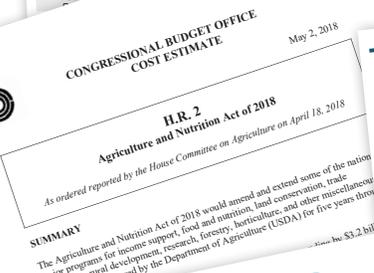
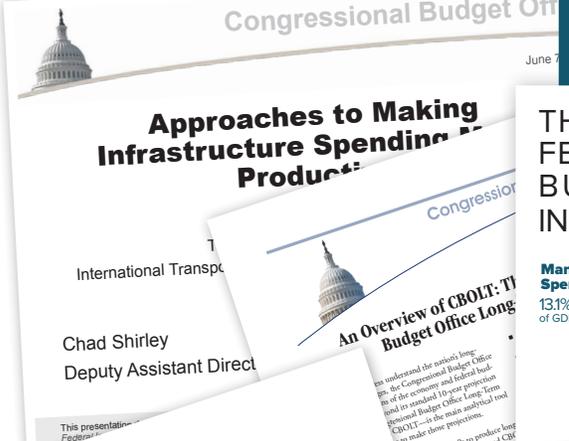
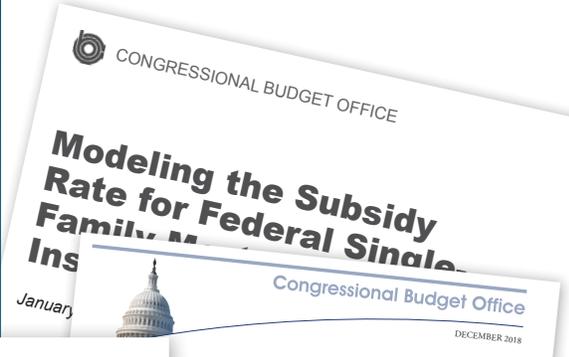


# CBO

## Transparency at CBO: Future Plans and a Review of 2018



**August 2018 Baseline Forecast—Data Release (Quarterly)**

Units	2016Q1	2016Q2	2016Q3	2016Q4	2017Q1
<b>Output</b>					
Gross Domestic Product (GDP)	18325	18538	18729	18906	19058
Percentage change, annual rate	0.8	4.7	4.2	19.135	19.272
Gross National Product (GNP)	18501	18733	18918	19135	19304
Percentage change, annual rate	-0.1	6.1	4.0	4.7	2.9
Potential GDP	18634	18823	18964	19133	19304
Percentage change, annual rate	2.0	4.1	3.0	3.6	3.6
Real GDP	16572	16664	16778	16951	16903
Percentage change, annual rate	16.717	16.825	16.933	17.041	17.081
Real GNP	-0.3	2.6	2.6	2.6	0.9
Percentage change, annual rate	16.850	16.918	16.986	17.054	17.121
Real Potential GDP	1.7	1.6	1.6	1.6	1.6
<b>Prices</b>					
2009=100	110.0	110.6	111.0	111.6	112.2
Percentage change, annual rate	0.6	2.1	1.7	2.0	2.2
2009=100	110.6	111.2	111.7	112.1	112.6
Percentage change, annual rate	2.1	2.0	2.0	1.3	1.8
2009=100	237.8	239.5	240.5	242.2	243.9
Percentage change, annual rate	-0.1	2.7	1.8	2.7	3.0
2009=100	245.6	247.0	248.3	249.5	250.9
Percentage change, annual rate	2.3	2.3	2.2	2.0	2.2
2009=100	135.2	136.9	137.1	137.3	138.3
Percentage change, annual rate	-0.3	5.0	0.8	0.6	2.8
2009=100	110.6	111.3	111.6	112.2	112.8
Percentage change, annual rate	0.3	2.4	1.4	2.0	2.0
December 2005=100	125.1	126.0	126.6	127.2	128.3



### The Accuracy of CBO's Baseline Estimates for Fiscal Year 2018

ended, the Congressional baseline estimates of federal deficits and compares that to actual results for that year, as projections and identifying led to under- or overestimates in particular categories. accuracy of its work.

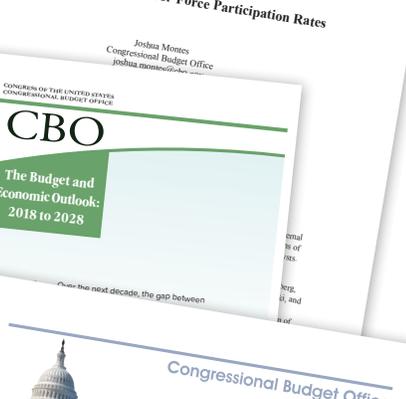
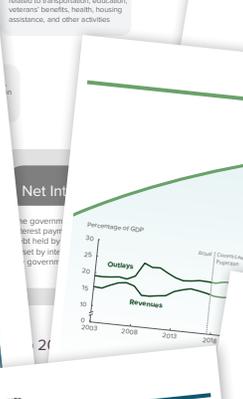
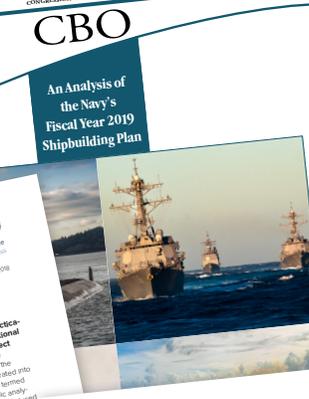
se 2017 projections for fiscal year 2018 compared with actual outcomes. CBO adjusted its projections to reflect the actual rates and spend.

absolute error for revenue projections made for 1983 to 2017 was larger—5.0 percent.

Deficit: The outlay and revenue differences were partially offsetting. As a result, the projected federal budget deficit for 2018 was just \$29 billion, or 3.7 percent more than the actual amount: \$817 billion compared with \$789 billion.

**How CBO Conducted This Analysis**

CBO regularly publishes baseline projections of federal outlays, revenues, and deficits for the current fiscal year and the ensuing decade. Those projections reflect the



## At a Glance

The Congressional Budget Office's transparency efforts aim to promote a thorough understanding of its work, help people gauge how estimates might change if policies or circumstances differed, and enhance the credibility of its analyses and processes. This document fulfills CBO's requirement to report on its plans for such efforts.

The agency intends to undertake many additional steps next year, including the following:

- Publish more overviews and documentation of some of its major models and more detailed information, including computer code, underlying key aspects of those models;
- Update its template for cost estimates to make important information easier to find and read; and
- Continue to evaluate previous estimates, when possible, in order to improve future ones.

Those efforts will build on progress made this year, which included creating several interactive products, publishing information about important models, publishing analyses of the accuracy of estimates, and producing reports explaining processes.



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# Transparency at CBO: Future Plans and a Review of 2018

## Summary

Transparency is a top priority for the Congressional Budget Office, and the agency continues to bolster its efforts to be transparent.

People can have different interpretations of what it means to be transparent. CBO has three goals:

- To promote a thorough understanding of the agency's analyses through accessible, clear, and detailed communication;
- To help people gauge how estimates might change if policies or circumstances differed; and
- To enhance the credibility of the agency's analyses and processes by showing the connections to data, professional research, and feedback from experts.

Earlier this year, during the appropriation process for the legislative branch, the Senate directed CBO to produce a report “including proposals on making supporting documents covering methods and assumptions used in analyses and cost estimates publicly available to a greater degree, and [reviewing] the feasibility of placing interactive models online and releasing source code for computer programs used in analyses.”<sup>1</sup> This report fulfills CBO's requirement to report on such plans for future transparency efforts within 90 days of the enactment of its appropriation for 2019 and reviews the agency's efforts during 2018. A continually updated list of CBO's most recent activities is available at [www.cbo.gov/about/transparency](http://www.cbo.gov/about/transparency).

## Future Plans

Next year, CBO will undertake many different transparency activities. Those for which the scope has been fully

developed are described in this report, and others will be initiated as well.

For instance, CBO expects to testify about its projections and analytical methods and will work to resolve issues raised by the Congress as it oversees the agency. CBO will publish more overviews and documentation of some of its major models and more detailed information, including computer code, about key aspects of those models. Examples of such models are those used to simulate choices about health insurance, project long-term budget outcomes, and forecast business investment. The agency also plans to update its template for cost estimates to make important information easier to find and read for lawmakers, their staff, and others. In addition, it will provide tables in spreadsheet format.

CBO will release data in many forms, including information on appropriation estimates in a more accessible format. The agency will continue to evaluate the accuracy of previous estimates and to compare its estimates with those of other organizations to improve future ones.

To take other examples, CBO will release a new interactive product to help users understand the effects of potential changes to Social Security. The agency will publish several reports about uncertainty in its estimates. And it will experiment with creating visual summaries of some of its major reports.

CBO will continue to interact daily with the Congress to explain the agency's estimates and obtain feedback and will continue to regularly obtain advice from outside experts. The update of the agency's health insurance model will be a major focus of such outreach.

## Review of 2018

In 2018, as CBO pursued its goals for transparency, it undertook these 10 types of activities:

1. See United States Senate, *Legislative Branch Appropriations, 2019*, Report to Accompany S. 3071, Senate Report 115-274 (June 14, 2018), p. 32, <https://go.usa.gov/xPJhf>.

- **Testifying and publishing answers to questions.** CBO testified at nine Congressional hearings and responded to requests from the Congress for public answers to specific questions. In addition to presenting oral remarks, answering questions at the hearings, and presenting written statements, the agency published 124 answers to Members' subsequent questions.
- **Explaining its analytical methods.** CBO published various reports explaining its analyses and made some supporting documents and some computer code available. Also, in nearly every cost estimate, CBO included a section describing the basis of the estimate.
- **Releasing data.** *The Budget and Economic Outlook*, the *Analysis of the President's 2019 Budget*, and several other reports were supplemented with a comprehensive set of data files, and most reports were accompanied by files providing the data underlying figures.
- **Analyzing the accuracy of its estimates.** CBO released various reports that compared projections and actual outcomes.
- **Comparing its current estimates with its previous ones.** In several of its recurring publications, CBO explained the differences between projections in 2018 and the previous year. In addition, cost estimates explained the extent to which provisions and estimates were similar to or different from earlier ones.
- **Comparing its estimates with those of others.** CBO regularly made comparisons with the budget projections of the Administration, with the economic projections of private forecasters and other government agencies, and with the policy analyses of various organizations. (In addition, when time did not allow for a formal publication, CBO often discussed comparisons with Congressional staff.)
- **Estimating the effects of policy alternatives.** CBO prepared reports and created interactive products to estimate the effects that some alternative assumptions about future policies would have on budgetary outcomes.
- **Describing how much uncertainty surrounds its estimates.** CBO created an interactive workbook that allows users to enter alternative economic scenarios

and obtain budgetary results, and in several major reports and cost estimates, the agency discussed the uncertainty surrounding its estimates.

- **Creating data visualizations.** To make CBO's projections easier to understand, the agency published chart books, slide decks, and infographics about the budget and the economy.
- **Conducting outreach.** The most important form of outreach was the direct communication between CBO and the Congress in person, by phone, and by email. In addition, CBO solicited input from a range of policy experts through its Panels of Economic and Health Advisers and obtained many external reviews of its work. CBO staff released podcasts and made presentations about the agency's processes, work in progress, and recently completed work—including several on Capitol Hill in partnership with the Congressional Research Service. And the agency published blog posts highlighting key issues.

## Background

CBO's transparency efforts are built on a strong foundation that has been laid over many years. Of late, the agency has allocated additional resources to do even more. For 2019, the Congress increased CBO's budget in part to hire new staff to contribute to transparency and responsiveness. Using that funding, the agency plans to fill 10 new positions devoted to making major contributions to such activities. Those additions will build on an expansion begun this year: Following the consolidation of some existing functions, CBO added several new positions to focus on activities to enhance transparency. More generally, almost everyone at CBO spends part of his or her time on such activities, and the amount of time for many is expected to increase next year.

As CBO continues to undertake efforts to bolster transparency, it will be important to understand which ones are particularly valuable and informative to the Congress and which ones may have less value. The agency must constantly balance its transparency efforts with its commitment to respond quickly to the Congress's needs and with its professional responsibility to release reports and estimates only when they reach sufficient quality. Being transparent has costs, and CBO must, in essence, make business decisions weighing the benefits and costs of devoting resources to different activities. The agency welcomes feedback about what people find most useful and suggestions about other ways in which the agency can provide more information about its work.

CBO's efforts to be transparent help it continue its long-standing commitment to providing information that is objective, insightful, timely, and clearly presented and explained. They support the agency's dedication to maintaining a level playing field regarding access to the information and analysis that it provides—ensuring that its work is made widely available to the Congress and the public. (However, work on proposals that have not been made public remains confidential to facilitate the development of legislation.)

CBO's transparency efforts complement its process for publicly releasing all of its formal cost estimates and analytic reports. Through that process, CBO delivers its work to interested Members of Congress and their staff, including, in particular, the sponsor of legislation or requester of a report, the Chairman and Ranking Member of the committees with jurisdiction over the subject at hand, and the budget committees. At about the same time, the agency posts the work on its website. In addition, an email service and Twitter announcements notify subscribers when the agency publishes work.

### Transparency Plans for 2019

In 2019, CBO plans to expand its efforts to undertake the 10 types of transparency activities just enumerated. In particular, those explaining CBO's analytical methods will fulfill two types of requests from the Congress. First, they will make supporting documents that discuss methods used in analyses and cost estimates publicly available to a greater degree. Second, they will include releasing segments of computer code used in some analyses. Releasing more data, estimating the effects of policy alternatives, and characterizing uncertainty will fulfill requests to create interactive products.

### Testifying and Publishing Answers to Questions

In 2019, CBO expects to testify about *The Budget and Economic Outlook* and other topics as requested by the Congress. That work will involve presenting oral remarks, answering questions at the hearings, and presenting written statements, as well as publishing answers to Members' subsequent questions for the record. CBO will continue to work to resolve issues raised as part of the oversight provided by the budget committees and the Congress generally. In addition, the agency expects that Members of Congress will ask other questions to which it will provide published responses.

### Explaining Analytical Methods

CBO will update the presentation of its cost estimates to highlight key parameters as well as information needed by the Congress for budget enforcement procedures. The agency will also publish cost estimate tables in spreadsheet format on its website to facilitate use of the information.

CBO also plans to publish short reports providing general information to help Members of Congress, their staff, and others better understand its work. One will provide brief explanations of some important concepts related to the Congressional budget process. For example, the report will explain differences between authorizations, appropriations, rescissions, and reappropriations. Another will explain the differences between two types of estimates used for credit programs: estimates prepared using the methodology specified in the Federal Credit Reform Act (FCRA), which applies to most federal credit programs, and estimates prepared on a fair-value basis, which incorporates market risk. And another short report will explain key scorekeeping rules and how they have been used in providing estimates for recent legislation.

During the next year, CBO will publish a substantial amount of technical information about updates to its health insurance simulation model (HISIM). Before publishing its spring 2019 baseline projections, the agency plans to release the following to provide a comprehensive picture of the model:

- A slide deck that describes the model's specifications and includes many of the key equations and parameters;
- Additional documentation describing the sources and preparation of input data; and
- Segments of computer code underlying the model's simulations of certain decisions about insurance choices.

(CBO cannot release some aspects of the model publicly because the agency must maintain the confidentiality of the underlying data.) In addition, the agency will report about how closely it is able to calibrate its estimates for several previous years with data from multiple sources about health insurance coverage.

CBO also will provide technical information about several other methods used to analyze the effects of federal policies:

- Descriptions of the data and analytical methods underlying the microsimulation model that it uses to analyze potential changes to the cost-sharing structure of Medicare's fee-for-service program and to medigap coverage.
- Descriptions of the analysis of two regulations aimed at expanding the number of people with insurance coverage through association health plans and short-term, limited-duration insurance and of the resulting adjustments to projections of insurance coverage made in the summer of 2018.
- Descriptions of how CBO is updating its approach to estimating the budgetary effect of changes to medical malpractice liability laws to incorporate evidence from new research and data.
- Descriptions of how CBO estimates the effects of employers' matching and default contribution rates on federal employees' own contribution rates to the Thrift Savings Plan and on the government's costs.

In addition to the segments of computer code from HISIM, CBO plans to release some code from other models: one used to project long-term budget outcomes, another used to forecast business investment, and a third used to roughly approximate the budgetary effects of broad changes in the economy.

### Releasing Data

In 2019, CBO will continue to publish extensive sets of data in conjunction with its major recurring reports, including detailed information on 10-year budget projections, historical budget outcomes, 10-year projections for trust funds, revenue projections by category, spending projections by budget account, tax parameters and effective marginal tax rates on labor and capital, and 10-year projections of economic variables, as well as data about the economy's maximum sustainable output.

The agency will also provide details about baseline projections—with more supporting spreadsheets at some point in 2019—covering the following: the Pell grant program, student loan programs, Medicare, the military retirement program, the pension benefit guarantee

program, the Social Security Disability Insurance program, the Social Security Old-Age and Survivors Insurance program, the trust funds for Social Security, child nutrition programs, child support enforcement and collections, foster care and adoption assistance programs, the Supplemental Nutrition Assistance Program, the Supplemental Security Income program, the Temporary Assistance for Needy Families program, the unemployment compensation program, the Department of Agriculture's mandatory farm programs, federal programs that guarantee mortgages, programs funded by the highway trust fund, benefits for veterans and military personnel stemming from the Post-9/11 GI Bill, and veterans' disability compensation and pension programs.

Other data will provide details about long-term budget projections, projections underlying Social Security estimates, more than a thousand expired or expiring authorizations of appropriations, and dozens of federal credit programs. When CBO analyzes the President's budget request for 2020, it will post a set of files providing estimates of the budgetary effects of specific proposals. Throughout the year, the agency will post the data underlying the figures in various reports.

Also in 2019, CBO will publish information on its estimates for appropriation bills in a more accessible format and will post an interactive product to help users obtain information about the agency's estimates of the distribution of household income.

### Analyzing the Accuracy of CBO's Estimates

In 2019, CBO will release a report analyzing the accuracy of its past projections of deficits and debt. As part of a continuing series of reports about the accuracy of its previous cost estimates, CBO will publish a reexamination of its original estimate of the cost of the legislation establishing the Department of Defense Medicare-Eligible Retiree Health Care Fund. The agency will continue its new annual series reviewing the accuracy of its outlay and revenue projections for the previous year. The biennial report on the accuracy of CBO's economic forecasts will be released next year. And CBO will publish comparisons of previous projections of federal subsidies for health insurance with actual amounts in 2018.

### Comparing Current Estimates With Previous Ones

In several of its recurring publications—reports about the budget and economic outlook, federal subsidies for health insurance, and the long-term budget outlook

—CBO will continue to explain the differences between the current year’s projections and those from the previous year. In its cost estimates, CBO will continue to identify related legislative provisions for which it has provided estimates in the recent past and explain the extent to which the provisions and estimates at hand are similar or different.

### **Comparing CBO’s Estimates With Those of Other Organizations**

Next year, CBO will report on lessons learned from a symposium on life-cycle macroeconomic modeling. The symposium will use CBO’s model and related models from six other organizations to analyze the long-term effects of certain changes to Social Security. The agency will continue to publish its regular comparisons of its budget projections with the Administration’s and of its economic projections with those of private forecasters and other government agencies. And the agency will include comparisons of estimates in various reports, including the upcoming report on the effects of new regulations related to association health plans and short-term, limited-duration insurance. In addition, when time does not allow for publication, analysts will sometimes be able to discuss such comparisons with Congressional staff.

### **Estimating the Effects of Policy Alternatives**

In 2019, CBO will release a new interactive product to help users understand the effects of potential changes to Social Security. The agency will enhance users’ ability to search on its website among the 121 budget options it released in a digital format at the end of 2018. A new chapter in *The Budget and Economic Outlook* will consolidate discussion of the effects of policy alternatives to make that information more easily accessible. And reports on other topics will also illustrate the potential effects of various policy proposals.

### **Characterizing Uncertainty Surrounding Estimates**

Next year, CBO will publish a report generally describing the sources of uncertainty surrounding its cost estimates and how the agency provides information about such uncertainty. The new cost estimate template will feature, when possible, a section on specific areas of uncertainty in the estimate. The agency will also publish a report explaining the methods used in certain cases when cost estimates are a weighted average of the effects associated with different possible circumstances, taking account of their respective probabilities.

CBO will update its interactive workbook showing how changes in economic conditions might affect the federal budget. *The Budget and Economic Outlook*, the *Long-Term Budget Outlook*, and *Federal Subsidies for Health Insurance* will contain substantial discussions of uncertainty.

### **Creating Data Visualizations**

In 2019, CBO will experiment with creating visual summaries for *The Budget and Economic Outlook* and *Federal Subsidies for Health Insurance*. The agency will provide additional information from those reports in slide decks and create infographics about actual outlays and revenues in 2018. And the agency will continue to look for opportunities to include graphics to enhance the explanations in some cost estimates.

### **Conducting Outreach**

CBO will continue to communicate every day with people outside the agency to explain its findings and methods, respond to questions, and obtain feedback. The agency’s Director will meet regularly with Members of Congress to do the same. At the beginning of the 116th Congress, to assist the Congress, the agency will update its *Introduction to the Congressional Budget Office* and produce a video introduction as well.

As the agency updates its health insurance model, it will continue to discuss the development with representatives from the Congress, federal agencies, states, insurers, employers, doctors, hospitals, and the general public. The agency will also obtain feedback from researchers such as those on the technical review panel that it established for HISIM.

After the spring 2019 baseline is published, CBO staff will meet with Congressional staff to discuss the new projections and answer questions.

CBO will continue to obtain input from its Panel of Economic Advisers and Panel of Health Advisers. It will continue to turn to other experts as well. For example, CBO will convene a recurring meeting of crop insurance and commodity analysts to review the past performance of the crop insurance program and commodity markets and to discuss projections of future spending in those areas. Many reports will benefit from outside experts’ written comments on preliminary versions. For some recurring reports produced on compressed timetables, such as the *Long-Term Budget Outlook*, the agency will solicit comments on previously published versions and

selected technical issues to incorporate improvements in future editions.

CBO staff will give presentations on Capitol Hill—some in collaboration with the Congressional Research Service—on its budget and economic projections and on other topics. Those presentations allow CBO to explain its work and answer questions. The agency will also give presentations about its findings and about work in progress in a variety of venues to offer explanations and gather feedback. In addition, CBO will use podcasts and blog posts to summarize and highlight various issues.

### Testifying and Publishing Answers to Questions in 2018

CBO testifies at Congressional hearings and responds to requests from the Congress for public answers to specific questions. This year, CBO appeared as a witness at nine hearings. In addition to presenting oral remarks, answering questions at the hearings, and presenting written statements, the agency published answers to Members' subsequent questions. Here are the venues and topics (along with the supplements provided):

- Before the Senate Budget Committee about CBO's work in 2017 and the agency's plans for the future (followed by 9 answers to questions for the record about health care, taxes, the economy, and other issues).
- Before the House Budget Committee about CBO's work in 2017 and the agency's plans for the future (accompanied by a two-page handout highlighting key points covered in the oral remarks and followed by 29 answers to questions for the record about CBO's operations and other issues).
- Before the House Budget Committee about baseline projections and cost estimates (followed by 41 answers to questions for the record about macroeconomic analysis, CBO's baseline, cost estimates, modeling and data, and other issues).
- Before the House Budget Committee describing seven things to know about CBO's analyses (accompanied by a two-page handout highlighting key points covered in the oral remarks and followed by 8 answers to questions for the record about the agency's analytical processes).
- Before the Senate Budget Committee about the budget and economic outlook (followed by 18 answers to questions for the record about spending, revenues, deficits, debt, health care, the economy, and other issues).
- Before the House Budget Committee about the budget and economic outlook (followed by 8 answers to questions for the record about baseline projections and cost estimates related to health care).
- Before the House Appropriations Committee's Subcommittee on the Legislative Branch about CBO's budget request, describing the agency's plans to bolster responsiveness and transparency and expand analytical capacity (followed by 7 answers to questions for the record about CBO's operations).
- Before the Senate Appropriations Committee's Subcommittee on the Legislative Branch about CBO's budget request, similarly describing the agency's plans.
- Before the Senate Budget Committee providing an update on transparency at CBO (followed by 4 answers to questions for the record about the topic of the hearing as well as the agency's report on expired and expiring authorizations of appropriations and a cost estimate).

In addition, CBO publicly answered specific questions asked by Members in letters providing information about the effects of the 2017 tax act on income accruing to foreign investors, the period of availability of appropriated funds, the agency's estimates of the effects of changes in the discount that manufacturers of brand-name drugs must offer to beneficiaries in the "coverage gap" of Medicare's Part D program, the effects of two illustrative scenarios in which the primary deficit (the deficit excluding net outlays for interest) is reduced, and progress in updating CBO's health insurance simulation model.

The agency also received questions about the cost-sharing reductions (CSRs) that insurers who participate in the marketplaces established under the Affordable Care Act are required to offer to eligible people, which decrease deductibles and other out-of-pocket expenses like co-payments. CBO responded with a letter providing an estimate of the effects of a legislative proposal, a letter describing the budgetary treatment of CSRs, a letter answering

follow-up questions about that budgetary treatment, and another letter with additional follow-up.

### Explaining Analytical Methods in 2018

CBO’s estimates are produced by teams of people who use information obtained from experts, data, and research to determine which analytical methods to use. The agency aims to explain its methods, sometimes for a general audience and sometimes by providing technical information.

#### General Information

In four reports in 2018, CBO has explained its general approaches to analysis:

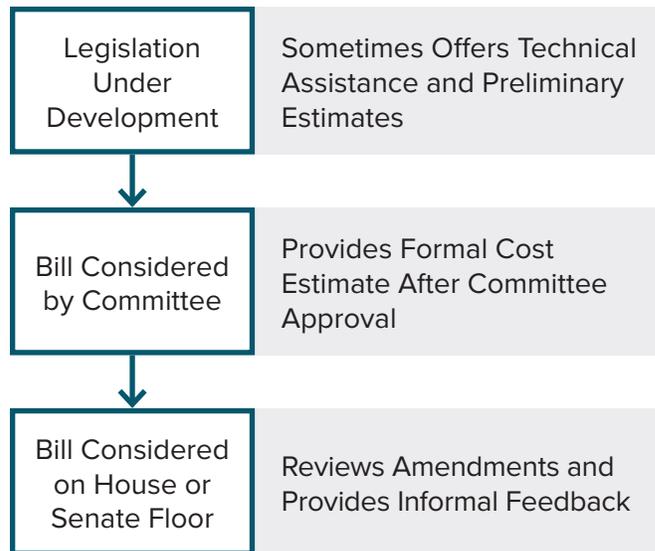
- How CBO produces baseline budget projections, including what the baseline is, how CBO and the Congress use the baseline, how long the process of developing the baseline takes and what resources are required, what general principles guide the work, and what steps the agency takes to ensure accuracy.
- How CBO produces cost estimates, including what process the agency follows (see Figure 1), how it ensures thoroughness and objectivity, how and when it incorporates macroeconomic effects on the budget, and what causes uncertainty in estimates.
- How CBO analyzes major proposals affecting health insurance, including how the agency develops an analytical strategy, how it models the effects of a proposal, and how it reviews and writes about the estimate.
- How CBO’s cost estimates are structured and what information they contain.

This year, CBO also has published material providing details about particular analytical methods:

- An interactive workbook to demonstrate how CBO projects estimates of spending on discretionary programs over multiple years, helping Congressional staff and researchers understand an important component of the agency’s process for producing roughly 40 percent of its formal cost estimates and almost all baseline projections for discretionary spending accounts.

Figure 1.

### CBO Provides Technical Assistance and Prepares Formal Estimates, Depending on the Stage of the Legislative Process



Source: Congressional Budget Office.

- A slide deck about how HISIM is used in preparing CBO’s 2018 baseline, describing how the model applies parameters drawn from research to predict behavioral responses and to project the effect of a change in policy, so that readers can better assess a broad array of policy choices in the context of existing research.
- A report about the model used to make long-term projections, describing its four components—the demographic model, the microsimulation model, the long-term budget model, and the policy growth model—and how they relate to one another.
- A slide deck providing an overview of CBO’s microsimulation tax model, explaining how the model applies the rules of the tax system to each member of a representative sample of taxpayers to generate estimates of baseline tax receipts.
- An appendix about the effects of the 2017 tax act in the agency’s report on the budget and economic outlook, describing how that act changes businesses’ and individuals’ incentives in various ways and how

those economic effects were incorporated into the agency's baseline budget projections.

- A primer about how CBO estimates the cost of federal credit programs, discussing the accounting procedures currently used in the federal budget, as prescribed by FCRA, and an alternative, the fair-value approach, in which costs are estimated on the basis of the market value of the federal government's obligations.
- A report about how CBO estimates the cost of new ships by relying on historical experience, with adjustments for rate (the production efficiencies that are made possible when several ships of the same type are built simultaneously or in close succession at a given shipyard), learning (the gains in efficiency that accrue over the duration of production as shipyard workers gain familiarity with the ships), acquisition strategy (such as whether contracts are granted directly to a company or awarded as the result of a competitive process), and economic factors.
- A report explaining the budgetary treatment of Fannie Mae and Freddie Mac, including the federal government's control of those government-sponsored entities (GSEs) in conservatorship, the types of estimates CBO prepares for federal credit programs, the rationale for CBO's use of fair-value accounting for the GSEs, the differences between fair-value estimates and estimates done under procedures for FCRA, and the implications of the budgetary treatment of the GSEs.
- An appendix in CBO's report on taxes' effect on the incentive to invest in intangible assets that explains how the agency defined intangible assets and estimated their value.

Nearly all cost estimates include a section describing the basis of the estimate. For example, among ones done this year, an estimate for America's [Water Infrastructure Act of 2018](#) (S. 2800) described how CBO estimated the pace at which the funds appropriated for certain projects would be spent, using information from the U.S. Army Corps of Engineers about when construction for each project could begin, how long the project would take to complete, and what funding would be necessary to complete it over the anticipated construction period. Another example, an estimate for the [Long-Term Care Veterans](#)

[Choice Act](#) (H.R. 5693), described how CBO estimated the number of people eligible for certain programs and the cost per person for the services provided.

### Technical Information

In several technical documents this year, CBO has explained its methods for macroeconomic analysis:

- The process for producing the agency's 10-year economic forecast, including background analysis, a series of preliminary forecasts using the agency's large-scale macroeconometric model (which combines the forecasts of underlying inputs to produce forecasts of the macroeconomic variables of interest), and several rounds of internal and external review.
- The methodology used for projecting labor force participation rates, built from estimates for age-sex-education-race/ethnicity subgroups.
- The steps for estimating and projecting the economy's maximum sustainable output, including data sources, analytical methods, and modeling framework that the agency uses.
- The key methods used to estimate the macroeconomic effects of the 2017 tax act, including how CBO synthesizes information from previously published research on investment, labor supply, consumption, inflation, and interest rates.
- The model that CBO uses to estimate investment by businesses (consisting of private purchases of equipment, structures, and intellectual property products, as well as the change in business inventories), which is a crucial part of the agency's economic forecast—including explanations of the conceptual framework underlying the model, recent modifications, comparisons with other models of investment, and the model's functioning within CBO's primary forecasting model for the economy overall.

The agency also has prepared technical documents describing its methods for other types of analysis:

- A paper about how cuts to pension benefits and reductions in current pay caused by higher contributions by employees affect retention, examining changes in resignation rates, retirement rates, and job tenure.

- A methodological appendix to the report on the distribution of household income, describing the units of analysis, data, income measures, incidence of federal taxes, adjustments to income to account for household size, and changes in CBO's distributional analyses over time.
- A methodological appendix to the report on the distribution of federal support for students pursuing higher education, describing sources of data, the measure of household income, income groups, the allocation of education spending to households, the allocation of tax expenditures to households, interactions among provisions, and the sensitivity of the analysis to alternative assumptions.
- A paper about how CBO adjusts for survey underreporting of transfer income in its distributional analyses, describing how the agency estimates probabilities that people receive transfer income and then imputes recipients on the basis of those probabilities so that the total number of people receiving a transfer in the model matches the number of recipients recorded in administrative data.
- A slide deck about modeling the subsidy rate for federal single-family mortgage insurance programs, describing how the model uses information on home prices, interest rates, unemployment rates, mortgage originations, insurers' market shares, and mortgages' characteristics.
- A paper surveying the available economics literature on state and local governments' use of federal grants for transportation infrastructure to substitute for some spending they would have undertaken using nonfederal funds and suggesting further analysis to clarify the size of that substitution effect.
- A methodological appendix to a report on the operating costs for aging Air Force aircraft, explaining two models used: a simple model that looks for a correlation between operating costs per flying hour and the average age of the fleet and an enhanced model that adds the size of the Air Force's total budget as an independent variable.
- A methodological appendix to a report on federal support for financing state and local transportation and water infrastructure, explaining CBO's modeling

of the federal tax revenues forgone on tax-exempt bonds—covering bond volumes, the types of revenues affected, the interest rates on taxable bonds, and the average tax rate of market-clearing investors and providing an illustrative calculation of federal costs.

In addition, the agency has provided computer code related to two of its papers on these topics:

- [Historical estimates of maximum sustainable output](#) (allowing researchers to replicate CBO's estimates for 1949 to 2016).
- [Survey underreporting](#) (enabling researchers to replicate CBO's imputations for 1979 to 2016 for three of the largest means-tested transfer programs: Medicaid and the Children's Health Insurance Program, the Supplemental Nutrition Assistance Program, and the Supplemental Security Income program).

CBO also has published a [blog post](#) about estimating the long-term effects of federal R&D (research and development) spending on economic outcomes, which explained the agency's current approach and identified areas where additional research would be especially beneficial. For example, the agency identified a need for more information on the average amount of time that will elapse before different types of R&D spending translate into viable commercial products that affect economic output.

### Releasing Data in 2018

In 2018, CBO has provided many files of data underlying the analysis for its major reports and other studies. The agency maintains a [page](#) on its website with links to releases of data made over many years. Such detail demonstrates the underpinnings of key projections.

Files on these topics were posted on the website with the April 2018 report on the budget and economic outlook:

- [10-year budget projections](#) of spending and revenues by category and of deficits and debt held by the public.
- [Historical budget data](#) about revenues, outlays, and the deficit or surplus since 1965.

- 10-year projections of balances and deficits or surpluses for Social Security, Medicare, military retirement, civilian retirement, and other trust funds.
- Revenue projections by category, with additional detail about the calculation of adjusted gross income, taxable income, and income tax liability.
- Spending projections by budget account, showing budget authority and outlays, organized by Treasury identification number (followed by an update in May).
- Tax parameters and effective marginal tax rates on labor and capital, used in CBO’s microsimulation tax model and economic forecast, respectively.
- 10-year projections of output, prices, labor market measures, interest rates, income, and other economic factors. (A more recent version of that file was released with an updated assessment of the economic outlook.)
- Data about the economy’s maximum sustainable output, with additional data about the natural rate of unemployment (the rate that arises from all sources other than fluctuations in the economy) and related measures of the labor supply, capital services, and productivity. (A more recent version of that file was also released with the updated assessment of the economic outlook.)

CBO also maintains a page on its website with details about baseline projections for selected programs over many years. In April 2018, the agency published 20 files with such information underlying its 10-year budget projections.

Those files include ones on health and education programs:

- The Pell grant program, with projections for the program’s three sources of funding: discretionary budget authority, which provides the largest portion and supports a maximum award set in the annual appropriation act; mandatory budget authority, which is specified in the Higher Education Act; and a “mandatory add-on,” which is automatically added, on the basis of a formula, to the discretionary portion of each award.

- Student loan programs, with cost projections for each associated budget account using estimating procedures established in FCRA, projections of loan volume and subsidy rates for direct student loans using those procedures, estimates of administrative costs, projections of interest rates for borrowers, and cost projections for the programs using fair-value estimating procedures.
- Medicare, with projections of the components of mandatory outlays, the components of benefit payments, annual growth rates, payment updates and changes in price indexes, enrollment, the status of the Hospital Insurance trust fund, and offsetting receipts.

The files also include ones on Social Security and pensions:

- The military retirement program, including projections of the number of beneficiaries and average annual benefits for retirees and surviving spouses and dependents of deceased service members.
- The Pension Benefit Guaranty Corporation, including projections of premiums, interest receipts, and outlays for the single-employer program and the multiemployer program, as well as administrative costs.
- The Social Security Disability Insurance program, with projections of the number of beneficiaries, the average monthly benefit, the average wage for indexing, the maximum amount of earnings that is taxable, the cost-of-living adjustment, and other factors.
- The Social Security Old-Age and Survivors Insurance program, with projections of the number of beneficiaries and the average monthly benefit for retired workers and families and for surviving spouses and dependents—along with the average wage for indexing, the maximum amount of earnings that is taxable, the cost-of-living adjustment, and other factors.
- The trust funds for Social Security, with projections of outflows for benefits and other costs and for income from payroll taxes, interest, and other sources.

The files also cover other income security programs:

- Child nutrition programs, including projections of the consumer price index for food away from home and of budget authority for the National School Lunch Program, the School Breakfast Program, the Child and Adult Care Food Program, the procurement of commodities, the Summer Food Service Program, state administrative expenses, and other spending.
- Child support enforcement and collections, including projections of administrative costs, incentive payments, and other payments—as well as collection amounts.
- Foster care and adoption assistance programs, including projections of outlays for maintenance, administration, training, and other costs—along with average monthly caseloads.
- The Supplemental Nutrition Assistance Program, with projections of total benefit amounts and details about administrative costs—as well as information on average monthly participation, average monthly benefits, changes in the cost of the Thrifty Food Plan, and the unemployment rate.
- The Supplemental Security Income program, including projections of the number of beneficiaries who are aged, blind, or disabled adults and who are blind or disabled children and information on the number of awards and average monthly benefits for those groups.
- The Temporary Assistance for Needy Families program, including projections of budget authority for State Family Assistance Grants, grants related to marriage and fatherhood, and other types of assistance.
- The unemployment compensation program, with projections of regular benefits, extended benefits, and trade adjustment assistance—and data on the number of people receiving first payments, average weekly benefits, the average duration of benefits, the number of people in the labor force, and the unemployment rate.
- The Department of Agriculture’s mandatory farm programs, including projections of outlays for crop insurance, conservation programs, disaster assistance, and assistance from the Commodity Credit Corporation account and related accounts—along with the supply of and outlays related to corn, soybeans, wheat, upland cotton, rice, peanuts, sorghum, barley, oats, sunflower seed, canola, flaxseed, safflower, mustard seed, inedible rapeseed, cotton, dry field peas, lentils, and large and small chickpeas.
- Federal programs that guarantee mortgages, including projections of the budgetary effects of the activities of Fannie Mae and Freddie Mac, the Federal Housing Administration’s Mutual Mortgage Insurance program, the home loan program for veterans, and the Government National Mortgage Association’s mortgage-backed securities program, accompanied by estimates of the value of annual loans and subsidy rates.
- Programs funded by the highway trust fund, including projections for the fund’s highway and transit accounts, with the start-of-year balances, revenues and interest, outlays, and cumulative shortfalls.
- Benefits for veterans and military personnel stemming from the Post-9/11 GI Bill, including projections of the number of beneficiaries and the average annual payments.
- Veterans’ disability compensation and pension programs, including projections for each program of the number of beneficiaries and the average annual benefits, both for veterans and for surviving spouses and dependents.

Two files were posted with the 2018 report on the long-term budget outlook, providing these details:

- Long-term budget projections, with parameters used in the macroeconomic model, data about demographic and economic factors, labor force participation rates by age group and sex, information about trust funds, and other details.
- Projections underlying Social Security estimates, with data about covered workers; covered and

And the files cover some other programs:

taxable earnings; Old-Age, Survivors, and Disability Insurance beneficiaries; cost and income rates; immigration and emigration; fertility rates; mortality rates; population; average interest rates; mortality improvements by age group; and labor force participation rates.

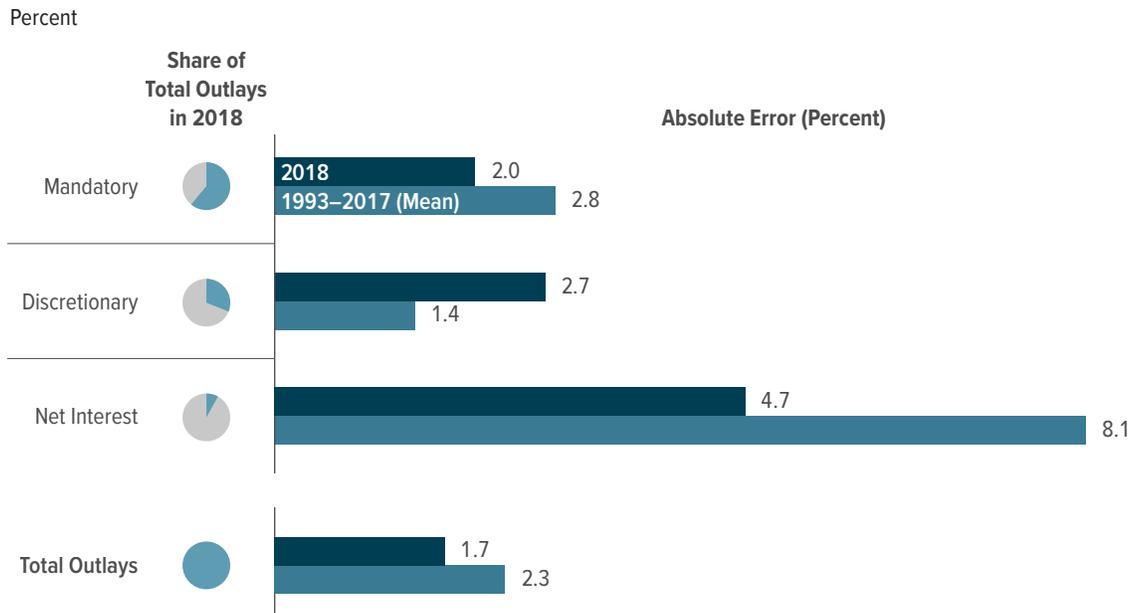
Another set of files was posted with the report analyzing the President's budget request for 2019. Those files provide estimates of the budgetary effects of specific proposals that would affect agriculture, child support, education, health programs, the highway trust fund accounts, Medicare, mortgage programs, the Pension Benefit Guaranty Corporation, Social Security, Supplemental Security Income, special immigrant visas, the Supplemental Nutrition Assistance Program, Temporary Assistance for Needy Families, and unemployment compensation. Also released with that report was a file providing updated spending projections by budget account.

In 2018, supplemental data have also accompanied several other analyses:

- Data describing over 1,500 expired and expiring authorizations of appropriations, including the amounts of funding authorized and appropriated, the expiration dates of those authorizations, and the relevant statutory authorities.
- Data about 79 federal credit programs, including projections for direct loans and loan guarantees of subsidies, risk parameters, and loan characteristics. (A file with similar data for the previous year was also posted.)
- Historical data about the distribution of income in 2014, including, for four household types and numerous income groups, estimates of demographics, average household income, components of income before transfers and taxes, components of means-tested transfers, components of federal taxes, means-tested transfer rates, federal tax rates, shares of household income, shares of means-tested transfers, and shares of federal taxes owed.
- Data on personnel per unit, costs per unit, and number of units for each type of major combat unit in the U.S. military's force structure—such as National Guard infantry brigade combat teams, attack submarines, and F-16 fighter aircraft squadrons.
- Historical data about enrollment in and spending for Medicaid managed care by state, including information about which states had various types of such managed care and—for states that had general comprehensive managed care organizations—whether those programs were statewide or regional and which eligibility groups and services the programs covered.
- Data about adjustments for survey underreporting of transfer income, including the total number of recipients and benefit amounts for means-tested transfers and for Medicare.
- Budget projections under CBO's extended baseline and alternative scenarios for fiscal policy.
- Data supplementing CBO's long-term projections for Social Security presented in the *Long-Term Budget Outlook*.
- Detailed tables on public spending on transportation and water infrastructure to supplement a slide deck on the topic.
- A crosswalk between the Department of Defense's data on funding for overseas contingency operations and CBO's presentation of the information and a useful source document from the department providing a detailed description of relevant appropriations between 1950 and 1979.
- Additional information beyond what is included in a slide deck on the distribution of household income in 2015 and additional data for researchers, specifically, a zipped archive of comma-separated values files containing the supplemental data with household rankings based on alternative income definitions and with each ranking disaggregated by household type.
- Detailed information about how taxes affect the incentive to invest in intangible assets, including the parameters of CBO's model, comparisons with previous estimates by the agency, effective tax rates by industry and at the entity level, and estimates of debt-financed shares of investment by industry and form of organization.

Figure 2.

**Projection Errors for Total Outlays and the Share of Total Outlays, by Category of Spending**



Source: Congressional Budget Office.

The mean absolute error is the arithmetic average of the projection errors without regard to whether they are positive or negative, so errors in different directions do not offset one another. CBO calculated projection errors by subtracting the actual outlay amount from the projection and dividing that difference by the actual outlay amount.

The mean absolute errors are based on budget-year projections for 1993 to 2017. The 2018 projection was in the June 2017 baseline (and has been adjusted for subsequent legislation). The budget year is the second year of the baseline projection period, which usually begins several months after a baseline is released.

The estimated budgetary effects of legislation enacted after the projections were produced and outlays related to the activities of Fannie Mae and Freddie Mac (which are classified as mandatory) are excluded from the errors.

Many documents this year have included figures illustrating key points, and the data underlying the figures in each document were posted along with the reports. Those reports have analyzed a 355-ship naval fleet, the accuracy of CBO’s outlay estimates, the budget and economic outlook, the distribution of federal support for students pursuing higher education, the distribution of household income in 2014, the updated economic outlook, federal aid for postsecondary students, federal subsidies for health insurance coverage for people under age 65, the growth of Medicaid managed care, labor force participation of people ages 25 to 54, the long-term budget outlook, the maintenance of combat aircraft, the President’s 2019 budget, ship reactivations, survey underreporting of transfer income, the deficit reductions necessary to meet various targets for federal debt, transitioning to alternative structures for housing finance, the operating costs of aging Air Force aircraft, reducing

primary deficits, public spending on transportation and water infrastructure, federal support for financing state and local transportation and water infrastructure, the Navy’s fiscal year 2019 shipbuilding plan, funding for overseas contingency operations and its impact on defense spending, and the distribution of household income in 2015.

**Analyzing the Accuracy of CBO’s Estimates in 2018**

This year, CBO released two broad analyses describing how the agency’s projections compared with actual outcomes. The first of those focused on the accuracy of CBO’s March 2016 outlay projections for fiscal year 2017 and the second, on CBO’s June 2017 baseline estimates (for federal spending, revenues, and the deficit) for fiscal year 2018 (see Figure 2). The reports were based on assessments that the agency has conducted internally

for decades to identify ways to improve its analysis. They also built upon periodic reports issued in prior years.

In *Federal Subsidies for Health Insurance for People Under Age 65: 2018 to 2028* (on pages 25 to 27), CBO compared projections for 2017 published in March 2016 and September 2017 with actual amounts for 2017. That analysis was a continuation of CBO's past work with the staff of the Joint Committee on Taxation (JCT) comparing the projections with actual enrollment and costs reported by the Administration, state governments, and surveys.

The April 2018 data file about revenue projections (mentioned above) included—for 1982 through 2017—differences between CBO's projections and the actual amounts of total revenues, gross domestic product (GDP), and revenues as a share of GDP.

In *A Review of CBO's Estimate of the Effects of the Recovery Act on SNAP*, the agency reported on how accurate its estimates of outlays for the American Recovery and Reinvestment Act of 2009 (enacted to respond to significant weakness in the economy) were—both in total and for individual years and programs. Among the various estimates, the one related to the Supplemental Nutrition Assistance Program accounted for a larger share of the overall difference between estimates and actual spending under the legislation from 2009 and 2013. Consequently, the report focused on and analyzed that estimate.

### Comparing Current Estimates With Previous Ones in 2018

In several of its recurring publications, CBO explained the differences between this year's projections and last year's, including its reports about the budget and economic outlook, the updated economic outlook, federal subsidies for health insurance, the long-term budget outlook, the tax burdens on investments, and the long-term outlook for Social Security. The explanations provide insight into the agency's methods by indicating why changes occurred. In addition, some cost estimates exemplified CBO's practice of examining legislative provisions that have been analyzed in previous cost estimates and explaining the extent to which the provisions and estimates are similar to or different from the earlier ones.

In an appendix to *The Budget and Economic Outlook: 2018 to 2028*, CBO explained the differences between the agency's current projections and those it published last year, separating those changes into three types: legislative changes, which result from the enactment of new laws and generally reflect the budgetary effects reported in CBO's cost estimates at the time the new laws were enacted; economic changes, which stem from the agency's updated economic forecast (and include the effects of macroeconomic feedback associated with legislative changes); and technical changes, which are updates to projections for reasons other than legislative or economic changes. (Such differences also were noted when CBO adjusted its budget projections in conjunction with releasing its analysis of the President's budget [on pages 11 to 12]).

In *The Budget and Economic Outlook: 2018 to 2028* (on pages 33 to 39), the agency explained the reasons for changes to its economic forecast since last year's. The revisions arose from changes in fiscal policies, economic conditions, methodology, and the available economic data.

In *An Update to the Economic Outlook: 2018 to 2028* (on page 16), the agency explained the reasons for changes to its economic forecast since the one done earlier this year. The update incorporated a revised path for discretionary spending as well as new data on financial markets and information from other forecasters about interest rates.

In *Federal Subsidies for Health Insurance for People Under Age 65: 2018 to 2028* (on pages 20 to 25), CBO explained the reasons for changes in the estimates of insurance coverage and subsidies since the estimates done last year. The changes stemmed mainly from the following: effects of eliminating the individual mandate penalty (including revised methods for estimating those effects); updated projections of premiums in the nongroup market to account for how insurers and state insurance commissioners reacted to the lack of a direct appropriation for cost-sharing reductions; effects of two proposed regulations that would expand association health plans and short-term, limited-duration insurance; an extension of the Children's Health Insurance Program; new data about per capita costs in Medicaid; an updated assessment of administrative data and data from surveys of households and employers about employment-based

coverage; and new data showing less reported liability related to penalty payments from employers.

In an appendix to *The 2018 Long-Term Budget Outlook*, CBO explained the differences between the agency's current projections and those it published last year. The agency reviewed the reasons for changes in spending for Social Security, major health care programs, other programs, and interest. CBO also discussed the reasons for changes to revenues and to Social Security's long-term finances.

In *The Distribution of Household Income, 2014* (on pages 33 and 34), CBO explained how its current estimates differ from those in previous reports. For the most recent edition of the report, the agency changed the measure of household income to capture income before transfers and taxes and thereby provide a basis for separately assessing the effects of those transfers on the distribution of income. CBO also improved its estimates of income from means-tested transfers for the period examined in the report, which spans from 1979 to 2014.

Extending the analysis in a 2014 CBO report, in which the agency calculated the tax burden on income from investments in tangible assets (that is, assets whose value is derived from physical attributes), *How Taxes Affect the Incentive to Invest in New Intangible Assets* presented CBO's calculations of the tax burden on investments in intangible assets (or assets that do not derive their value from physical attributes, such as software, chemical formulas arising from research and development, and literary works).

In *CBO's Long-Term Social Security Projections: Changes Since 2017 and Comparisons With the Social Security Trustees' Projections*, the agency updated its projections of the Social Security system's finances to incorporate newly available data and information from the research community and updated its models to incorporate improvements in methods and feedback on its analytical approach.

Cost estimates often identify bills for which similar or related estimates have been issued. The cost estimate for the Caring for Our Veterans Act of 2017, for example, explains (on page 22) which sections of the act were similar to legislation that CBO had previously analyzed and how the estimated costs for those sections were the same as those the agency had previously reported.

## Comparing CBO's Estimates With Those of Other Organizations in 2018

CBO regularly makes comparisons with the budget projections of the Administration, but opportunities for comparisons with other organizations are rare, in part because many other organizations do not focus on federal costs. In contrast, the agency always has the chance to make comparisons with the economic projections of private forecasters and other government agencies, and sometimes to make comparisons with their policy analyses. (Some of those comparisons are discussed with Congressional staff when time does not allow for preparing a formal presentation.) CBO's estimates can differ from others' because of differences in the policies considered, the data used, the interpretation of research findings, the analytical approaches, and other reasons.

In its report analyzing the President's budget request for 2019, CBO estimated that the deficits occurring under the President's proposals would be larger than the Administration projected. Nearly all of that difference arose because the Administration projected higher revenue collections—stemming mainly from a projection of faster economic growth. CBO and the Administration used different economic forecasts, reflecting differences in projections of economic activity under current law and of economic effects of the Administration's proposals.

In *Federal Subsidies for Health Insurance for People Under Age 65: 2018 to 2028* (on page 11), CBO and JCT compared their assessment of the effects of the rules for association health plans and short-term, limited-duration insurance with other published analyses. Comparing results was difficult because the policy scenarios evaluated were different. One outcome that was straightforward to compare was the effect of the rules on premiums for the small-group and nongroup plans that comply with current regulations governing those markets. For that measure, CBO's estimate of the increase in premiums accorded with most other published estimates but was smaller than the increase estimated by the Chief Actuary for the Centers for Medicare & Medicaid Services. Similarly, CBO's estimate of the number of enrollees in association health plans was similar to other estimates. For the regulation on short-term, limited-duration insurance, different analyses have reported very different measures, but most have reported the number of people leaving nongroup plans that comply with the current regulations governing that market. On that measure,

Table 1.

**Assorted Estimates of the Effects of the 2017 Tax Act on the Level of Real GDP**

Percent

	First Five Years					Tenth Year	Average		
	2018	2019	2020	2021	2022	2027	2018–2022	2023–2027	2018–2027
Moody's Analytics	0.4	0.6	0.2	0.1	0.0	0.4	0.3	0.3	0.3
Macroeconomic Advisers	0.1	0.3	0.5	0.6	0.6	0.2	0.4	0.5	0.5
Tax Policy Center <sup>a</sup>	0.8	0.7	0.5	0.5	0.5	*	0.6	0.3	0.5
International Monetary Fund	0.3	0.9	1.2	1.2	1.0	-0.1	0.9	0.3	0.6
Joint Committee on Taxation	–	–	–	–	–	0.1 to 0.2	0.9	0.6	0.7
<b>Congressional Budget Office</b>	<b>0.3</b>	<b>0.6</b>	<b>0.8</b>	<b>0.9</b>	<b>1.0</b>	<b>0.6</b>	<b>0.7</b>	<b>0.8</b>	<b>0.7</b>
Goldman Sachs	0.3	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.7
Tax Foundation	0.4	0.9	1.3	1.8	2.2	2.9	1.3	2.9	2.1
Penn Wharton Budget Model	–	–	–	–	–	0.6 to 1.1	–	–	–
Barclays	0.5	–	–	–	–	–	–	–	–

Sources: Congressional Budget Office and the organizations listed above.

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

GDP = gross domestic product; – = not available; \* = between -0.05 percent and zero.

a. Values are for fiscal years.

CBO and JCT's estimate was significantly higher than the Administration's estimate accompanying the proposed rule but lower than estimates in other published analyses.

In *The Budget and Economic Outlook: 2018 to 2028* (on pages 39 to 41), CBO compared its forecast with the range of forecasts from about 50 private-sector forecasters and 15 forecasts from the Federal Reserve system. CBO's projections suggested a stronger outlook in the near term for output growth, inflation, and unemployment than did most of those other forecasts. CBO's projections differed from those of other forecasters for a variety of reasons. For example, other forecasts may not have included all of the economic effects of the federal tax and spending legislation enacted in late 2017 and early 2018, which, in CBO's projections, boosted economic growth and interest rates and lowered the unemployment rate. Also, other forecasts may have incorporated expectations about future fiscal policies that differed from CBO's assumption that current laws generally remain unchanged. Differences in the economic data available when the forecasts were prepared and differences in the economic and statistical models used also might have accounted for the discrepancies. Outside forecasters may have assumed a stronger link between inflation and slack in the labor market, for example, than CBO did, which

could explain why inflation was lower in CBO's forecast than it was in other forecasts.

In *The Budget and Economic Outlook: 2018 to 2028* (on page 117), CBO compared its estimates with those of other organizations that had assessed the economic effects of the 2017 tax act (see Table 1). The forecasts varied, but most showed increases in the level of real (inflation-adjusted) GDP over the first few years and a more moderate increase by 2027.

In *An Update to the Economic Outlook: 2018 to 2028* (on pages 16 to 20), the agency again compared its forecast with the range of forecasts from about 50 private-sector forecasters and 15 forecasts from the Federal Reserve system. All in all, CBO's projections suggested a stronger outlook in the near term for output growth, inflation, and unemployment than did many private-sector forecasters'. Compared with projections by Federal Reserve officials, CBO's suggested a stronger economic outlook for 2018, a similar outlook for 2019, and a weaker outlook for 2020 and the longer term.

In *An Analysis of the Navy's Fiscal Year 2019 Shipbuilding Plan*, CBO provided its estimates of the particulars of the Navy's plan and compared them with the service's,

including calculations for the planned inventory, purchases, deliveries, and retirements of the ships in its fleet for the next 30 years.

In *CBO's Long-Term Social Security Projections: Changes Since 2017 and Comparisons With the Social Security Trustees' Projections*, the agency described how much of the difference between CBO's projection of the 75-year actuarial balance and that of the trustees is explained by differences in projections of four major inputs into estimates of the system's finances: the population; the earnings subject to the Social Security payroll tax; real interest rates; and the key components of nominal GDP growth—labor force participation rates, productivity growth, inflation, and the unemployment rate.

### Estimating the Effects of Policy Alternatives in 2018

CBO's baseline budget projections—which are constructed in accordance with provisions of law—are intended to show what would happen to federal spending, revenues, and deficits if current laws generally remained unchanged. To assist policymakers and analysts who may hold differing views about the most useful benchmark for considering possible changes to laws or who may wish to assess the effects of differing policies, CBO estimates how some alternative assumptions about future policies would affect budgetary projections. Estimating the effects of policy alternatives also promotes understanding of why and how estimates can differ and how large the effects of the alternatives might be.

In *The Budget and Economic Outlook: 2018 to 2028* (on pages 88 to 92), the agency separately reported the effects of providing emergency nondefense funding at the average historical amount, increasing discretionary appropriations at the rate of inflation after 2018, freezing discretionary appropriations at the 2018 amount, extending certain provisions of the 2017 tax act, extending expensing of equipment and property at a rate of 100 percent, repealing certain postponed or suspended health taxes, and extending other expiring revenue provisions. That analysis examined effects on the deficit and on debt service.

A report about the long-term budget outlook under alternative scenarios for fiscal policy showed how the federal budget and the nation's economy would evolve under three alternative scenarios—illustrating the effects of three different ways to maintain certain policies currently in place. In the first scenario, current law is

changed to maintain those policies—including extending the individual income tax provisions of the 2017 tax act that are scheduled to expire in 2026—and to provide more typical amounts of annual emergency funding than the unusually large sum that was provided for 2018. The second scenario resembles the first scenario initially, but after 2028, revenues remain flat as a percentage of GDP, rather than growing over time. The third scenario is like the second, except that revenues remain flat relative to GDP beginning in 2018 rather than after 2028.

[An interactive tool to project the costs of customized plans for the military's forces](#) lets users add or subtract tanks, ships, aircraft, and other units. It reports the estimated effects on the Department of Defense's operation and support costs and the size of the military.

[A report comparing scenarios for the nation's naval force](#) explored differences in shipbuilding and operating costs, the composition and capabilities of the fleet, and effects on the shipbuilding industry. Under one alternative, the Navy would create a 355-ship fleet (the size envisioned by the service) by building more ships over the next 20 years, achieving the force goal by 2037. Under the second alternative, the Navy would construct new ships on a schedule similar to that for the first alternative and extend the service life of some large surface combatants, amphibious ships, attack submarines, and logistics ships; using that approach, the Navy would attain a 355-ship fleet sooner, in about 2028, but would not achieve the composition that the service wants until 2037. Under the third alternative, the Navy would maintain a fleet comparable in size and composition to today's fleet of 280 ships. Under the fourth alternative, the Navy's funding for procuring ships would continue at roughly its historical level.

[In a report describing the deficit reductions necessary to meet various targets for federal debt](#), CBO analyzed the reductions in the primary deficit that would be needed to meet three different debt targets over four different time frames. CBO provided scenarios under which the reductions would be constant each year and under which the reductions would grow over time.

[For a report on alternative structures for housing finance](#), CBO created illustrative transition paths that, between 2019 and 2023, would move the secondary mortgage market from dominance by Fannie Mae and Freddie Mac (which have been under the control of the federal

government since the financial crisis of 2008) to one of four alternative structures: a single, fully federal agency that would guarantee qualifying mortgage-backed securities (MBSs); a hybrid public-private market in which the government and several private guarantors would share the credit risk on eligible MBSs; a secondary market in which the government would play a very small role during normal times but would act as the “guarantor of last resort” during a financial crisis; and a largely private model in which there would be no federal guarantees in the secondary mortgage market.

CBO’s 2018 edition of its periodic collection of options for reducing the deficit presented 121 options that would decrease federal spending or increase federal revenues over the next 10 years, most of them by \$10 billion or more. The options in the report came from various sources. Some were based on proposed legislation or on the budget proposals of various Administrations; others came from Congressional offices or from entities in the federal government or in the private sector.

### Characterizing Uncertainty Surrounding Estimates in 2018

CBO’s budget and economic projections reflect the middle of a range of outcomes under a given set of policies. CBO’s analysts often test the sensitivity of their projections to identify the range of possible outcomes for those projections and to observe the way that projections change as factors vary. Likewise, in its cost estimates, CBO aims to produce estimates that generally reflect the middle of a range of the most likely budgetary outcomes that would result if the legislation was enacted. Discussion of uncertainty helps policymakers understand the factors that might cause estimates (or outcomes) to differ in the future.

In a report about how changes in economic conditions might affect the federal budget, CBO analyzed the effects of differences in four economic variables from the values in the agency’s current economic forecast. Those variables were (1) the growth of productivity and, consequently, the growth of real output, (2) labor force growth and, in turn, real economic growth, (3) interest rates, and (4) inflation. To accompany the report, CBO launched an interactive workbook allowing users to enter alternative economic scenarios and obtain the budgetary results. Scenarios can be entered for productivity growth, labor force growth, interest rates, or inflation. The user can then see estimates of revenues, several types of spending,

and deficits and compare them with CBO’s baseline budget projections. The estimates shown in the workbook are simplified approximations of the results that CBO’s broad set of economic and budget models would yield.

The report about the long-term budget outlook under alternative scenarios for fiscal policy showed estimates of likely ranges of effects on inflation-adjusted income per person and on interest rates. The central estimates and ranges reflected alternative assessments of two factors: how much deficits crowd out investment in capital goods such as factories and computers (because a larger portion of private saving would be used to purchase government securities) and how much people respond to changes in after-tax wages by adjusting the number of hours they work. The ranges of values stemmed from research on those variables; each range was intended to cover roughly the middle two-thirds of the likely values for the variable. To calculate the ranges of estimates for the effects of each set of fiscal policies, CBO used the ranges of values for each variable. To calculate the central estimates, it used values for the variables at the midpoints of those ranges.

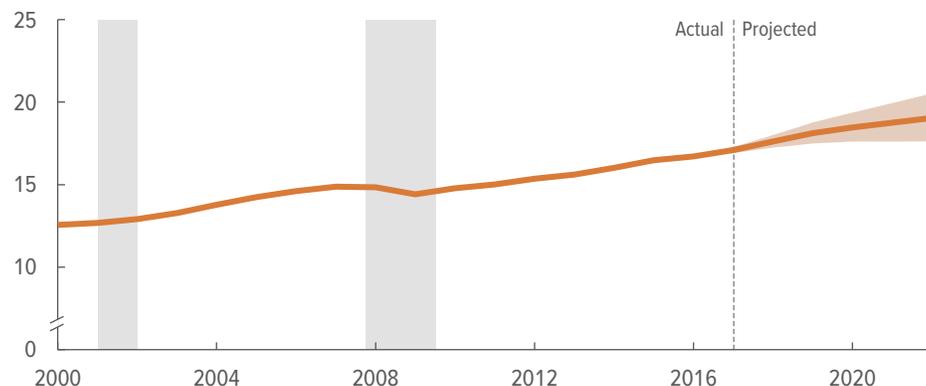
In *The Budget and Economic Outlook: 2018 to 2028*, the agency discussed the uncertainty surrounding the projections of spending, revenues, and the 2017 tax act (on pages 62, 78, and 129 to 130, respectively). CBO calculated the average amount that past spending and revenue projections had differed from actual amounts to put the current projections in context. For the 2017 tax act, the agency was uncertain about various issues—for example, the way the act would be implemented by the Treasury Department; how households and businesses would rearrange their finances in the face of the act; and how households, businesses, and foreign investors would respond to changes in incentives to work, save, and invest in the United States.

In that same report (*The Budget and Economic Outlook: 2018 to 2028* [on pages 32 and 33]), the agency also explained how the extent of recent changes in fiscal policy added uncertainty to its economic projections throughout the forecast period. In the long term, key determinants of growth, such as the labor force, the capital stock (equipment, structures, intellectual property products, and inventories), and productivity, could evolve much differently than projected. In the near term, many developments, including changes in consumers’ or businesses’ confidence or in international conditions and trade agreements, could make economic outcomes

Figure 3.

### The Uncertainty of CBO's Projections of Real GDP

Trillions of 2009 Dollars



In CBO's baseline projections, **real GDP** grows at an average annual rate of 2.2 percent over the 2018–2022 period—but there is a roughly two-thirds chance that the growth would be between 0.8 percent and 3.5 percent.

Sources: Congressional Budget Office; Bureau of Economic Analysis.

Real values are nominal values that have been adjusted to remove the effects of inflation. The shaded area around CBO's baseline projection of real GDP is one way to illustrate the uncertainty of that projection. The area is based on the errors in CBO's one-, two-, three-, four-, and five-year projections of the average annual growth rate of real GDP for calendar years 1976 through 2017.

The vertical bars indicate recessions, which extend from the peak of a business cycle to its trough.

GDP = gross domestic product.

differ significantly from CBO's projections. To roughly quantify the degree of uncertainty in its projections for the next five years, CBO analyzed its past forecasts of the growth rate of real GDP (see Figure 3).

In *An Update to the Economic Outlook: 2018 to 2028* (on pages 14 to 16), the agency again discussed uncertainty in the economic forecast. That uncertainty stemmed in part from several uncertain estimates of the effects of recent changes to fiscal policy and from recently implemented changes to trade policies (and proposals calling for further changes).

In *Federal Subsidies for Health Insurance for People Under Age 65: 2018 to 2028* (on pages 19 and 20), CBO and JCT discussed the uncertainty surrounding the estimates. If national economic trends diverged from CBO's economic forecast, for example, that would alter the number of people offered insurance by their employers, as well as the number of people eligible for Medicaid or coverage through the marketplaces. Another source of uncertainty was the extent to which the emergence and adoption of health care technology could raise or lower costs.

In *The 2018 Long-Term Budget Outlook* (on pages 23 to 25), CBO examined how much federal debt would be higher or lower than estimated in the agency's extended baseline if rates of labor force participation, productivity growth, interest on federal debt, and health care cost growth were higher or lower than projected. The degree of variation in those rates was based on CBO's assessment of historical movements and on possible future developments.

In the report on federal support for financing state and local transportation and water infrastructure, CBO compared estimated federal costs of various financing mechanisms and tested the sensitivity of its estimates by examining how the estimates would change with different values for several factors: average marginal tax rates for different types of investors who hold tax-exempt bonds; interest rates on Treasury bonds, tax-exempt bonds, and loans from state banks; and the required matching ratio of state funds to federal funds used to capitalize state banks.

In the report analyzing the Navy's fiscal year 2019 shipbuilding plan, CBO explained how much of the difference between the agency's and the service's estimates

stemmed from uncertainty about the design and capabilities of large ships being built 10 or 20 years from now—especially for two large shipbuilding programs in the 2030s and 2040s.

A section of a cost estimate for the Agriculture and Nutrition Act of 2018 (on page 20) provides an example of how factors creating uncertainty were discussed in some analyses of proposed legislation. The section explained how the estimates for commodity support programs were particularly sensitive to changes in commodity prices and production, which were sensitive to changes in weather and markets, especially trade. The estimates for nutrition programs were particularly sensitive to how, and how quickly, the states would implement the policies regarding work requirements, child support, and categorical eligibility. Changes in the state of the economy, especially inflation and unemployment, could also affect the estimates.

### Creating Data Visualizations in 2018

To make CBO’s projections easier to understand, the agency has published slide decks this year on these topics:

- **The budget**, presenting the outlook for revenues, spending, deficits, and debt.
- **The economy**, presenting the outlook for the labor market, inflation, interest rates, and the growth of economic output, personal consumption, business investment, government purchases, residential investment, and imports and exports.
- **The long-term outlook for the budget**, including the size of the changes in spending and revenues needed under different scenarios to put the budget on a sustainable path.

In two instances this year, CBO presented updates of recurring work as slide decks rather than traditional reports. That was the approach for the analyses of public spending on transportation and water infrastructure and of the distribution of household income in 2015.

In three other instances, reports by the agency took the form of chart books, which present their information visually, principally through a series of exhibits. One of those reports depicted the factors affecting the labor force participation of people ages 25 to 54. It explained

changes in participation rates (by demographic characteristic), such changes stemming from economic conditions and fiscal policies, and reasons people do not participate in the labor force. Another of those reports explored the growth of Medicaid managed care. CBO described the various types of managed care plans, the spending on such plans, variation among states’ use of them, and changes in the use of managed care over time. And the other report explained the funding that agencies have received for international affairs activities, both within their base budget for ongoing activities and outside of that budget, and discussed the use of that “nonbase” funding for base-budget activities.

CBO has also published four infographics on these topics:

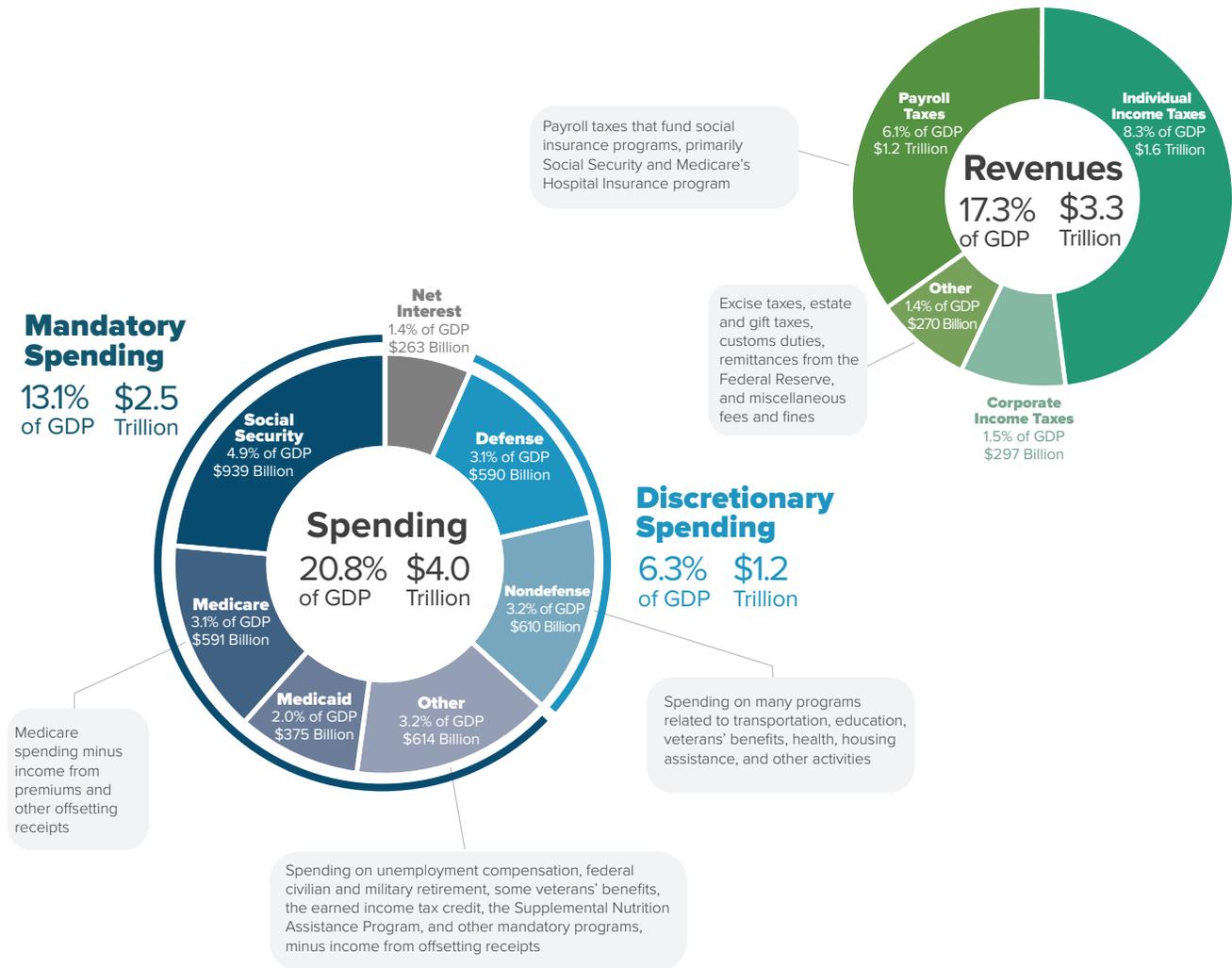
- **The federal budget**, describing the categories of the budget (see Figure 4) and presenting the trends in deficits and debt.
- **Revenues**, showing changes over time for the sources of revenues—individual income taxes, payroll taxes, corporate income taxes, and other taxes—and presenting details about those categories.
- **Mandatory spending**, showing changes over time for categories of such spending—such as major health care programs, Social Security, and income security—and presenting details about spending within those categories.
- **Discretionary spending**, showing changes over time for defense and nondefense spending and presenting details about spending within those categories.

### Conducting Outreach in 2018

CBO’s staff communicate every day with people outside the agency to explain its findings and methods and to obtain feedback that helps it maintain and improve the quality of its work, in addition to conducting the daily gathering of information that supports its analyses. As part of its outreach, CBO consults with experts outside the organization, obtaining feedback complementing its rigorous internal review process (which involves multiple people at different levels in the organization). It also explains its work and obtains feedback when its staff give presentations to various audiences. And it works to make the information it provides more accessible, using its blog to highlight issues and experimenting with new

Figure 4.

**The Federal Budget in 2017**



Source: Congressional Budget Office.

ways to present findings in its publications and on its website.

**Direct Communication With Members and Staff**

The most important form of outreach is the direct communication between CBO and the Congress in person, by phone, and by email. The agency's Director meets regularly with Members of Congress to explain the agency's work, respond to questions, and obtain feedback.

And during the development of legislation, communication between CBO staff and Congressional staff is frequent. Often, after a major cost estimate is released,

CBO staff reach out more broadly to staff of key committees. This year, CBO began to invite a wider range of Congressional staff to participate in moderated telephone calls about particularly complex estimates, allowing them to ask questions soon after an estimate was released.

**Consultation With Outside Experts**

In 2018, CBO has continued its practice of extensive consultation with outside experts as it prepares various analytical products. As part of its regular processes of developing cost estimates and undertaking other analyses, CBO consults with numerous outside experts who represent a variety of perspectives. The experts include

professors, analysts at think tanks and consulting firms, representatives of industry groups, other experts in the private sector, and people working for federal agencies and for state and local governments. CBO obtains suggestions about whom to consult and independently seeks others so that the agency can gather information and insights from experts with varied backgrounds, training, experience, and views. (Importantly, the agency works with Congressional staff to ensure that information about a legislative proposal that they wish to keep confidential remains so during its development.) When time allows, CBO seeks external review of methodologies and draft reports. Such external review allows the agency's analyses to reflect both the consensus and diversity of views of experts from around the country.

CBO's Panel of Economic Advisers met twice this year, and its Panel of Health Advisers, once. As part of the agenda for the first meeting of the Panel of Economic Advisers, CBO requested and received feedback on its economic forecasting methods, its analysis of the effects of the 2017 tax act, its modeling of international income flows, and its modeling of inflation. Panelists and invited experts also discussed two broad issues underlying various analyses by CBO: the decline in the employment-to-population ratio and low productivity growth.

As part of the agenda for the second meeting of the Panel of Economic Advisers, CBO again requested and received feedback on its economic forecasting methods and ongoing analysis of the effects of the 2017 tax act. Other topics of discussion were the effects of new tariffs on the U.S. economy and a method for quantifying uncertainty in CBO's 10-year economic projections.

The meeting of the Panel of Health Advisers included presentations on and discussions about CBO's new health insurance model, Medicare Advantage, veterans' health care, and opioid abuse. To aid the agency's development of the health insurance model, the agency appointed a new panel, which will provide technical feedback.

When obtaining written feedback about an analysis, CBO acknowledges that assistance in a section called "About This Document" at the end of a publication. In the work released this year, a particular focus of that feedback has been on the agency's macroeconomic analyses:

- The update of the economic outlook benefited from panel members' feedback on a preliminary economic forecast. Those experts' primary affiliations were with the following organizations: the Brookings Institution; Columbia University; the D. E. Shaw Group; the Federal Reserve Bank of San Francisco; Goldman Sachs; Harvard University; Massachusetts Institute of Technology; Moody's Analytics; the Peterson Institute for International Economics; Princeton University; Stanford University; the University of California, Berkeley; the University of California, San Diego; the University of Chicago; the University of Maryland; and the University of Michigan. Other experts invited to the panel meeting were from New York University, UBS Group AG, and the University of Maryland.
- CBO's report on the budget and economic outlook benefited from panel members' feedback on last year's preliminary economic forecast. An expert invited to that meeting was from Keybridge LLC.
- The explanation of how CBO produces its 10-year economic forecast benefited from comments by analysts at Macroeconomic Advisers and Moody's Analytics.
- The explanation of the steps for estimating and projecting the economy's maximum sustainable output benefited from comments by analysts at Columbia University, the University of Maryland, and Wellesley College.
- CBO's projection of labor force participation rates benefited from comments by analysts at the Federal Reserve Bank of Chicago, the Federal Reserve Bank of San Francisco, Macroeconomic Advisers, Stanford University, and the University of Houston.
- The description of labor force participation of people ages 25 to 54 benefited from comments by analysts at the Federal Reserve Bank of Cleveland and the RAND Corporation.
- An explanation of how nominal foreign currency depreciation against the U.S. dollar affects U.S. wealth benefited from comments by analysts at the George Washington University; the University of California, Berkeley; and the University of Utah.

Other feedback was obtained on a variety of topics, from analysts at the institutions named:

- Estimates of the cost of federal credit programs—the American Enterprise Institute and the Center on Budget and Policy Priorities (along with feedback from a former staff member of the Senate Budget Committee).
- Cash and accrual measures in federal budgeting—George Mason University, the George Washington University, and the University of Maryland.
- How cuts to pension benefits and reductions in current pay (caused by higher contributions by employees) affect retention—Massachusetts Institute of Technology and Stanford University.
- The distribution of federal support for students pursuing higher education—the American Enterprise Institute and the Board of Governors of the Federal Reserve System.
- Federal aid for postsecondary students—Harvard University, Stanford University, and the University of Virginia.
- The maintenance of combat aircraft—the Congressional Research Service, CNA, and the University of Missouri.
- Comparing a 355-ship fleet with smaller naval forces—the George Washington University and the Heritage Foundation.
- Exploring the growth of Medicaid managed care—Georgia State University, the UnitedHealthcare Community Plan of New Mexico, and the University of Wisconsin.
- Private-sector prices for physicians' services—the Medicare Payment Advisory Commission, Stanford University, and Yale University.
- How, in its distributional analyses, CBO adjusts for underreporting of transfer income in surveys—the Census Bureau and the University of Chicago.
- Transitioning to alternative structures for housing finance—the Board of Governors of the Federal

Reserve System, the Massachusetts Institute of Technology, the Mortgage Bankers Association, the University of Maryland, and the Urban Institute.

- The operating costs of aging Air Force aircraft—CNA, the Institute for Defense Analyses, and RAND.
- Accounting for Fannie Mae and Freddie Mac in the federal budget—the Congressional Research Service, the Massachusetts Institute of Technology, Moody's Analytics, and the Mortgage Bankers Association.
- Federal support for financing state and local transportation and water infrastructure—Mercator Advisors; the University of Texas, Austin; and the Urban Institute.
- The analysis of the Navy's fiscal year 2019 shipbuilding plan—the Hudson Institute and the Telemus Group.
- Funding for overseas contingency operations—the Aerospace Corporation, Boeing Global Services, and the Center on Budget and Policy Priorities.
- How taxes affect the incentive to invest in new intangible assets—the University of Maryland and the University of South Carolina.

### Podcasts

This year, CBO launched a new type of product: podcasts. The debut comprised a three-part series focused on transparency. Episodes explained the function and value of cost estimates; "Budget 101," or the components of the budget, how CBO assists the budget committees, and CBO's current budget projections; and transparency efforts at the agency.

### Presentations

CBO partnered with the Congressional Research Service this year to give several presentations on Capitol Hill at which Congressional staff could learn more about CBO's work and have their questions answered:

- An overview of CBO's estimates of federal subsidies for health insurance for people under age 65 described the agency's baseline projections, recent revisions to those projections, and the analytical methods used.

- A description of CBO's process for estimating the costs of legislative proposals affecting health insurance coverage used the agency's analysis of the effects of eliminating the individual mandate for health insurance as an example.
- An explanation of CBO's 10-year economic forecast and how it is produced included a discussion of the agency's most recent forecast and of the effects of the 2017 tax act on that forecast.
- A presentation about the way CBO estimated the budgetary effects of financial legislation explained how two bills—if enacted—could affect the federal budget through costs to resolve failed financial institutions and administrative costs for federal financial regulators.
- A presentation described what CBO's baseline projections are and how they are formulated.
- How the government budgets for student loans at the Postsecondary National Policy Institute (providing an overview of how CBO estimates the costs of federal student loans under the Federal Credit Reform Act of 1990).
- Pell grants at the Postsecondary National Policy Institute (providing an overview of the program and the components of its funding).
- CBO's analyses and projections of federal health care costs at the annual meeting of the OECD Network of Parliamentary Budget Officials and Independent Fiscal Institutions (explaining how the agency uses its health insurance model and providing examples of how the agency documents its work).

Some presentations by CBO staff were about work in progress and served as vehicles to gather feedback to incorporate into subsequent products:

CBO staff also gave presentations on these topics at the venues listed:

- CBO's role in the legislative process at the Budget Line of Business 2018 Spring Forum (describing the Congressional Budget Act, CBO's products, the agency's budget and economic outlook, and ways executive branch agencies can assist CBO).
- The role of the legislature in the U.S. budget process at the annual meeting of the OECD (Organisation for Economic Co-operation and Development) Network of Parliamentary Budget Officials and Independent Fiscal Institutions (providing an overview of the budget process, the roles of the President and the Congress, and the time line for drafting a budget resolution and enacting appropriations).
- 10 things to know about CBO at the French National Assembly (reviewing the agency's role in supporting the Congress).
- Oversight of CBO at the annual meeting of the OECD Network of Parliamentary Budget Officials and Independent Fiscal Institutions (reviewing the agency's recent, current, and future efforts related to responsiveness and transparency).
- Updating CBO's health insurance model at the Bipartisan Policy Center (explaining how the model is used to help estimate the cost of proposals affecting health insurance coverage and how a new version of the model is being developed to enhance the agency's analytical capabilities).
- Exploring the growth Medicaid managed care at AcademyHealth's annual research meeting (examining the extent to which Medicaid benefits are delivered through managed care organizations and the reasons for recent growth in enrollment in and spending for managed care).
- Prices for and spending on specialty drugs in Medicare Part D and Medicaid at the conference of the American Society of Health Economists (providing information on prices [net of rebates and discounts], increases in net spending, and total net spending and out-of-pocket costs).
- The 2018 outlook for the Navy's shipbuilding at the Defense Outlook Forum (examining the costs of different ways to build a 355-ship fleet and comparing those costs with the costs of smaller naval forces).
- The operating costs and aging of Air Force aircraft at the annual conference of the Western Economic

Association (examining reasons for changes in those costs over time).

- Technical aspects of updating HISIM at the meeting of CBO's Panel of Health Advisers and in a webinar for the American Academy (explaining the role of the model at the agency, data underlying the new model, and the modeling of decisions by consumers and firms).

Other presentations were about recently completed work and afforded the opportunity for CBO staff to offer explanations, answer questions, and gather feedback to improve the quality of future related work. The presentations covered these topics at the venues or to the groups listed:

- The budget and economic outlook at a CBO press briefing, at the National Economists Club, to the Delegation of the European Union to the United States, to the trustees of the Committee for Economic Development of the Conference Board, and at the International Tax Policy Forum (presenting the agency's projections for spending, revenues, deficits, debt, and the economy).
- CBO's economic and budget projections at the NABE (National Association of Business Economics) Foundation's annual economic measurement seminar (highlighting the agency's process for developing its economic forecast and baseline budget projections and providing an overview of the current forecast and projections).
- The 2017 tax act's effects on CBO's budget and economic projections at the National Bureau of Economic Research (explaining the effects on the economy's productive capacity, on actual output in relation to the economy's maximum sustainable output, on income, and on the budget).
- Productivity and growth in CBO's forecasts at the NABE Foundation's annual economic measurement seminar (describing the agency's most recent 10-year projections of the economy's maximum sustainable output and discussing possible underlying causes for the slowdown of growth in total factor productivity, which is the growth of real output per unit of combined labor and capital services).
- Prospects for the Department of Defense's budget over the next decade at the Professional Services Council's 2018 Federal Strategic Planning Forum (explaining the Administration's goals for increasing the readiness, size, and capabilities of the military).
- Alternatives for military health care at the annual conference of the Western Economic Association (reviewing possible changes to the Department of Defense's Military Health System and discussing the effects of those changes on the federal budget, the quality of military health care, and preparedness for wartime missions).
- Approaches to making infrastructure spending more productive at the Transportation Research Board's International Transportation and Economic Development Conference (explaining how greater emphasis on particular contributions of infrastructure to productivity or different ways of allocating funds could make federal infrastructure spending more productive).
- Federal student loan and assistance programs at a meeting of the Committee for Education Funding (explaining the types and volume of loans, grants and other assistance, and estimates of costs).

### Accessibility

This year, CBO has used its blog to summarize and highlight various issues:

- The budget and economic outlook (presenting the Director's statement about CBO's report on the topic, which indicated that deficits were set to increase rapidly and that economic growth was projected to be relatively strong this year and next and then to moderate).
- The effects on the budget of alternative economic scenarios (explaining how people can use CBO's new interactive workbook to assess the sensitivity of the agency's budget projections to key inputs—showing the effects if, for example, productivity growth was 0.1 percentage point higher than it is in the agency's economic forecast).
- CBO's economic forecast, its projections of spending, its projections of revenues, its projections of deficits and debt, and the effects of the 2017 tax act on the

agency's projections (providing excerpts from *The Budget and Economic Outlook*).

- The updated economic outlook (presenting the Director's statement about CBO's report on the topic, which indicated that recent strong growth was boosted by a combination of factors, including a surge in agricultural exports, which, in CBO's view, would reverse later in the year).
- The long-term budget outlook (presenting the Director's statement about CBO's report on the topic, which indicated that if current laws generally remained unchanged, growing budget deficits would boost debt sharply in coming years).
- CBO's role and operations (presenting the main points made in oral testimony about how the agency supports the Congress).
- CBO's baseline and cost estimates (presenting the main points made in oral testimony about rules governing those endeavors).
- Cost-sharing reductions for health insurance (describing how they have been incorporated in the agency's baseline budget projections).
- Explanations of methods (highlighting how newly released interactive workbooks and computer code complement other approaches).

The agency also is making changes to its publication formats and certain pages on its website to make information easier to find. CBO began to experiment with adding an "At a Glance" section (providing brief context and key findings) at the beginning of some major publications, including the reports about federal subsidies for health insurance coverage for people under age 65, the long-term budget outlook, the distribution of federal support for students pursuing higher education, transitioning to alternative structures for housing finance, federal support for financing state and local transportation and water infrastructure, the Navy's fiscal year 2019 shipbuilding plan, funding for overseas contingency operations, taxes' effects on the incentive to invest in new intangible assets, and the costs of federal insurance programs. The agency redoubled its efforts to make content easier to find on the "Topics" pages of its website. For

example, the page about methods for analyzing health insurance coverage was updated to feature five new publications in 2018 that provide explanations. In addition, CBO added a section on its "Press Center" web page about upcoming releases, informing the Congress about key publications that are to be released during the coming week or soon thereafter. Finally, the agency pulled together on its website an ongoing list of the various transparency efforts catalogued in this document.

### Key Related Efforts in 2017 and Earlier Years

CBO's accomplishments in 2018 that are related to transparency were built upon efforts made in previous years. Throughout its history, the agency has endeavored to clearly describe its analyses. Much work of the type described in this report took place in prior years and recurred this year. And some of the agency's work explaining its methods, examining its accuracy, and conducting outreach occurred before this year and is scheduled to occur again after this year, so it is not cataloged in the preceding discussion.

The methods used this year to estimate likely ranges of effects under alternative scenarios for fiscal policy built upon past work. CBO's explanations of those methods for analyzing fiscal policy were released in seven earlier publications on these topics:

- How CBO analyzes the effects of changes in federal fiscal policies on the economy (summarizing the models used for the short term and the long term and explaining how effects on the supply of labor are integrated into the analysis),
- How CBO estimates the economic effects of fiscal policy in the short term,
- How CBO estimates the economic effects of budget deficits in the long term,
- How the tax treatment of capital income affects investment incentives,
- How the supply of labor responds to changes in fiscal policy,
- The effects of changes in after-tax wages on the supply of labor at a given point in time, and

- The effects of changes in after-tax wages on the supply of labor over a lifetime.

CBO's work this year comparing its projections with actual results built upon major efforts in previous years to look back at many years of past projections and actual

results—including reports that evaluated its economic forecasts, its revenue projections, and its outlay projections. Another key report, released last year, evaluated its projections of subsidies for health insurance under the Affordable Care Act and compared the projections with estimates by other organizations.



## About This Document

The Congressional Budget Office prepared this document in fulfillment of its requirement to report on its transparency plans. It was written by Jeffrey Kling, with contributions from Leigh Angres, Jessica Banthin, Joseph E. Evans, Jr., Kathleen FitzGerald, Sebastien Gay, Theresa Gullo, Joseph Kile, Deborah Kilroe, Leo Lex, John McClelland, T.J. McGrath, David Mosher, Sam Papenfuss, Kevin Perese, David Weaver, and Jeffrey Werling. David Wylie assisted with fact-checking.

The report was reviewed by Wendy Edelberg, Mark Hadley, and Robert Sunshine. John Skeen edited the report, and Jorge Salazar prepared it for publication. An electronic version is available on CBO's website ([www.cbo.gov/publication/54885](http://www.cbo.gov/publication/54885)).

The agency continually seeks feedback to make its work as useful as possible. Please send any feedback to [communications@cbo.gov](mailto:communications@cbo.gov).

Keith Hall  
Director  
December 2018