Congressional Budget Office

How CBO Prepares
Baseline Budget Projections

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The Congressional Budget Act of 1974, often called the Budget Act, established the House and Senate Committees on the Budget to set federal spending policy and identify priorities for allocating budgetary resources. To support those committees in carrying out their responsibilities, it also established the Congressional Budget Office and required CBO to provide an annual report on spending, revenues, and deficits with subsequent revisions to that annual report.

To fulfill that requirement, at least twice each year, CBO provides the Congress with projections of revenues from each major revenue source, spending for every federal budget account, and the resulting deficits, along with forecasts for the nation's economy. Those baseline projections are constructed to reflect an assumption that current laws governing taxes and spending would generally remain in place during the current fiscal year and for the ensuing 10 years. Baseline projections furnish the Congress with a neutral benchmark to use in determining whether proposed legislation is subject to various budget enforcement procedures.[1] Most of the rules that govern baseline construction are specified in law, although some have been developed by CBO in consultation with the House and Senate Committees on the Budget.

CBO's projections are published as tables and described narratively in its publications. One set of regular reports, *The Budget and Economic Outlook,* typically begins with a January release that is followed by updates in the spring and summer.[2] The spring report often is released in conjunction with CBO's analysis of the President's budget request and reflects data and information that normally become available when the request is transmitted.[3] Most commonly, the spring revision of the baseline underlies the Congressional budget resolution, and the effects of most legislation on mandatory spending and revenues are estimated relative to that baseline.[4] The summer update reflects new information about spending and revenues for the current year, any newly enacted legislation, and any significant new macroeconomic developments.

CBO's baseline projections are the result of a process that at various stages involves most of the agency's staff. The projections are available online by program and in regularly posted collections of supplemental information.

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1. CBO provides cost estimates to assist the Congress in determining the budgetary effects of legislation. For more information, see Congressional Budget Office, *How CBO Prepares Cost Estimates* (February 2018), www.cbo.gov/publication/53519. For more on the federal budget process and budget enforcement procedures, see Congressional Budget Office, *Cash and Accrual Measures in Federal Budgeting* (January 2018), Box 1, p. 4, www.cbo.gov/publication/53461.

2. Although CBO typically produces three baselines a year, it did not do so in 2017 and will not do so in 2018. In 2017, CBO did not release a March baseline because the President's budget request was not released until May; the revised baseline associated with that analysis was not completed until late June. Given that publication date, CBO did not produce a summer update to the baseline in 2017.

    CBO did not release a January 2018 baseline because of the enactment in December 2017 of major tax legislation, Public Law 115-97, an act to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018. That legislation will have significant effects on CBO's economic forecast and its projections of spending, revenues, and the deficit. After consulting with the budget committees, CBO agreed to incorporate the effects of that law into a new baseline for release as soon as possible. CBO expects to complete the summer update as usual this year.

    See Congressional Budget Office, "Major Recurring Reports: Budget and Economic Outlook and Updates," www.cbo.gov/about/products/major-recurring-reports#1.

3. See Congressional Budget Office, "Major Recurring Reports: Analysis of the President's Budget," www.cbo.gov/about/products/major-recurring-reports#3.

4. Mandatory, or direct, spending is governed by statutory criteria and usually not constrained by the annual appropriation process.

In general, the process of developing a projection for a spending account or revenue source consists of:

- Analyzing actual results from previous years,

- Incorporating CBO's economic forecast,

- Ensuring consistency with current law,

- Modeling spending and revenues appropriately, and

- Reviewing the resulting projections.

In keeping with its mandate to provide objective, impartial analyses, CBO never makes recommendations in its products. This document provides answers to questions that CBO is frequently asked about how it prepares its baseline projections for the budget.

What Is the Baseline?

CBO's baseline is a set of detailed projections of spending, revenues, deficits, and debt. Those projections inform policymakers about budgetary trends under current law and are not meant to predict future outcomes. The baseline is a benchmark for assessing the effects of proposed legislation.

Generally, CBO's baseline reflects statutory limits on spending and the scheduled expiration dates for most tax provisions and some spending programs, following rules specified in law and guidance from the budget committees. In some cases, however, the law or the budget committees require CBO to assume that the spending or revenues will continue despite the underlying law.

Most of the principles and rules that govern the formulation of the baseline are set in law. Others originated in budget resolutions, rules of the House or the Senate, conference reports that accompanied budget legislation, and the 1967 *Report of the President's Commission on Budget Concepts*. Some rules have been developed by CBO in consultation with the House and Senate Budget Committees; such consultation is essential to resolve uncertainty about how to implement the rules in particular cases.

Section 257 of the Balanced Budget and Emergency Deficit Control Act (sometimes called the Deficit Control Act), enacted in 1985 and amended several times since then, defines the baseline and spells out

some of the rules for spending and revenue projections. (Although the Budget Act requires CBO to report projections to the budget committees each year, it does not specify the methods by which CBO is to arrive at those figures.) The Deficit Control Act also specifies procedures and assumptions for projections that involve expiring programs, collections of excise taxes dedicated to trust funds, and discretionary spending.

CBO's baseline budget projections rely on its economic forecast, which normally is updated twice each year. Like the budget projections, that forecast also incorporates the economic effects of fiscal policy embedded in current law, and it is developed to represent roughly the middle of a range of the most likely outcomes for the U.S. economy.[5]

The projection of deficits in the baseline often is used to summarize the nation's fiscal condition. In June 2017, for example, CBO projected that the federal budget deficit would be $563 billion in 2018, representing 2.8 percent of the nation's economic output (its gross domestic product, or GDP) for the year, and that the deficit would be on an upward trajectory thereafter, reaching almost $1.5 trillion (or 5.2 percent of GDP) in 2027 (see Table 1). Underlying that projection were CBO's projections for discretionary and mandatory spending, net interest costs, and revenue collections as well as economic output for the 2017–2027 period.

How Is the Baseline Used by CBO and the Congress?

In addition to providing the basis for *The Budget and Economic Outlook*, the analyses of the President's annual budget request, and other reports, CBO's baseline is the foundation for the agency's cost estimates for proposed changes in law that would affect mandatory spending or revenues.

CBO's baseline also underlies its long-term budget projections (which span 30 years), and it is brought to bear in CBO's analytical research and reporting to assess the effects of proposed changes in fiscal policy.[6]

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5. See Robert Arnold, *How CBO Produces Its 10-Year Economic Forecast,* Working Paper 2018-02 (Congressional Budget Office, February 2018), www.cbo.gov/publication/53537.

6. See Congressional Budget Office, "Major Recurring Reports: Long-Term Budget Outlook," www.cbo.gov/about/products/major-recurring-reports#2, and "Major Recurring Reports: Long-Term Projections for Social Security," www.cbo.gov/about/products/major-recurring-reports#5.

Table 1.

CBO's Baseline Budget Projections, June 2017

	Actual, 2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total 2018–2022	Total 2018–2027
In Billions of Dollars														
Revenues	3,268	3,315	3,531	3,687	3,853	4,011	4,178	4,361	4,545	4,742	4,948	5,158	19,261	43,016
Outlays	3,853	4,008	4,094	4,375	4,628	4,891	5,205	5,419	5,628	5,967	6,300	6,621	23,194	53,128
Deficit	-585	-693	-563	-689	-775	-879	-1,027	-1,057	-1,083	-1,225	-1,352	-1,463	-3,933	-10,112
Debt Held by the Public at the End of the Year	14,168	14,656	15,537	16,282	17,108	18,037	19,109	20,212	21,342	22,613	24,014	25,524	n.a.	n.a.
As a Percentage of Gross Domestic Product														
Revenues	17.8	17.3	17.7	17.8	18.0	18.1	18.1	18.2	18.3	18.3	18.4	18.4	18.0	18.2
Outlays	20.9	21.0	20.5	21.2	21.6	22.1	22.6	22.6	22.6	23.0	23.4	23.6	21.6	22.4
Deficit	-3.2	-3.6	-2.8	-3.3	-3.6	-4.0	-4.5	-4.4	-4.3	-4.7	-5.0	-5.2	-3.7	-4.3
Debt Held by the Public at the End of the Year	77.0	76.7	78.0	78.8	80.0	81.4	82.9	84.4	85.7	87.3	89.2	91.2	n.a.	n.a.

Source: Congressional Budget Office.

n.a. = not applicable.

The budget committees typically use the baseline as the starting point for the budget resolution, often relying on estimates relative to the baseline for proposed policy changes to be incorporated in the resolution.

How Long Does It Take CBO and What Resources Are Required to Produce a Baseline?

Producing the spending and revenue projections for each year's initial baseline, typically released in January, takes nearly two months, beginning with an analysis of actual results for the recently completed fiscal year. For some of CBO's work, the process continues throughout the year. Each update and revision to the spending and revenue projections requires three to four weeks to complete. Analysis of the information, writing, and production of accompanying reports generally requires about a month.

The projection process involves the majority of CBO staff—analysts, managers, and support staff from every division in the agency. Some CBO staff spend most of their time on work related to the baseline; others provide analytical support for the projection models, review the projections, and prepare the *Outlook* report and supporting materials for publication. The staff of the Joint Committee on Taxation (JCT) also provide information about recently enacted tax legislation and

estimates of the budgetary effects of extending expiring tax provisions.

What General Principles Guide the Work?

CBO's analysts aim to produce projections that are supported by well-researched estimates about the most important factors that affect a program or revenue source and that generally reflect the middle of a range of the most likely outcomes.

CBO Obtains Information From a Broad Range of Sources

CBO relies on experts from many places in the federal government, including the Office of Management and Budget (OMB), the Department of the Treasury (including the Internal Revenue Service), executive branch agencies' budget and program offices, JCT, the Government Accountability Office, and the Congressional Research Service. CBO's analysts also confer with experts—from think tanks, universities, interest groups, state and local governments, and elsewhere—who represent a breadth of perspectives and disciplines.

CBO's Panel of Economic Advisers, consisting of widely recognized experts, offers assistance in a broad range of topics. Members of the agency's Panel of Health Advisers are experts in health policy and the health care sector.

CBO hosts meetings of the advisers and routinely solicits their views between meetings. Through those inter-actions, CBO benefits from the advisers' understanding of current research and their reviews of the agency's economic forecast and health analysis.

CBO's Estimates Reflect the Middle of a Range of Outcomes

CBO's analysts often test the sensitivity of their projec-tions to identify the range of possible outcomes for those projections. The goal is to develop estimates that reflect the middle of such a range. For example, an analyst may assess whether a projection is roughly as likely to be too high as too low. For major spending accounts and reve-nue sources, analysts routinely test how sensitive baseline projections are to specific factors by observing the way that projections change as particular factors come into play. Every baseline update offers CBO the opportunity to improve its projections and to refine its assessment of possible outcomes.

How Does CBO Ensure That Baseline Projections Are as Accurate as Possible?

CBO rigorously reviews its estimates before they are published. Individual analysts, peer reviewers within CBO, and CBO managers at all levels review projections for each spending account and revenue source to ensure that estimates are plausible and accurate (see Figure 1). The reviews focus on significant changes and on any current or potential issues that might arise with respect to enforcement of budget procedures.

The following are examined during the process:

- Historical trends,

- The relationship of budget authority to outlays over time,

- The relationship of revenues to associated macroeconomic income measures,

- Other outside estimates (when they exist), and

- Explanations of atypical patterns.

At formal review meetings, analysts and managers review the reasoning that underlies projections. Those discus-sions also examine significant changes in projections and

identify their drivers (for example, the performance of the economy, technical aspects of program implementa-tion, unanticipated events, or changes in law or policy). Once the review of all accounts is completed, the spend-ing and revenue baselines are reviewed and checked for overall reasonableness and analytical soundness.

What Components of the Federal Budget Does the Baseline Include?

CBO's baseline projections involve the four major com-ponents of the federal budget:

- Mandatory (or direct) spending, which is governed by statutory criteria and usually not constrained by the annual appropriation process;

- Discretionary spending, which is controlled by annual appropriation acts;

- Net spending for interest, the interest the government pays and receives and that largely depends on the amount of debt held by the public and the interest rates on that debt; and

- Revenues, including taxes, fees, and fines collected by the Treasury or other agencies.
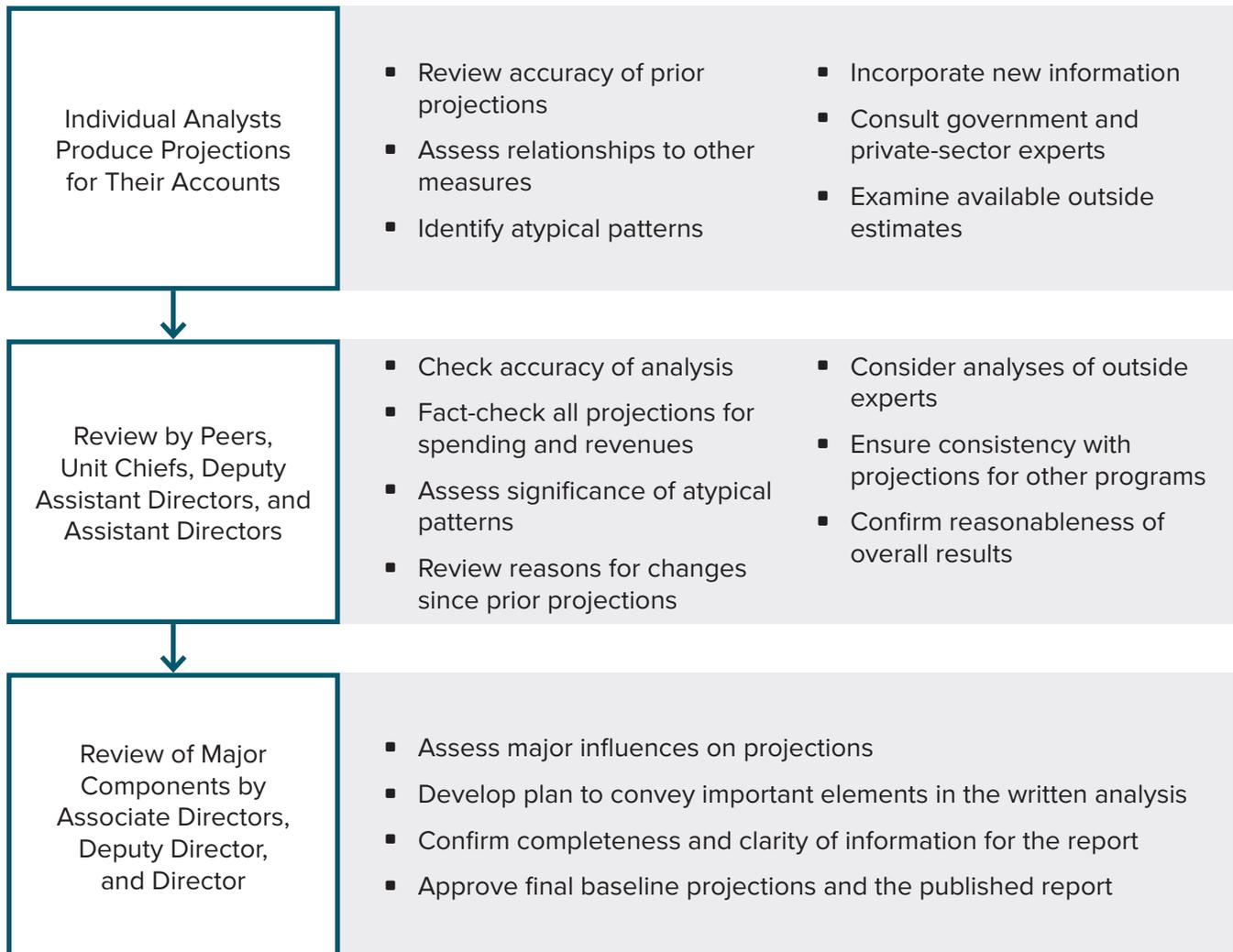
Mandatory Spending

Mandatory spending consists of outlays for some federal benefit programs and certain other payments to people, businesses, nonprofit institutions, and state and local governments. It includes outlays for Social Security, Medicare, and Medicaid, as well as for unemployment insurance, student loans, and other programs that gener-ally are governed by statute rather than by specific annual appropriations. (Some mandatory programs, such as the Supplemental Nutrition Assistance Program, receive annual funding in appropriation acts.)

According to CBO's analysis, mandatory spending in 2017 totaled $2.5 trillion (or 13.1 percent of GDP), representing 63 percent of total federal outlays for the year (net of offsetting receipts, such as Medicare Part B premiums and royalties from leases on federal land, which reduce outlays). The share of all federal outlays classified as mandatory spending has grown significantly over time; such spending accounted for about 48 percent of federal spending in 1993.

Figure 1.

CBO's Process for Developing and Reviewing Baseline Projections

Individual Analysts Produce Projections for Their Accounts	■ Review accuracy of prior projections ■ Assess relationships to other measures ■ Identify atypical patterns	■ Incorporate new information ■ Consult government and private-sector experts ■ Examine available outside estimates
Review by Peers, Unit Chiefs, Deputy Assistant Directors, and Assistant Directors	■ Check accuracy of analysis ■ Fact-check all projections for spending and revenues ■ Assess significance of atypical patterns ■ Review reasons for changes since prior projections	■ Consider analyses of outside experts ■ Ensure consistency with projections for other programs ■ Confirm reasonableness of overall results
Review of Major Components by Associate Directors, Deputy Director, and Director	■ Assess major influences on projections ■ Develop plan to convey important elements in the written analysis ■ Confirm completeness and clarity of information for the report ■ Approve final baseline projections and the published report	

Source: Congressional Budget Office.

Discretionary Spending

Funding for most discretionary programs is provided through annual appropriation acts and continuing resolutions in the form of budget authority—the authority to incur financial obligations that result in federal outlays. (A few programs receive multiyear appropriations.) Discretionary spending is divided into two main categories: defense spending and nondefense spending. (The nondefense discretionary spending category includes funding for a wide range of activities, including education and training, transportation, veterans' benefits, law enforcement, national parks, disaster relief, and foreign aid.) Depending on the activity or program, federal outlays that arise from budget authority can occur over short periods (to pay salaries, for example) or longer ones (to pay for long-term research or construction). Therefore, discretionary outlays recorded each year come not only from new budget authority but also from prior appropriations.

According to CBO's analysis, discretionary spending in 2017 totaled about $1.2 trillion (or 6.2 percent of GDP). Over the past 25 years, discretionary spending has decreased as a share of total federal outlays, falling from 38 percent in 1993 to 30 percent in 2017.

Net Spending for Interest
Net interest outlays reflect the government's interest payments on debt held by the public, such as Treasury bills, notes, and bonds, offset by interest income that the government receives on loans and cash balances and by other earnings.

According to CBO's analysis, net interest outlays in 2017 were $263 billion (or 1.4 percent of GDP). Despite significant growth in the amount of outstanding debt, declining interest rates have caused net interest outlays as a percentage of GDP to decrease over the past 25 years. Similarly, net interest as a share of total federal outlays decreased from 14 percent in 1993 to 7 percent in 2017.

Revenues
Federal revenues come from taxes imposed on individual and corporate income, employer payrolls, the production and importation of specific goods, and transfers of estates and gifts. Other receipts include remittances from the Federal Reserve System, fees imposed on various activities, and fines.

Individual income taxes constitute the largest source of federal revenues. In 2017 they totaled $1.6 trillion (or 8.3 percent of GDP), representing 48 percent of total federal revenues for the year. Over the past 25 years, receipts from individual income taxes have averaged about 46 percent of total revenues. Payroll taxes—mainly for Social Security and Medicare Part A (the Hospital Insurance program)—are the second-largest source, totaling $1.2 trillion in 2017 (or 6.1 percent of GDP). They accounted for 35 percent of total revenues in 2017 and a little over a third of total federal revenues in most years since 1993. Corporate income taxes constituted 9 percent of revenues in 2017, and all other sources combined contributed about 8 percent.

Revenues from all sources were $3.3 trillion in 2017 (or 17.3 percent of GDP). Revenues totaled 17.0 percent of GDP in 1993. Over the past 25 years, revenues have been as low as 14.6 percent of GDP and as high as 20.0 percent of GDP.

What Is the Basic Approach to Constructing the Baseline?
CBO's baseline for spending is built from the bottom up. Projections are developed for each of the nearly 3,000 subaccounts in the baseline—nearly 60 percent are for discretionary spending, about 40 percent are for

direct spending, and about 2 percent are for net interest outlays. After each account is projected, analysts layer on anticipated effects of provisions in law that limit various types of spending: caps on certain categories of discretionary spending and reductions—or sequestration—of some mandatory spending.

The revenue baseline is constructed from projections of tax, fine, and fee collections. In each case, a revenue projection results from applying the appropriate tax rate to the projection of the tax base to reflect current law. For example, CBO projects the amount of wages paid to workers and from that amount it projects payroll tax revenue on the basis of payroll tax rates. Most federal revenue comes from three sources—individual income taxes, payroll taxes, and corporate income taxes. More than 50 smaller sources, including excise taxes, contribute as well.

For each spending account and source of revenue that CBO projects, analysts first look at actual results and compare them with earlier projections to assess the accuracy of past estimates. They also examine legislation enacted in the interim as well as administrative or other changes that would affect spending, and they adjust projections accordingly. In addition, analysts incorporate the results of CBO's economic forecast—accounting for how economic factors are used in each model and for other effects expected to result from economic changes that are not explicitly modeled.

To develop baseline projections, CBO's analysts must apply expertise and knowledge about federal programs and real-world interactions. For example, in the event of a major storm or flood, analysts working on agriculture spending projections must account for the extent and consequences of disruptions to production. The creation of a new program or significant changes to an existing one would require analysts to draw on information about results for and the functioning of similar programs in order to estimate how rapidly those changes would be implemented and thus when their budgetary effects would occur.

Sometimes, however, analysts must estimate the behavioral responses of beneficiaries or taxpayers in the absence of sufficient comparable precedents. For example, estimating revenues following the enactment of Public Law 115-97, which made many changes to tax law, will include projecting the kinds of organizational

choices that businesses might make in light of the new rules. In particular, whether businesses choose a corporate or a partnership structure will affect both the amount and the type of tax revenue the federal government collects.

Analyzing Actual Spending and Revenues

Baseline updates begin with a thorough analysis of prior-year spending and revenue collections for each account and source of revenue. Analysts compare previous estimates of outlays and revenues in the baseline projections with the actual outlays recorded by the Department of the Treasury in its *Daily Treasury Statement* (DTS) and *Monthly Treasury Statement* (MTS), as well as with detail from the department's "Combined Statement of Receipts, Outlays, and Balances" and other reports from the Administration. That scrutiny allows analysts to determine the accuracy of their estimates and to identify the sources of error.

In many cases, detailed spending and revenue information is not available at the time CBO initiates its analysis, so analysts incorporate their own estimates of the disaggregated actual data into the agency's updated projections. For example, some programmatic data lags overall outlay data by several months, and aggregated revenue data are generally available a year or two sooner than are the detailed tax return data that form the basis of CBO's various models. Because of such lags, analysts may incorporate into their models estimates of disaggregated recent spending and revenue collections, even though such estimates may end up being significantly different from the actual underlying detail eventually reported.

CBO uses historical patterns and experience to inform its assessment of factors that might explain deviations from its estimates and from previous trends, and it incorporates those results into its projections. CBO may use its assessment—often in consultation with outside experts—to modify its modeling of the behavior of people and businesses. Other, unexpected results also may become evident, leading either to modifications of projections within the structure of CBO's models or to other adjustments.

The agency generally expects—on the basis of historical experience—that as-yet-unknown factors that cause spending and collections to deviate from model-based estimates will dissipate gradually over a projection period. In the case of projections of revenues from

individual income taxes, CBO's analyses suggest that such a methodology tends to minimize forecast errors.[7]

When CBO updates its projections for the spring and summer baselines, analysts take into account spending, obligations, and receipts for the current fiscal year by reviewing the most recent DTS, MTS, and other reports from the Administration. Analysts also study spending and revenue trends not only at the account or source level but also from a broader perspective of overall outlays and receipts.

Ensuring Consistency With Current Law

Spending and revenue estimates reflect current law as it relates to the underlying programs or revenue sources as well as to provisions of the Deficit Control Act regarding CBO's baseline projections. Those projections include updates that account for legislation enacted since the previous baseline was completed and for new regulations and administrative actions that are substantively different than expected previously. CBO also accounts for the estimated effects of legislated limits (often referred to as spending caps) on certain types of discretionary spending along with the effects of sequestration (a legal process by which previously provided spending authority is canceled) of mandatory budgetary resources scheduled for future years as provided for in the Budget Control Act of 2011 (as amended).[8]

The Deficit Control Act directs CBO to follow several rules for projecting spending, some of which may be in conflict with underlying law for a specific program:

- Assume full funding for benefits under entitlement programs even if the source of that funding is not specified,

- Assume that most mandatory programs (and thus their spending) continue to operate after their scheduled expiration dates throughout the baseline projection period, and

- Assume that the most recent discretionary appropriation grows at the rate of inflation specified

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7. See Congressional Budget Office, *Improving CBO's Methodology for Projecting Individual Income Tax Revenues* (February 2011), www.cbo.gov/publication/22007.

8. For more, see Congressional Budget Office, "Sequestration," www.cbo.gov/topics/budget/sequestration.

in the Deficit Control Act even if the appropriation is for an emergency or is widely viewed as a onetime appropriation.

Because CBO's cost estimates for mandatory programs are developed relative to the baseline, reauthorizing an expiring mandatory program often will not be reflected as a "cost" relative to the baseline, even though it would have consequences for a program's operation. For example, the Temporary Assistance for Needy Families (TANF) block grant program, which provides federal funding to states to create and administer their own assistance programs for low-income families, is authorized through February 8, 2018. Over the 2018–2027 period, outlays for TANF in the baseline average roughly $16.5 billion a year. If the Congress simply reauthorizes TANF, CBO's cost estimate would not show any increase in spending because, according to the rules in the Deficit Control Act, the baseline incorporates the assumption that the spending for TANF will occur.

For discretionary spending, CBO projects that future funding for individual accounts will increase according to projected inflation. (However, total spending for those accounts in CBO's baseline reflects the effects of caps on overall discretionary funding that are in effect through 2021.) Unlike estimates for legislation affecting mandatory programs, however, estimates of the costs of appropriation bills are not affected by baseline projections. The costs of discretionary appropriations are estimated relative to current law (that is, appropriations are assumed not to continue) rather than relative to the baseline.

As with projections of mandatory spending, CBO's revenue projections reflect the laws that are in effect at the time a projection is made. The only exception is for projections of excise taxes dedicated to trust funds. As required by the Deficit Control Act, CBO's projections incorporate the assumption that those taxes are extended for the remainder of a projection period at their expiring rate. For example, many of the taxes that fund the Airport and Airway Trust Fund will expire after March 31, 2018, and many of the taxes that fund the Highway Trust Fund expire after September 30, 2022. Nevertheless, CBO's revenue projections for the entire baseline period include collections of those taxes at their expiring rates.

Incorporating the Economic Forecast

CBO's economic forecasts underlie all of the agency's baseline projections for the federal budget and are crucial to the development of spending projections. For example, inflation is a significant factor for benefits paid under Social Security, the Supplemental Nutrition Assistance Program, and other programs that may increase each year as a result of cost-of-living or other adjustments tied to inflation. In addition, CBO projects discretionary spending for individual programs by increasing the amount of a current-law appropriation to account for inflation as specified in the Deficit Control Act. Various components of the baseline depend on other projections, such as those involving the nation's economic output, labor supply, and interest rates.

Projections of revenue collections are particularly sensitive to CBO's economic forecast. As personal income, payrolls, corporate profits, imports, consumption of goods, and wealth increase, so do receipts from income and payroll taxes, customs duties, excise taxes, and estate and gift taxes. Because income and payroll taxes account for about 90 percent of federal revenues, CBO's projections of revenues depend most heavily on its projections of wages, other personal income, and corporate profits. Most of those macroeconomic measures use definitions from the national income and product accounts (or NIPAs, which are produced by the Bureau of Economic Analysis within the Department of Commerce), but the tax bases correspond to measures defined by tax law. CBO accounts for differences between those measures when it generates revenue projections, and it uses various methods to project each of the many differences in income measures.

Ideally, the historical relationships between relevant economic indicators and tax revenues could be used in developing revenue projections. However, those relationships can be influenced by prior changes in law, so history is not necessarily a useful guide for projecting revenues under current law. To extrapolate into the future the historical relationship between revenues and GDP or other macroeconomic indicators, CBO would need to quantify the effects of past changes in fiscal policy. If such effects were not appropriately accounted for, then the projections would implicitly incorporate the assumption that in the future, changes in law would be similar to changes in the past that were enacted under similar economic conditions. Because of the difficulty

in accounting for such effects, CBO does not use such a technique to project revenues.

As an alternative, CBO identifies the relationship between macroeconomic measures of the economy and the activities on which federal taxes are imposed. Then, to project revenues the agency applies the appropriate tax rates—including the effects of changes to tax provisions that are scheduled under current law—to its projection of taxable activities, which incorporates the macroeconomic projections related to each activity. CBO models each tax source separately and projects total revenues by summing the projections of the separate sources.

How Does CBO Produce Spending and Revenue Projections?

CBO's spending and revenue projections are estimated separately and compiled into aggregated amounts. Analysts combine those estimates in order to project annual deficits, calculate spending on net interest, and project measures of debt. In developing baseline projections for federal spending, individual projections are compiled within a database that CBO uses to adjust its projections to account for discretionary spending caps and for sequestration. Similarly, for revenue projections, the amounts estimated from all sources are combined to project a total for the baseline period.

Projecting Mandatory Spending

CBO's baseline projections for the hundreds of accounts and subaccounts for mandatory programs can range from a million dollars a year for smaller programs to hundreds of billions of dollars a year for programs like Medicare and Social Security. In developing those projections, analysts must account for each program's characteristics and complexities and incorporate current information related to the program.

Because of the diversity of mandatory programs, analysts gather and analyze a wide variety of data from many sources. For example, projections for Medicare must account for the age of beneficiaries and for the eligibility, coverage, and payment rules for Medicare's different benefit programs, along with Medicare's interactions with Medicaid and other federal benefit programs. Projections of Social Security benefits account for the number of people who are eligible, the ages at which they typically claim benefits, and expected wage and price inflation, among other factors. Projections for student loan and housing programs must account for default rates, and projections

for crop insurance must account for acreage planted in a given crop.

Projections of mandatory spending also must account for the effects of changes to programs and activities that result from previously enacted legislation.

As an example, an analyst at CBO would follow a three-step process to project spending for military retirement:

- Estimate the number of retirees and survivors (surviving spouses and children) over the baseline projection period. That estimate would incorporate the actual caseload by age in the most recently completed fiscal year, projected retirements over the next decade on the basis of the military force structure, and projected new survivor beneficiaries on the basis of both the share of retirees electing to purchase survivor benefits and retiree mortality rates. The estimate also would incorporate information from other sources, such as the Society of Actuaries' periodic updates to projected mortality rates.

- Estimate the average net payment amount for retirees and survivors. That estimate would incorporate the actual gross payment amounts and offsets from the most recently completed fiscal year, the most recent cost-of-living increase provided to military retirees and pay increase provided to service members, and CBO's latest projections of inflation from the economic forecast. Military retiree and survivor payments could be offset if the retiree or survivor also received disability or survivor benefits from the Department of Veterans Affairs. Those offsets are calculated using data about the receipt of benefits provided by the department, along with CBO's projections of trends for disability compensation.

- Build in adjustments to account for changes in law or policy that would cause unusual changes to caseloads or average payments. Those adjustments also include accounting for the timing of the disbursement of retirement payments that can vary across months and fiscal years.

Projecting Discretionary Spending

Analysts typically start projections for discretionary spending accounts with the most recent appropriation, apply the appropriate inflation rate, identify the percentage of an appropriation that will be spent in the current

Table 2.

Spending Projections for a Sample Discretionary Account

Millions of Dollars

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Inflation (Percent)	n.a.	2	2	2	2	n.a.
Rate of Spending (Percent)	40	40	20	0	0	100
Budget Authority	100	102	104	106	108	520
Outlays From Budget Authority From Prior Years	58	19	0	0	0	77
New Outlays						
From budget authority in Year 1	40	40	20	n.a.	n.a.	100
From budget authority in Year 2	n.a.	41	41	20	n.a.	102
From budget authority in Year 3	n.a.	n.a.	42	42	21	104
From budget authority in Year 4	n.a.	n.a.	n.a.	42	42	85
From budget authority in Year 5	n.a.	n.a.	n.a.	n.a.	43	43
Total Outlays	**98**	**100**	**102**	**104**	**107**	**511**

Source: Congressional Budget Office.

Numbers may not add up to totals because of rounding.

Budget authority in Year 1 is the amount appropriated in the current year.

Budget authority for Years 2 through 5 is the amount in Year 1, inflated using the appropriate inflators from the macroeconomic forecast.

Budget authority in each year is spent at the estimated rate for each account.

Outlays for each year are a combination of spending from budget authority that was provided in previous years (prior-year spending) and from the budget authority for the current year (new outlays).

n.a. = not applicable.

year and each subsequent year on the basis of historical spending patterns and experience from the most recent fiscal year, and estimate when the appropriated amounts still available from previous years will be spent (see Table 2).

Because funding for personnel is required to be inflated at a different rate than funding for other purposes, inflation rates are weighted by the expected percentage of funding to be used to pay salaries and benefits and the percentage to be used for all other purposes in each account. The time it takes to spend the projected funding depends on the purpose for or conditions under which the money is provided. Funds from accounts that cover mainly salaries and expenses are spent more quickly (for example, 90 percent in the first year and 10 percent in the second), whereas funds from accounts that fund large activities, such as construction projects, for example, will have longer, slower rates of spending (for example, 25 percent the first year, 30 percent in the second and third years, and 15 percent in the final year of the program).

Finally, other background analyses are conducted for the most recent activities funded by appropriations, and analysts study economic and other trends that will affect the outlay projections.

After account-level projections for discretionary spending are made final, the total amount of budget authority is reduced to account for the caps on discretionary spending (and subsequent reductions to those caps) imposed through 2021 by the Budget Control Act of 2011. CBO does not adjust each account because, although the total amount of spending is constrained by the caps, the accounts themselves are not. The spending allocated under the caps is set by the Congress, and CBO makes no judgment about such priorities.

Projecting Net Interest
When they estimate net interest spending, analysts use a dedicated model that first incorporates the existing stock of all outstanding Treasury debt and the accompanying interest rates associated with each security. The model then integrates projections of future deficits and other financing obligations, CBO's forecast for interest rates,

Table 3.

CBO's Approaches to Projecting Revenues

Revenue Source	Main Model Type	Main Macroeconomic Inputs
Individual Income Taxes	Microsimulation	Wage and salary income, proprietors' income, interest income, dividends
Payroll Taxes	Microsimulation	Wage and salary income, proprietors' income
Corporate Income Taxes	Aggregate based	Domestic economic profits
Excise Taxes	Aggregate based	Real (inflation-adjusted) and nominal GDP, energy prices
Customs Duties	Aggregate based	Imports
Estate and Gift Taxes	Microsimulation	Nominal GDP, equity prices, real estate wealth
Federal Reserve Remittances	Combination[a]	Interest rates, central bank's portfolio of securities
Miscellaneous Fees and Fines	Various methods	None

Source: Congressional Budget Office.

a. The modeling of the central bank's holdings of Treasury securities and the resulting earnings uses a microsimulation approach. CBO uses an aggregate-based approach to project other earnings and costs of the Federal Reserve.

and judgments about the mix—or type—of securities that the Treasury will issue to meet the resulting borrowing needs.

Outlay estimates for net interest rely on two critical factors—federal debt and interest rates:

- The stock of federal debt at the beginning of a projection period, along with the additional debt (generally the amount of annual projected deficits) substantially determines annual borrowing.

- Estimates of interest rates determine the amounts that the Treasury would pay on outstanding debt.[9]

To a lesser extent, interest costs also are sensitive to the mix of securities sold by the Treasury. In addition to estimating primary deficits and interest rates, CBO must project the types of debt that the Treasury might issue to finance annual deficits. The Treasury can select the characteristics of the debt it issues—for example, the time to maturity, whether interest rates are fixed or floating, and whether the interest payments include an adjustment for

inflation. Those parameters also are reflected in baseline estimates of net interest outlays.

Compiling the Database for Spending

Analysts compile their spending projections in a database that is a collection of subaccount-level information coded to define various characteristics of each budget account. The database allows CBO to provide detailed reports to the Congress on many aspects of its spending projections. The characteristics of the budget accounts include which committees have jurisdiction, whether the account is discretionary or mandatory, whether funding for the account has been designated as an emergency requirement, and whether the account is subject to sequestration.

The database also includes account-level data from OMB and the Treasury and historical data on the amount of budget authority and outlays. That collection of information allows CBO to create, manage, and compare a variety of data sets, including annual baselines, baseline updates, and analyses of the President's annual budget request.

Projecting Revenues

CBO analysts project more than 50 sources of revenue. The model used for each source depends on the information available (see Table 3). In some cases—for individual income taxes, for example—microsimulation modeling suggests how individual taxpayers would behave in the face of current tax provisions. In other cases—for gasoline taxes, for example—activity is modeled in the aggregate.

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9. CBO typically produces estimates of the sensitivity of its spending and revenue forecasts to economic factors. In January 2017 CBO estimated that if interest rates were 1 percentage point higher every year than those in CBO's economic forecast, interest costs in 2027 would be $210 billion higher in that year, and $1.3 trillion higher over the 2018–2027 period. See Congressional Budget Office, *The Budget and Economic Outlook: 2017 to 2027* (January 2017), www.cbo.gov/publication/52370.

The microsimulation model for individual income taxes starts with databases of individual or household-specific information, including an anonymous sample of tax returns provided through an arrangement with the Internal Revenue Service. On the basis of those inputs, CBO uses the model to project federal revenues from income taxes and payroll taxes. However, CBO also uses population data to account for changes in the number and demographic composition of the taxpayer population, and it uses tax data to account for the kinds of income people receive or the wealth they accrue.

To simulate conditions in a projection year using the database of tax returns or other information from an earlier year, CBO accounts for projected changes in the number of returns and in the amount of income, deductions, or other important information from sample returns. That process involves changing the weights in the sample—the total number of returns that each sample return represents—and income, wealth, or other measures of economic activity for each return. In the current baseline, wages and salaries are projected to increase faster for higher-income taxpayers but the distribution of most income sources among all taxpayers remains constant and grows at rates that are consistent with the economic forecast.

Aggregate-based modeling for other revenue sources starts with data on total economic activity, such as the total tax base on which a particular excise tax is applied or corporate profits for the economy as a whole as measured in the NIPAs. CBO projects the aggregate tax base and determines the relevant tax rate for each revenue source. The aggregate-based approach is more appropriate for projecting revenue from sources for which the distribution of economic activity among taxpayers is less important—for excise taxes, for example, because the same tax rate generally applies to similar production and consumption, or for corporate income because it generally is taxed at a uniform rate.

For example, when CBO projects receipts from the gasoline excise tax, it starts with the most recent data on gasoline taxes and divides those amounts of revenue by the federal tax rate of 18.4 cents per gallon to find the total number of gallons taxed. It then projects gasoline consumption by accounting for changes in the number of miles that people drive; legislated increases in fuel economy standards, which will reduce gasoline consumption per mile traveled; and projected changes in the

cost of fuel, which are part of CBO's economic forecast. (Although most of the gasoline tax is scheduled to expire at the end of fiscal year 2022, CBO's baseline projections incorporate the assumption that the rate in place at the end of that year will continue throughout the baseline projection period.)

Despite their differences, the microsimulation and aggregate-based approaches have several common elements:

- CBO's economic projections are critical inputs to both models.

- Both types of models are structured on the basis of tax years, which generally conform to calendar years, so they produce estimates of taxes owed by taxpayers for a particular tax year. To convert tax year projections of taxes owed to fiscal year projections of tax payments, CBO must account for the rules that govern withholding, estimated payments, and historical payment patterns to project how much that is owed for a particular tax year will be paid in the same fiscal year and how much will be paid in the next or later fiscal years.

- The models' results must be adjusted to reflect the effects of scheduled changes in tax law, such as the scheduled expiration on December 31, 2025, of most of the changes to the individual income tax that were enacted in P.L. 115-97.

How Does CBO Ensure Consistency Between Budget Projections and the Economic Forecast?

CBO's analysis of the nation's economic outlook depends in part on fiscal policy, including policy regarding the federal deficit. The difference between revenues and outlays, for example, affects short-term demand and the economy's long-term capacity to produce goods and services.

In CBO's projection methodology, total economic activity and federal budgetary flows are determined jointly. Although CBO's macroeconomic models are not automatically linked with its revenue and spending models, the results from the models and the various projection methods are passed back and forth during the preparation of the baseline to ensure that macroeconomic and budgetary projections remain consistent. That joint

determination of the economic, spending, and revenue projections ensures that each baseline fully reflects the interactions of current-law policy and the economy.

Does CBO Assess the Accuracy of Its Budgetary Projections?

In addition to the analysis of actual results from the previous year that starts off the annual baseline process, CBO's internal review process stresses its assessment of the quality of past projections to identify opportunities to refine methods and improve the accuracy of future projections. The agency has reviewed its economic and budgetary projections over a long period and published reports that measure and analyze estimating errors.[10] In addition, CBO undertakes separate analyses to attempt to improve its projections. For example, CBO's recent analysis of the extent to which certain international tax avoidance strategies could lead to changes in corporate income tax receipts led it to reduce its projection of the fraction of corporate profits subject to the corporate tax.[11]

What Information Does CBO Release?

Each year, *The Budget and Economic Outlook* and its updates describe the main factors that influence baseline projections for spending and revenues.[12] That infor-

mation typically includes estimates of the sensitivity of the results to alternative economic projections and the budgetary effects of mandatory spending that is assumed to continue in the baseline projections because of the provisions of law that govern baseline construction. To assist policymakers who may hold differing views about the most useful benchmark projections for discretionary spending, CBO's reports show paths under alternative policy assumptions—for example, giving projections in which discretionary appropriations are frozen at the amounts provided in the current fiscal year.

CBO also regularly provides explanations of how and why economic and budgetary projections have changed from earlier reporting. It posts supplemental materials, including various spreadsheets that show budget authority and outlays for every account in the baseline. Supplemental tables with more detailed information on larger, more complicated programs and accounts also are posted.[13]

For revenue projections, the supplemental data include information on the components of projected revenues from payroll and excise taxes, detail on projected individual capital gains realizations and the resulting tax receipts, and estimates provided by JCT of changes in baseline projections that would occur if different expiring tax provisions were instead assumed to be extended permanently.

That information, along with information concerning CBO's economic projections, is available on CBO's website at "Budget and Economic Data," www.cbo.gov/about/products/budget-economic-data.

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10. For a discussion of CBO's assessments of its baseline projections and economic forecasts, see Congressional Budget Office, *An Evaluation of CBO's Past Outlay Projections* (November 2017), www.cbo.gov/publication/53328, *CBO's Revenue Forecasting Record* (November 2015), www.cbo.gov/publication/50831, and *CBO's Economic Forecasting Record: 2017 Update* (October 2017), www.cbo.gov/publication/53090.

11. See Congressional Budget Office, *An Analysis of Corporate Inversions* (September 2017), www.cbo.gov/publication/53093.

12. See Congressional Budget Office, "Major Recurring Reports: Budget and Economic Outlook and Updates," www.cbo.gov/about/products/major-recurring-reports#1.

13. See Congressional Budget Office, "Baseline Projections for Selected Programs," www.cbo.gov/about/products/baseline-projections-selected-programs, and "Budget and Economic Data," www.cbo.gov/about/products/budget-economic-data.

List of Tables and Figures

About This Document

This document, which is part of the Congressional Budget Office's continuing effort to make its work transparent, explains the process by which CBO constructs its baseline. In keeping with CBO's mandate to provide objective, impartial analysis, the document makes no recommendations.

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