rather than 0.1 percentage point, would change the deficit by about twice as much—but such a calculation would be less useful for a substantially different rate of economic growth.

CBO chose variations of 0.1 percentage point and 1 percentage point solely for simplicity. Those differences do not necessarily indicate the extent to which actual economic performance might differ from CBO’s projections. For example, CBO’s analysis of its economic forecasts from the past three decades found that the standard deviation of its five-year forecasts for the annual average

1. Interest rates on short-term Treasury securities could not be much lower in the near term. Rates on three-month Treasury securities were 0.04 percent in the last quarter of 2015, and CBO forecasts that they will remain below 1 percent through most of this calendar year.

growth of real GDP around the annual average growth rates of actual GDP was 1.2 percentage points. (If the nature of those differences is the same in the future as in the past, then CBO's current forecast for the next five years will, roughly speaking, have a two-thirds chance of being within a range of 1.2 percentage points above or below the actual amount.) Similarly, the standard deviation of its five-year forecasts for the annual average rate of inflation around the actual annual average rate of inflation was 0.6 percentage points.²

Slower Growth of Real GDP

Stronger economic growth improves the budget's bottom line, and weaker growth worsens it. The first rule of thumb illustrates the effects of economic growth that is slightly weaker than expected. A change in the rate of real economic growth could affect inflation, unemployment, wage rates, and interest rates; however, this rule of thumb does not include the effects of changes in those variables.

CBO's economic forecast includes growth of real GDP averaging 2.6 percent for the next two calendar years, dropping to an average of 2.0 percent from 2018 to 2026. If 0.1 percentage point was subtracted from each of those rates, by 2026 GDP would be roughly 1 percent smaller than the amount underlying CBO's baseline.

Slower growth of GDP would have several effects on the budget. If growth was 0.1 percentage point lower per year, it would result in less growth in taxable income and thus lower tax revenues—\$2 billion less in 2016 and \$58 billion less in 2026 (see Table B-1). With a smaller amount of revenues, the federal government would need to borrow more and thus would incur higher interest costs. Additional payments to service federal debt would be very small during the first few years of the projection period but larger in later years, reaching \$10 billion by 2026. Mandatory spending, however, would be affected only slightly by such a decline in economic growth—in the form of higher outlays for the refundable portions of the earned income and child tax credits.³

2. See Congressional Budget Office, *CBO's Economic Forecasting Record: 2015 Update* (February 2015), www.cbo.gov/publication/49891.

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

All told, if growth of real GDP each year was 0.1 percentage point lower than in CBO's baseline projections, annual deficits would be larger by amounts that would climb to \$69 billion by 2026, CBO estimates. The cumulative deficit for 2017 through 2026 would be \$327 billion higher.

Higher Interest Rates

The second rule of thumb illustrates the sensitivity of the budget to changes in interest rates, which affect the flow of interest payments to and from the federal government. When the budget is in deficit, the Treasury must borrow additional funds from the public to cover the shortfall. Moreover, each year the Treasury refinances a substantial portion of the nation's outstanding debt at market interest rates. Those rates also help determine how much the Federal Reserve remits to the Treasury. Changes in interest rates could affect economic growth, the allocation of taxable income, unemployment, and inflation; however, this rule of thumb does not include the effects of changes in those variables.

If interest rates on all types of Treasury securities were 1 percentage point higher each year through 2026 than is projected in the baseline and all other economic variables were unchanged, the government's interest costs would be substantially larger. The difference would amount to only \$16 billion in 2016 because most marketable government debt is in the form of securities that have maturities greater than one year. As the Treasury replaced maturing securities, however, the budgetary effects of higher interest rates would mount. Added costs from higher interest rates on the debt projected in CBO's baseline would reach \$200 billion in 2026 under this scenario (see Table B-1).

As part of its conduct of monetary policy, the Federal Reserve buys and sells Treasury and other securities, including, over the past several years, a large amount of mortgage-backed debt. The Federal Reserve also pays interest on reserves (deposits that banks hold at the central bank). The interest that the Federal Reserve earns on its portfolio of securities and the interest that it pays on reserves affect its remittances to the Treasury, which are counted as revenues. If all interest rates were 1 percentage point higher for the coming decade than CBO projects, the Federal Reserve's remittances would be smaller for a number of years because higher interest payments on reserves would outstrip additional interest earnings on its portfolio. However, over time, the current holdings in the portfolio would mature

Table B-1.

How Selected Economic Changes Might Affect CBO's Baseline Budget Projections

Billions of Dollars

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total	
												2017-	2017-
												2021	2026
Growth Rate of Real GDP Is 0.1 Percentage Point Lower per Year													
Change in Revenues	-2	-5	-9	-14	-19	-24	-30	-36	-43	-50	-58	-70	-286
Change in Outlays													
Mandatory spending	*	*	*	*	*	*	*	1	1	1	1	1	4
Debt service	*	*	*	1	1	2	3	5	6	8	10	5	37
Total	*	*	*	1	2	3	4	5	7	9	11	6	41
Increase (-) in the Deficit	-2	-5	-10	-15	-20	-26	-33	-41	-49	-59	-69	-76	-327
Interest Rates Are 1 Percentage Point Higher per Year													
Change in Revenues	-21	-26	-21	-15	-11	-7	-3	1	4	6	8	-80	-64
Change in Outlays													
Higher interest rates	16	43	64	83	102	121	138	155	169	184	200	414	1,261
Debt service	*	2	5	10	16	22	30	38	47	57	69	56	297
Total	16	45	70	94	118	143	168	193	217	242	269	470	1,558
Increase (-) in the Deficit	-38	-71	-91	-109	-129	-150	-171	-192	-213	-236	-260	-549	-1,622
Inflation Is 1 Percentage Point Higher per Year													
Change in Revenues	-5	23	64	109	156	207	261	320	384	454	529	559	2,507
Change in Outlays													
Discretionary spending ^a	0	1	1	2	3	4	12	23	36	50	65	12	196
Mandatory spending	*	14	34	60	89	121	159	195	234	286	340	318	1,532
Higher interest rates ^b	23	59	84	106	129	152	174	195	215	235	256	530	1,605
Debt service	*	2	4	7	10	14	18	23	29	35	43	37	186
Total	24	75	123	176	232	291	363	437	514	605	704	897	3,519
Increase (-) in the Deficit	-29	-52	-58	-67	-76	-84	-101	-117	-130	-152	-175	-337	-1,012
Memorandum:													
Deficit in CBO's January 2016 Baseline	-544	-561	-572	-738	-810	-893	-1,044	-1,077	-1,089	-1,226	-1,366	-3,575	-9,378

Source: Congressional Budget Office.

GDP = gross domestic product; * = between zero and \$500 million.

- a. Most discretionary spending through 2021 is governed by caps established by the Budget Control Act of 2011; in CBO's baseline, that spending would not be affected by changes in projected inflation.
- b. The change in outlays attributable to higher interest rates in this scenario differs from the estimate in the scenario for interest rates because the principal of inflation-protected securities issued by the Treasury grows with inflation.

and be replaced with higher-yielding investments; CBO projects that by 2023 the Federal Reserve's remittances would be larger if interest rates were higher than projected. Overall, rates that were 1 percentage point higher than in CBO's baseline (all else being equal) would cause revenues from the Federal Reserve's remittances to be \$64 billion smaller between 2017 and 2026.

The larger deficits generated by the increase in interest rates would require the Treasury to borrow more than is

projected in the baseline. That extra borrowing would raise the cost of servicing the debt by amounts that would reach \$69 billion in 2026.

In sum, if interest rates were 1 percentage point higher than projected in CBO's baseline, the deficit would worsen progressively over the projection period by amounts increasing from \$38 billion in 2016 to \$260 billion in 2026. The cumulative deficit would be \$1.6 trillion higher over the 2017–2026 period.

Higher Inflation

The third rule of thumb shows the budgetary effects of inflation that is 1 percentage point higher, for all price and wage indexes, than is projected in CBO's baseline—with no differences in other economic variables except for interest rates, as described below. Although higher inflation increases both revenues and outlays, the net effect would be substantially larger budget deficits. Changes in inflation could also lead to changes in economic growth and unemployment; however, this rule of thumb does not include the effect of changes in those variables.

Effects on Revenues

Larger increases in wage rates and prices 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. The parameters in the individual income tax system that affect most taxpayers—including the income thresholds for both the regular and alternative minimum tax brackets, the standard deduction, and personal exemptions—are indexed for inflation. Therefore, the share of taxpayers' income that is taxed at certain rates does not change very much when income increases because of higher inflation, so tax collections tend to rise roughly proportionally with income under those circumstances. However, some parameters of the individual income tax system are not 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 higher inflation, the surtax would apply to a larger share of taxpayers' income.

For the payroll tax, rates are mostly the same across income levels, and the maximum amount of earnings subject to the Social Security tax rises (after a lag) with average wages in the economy; therefore, higher wage inflation leads to a roughly proportional increase in payroll tax revenues. Similarly, although the brackets under the corporate income tax are not indexed for inflation, nearly all corporate profits are taxed at the top rate; consequently, an increase in profits resulting from higher inflation generates a roughly proportional increase in corporate tax revenues. All told, inflation that was 1 percentage point higher than CBO projects in each year would add \$2.5 trillion to projected revenues in CBO's baseline between 2016 and 2026.

Effects on Mandatory Spending

Higher inflation, however, would also increase the cost of a number of mandatory spending programs, adding \$1.5 trillion to projected spending. Benefits for many

mandatory programs are automatically adjusted each year to reflect increases in prices. Specifically, benefits paid for Social Security, federal employees' retirement programs, disability compensation for veterans, Supplemental Nutrition Assistance Program, Supplemental Security Income, the refundable portion of the earned income tax credit, and the child nutrition programs, among others, are adjusted (with a lag) for changes in the consumer price index or one of its components. 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 price changes but tends to grow with inflation because the costs of providing benefits under those programs increase as prices rise. In addition, to the extent that initial benefit payments to participants in retirement and disability programs are linked to wages, increases in nominal wages resulting from higher wage inflation boost future outlays for those programs.

Effects on Discretionary Spending

Higher inflation would raise CBO's baseline projections of future spending for discretionary programs, but only by a modest amount. Two components of CBO's discretionary baseline would be affected by this rule of thumb.

First, the Budget Control Act of 2011 (Public Law 112-25), as modified by subsequent legislation, imposes caps on most discretionary budget authority through 2021, and CBO's baseline incorporates the assumption that appropriations for most purposes will be equal to those caps. Higher inflation would not alter the statutory caps and thus would have no effect on CBO's projections of spending constrained by those limits. For the years following 2021—when caps will no longer be in place—CBO's baseline projections incorporate the assumption that the discretionary funding subject to the caps will increase with inflation. As a result, inflation that was 1 percentage point higher than in the baseline would boost projected outlays from 2022 through 2026 by a total of \$150 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 fixed caps.⁴ If, over time, higher inflation led lawmakers

4. In CBO's baseline, the caps for 2017 and 2018 remain close to the total amount specified for 2016; the caps grow by about 2.5 percent a year from 2019 through 2021.

to adjust the discretionary caps, the effect on spending and on the deficit would be greater.

Second, higher inflation would slightly increase discretionary outlays in CBO's baseline over the 2017–2026 period because the law specifies that the caps may be adjusted to accommodate appropriations for certain purposes. In 2016, those adjustments include \$74 billion designated for overseas contingency operations, \$7 billion in funding provided for disaster relief, \$1.5 billion for initiatives aimed at enhancing program integrity by reducing improper payments from certain benefit programs, and nearly \$1 billion in funding for emergencies. CBO's baseline extrapolates the funding provided for those purposes in future years based on the amounts appropriated for 2016, with adjustments for inflation; if inflation was 1 percentage point higher, projected outlays for those purposes would increase by \$46 billion between 2017 and 2026. Altogether, if inflation was 1 percentage point higher, CBO's projections of discretionary outlays would rise by \$196 billion over the 10-year period.

Effects on Net Interest Costs

Inflation also has an impact on outlays for net interest because it affects interest rates. If inflation was 1 percentage

point higher than CBO projects, for example, then interest rates would be 1 percentage point higher (all else being equal). As a result, new federal borrowing would incur higher interest costs, and outstanding inflation-indexed securities would be more costly for the federal government. In addition, higher interest rates would first reduce and then increase revenues from the Federal Reserve's remittances to the Treasury (as explained in the section on higher interest rates). The direct effect of such higher rates is that \$1.6 trillion of additional interest costs would be added to CBO's baseline projection of outlays. In addition, the effects of higher inflation would increase debt by \$826 billion over the 10-year period and therefore boost interest costs by another \$186 billion.

Total Effects

If inflation each year was 1 percentage point higher than the rate underlying CBO's baseline, total revenues and outlays over the 10-year period would be about 6 percent and 7 percent greater, respectively, than is projected in the baseline. Over the 2017–2026 period, the deficit would be \$1.0 trillion higher (see Table B-1).

