



Congressional Budget Office

The Economic Impact of the President's 2013 Budget

April 2012

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE APR 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012	
4. TITLE AND SUBTITLE The Economic Impact of the President's 2013 Budget				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Congressional Budget Office, Ford House Office Building, 4th Floor , Second and D Streets, SW , Washington, DC, 20515-6925				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Contents

Overview	1
How the Government’s Fiscal Policies Can Affect the Economy	2
Fiscal Policies and Output in the Short Run	2
Fiscal Policies and Output in the Long Run	3
How the President’s Budgetary Proposals Would Affect the Economy	3
Effects on the Economy Through 2017	3
Effects on the Economy After 2017	4
Economic Models and Results	8
Estimated Economic Effects and Their Budgetary Implications Through 2017	8
Estimated Economic Effects and Their Budgetary Implications After 2017	9
Comparison with CBO’s Estimate of the President’s 2012 Budget	10
Appendix: CBO’s Methodology for Analyzing the Economic Impact of the President’s 2013 Budget	13
About This Document	19
Tables	
1. Projected Deficits Under CBO’s March 2012 Baseline and CBO’s Estimate of the President’s Budget With and Without Macroeconomic Effects	2
2. CBO’s Estimates of Effective Federal Marginal Tax Rates on Capital Income	5
3. CBO’s Estimates of Effective Federal Marginal Tax Rates on Labor Income	7
4. CBO’s Estimates of How the President’s Budget Would Affect Inflation-Adjusted Gross National Product	8
5. Difference in Projected Deficits Under CBO’s March 2012 Baseline and CBO’s Estimate of the President’s Budget With and Without Macroeconomic Effects	9
A-1. CBO’s Estimates of How the President’s Budget Would Affect Inflation-Adjusted Gross National Product, 2018 to 2022	17



The Economic Impact of the President's 2013 Budget

Each year, after the President releases his annual budget request, the Congressional Budget Office (CBO) analyzes the proposals and, using its own estimating procedures and assumptions, projects what the federal budget would look like over the next 10 years if those proposals were adopted. CBO usually provides those results in two parts: The first part presents an examination of the proposals' budgetary impact without considering their effects on the U.S. economy. The second part, which takes more time to prepare, shows their potential effects on the economy and, in turn, the impact of those macroeconomic effects on the budget. CBO has now completed that second analysis, and this report summarizes the results.

Overview

In its analysis of the President's proposals excluding any macroeconomic effects, which was issued on March 16, CBO concluded that the federal budget deficit would equal \$1.3 trillion (or 8.1 percent of gross domestic product, GDP) in fiscal year 2012 and would decline to about \$1.0 trillion (or 6.1 percent of GDP) in 2013.¹ The deficit would decline further relative to GDP in subsequent years, reaching 2.5 percent by 2017, but then increase again, reaching 3.0 percent of GDP in 2022.

The projected deficits under the President's proposals would exceed those in CBO's baseline—a benchmark showing the outcome if current laws generally remained unchanged—by 0.5 percent of GDP (\$82 billion) in 2012, by 2.2 percent of GDP (\$365 billion) in 2013, and by between 1.4 percent and 1.9 percent of GDP in each year from 2014 through 2022. In all, between 2013 and

2022, deficits would total \$6.4 trillion (or 3.2 percent of total GDP projected for that period), \$3.5 trillion more than the cumulative deficit in CBO's baseline.

Estimates of the macroeconomic effects of those proposals depend on many specific assumptions and judgments, so CBO used several different approaches to estimating those effects, generating a range of possible outcomes. The estimates cover the periods 2013 to 2017 and 2018 to 2022.

CBO estimates that the President's budgetary proposals would boost overall output initially but reduce it in later years. For the 2013–2017 period, under most of the estimates CBO produced using alternative models and assumptions, the President's proposals would increase real (inflation-adjusted) output (relative to that under current law) primarily because taxes would be lower than those under current law, and, therefore, people's disposable income and their demand for goods and services would be greater. Over time, however, the proposals would reduce real output (relative to that under current law) because the deficits would exceed those projected under current law, and the effects of increasing government debt would more than offset the favorable effects of lower marginal tax rates on labor income.² When the net impact of those two types of effects would shift from an increase in real output to a decrease would depend on various factors, including the impact of increased aggregate demand on output and the effect of deficits on investment.

By CBO's estimate, under the President's proposals, the nation's real output during the 2013–2017 period would

1. See Congressional Budget Office, *An Analysis of the President's 2013 Budget* (March 2012).

2. A marginal tax rate reflects the rate that applies to the last dollar of income.

Table 1.

Projected Deficits Under CBO's March 2012 Baseline and CBO's Estimate of the President's Budget With and Without Macroeconomic Effects

(Trillions of dollars, by fiscal year)

	2013-2017	2018-2022
	CBO's March 2012 Baseline	
Total Deficit	-1.7	-1.2
	CBO's Estimate of the President's Budget	
Total Deficit		
Without macroeconomic effects	-3.2	-3.2
With macroeconomic effects		
Small	-3.2	-3.3
Large	-3.0	-3.6

Source: Congressional Budget Office.

be, on average, between 0.2 percent lower than the amount under current law and 1.4 percent higher than under current law.³ For the 2018–2022 period, CBO estimates that the President's proposals would reduce real output, on average, by between 0.5 percent and 2.2 percent compared with what would occur under current law.⁴

Those economic effects would in turn influence the budget through changes in taxable income, in outlays for unemployment insurance and other programs, and in interest payments on government debt, among other factors. According to CBO's estimates, the effects on the budget would be as follows:

- For this analysis, CBO focuses on effects on gross national product (GNP) (the total market value of goods and services produced in a given period by the labor and capital supplied by the country's residents, regardless of where the labor and capital are located) instead of the more commonly cited gross domestic product. Changes in GNP exclude foreigners' earnings on investments in the domestic economy but include domestic residents' earnings; in an open economy like that of the United States, changes in GNP are therefore a better measure of changes in domestic residents' income than are changes in GDP. CBO's budget calculations for this analysis reflect the fact that features of U.S. tax laws result in some foreign income of U.S. residents effectively being untaxed.
- The economic effects presented for the 2018–2022 period represent the central two-thirds of all estimates that CBO produced using alternative models and assumptions. For detailed estimates of the economic effects, see the appendix.

■ For the 2013–2017 period, before accounting for the macroeconomic effects, CBO estimates that the President's proposals would add a total of \$1.5 trillion to deficits, resulting in a cumulative deficit of \$3.2 trillion over that period (see Table 1). The economic feedback from the President's proposals would yield projected deficits totaling between \$3.0 trillion and \$3.2 trillion over that period.

■ For the 2018–2022 period, before accounting for the macroeconomic effects, CBO estimates that the President's proposals would add a total of \$2.0 trillion to deficits, resulting in a cumulative deficit of \$3.2 trillion over that period. The economic feedback from the President's proposals would yield projected deficits totaling between \$3.3 trillion and \$3.6 trillion over that period.⁵

How the Government's Fiscal Policies Can Affect the Economy

The government's fiscal policies (that is, taxes and spending) can affect the economy's actual output as well as its potential output (a level that corresponds to a high rate of use of labor and capital). Therefore, fiscal policies can have both short-run and long-run consequences.

Fiscal Policies and Output in the Short Run

As the recent severe recession and ongoing slow recovery have shown, the nation's economic activity can deviate for substantial periods from its potential level in response to changes in demand for goods and services by consumers, businesses, governments, and foreigners. Although the nation's real economic output has now surpassed its pre-recession level, output remains well below its potential, and unemployment remains high.

When output is low relative to its potential, as it has been since the start of the recession in 2008, tax cuts and increases in government spending can boost demand and thereby hasten a return to the potential level of output. In general, increases in demand encourage businesses to gear up production and hire more workers than they otherwise would, and decreases in demand have the opposite effect. Therefore, budgetary policies that raise private and public spending tend to boost output toward its potential

- Those projected deficits (for the 2018–2022 period) represent the central two-thirds of all estimates that CBO produced using alternative models and assumptions.

level. (Even without such policies, stabilizing economic forces tend to move output back toward its potential after a while.)

However, policies that aim to increase demand, such as increases in government purchases or reductions in taxes, are likely to decrease national income in the long run, relative to what it would be in the absence of those policies, because such policies tend to increase government borrowing and eventually reduce the nation's saving and capital stock. Therefore, policies that increase demand often involve a trade-off between boosting economic output in the short run and reducing output in the long run.

Fiscal Policies and Output in the Long Run

The nation's potential to produce goods and services is the key determinant of the nation's output over the long term. That potential depends on the size and quality of the labor force, on the stock of productive capital (such as factories, vehicles, and computers), and on the efficiency with which labor and capital are used to produce goods and services.⁶ Lasting changes in those factors can have a lasting influence on the economy's ability to supply goods and services.

The government's budgetary policies affect potential output primarily by affecting the amount of public saving (the net effect of surpluses or deficits of state and local governments and the federal government) and the incentives for individuals and businesses to work, save, and invest. The nation's capital stock, which helps to determine how much output can be produced, depends both on public saving and on private saving (by households and businesses). A federal deficit represents negative public saving and, therefore, lower national saving. Federal policies also can influence national saving by affecting private saving (as discussed below). An overall decline in national saving reduces the capital stock owned by U.S. citizens over time through a decrease in domestic investment, an increase in net borrowing from abroad, or both.

Specific tax and spending policies can affect the economy's potential output in various ways. Changes in tax rates affect people's willingness to work and to save, possibly influencing short-run demand and also affecting long-run supplies of labor and capital. Similarly, changes in government spending for goods and services or for

transfer payments (such as unemployment insurance or Social Security benefits) can affect demand in the short run and also can increase or decrease people's willingness to work and to save, thus affecting the size of the labor force and the capital stock in the long run. In addition, changes in government spending on goods and services can alter the amount of public investment, which affects potential output as well.

Changes in the demand for goods and services resulting from fluctuations in the business cycle—which push output away from its potential—tend to be temporary. CBO currently projects that, under current law, economic output will return to its potential in 2018. Additional business-cycle fluctuations will happen in the future, but it is impossible to know when they will occur and whether they will be large or small. For that reason, CBO's projections beyond the next several years generally show actual output in line with potential output.

How the President's Budgetary Proposals Would Affect the Economy

The President's budgetary proposals would influence the economy in different ways in the short run and the longer run, boosting output in the next few years but diminishing it later on.

Effects on the Economy Through 2017

Over the 2013–2017 period, the President's proposals would affect the economy predominantly through their influence on aggregate demand. The proposals would decrease revenues (by an estimated \$1.0 trillion) and increase outlays, excluding interest (by \$0.5 trillion), relative to CBO's baseline projections. The changes in spending would consist of an increase in transfer payments and reductions in purchases of goods and services.⁷ For example, the President's proposal to freeze Medicare's payments to physicians at 2012 levels (rather than allow them to drop, as scheduled under current law) would

6. Efficiency in turn depends on such factors as production technology, the way businesses are organized, and the regulatory environment.

7. In the national income and product accounts (maintained by the Department of Commerce's Bureau of Economic Analysis), the government's expenditures are classified into major groups: consumption expenditures, or spending on goods and services, including costs of capital depreciation (with separate estimates for defense and nondefense spending); transfer payments (to individuals, state and local governments, and the rest of the world); interest payments; and subsidies to businesses and to government enterprises.

increase transfer payments, and much of the reduction in spending for military operations in Afghanistan and related activities (also known as overseas contingency operations) under the President's budget represents smaller purchases of equipment and supplies as well as reduced costs for military personnel. The reductions in taxes and increases in transfers would boost people's disposable income, increasing consumer demand for goods and services.⁸ The boost to consumer demand would outweigh the reduction in government purchases, under most of the estimates CBO produced using alternative models and assumptions, leading to a net increase in overall demand, which would probably boost output over the period. Over the 2015–2017 period, however, those effects would fade as the economy approached its underlying potential.

Effects on the Economy After 2017

The President's policies would probably lower output between 2018 and 2022, primarily because of the policies' impact on the capital stock. Those policies would result in a smaller stock of domestically owned capital, mainly because deficits would be larger than those projected under current law. The impact of the larger deficits on the capital stock would be augmented, slightly, after 2013 by a small increase in the marginal tax rate on capital income, which is the rate that applies to the return on additional investment. The impact on the capital stock would become stronger over time as continued budget deficits led to a greater additional accumulation of government debt. At the same time, various policies in the President's budget would have differing effects on the size of the labor force: Proposed reductions in the marginal tax rates on labor income, relative to those that would occur under current law, would tend to increase the labor supply, while proposed increases in transfer payments, together with reductions in pretax wages stemming from

8. Changes in tax rates—a decrease in the effective marginal tax rate on labor income, which would be only partially offset by an increase in the effective marginal tax rate on capital income (income derived from wealth, such as stock dividends, realized capital gains, or the owner's profits from a business)—would also increase potential output. However, actual output adjusts only slowly to changes in potential, and under current conditions, that adjustment would be slower than usual. Specifically, an increase in potential output relative to actual output would ordinarily lead the Federal Reserve to reduce interest rates, boosting output. However, because interest rates are already about as low as they can be, that effect would be muted over the next few years.

the smaller capital stock, would tend to decrease the labor supply. Under a majority of the sets of assumptions that CBO analyzed, labor supply is lower under the President's proposals over the 2018–2022 period.

Effects on the Nation's Capital Stock. The President's budgetary policies would influence the size of the nation's capital stock primarily by lowering national saving through higher federal budget deficits. Each year between 2013 and 2022, the proposals would expand the federal deficit relative to that in CBO's baseline, which would reduce national saving, other things being equal. (Some—but not all—of the relative reduction in public saving would be offset by an increase in private saving, in part because larger deficits would cause interest rates to be higher and because households and businesses would anticipate higher taxes and lower transfers in the future.) The President's tax proposals would also affect private saving by altering effective marginal tax rates on capital income and thus the after-tax rate of return on saving.⁹

Under current law, CBO estimates, the effective marginal tax rate on capital has increased to 14.5 percent in 2012 from the estimated 12.8 percent rate in 2011 because the main investment incentive enacted in the 2010 tax act (officially, the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010, Public Law 111-312) is cut in half. According to the agency's projections, that rate will rise again in 2013, as certain provisions of the 2010 tax act (including the investment incentive) expire and as a surtax on investment income enacted in the Health Care and Education Reconciliation Act of 2010 (P.L. 111-152) becomes effective.

The President's tax proposals would alter those marginal tax rates through changes in both individual and corporate tax provisions. Some of the President's proposals would increase the marginal tax rate on capital income, whereas others would decrease that rate. On net, CBO estimates, the President's proposals would reduce the effective marginal tax rate on capital income in 2013 relative to the rate under current law by 0.2 percentage points. After 2013, the impact of the President's

9. The effective marginal tax rate is calculated by averaging effective marginal tax rates associated with investment in different types of tangible assets, with the weights depending on each type's share of the capital stock.

Table 2.**CBO's Estimates of Effective Federal Marginal Tax Rates on Capital Income**

(Percent)

Calendar Year	Effective Marginal Tax Rate Under Current Law	Effective Marginal Tax Rate Under the President's Budget	Difference	
			Percentage Points	Percent
2011	12.8	12.8	0	0
2012	14.5	12.8	-1.7	-12.0
2013	20.7	20.6	-0.2	-0.7
2014	20.9	21.2	0.4	1.7
2015	21.0	21.5	0.5	2.4
2016	21.2	21.9	0.7	3.2
2017	21.3	21.9	0.6	2.8
2018	21.3	22.0	0.7	3.2
2019	21.4	22.1	0.7	3.2
2020	21.3	22.0	0.7	3.3
2021	21.3	22.1	0.8	3.8
2022	21.3	22.0	0.7	3.4

Source: Congressional Budget Office.

Note: The effective marginal tax rate on income from capital is the share of the last dollar of such income paid in federal individual income taxes and corporate taxes.

proposals that increase the marginal tax rate on capital would outweigh the impact of proposals that reduce the marginal rate, yielding a net increase ranging from 0.4 to 0.8 percentage points (see Table 2).¹⁰

Proposals That Would Decrease the Marginal Tax Rate on Capital Income. Several proposals would decrease the marginal rate on capital income, relative to that under current law, by fully or partially extending provisions that have expired or are scheduled to expire in the next few years. The most significant of the proposals would be retroactive to the start of 2012. Under current law, the amounts of income exempt from the individual alternative minimum tax (AMT) fell at the beginning of 2012. The President proposes to keep the AMT exemption amounts at their higher 2011 levels and index all of the parameters of the AMT for inflation after 2011; beginning in 2012, that change would reduce the marginal rate on capital income relative to that under current law. A proposal to reinstate and permanently extend the tax credit for research and experimentation (which expired at the end of 2011) would also reduce that marginal rate

beginning in 2012. A third proposal, applying in 2012 only, would enable companies to continue to immediately deduct 100 percent of new investments in equipment and certain shorter-lived structures, rather than have the percentage reduced to 50, as is scheduled to occur under current law.

Other provisions would take effect starting in 2013. Proposals to lower tax rates (relative to those under current law) for incomes below \$200,000 for individuals and for incomes below \$250,000 for married couples and a proposal to extend changes in the tax treatment of certain investments in equipment by small businesses would also decrease the marginal tax rate on capital income.

Proposals That Would Increase the Marginal Tax Rate on Capital Income. The President's proposal to cap at 28 percent the rate at which itemized deductions and certain exclusions from income reduce a taxpayer's income tax liability would generate the largest increase in the marginal rate on capital income. Most of that increase would be caused by a reduction in the tax benefits from deducting mortgage interest and property taxes, which would raise the very low tax rate on income from an investment in owner-occupied housing. Tax rates on income from investments in corporate stock, noncorporate businesses, and debt instruments would increase little. Proposals to

10. For a description of CBO's method for estimating effective marginal tax rates, see Congressional Budget Office, *Computing Effective Tax Rates on Capital Income*, Background Paper (December 2006).

eliminate tax preferences for fossil fuels, to tax carried interest as ordinary income rather than at the lower rate for capital gains, and to reinstate the corporate income tax that helps to finance the Superfund program (for cleaning up abandoned hazardous waste sites) would also raise the marginal rate on capital income beginning in 2013.¹¹ Other proposals, including a change to inventory accounting rules and the establishment of a “financial crisis responsibility fee” (assessed on liabilities of various financial institutions) would also increase that marginal tax rate but would not take effect until 2014.

Proposals That Would Affect the Uniformity of Capital Taxation. Economic activity is affected not only by the average of the rates at which capital investments are taxed, but also by how uniformly such investments are taxed. If some capital investments receive more favorable tax treatment than others, additional resources will be directed to those types of investment even if other types would be more productive. CBO examined the extent to which various budgetary proposals would make the taxation of capital investments more or less uniform. Only the limit on itemized deductions for home mortgage interest and property taxes would significantly affect the uniformity of capital taxation, raising the effective tax on owner-occupied housing to rates closer to that on business investments. (CBO estimates that the impact of the President’s proposals on the uniformity of capital taxation would add 0.07 percent to real gross national product, or GNP, by 2022.)

Effects on the Labor Force. Potential output is strongly tied to the amount and quality of labor supplied in the economy. A sustained increase in total hours worked or in the capability of the labor force improves the economy’s potential to generate output. The President’s proposals would affect the number of hours worked and might also affect the quality of labor. CBO’s analysis focused on channels through which the proposals could affect the number of hours of labor supplied because the evidence about those channels is stronger than is the evidence about channels through which government policies can affect the quality of labor. CBO estimates that the

11. Carried interest typically forms part of the compensation received by a general partner of a private equity or hedge fund. It is generally a share of the profits on the assets under management.

President’s policies would reduce the effective marginal tax rate on labor by 1.5 to 1.6 percentage points over the 2013–2022 period (see Table 3), relative to the rates projected under current law.¹²

The President’s proposals would affect the quantity of labor by increasing both people’s total after-tax income (including wages and transfers) and the additional after-tax compensation they receive for each additional hour of work. Those changes would have opposing effects on people’s incentives. Workers would be encouraged to work longer hours because they would earn more for each extra hour of labor they supplied. But a disincentive also exists: Those same workers would earn more after-tax income at their current working hours, which would encourage them to decrease their work hours.¹³

The President’s proposals would reduce the effective marginal tax rate on labor primarily by eliminating some of the currently scheduled increases in individual income tax rates. Under current law, those rates will rise in 2012 with the decrease in the AMT exemption. They will rise again in 2013 when lower individual income tax rates that were extended by the 2010 tax act expire and provisions of the Affordable Care Act (which comprises the Patient Protection and Affordable Care Act [P.L. 111-148] and the Health Care and Education Reconciliation Act of 2010 [P.L. 111-152]) begin to take effect.¹⁴ Under the President’s proposals, changes to the AMT would lower the marginal tax rates on labor beginning in 2012, and the proposal to permanently extend lower income tax rates for incomes below \$200,000 for individuals and for incomes below \$250,000 for married couples would lower marginal tax rates on labor in 2013 and beyond.

12. The effective marginal tax rate on labor income is the rate that would apply to the return on working. It reflects the additional federal income and payroll taxes that would be paid on the income earned from additional work. The effective marginal tax rate is the weighted average of the effective marginal tax rates across all workers, with the weights depending on workers’ earnings.

13. For details of CBO’s approach to estimating changes in the supply of labor, see the appendix.

14. For a description of the impact of the Affordable Care Act on labor markets, see Congressional Budget Office, *The Budget and Economic Outlook: An Update* (August 2010), Box 2-1.

Table 3.**CBO's Estimates of Effective Federal Marginal Tax Rates on Labor Income**

(Percent)

Calendar Year	Effective Marginal Tax Rate Under Current Law	Effective Marginal Tax Rate Under the President's Budget	Difference	
			Percentage Points	Percent
2011	26.7	26.7	0.0	0.0
2012	28.3	26.8	-1.5	-5.1
2013	30.5	28.9	-1.6	-5.3
2014	31.0	29.4	-1.6	-5.2
2015	31.5	29.9	-1.6	-5.1
2016	32.1	30.6	-1.5	-4.7
2017	32.4	30.9	-1.5	-4.7
2018	32.8	31.3	-1.5	-4.6
2019	33.0	31.5	-1.5	-4.6
2020	33.4	31.8	-1.6	-4.8
2021	33.6	32.0	-1.6	-4.8
2022	33.8	32.2	-1.6	-4.8

Source: Congressional Budget Office.

Note: The effective marginal tax rate on income from labor is the share of the last dollar of such income paid in federal individual income and payroll taxes.

Although the President's proposals would generally reduce the effective marginal tax rate on labor, the effect of the proposals would vary across income levels. Lower- and middle-income taxpayers would see their marginal tax rates fall, relative to those under current law, because of the higher AMT exemption and lower income tax rates. In contrast, marginal rates for higher-income taxpayers would not be affected by those provisions but could rise because of the proposal to limit the tax savings from certain income exclusions and itemized deductions. CBO's analysis therefore incorporated different changes in effective marginal tax rates on labor income for people with different amounts of income.

The proposals' impact on the capital stock also could affect the supply of labor. Because higher deficits under the proposals would result in a smaller capital stock, and thereby also reduce labor productivity, pretax wage rates would be lower than those under current law (all else being equal), slightly weakening people's incentives to work.¹⁵

Effects on Technological Progress. New and improved processes and products are the source of most long-term

growth in productivity, and some of the President's budgetary proposals (such as the extension of tax credits for research and development) could affect the economy by influencing the rate at which technological progress is made. But economic researchers do not understand well how tax and spending policies affect such innovation, so for the most part CBO has not incorporated into its analysis effects on technological progress that might arise from the President's proposals.¹⁶

15. Changes in the amount of education, training, and experience that workers have—all of which affect the productivity of each hour worked—can also result in changes in potential output. CBO did not incorporate such effects into its analysis because they are quite difficult to quantify.

16. CBO did, however, project that the President's proposal to enhance and make permanent the research and experimentation tax credit would increase potential GNP slightly, by increasing productivity and increasing returns on investment. For a discussion of how government policies can influence technological progress, see Congressional Budget Office, *R&D and Productivity Growth*, Background Paper (June 2005); and Robert W. Arnold, *Modeling Long-Run Economic Growth*, Congressional Budget Office Technical Paper 2003-4 (June 2003).

Table 4.

CBO's Estimates of How the President's Budget Would Affect Inflation-Adjusted Gross National Product

(Average percentage difference from CBO's baseline, by calendar year)

	Change in Real GNP
2013	0.6 to 3.2
2013-2017	-0.2 to 1.4
2018-2022 ^a	-2.2 to -0.5

Source: Congressional Budget Office.

Note: GNP = gross national product.

- a. Percentage changes for 2018 to 2022 represent the central two-thirds of all estimates that CBO produced using alternative models and assumptions.

Economic Models and Results

CBO used several economic models to estimate the effects of the President's budgetary proposals on the economy relative to the agency's baseline projections. The models focus on somewhat different aspects of the economy and reflect distinct ways of thinking about it. One set of models is used to estimate short-term effects only; the other models emphasize the effects that matter more in later years. Each model represents people's economic decisions in a simplified way while capturing some important aspects of actual behavior.

CBO analyzed effects of the President's budgetary proposals for the next few years primarily by using a combination of macroeconomic forecasting models and historical short-run relationships (see the appendix for a detailed description of the analysis).¹⁷ CBO's estimates encompass a broad range of economists' views about the relevant economic relationships.

CBO used two models to analyze the longer-term effects of the President's proposals, a Solow-type model and a

life-cycle model. CBO's Solow-type model is an enhanced version of a widely used model originally developed by Robert Solow. CBO's life-cycle model is an overlapping-generations general-equilibrium model that is based on another standard model of the economy. Using each model, CBO produced a range of estimates by applying alternative assumptions about the degree to which economic variables influence households' decisions about how much to work and save, the importance of international flows of capital, and the extent to which U.S. interest rates are determined by the world economy. (See the appendix for further description of the models and assumptions, as well as estimates derived using each model under the full range of assumptions.) CBO projected that those longer-term effects would account for an increasing proportion of the economic effects of the President's proposals from 2014 through 2016 and all of the effects thereafter.

Estimated Economic Effects and Their Budgetary Implications Through 2017

CBO estimates that the President's proposed policies would raise real GNP by between 0.6 percent and 3.2 percent in 2013. For the 2013–2017 period, CBO estimates that the President's proposals would reduce GNP by as much as 0.2 percent or raise GNP by as much as 1.4 percent (see Table 4).

The projected effects on GNP over the 2013–2017 period stem primarily from decreases in tax revenues, averaging about \$192 billion (or 1.1 percent of GDP) a year. In most of the estimates produced for this analysis, those changes lead to an increase in GNP over that period. But the positive effects on GNP from increased aggregate demand would diminish over the 2013–2017 period as the Federal Reserve increasingly tightened monetary policy in response to an improving economy. Moreover, under some assumptions, potential GNP would be reduced as a result of the President's policies, owing to the reductions in the capital stock stemming from the increased budget deficits. Therefore, in a projection incorporating a relatively small effect of aggregate demand on output and a relatively large effect of deficits on investment (a combination referred to as "small macroeconomic effects" in Table 1 on page 2), GNP declines slightly relative to the amounts projected for CBO's baseline over the 2013–2017 period.

17. For an example of recent CBO work using the same method of analysis, see Statement of Douglas W. Elmendorf, Director, Congressional Budget Office, before the Senate Committee on the Budget, *Policies for Increasing Economic Growth and Employment in 2012 and 2013* (November 15, 2011).

Table 5.
Difference in Projected Deficits Under CBO's March 2012 Baseline and CBO's Estimate of the President's Budget With and Without Macroeconomic Effects

(Trillions of dollars, by fiscal year)

	Difference in Total Deficit (President's Budget Minus CBO's Baseline)	
	2013-2017	2018-2022
Without Macroeconomic Effects	-1.5	-2.0
With Macroeconomic Effects		
Small	-1.5	-2.1
Large	-1.2	-2.4

Source: Congressional Budget Office.

Note: Negative numbers indicate an increase in projected deficits under the President's budget relative to those under CBO's baseline, which incorporates the assumption that current laws generally remain unchanged.

Those overall economic effects would feed back to the budget and affect the size of deficits. CBO estimates those budgetary effects through a simplified analysis that takes account of changes in taxable incomes, interest rates, and prices, among other things, but the agency does not incorporate a detailed, program-by-program analysis, as it does in its regular budget estimates. Specifically, CBO estimates the following relatively small feedback effects:

- In 2013, before considering their economic effects, CBO estimates that the President's proposals would add \$365 billion to the baseline budget deficit of \$612 billion. Accounting for budgetary feedback from the economic effects of the proposals would reduce the additional budgetary cost of those proposals by between \$30 billion and \$110 billion, depending on the assumptions used in the analysis.
- For the 2013–2017 period, CBO projects that the President's proposals would increase deficits by a total of \$1.5 trillion, without accounting for the proposals' economic effects (see Table 5). Depending on the assumptions used in the analysis, the budgetary feedback from those economic effects could range from a reduction of as much as \$0.3 trillion in the projected cumulative cost of the proposals (to \$1.2 trillion) to a negligible change in that cost (leaving it at

\$1.5 trillion). After accounting for those economic effects, projected deficits over that period total between \$3.0 trillion and \$3.2 trillion.

The estimated budgetary feedback of the proposals depends heavily on the assumptions used in the analysis. The President's proposals would increase output in 2013, leading to higher taxable incomes and thus boosting revenues. However, the amount of that projected increase in revenues would vary, depending on whether the proposals are estimated to have a large or small effect on GNP. Over the 2013–2017 period, the projected boost to taxable income fades as the economy responds to higher deficits and as interest rates rise in response to greater output and the anticipation of higher future deficits. If the President's proposals are estimated to have large macroeconomic effects, projected deficits decline because the increase in taxable incomes and revenues more than offsets the effect of higher interest payments on the national debt. However, if the President's proposals are projected to have small macroeconomic effects, the projected deficits rise very slightly as the higher interest payments more than offset the budgetary impact of the increase in taxable incomes.

Estimated Economic Effects and Their Budgetary Implications After 2017

For the period from 2018 to 2022, CBO estimates that the President's proposals would reduce real GNP by between 0.5 percent and 2.2 percent (see Table 4). The negative effect of the President's proposals on GNP would occur primarily because the negative effects of higher deficits on investment by U.S. residents would outweigh the positive effects of lower effective marginal tax rates on labor.

Before their overall economic effects are taken into account, the President's proposals would add \$2.0 trillion to budget deficits over the 2018–2022 period, CBO estimates. The budgetary feedback from the economic effects increases the cumulative projected cost of the proposals in that period by between \$0.1 trillion and \$0.4 trillion, depending on which model and which assumptions are used in the analysis (see Table 5). Thus, taking economic effects into account raises the projected increase in deficits under the President's proposals to between \$2.1 trillion and \$2.4 trillion, relative to those under current law. As a result, projected deficits total between \$3.3 trillion and \$3.6 trillion over the 2018–2022 period.

Because of the substantial uncertainty that surrounds the results of such models, the budgetary effects of economic feedback are difficult to pinpoint. The numbers presented here represent the central two-thirds of all estimates that CBO produced using alternative models and assumptions.

By CBO's estimates, the President's budgetary proposals would roughly stabilize the ratio of debt to GDP from 2020 through 2022, before their macroeconomic effects are taken into account. When those effects are incorporated in the estimate, the ratio rises modestly over those years, primarily because the higher deficits under the proposals, compared with those under current law, would raise interest rates and increase interest payments on the federal debt. If the ratio of debt to GDP continued to rise after 2022, the budgetary effects on economic output would become increasingly negative as rising debt crowded out growing amounts of productive capital. Moreover, interest rates would continue to rise, increasing interest payments and therefore deficits and accelerating the erosion of economic output. Ultimately, unabated increases in the ratio of debt to GDP are not sustainable.

Comparison with CBO's Estimate of the President's 2012 Budget

CBO's estimates of the macroeconomic effects of the President's budgetary proposals for fiscal year 2013 differ from its estimated effects of the proposals for fiscal year 2012 (published a year ago in *An Analysis of the President's Budgetary Proposals for Fiscal Year 2012*) because of changes in both the proposals and CBO's methodology.

The effects of the 2013 budget differ from those of the preceding budget in four main ways. In particular, the proposals for 2013 would do the following:

- Increase deficits by a greater amount, largely because of a greater increase in spending compared with that in CBO's baseline. Those larger deficits would provide a bigger short-run boost to output but then have a more negative long-run effect.
 - Cut the effective marginal tax rate on labor by a smaller amount relative to that under current law, reducing the positive effect on the labor supply and, therefore, output.
 - Increase, rather than reduce, marginal tax rates on capital income compared with those under current law, which would reduce the incentive to save and thus lead to a more negative long-run effect on output.
 - Take effect one year later, in 2013 rather than 2012, thereby spanning a period in which the extension of various tax reductions has a greater effect, so the short-run impact on aggregate demand and output would be much larger.
- In addition, CBO's methodology for short-run analysis, which focuses primarily on effects on aggregate demand, has changed in four main ways on the basis of economic developments over the year, reviews of recent research, and improvements to the relevant model. Specifically, CBO did the following:
- Extended the period during which the Federal Reserve is assumed to keep interest rates near zero, increasing the estimated positive short-run effects of the proposals;
 - Reduced the estimated "small" effect of higher spending or lower taxes on output;¹⁸
 - Revised its assumption about the transition from short- to long-run effects, now projecting that the former would diminish more rapidly and the latter (affecting potential output) would occur more quickly—which tends to reduce the estimated short-run positive effects of the proposals; and¹⁹
 - Improved the manner in which estimates of long-term interest rates incorporate estimates of expected future short-term rates. Because increased deficits crowd out investment and cause those expected future rates to rise, the change tends to reduce the estimated short-run positive effects of the proposals on output.²⁰

18. For more details about that revision, see Congressional Budget Office, *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output From July 2011 Through September 2011* (November 2011), p. 8 and Appendix.

19. For more details about that approach, see Congressional Budget Office, *The Macroeconomic and Budgetary Effects of an Illustrative Policy for Reducing the Federal Budget Deficit* (July 14, 2011).

CBO also made two main changes to its Solow-type model on the basis of reviews of recent research and its continual development of the model:

- CBO reduced the “small” and “medium” negative effects of deficits on investment incorporated in the model, which leads to smaller negative effects on output.
- CBO adjusted its assumptions about how people would adjust their work hours in response to changes in marginal tax rates on labor income. The agency increased the “strong labor supply response” but

decreased the “weak labor supply response.” That revision tends to make the estimates of the proposals’ effects less negative under the strong response and more negative under the weak response.

The agency made one main change to its life-cycle model. The projections now incorporate falling mortality rates and, therefore, an increase in the share of the population that is elderly. That change increases the estimated negative impact on the labor supply and saving from greater government transfers and, more generally, the crowding out of investment from higher deficits. The change makes the estimated impact of the President’s proposals on output more negative.

20. Ibid.



Appendix:

CBO's Methodology for Analyzing the Economic Impact of the President's 2013 Budget

The Congressional Budget Office (CBO) used several approaches to estimate the economic effects of the President's budgetary proposals from 2013 to 2022, the period covered by the agency's current 10-year baseline projections. (Ranges of estimates generated by those approaches are presented in the preceding analysis.)

Analyzing Short-Term Economic Effects

CBO analyzed effects of the President's budgetary proposals for the next few years primarily using historical evidence about the direct effects of certain kinds of policies and the results of macroeconomic forecasting models regarding the way that such effects propagate through the economy. That approach produced estimated "multipliers" for each of several categories of budgetary provisions, with each multiplier representing the effects that a dollar's worth of a budgetary change in a given category would have on the nation's output. The categories include, for example, tax cuts primarily affecting lower-income taxpayers and purchases of goods and services by the federal government. A category's multiplier was applied to the total budgetary change in that category to estimate its overall impact on output.

CBO's estimates of economic effects for the next few years focus on the impact of the President's proposals on the demand for goods and services, because economic output in the short run is largely determined by such demand. Therefore, those estimates primarily reflect temporary changes in actual output relative to potential output (the level of output consistent with a high rate of

resource use), especially in the first few years. Over the years 2014 to 2016, however, the estimated effects on output incorporate an increasing weight for long-run effects on the economy's potential output.¹

The analysis incorporates both direct and indirect effects of the President's proposals on economic output. A provision's direct effects consist of its immediate (or first-round) effects on economic activity. The size of a direct effect depends on a provision's impact on the behavior of recipients. For example, if someone receives a tax reduction of a dollar and spends 80 cents (saving the other 20 cents), and production increases over time to meet the additional demand generated by that spending, then the direct impact on output is 80 cents.

To estimate the size of the provisions' direct effects on output, CBO reviewed evidence on the responses of households and businesses to various types of fiscal policies, gleaned various conclusions. For example, temporary tax cuts will generally have less impact on a household's purchases than permanent cuts because a temporary cut has a smaller effect on total lifetime disposable income. As another example, increases in

1. For 2013, the estimated effects on output are based fully on effects on aggregate demand. For 2014, 2015, and 2016, the estimates are based on a blend of effects on demand and effects on potential output. (The latter are discussed in the upcoming section "Analyzing Long-Term Economic Effects.") In particular, the blend for 2014 weights the effects on demand at .75 and weights the effects on potential output at .25; for 2015, those weights are .5 and .5; and for 2016, .25 and .75. The estimate for 2017 is based fully on effects on potential output.

disposable income are likely to boost purchases more for lower-income households than for higher-income households. That difference arises, at least in part, because a larger share of people in lower-income households cannot borrow as much money as they wish in order to spend more than they do currently.

Budgetary proposals also can have indirect effects that enhance or offset the direct effects. For example, direct effects are enhanced when greater demand for goods and services prompts companies to increase investment. In the other direction, direct effects are muted if greater government borrowing caused by tax cuts or spending increases leads to higher interest rates that discourage spending by households and businesses. In estimating the magnitude of indirect effects, CBO relied heavily on estimates from macroeconomic forecasting models, informed by evidence from other types of models and from direct estimation using historical data.²

In CBO's analysis, people base their decisions about working and saving primarily on current economic conditions—especially wage levels, interest rates, and government policies. The analysis incorporates the assumption that people respond to those current developments as they typically have in the past. Those past responses have reflected, in part, an anticipation of other policies that might follow; for example, the degree to which people have increased their consumption in response to tax cuts has depended partly on their anticipation of future tax policy. Therefore, the analysis reflects people's anticipation of future policies in a general way, but it does not incorporate an assumption that people anticipate the exact nature of future policies in detail.

Because there is considerable uncertainty about many of the economic relationships that are important in the modeling, CBO provides a range of estimates of the effects of the President's budgetary proposals on gross national product (see Table 4 on page 8). The multipliers used in this analysis for the effect of changes in government spending on output ranged from 0.5 to 2.5, encompassing a broad range of economists' views about the relevant economic relationships.³

2. For more details about those sources of information, see Congressional Budget Office, *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output From October 2011 Through December 2011* (February 2012), Appendix.

The analysis CBO used to estimate the short-run economic effects of the President's budget incorporates simplified versions of some of the basic economic relationships embodied in three macroeconomic models—two created by private forecasting companies (Macroeconomic Advisers and IHS Global Insight) and one developed by the Federal Reserve (FRB-US). That analysis enables a differentiated examination of particular provisions of the President's budgetary proposals. For example, the analysis incorporates the empirical finding that changes in taxes that disproportionately affect lower-income households tend to have a greater effect on private spending than do changes that disproportionately affect higher-income households. CBO has used this approach in estimating the effects of the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), of extensions of expiring tax provisions, and of alternative policies for fiscal stimulus.⁴

Analyzing Longer-Term Economic Effects

CBO used two models to analyze the effects of the President's budgetary proposals in the longer run. In both models—a Solow-type growth model and a life-cycle growth model—potential output depends on the size of the capital stock, the supply of labor, and the productivity of labor and capital combined. Those factors, in turn, are determined by people's decisions regarding work and saving. CBO's estimates of economic effects after 2016 focus on the impact of the President's proposals on the supply

3. That range is consistent with what CBO used in its November 2011 analysis of the impact of the American Recovery and Reinvestment Act (Public Law 111-5). See Congressional Budget Office, *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output From July 2011 Through September 2011* (November 2011), p. 8. In analyzing the President's 2012 budget last year at this time, CBO used a range of 1.0 to 2.5.
4. See Congressional Budget Office, *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output From October 2011 Through December 2011*; Statement of Douglas W. Elmendorf, Director, Congressional Budget Office, before the Senate Committee on the Budget, *The Economic Outlook and Fiscal Policy Choices* (September 28, 2010); and Statement of Douglas W. Elmendorf, Director, Congressional Budget Office, before the Senate Committee on the Budget, *Policies for Increasing Economic Growth and Employment in 2012 and 2013* (November 15, 2011).

of labor and capital because the agency expects that economic output then will be fully determined by supply

factors.⁵ In particular, this analysis does not reflect any changes in actual output relative to potential output, because such variation is expected to be temporary and, though certain to play some role in the future, is difficult to predict over long horizons. As a result, in analyzing the proposals' effects after 2016, CBO assumed that output is always at its potential level.

The Solow-type growth model and life-cycle growth model differ somewhat in the extent to which people are expected to look to the future when making plans. For each model, CBO applied alternative assumptions about economic behavior. Those assumptions involve the degree to which economic variables influence households' decisions about how much to work and save as well as the extent to which real (inflation-adjusted) U.S. interest rates are determined by the domestic economy or the world economy. In addition, the life-cycle model necessitates assumptions about what people believe will happen to fiscal policies in the future.

Solow-Type Growth Model

CBO's Solow-type growth model is an enhanced version of a widely known model developed by Robert Solow.⁶ It incorporates the assumption that economic output is determined by the number of hours of labor that workers supply, the size and composition of the capital stock (for example, factories and computers), and total factor productivity—which represents the combined productivity of labor and capital. According to the Solow-type model, people base their decisions about working and saving primarily on current economic conditions—especially wage

5. CBO estimates that weakness in aggregate demand that leads to persistent unemployment can have a small but lasting impact on potential output. For example, some workers who have been unemployed for a long time, especially those displaced from a long-tenured job, are likely to have trouble landing another stable job. Consequently, they could remain unemployed for an extended period; moreover, even after they are reemployed, many will remain more vulnerable than before to additional future spells of unemployment. However, CBO's estimates of the economic impact of the President's proposals do not incorporate a reduction in persistent unemployment or any resulting increase in potential output.

6. For a detailed description of the Solow-type growth model, see Congressional Budget Office, *CBO's Method for Estimating Potential Output: An Update* (August 2001).

levels, interest rates, and government policies. The model incorporates the assumption that people respond to current developments as they have, on average, in the past; as a result, the estimated responses reflect people's past anticipation of policies in a general way but not their responses to specific future developments. For example, according to the model, people increase their saving somewhat in response to an increase in deficits (in part, in anticipation of possible future tax increases or spending cuts that typically follow an increase in deficits), but they do not behave as if they anticipate the details of future changes in government policies.

Channels Through Which the President's Proposals Would Affect the Economy.

The estimates that CBO developed using the Solow-type model incorporate the effects that the President's budgetary proposals would have on marginal tax rates on labor and, in turn, on the number of hours worked. The estimates also incorporate the effects that the President's budgetary proposals would have on marginal tax rates on capital and thereby on private saving.

The President's proposals would also increase budget deficits, which would have a negative effect on the capital stock. Specifically, the larger deficits would imply less public saving, and private saving would rise by an amount that only partially offset the decline in public saving. (Policies that increase deficits can lead to higher private saving for several reasons, including responses to higher interest rates and increases in disposable income, which can boost both spending and saving.) Therefore, national saving would be lower, and less domestic funding would be available to finance investment. However, the net reduction in national saving caused by higher deficits would not entirely translate into lower domestic investment. Instead, part of the reduction would be reflected in increased borrowing from abroad to finance investment in this country, which also means that a smaller portion of the returns from the domestic capital stock would be received domestically.

Alternative Assumptions. CBO used the Solow-type model to estimate the effects of the President's proposals under three alternative assumptions about how people would adjust their work hours in response to changes in marginal tax rates on labor income: a "strong labor supply response," under which workers' response is on the high side of the consensus range of empirical estimates from studies based on observed changes in the labor supply; a

“weak labor supply response,” under which workers respond very little; and a “medium labor supply response,” under which workers’ response is between strong and weak.⁷

The responsiveness of the labor supply to taxes is often expressed as the total wage elasticity (the change in total labor income caused by a 1 percent change in after-tax wages). The total wage elasticity, in turn, has two components: a substitution elasticity (which measures the effect of changes in marginal tax rates) and an income elasticity (which measures the effect of changes in average tax rates). In this analysis, CBO assumes that the total wage elasticity ranges from a low of -0.05 (composed of a substitution elasticity of 0.15 and an income elasticity of -0.20) to a high of 0.35 (composed of a substitution elasticity of 0.35 and an income elasticity of 0.0).

CBO also analyzed the President’s budget with the Solow-type model under three sets of assumptions about the effect of deficits on investment. In the first case (“small effect of deficits on investment”), each additional \$1 of deficit leads to a 10-cent decline in domestic investment, owing to a combination of reduced national saving and a partially offsetting increase in foreign capital invested in the United States. In particular, every additional \$1 of deficit is assumed to lead people to increase their private saving by about 68 cents and thus to reduce national saving by 32 cents, and every \$1 decline in national saving is assumed to lead to a 68-cent increase in the amount of foreign capital invested in the United States. Together, those assumptions imply that a \$1 increase in the budget deficit results in a 68-cent increase in private saving, a 22-cent increase in capital inflows (that is, 32 cents times 0.68), and a 10-cent decline in domestic investment.⁸

In the second case (“medium effect of deficits on investment”), each additional \$1 of deficit leads to a 30-cent decline in domestic investment. In particular, every additional \$1 of deficit is assumed to lead people to

7. For details of CBO’s approach to estimating labor supply changes for the Solow-type growth model, see Congressional Budget Office, *The Effect of Tax Changes on Labor Supply in CBO’s Microsimulation Tax Model*, Background Paper (April 2007); and *Labor Supply and Taxes*, CBO Memorandum (January 1996). Since issuing those publications, as a result of a subsequent review of the literature on labor supply responses, CBO has revised its estimates of how responsive people’s work decisions are to taxes.

increase their private saving by about 45 cents and thus to reduce national saving by 55 cents, and every \$1 decline in national saving is assumed to lead to a 45-cent increase in the amount of foreign capital invested in the United States. Together, those assumptions imply that a \$1 increase in the budget deficit results in a 45-cent increase in private saving, a 25-cent increase in capital inflows (that is, 55 cents times 0.45), and a 30-cent decline in domestic investment.

In the third case (“large effect of deficits on investment”), each additional \$1 of deficit leads to a 50-cent decline in domestic investment. In particular, every additional \$1 of deficit is assumed to lead people to increase their private saving by about 29 cents and thus to reduce national saving by 71 cents, and every \$1 decline in national saving is assumed to lead to a 29-cent increase in the amount of foreign capital invested in the United States. Together, those assumptions imply that a \$1 increase in the budget deficit results in a 29-cent increase in private saving, a 21-cent increase in capital inflows (that is, 71 cents times 0.29), and a 50-cent decline in domestic investment.

Applying the model under those various alternative assumptions produced nine different possible outcomes for the 2018–2022 period, with estimated changes in real output over that period ranging from a reduction of 1.8 percent to an increase of 0.2 percent (see Table A-1).⁹

Life-Cycle Growth Model

In CBO’s life-cycle growth model, people make decisions in response to prices in the economy (such as wages and rates of return on saving), and prices are determined by their choices (that is, the model is a “general-equilibrium” model). In the model, the economy consists of different

8. On the basis of a review of recent research, CBO has reduced its assumption of the impact of deficits on investment in the scenario incorporating a “small effect of deficits on investment” from 20 cents per dollar of deficit (the impact assumed in last year’s *An Analysis of the President’s Budgetary Proposals for Fiscal Year 2012*, among other analyses) to 10 cents per dollar of deficit. Similarly, CBO has reduced its assumption in the scenario incorporating a “medium effect of deficits on investment” from 36 cents per dollar of deficit to 30 cents per dollar of deficit.

9. To best convey CBO’s expectations of the likely effects of the President’s policies, the numbers presented in the main text of this report represent the central two-thirds of all of the agency’s estimates using the Solow-type and life-cycle models.

Table A-1.

CBO's Estimates of How the President's Budget Would Affect Inflation-Adjusted Gross National Product, 2018 to 2022

(Average percentage difference from CBO's baseline, by calendar year)

	Change in Real Gross National Product
	Solow-Type Model
Small Effect of Deficits on Investment	
Weak labor supply response	-0.6
Medium labor supply response	-0.2
Strong labor supply response	0.2
Medium Effect of Deficits on Investment	
Weak labor supply response	-1.2
Medium labor supply response	-0.8
Strong labor supply response	-0.5
Large Effect of Deficits on Investment	
Weak labor supply response	-1.8
Medium labor supply response	-1.5
Strong labor supply response	-1.2
	Life-Cycle Model ^a
Real U.S. Interest Rates Determined Entirely by the Domestic Economy ^b	-2.2
Real U.S. Interest Rates Determined Entirely by the World Economy ^c	-2.6

Source: Congressional Budget Office.

Notes: CBO's Solow-type growth model is an enhanced version of a model developed by Robert Solow.

CBO's life-cycle growth model is an overlapping-generations general-equilibrium model that is based on a standard model of the economy in which people are forward-looking in their behavior.

- a. For the President's budget over the 2018–2022 period, estimates derived from the life-cycle model are the same whether government spending is assumed to be reduced or tax revenues are assumed to be increased after 2026.
- b. Referred to as a "closed economy."
- c. Referred to as a "small open economy."

cohorts of households (also known as overlapping generations) that are forward-looking in their behavior.¹⁰

10. For a detailed description of the life-cycle model, see Shinichi Nishiyama, *Analyzing Tax Policy Changes Using a Stochastic OLG Model with Heterogeneous Households*, Congressional Budget Office Technical Paper 2003-12 (December 2003).

Moreover, according to the model, households know precisely how the government will resolve its long-term budget imbalance, whether by raising taxes in certain ways, cutting spending in certain ways, or implementing some combination of the two. Those households also face uncertainty about future wages and could become "credit-constrained" (that is, unable to borrow to maintain their spending) if their income declined significantly.

Fully Forward-Looking Behavior and Uncertainty. In contrast to the Solow-type model, the life-cycle model is built on the assumption that people make choices about working and saving both in response to current changes in government transfer payments, after-tax wages, and after-tax rates of return and in anticipation of changes in those factors. The model incorporates the assumption that people decide how much to work and save to make themselves as well off as possible over a lifetime. Such behavior is calibrated so that macroeconomic variables such as the total amount of labor supplied and the size of the capital stock match the amounts in the U.S. economy.

Households are assumed to have perfect foresight about the future of the economy as a whole and about government policies. That assumption differs from the assumption made in the Solow-type model, in which people respond to current developments in the way they have, on average, in the past. Using the two alternative approaches allows CBO's estimates to encompass a range of possible responses to the President's budgetary proposals.

CBO's life-cycle model incorporates the assumption that people consider the effects of future economic or policy changes on themselves but not on their children. Therefore, according to this model, older generations know that they could retire or die before a policy change occurs and tend to be less responsive to a future policy change than younger generations are.

Although CBO's life-cycle model does not reflect unpredictable fluctuations in aggregate output, it incorporates an assumption that individual households face unforeseeable fluctuations in their income for which they cannot buy insurance. Faced with that uncertainty, households take the precaution of holding additional savings as a buffer against potential drops in income. In this model, the precautionary motive to save is not strongly affected by changes in the after-tax rate of return

on savings; as a result, households' savings do not respond as much to changes in marginal tax rates on capital income as they would respond in models without a precautionary motive of this sort.¹¹

Channels Through Which the President's Proposals Would Affect the Economy. The estimates that CBO developed using the life-cycle model incorporate the effects that the President's budgetary proposals would have on after-tax wages and, in turn, on the number of hours worked. The estimates also incorporate the effects that the President's budgetary proposals would have on the after-tax rate of return on savings and thereby on the amount of private saving.

The President's proposals would also increase people's disposable income through both lower taxes and higher transfer payments. Other things being equal, those changes would lead people to work less and consume more. The resulting increase in private consumption would be only partially offset by decreased government purchases under the President's proposals. The net increase in purchases would tend to draw money away from ("crowd out") investment.

Alternative Assumptions. The ultimate impact of the President's policies on investment would depend on the degree to which interest rates are determined by the domestic, rather than the world, economy. Although the world economy plays some role in determining interest rates in the United States, the extent of that influence is uncertain. To consider a broad range of possibilities, CBO analyzed the effects of the President's proposals with the life-cycle model under two alternative assumptions: Interest rates in the United States are determined entirely by the domestic economy (equivalently, that the country has a so-called closed economy); and interest rates are determined entirely by the world economy

(equivalently, that the country has a so-called small open economy).¹²

Given the fully forward-looking behavior of households in the life-cycle model, producing estimates of the current effects of policies required CBO to make assumptions about future policies—not only during the 10-year period of the agency's regular baseline projections but into the indefinite future as well. For its analysis, CBO assumed that people anticipated that the policies in the President's budget would be maintained through 2022. (In reality, people might well believe that the policies would change at some point during the next decade.) Because CBO cannot predict what long-term policy changes might be made, the agency chose two illustrative alternatives for budgetary policy over the longer run. Under the first alternative, government transfer payments and government purchases of goods and services would be reduced by equal amounts. (The model incorporates the assumption that government purchases of goods and services do not directly influence people's private decisions about how much to work and save.) Under the second alternative, government revenues would be raised by (in equal measure) increases in effective marginal tax rates and increases in revenues that did not arise from increasing marginal tax rates (but from broadening the tax base, for instance). Under either alternative, changes in policy were assumed to be phased in gradually over 10 years, starting in 2027.

Applying the life-cycle model under those various alternative assumptions produced four possible outcomes for the 2018–2022 period, with estimated reductions in real output over that period ranging from 2.2 percent to 2.6 percent.¹³ Those reductions are somewhat larger than the largest reduction produced by the Solow-type model.

11. In the presence of uncertainty, households' responses to fiscal policies are strongly influenced by their aversion to risk. The degree of risk aversion assumed in CBO's model is consistent with existing estimates, although such estimates vary widely; see Raj Chetty, "A New Method of Estimating Risk Aversion," *American Economic Review*, vol. 96, no. 5 (December 2006), pp. 1821–1834.

12. Although neither of those assumptions about interest rates corresponds fully to the U.S. economy, they encompass a broad range of possible assumptions about the degree to which interest rates are determined by the domestic economy.

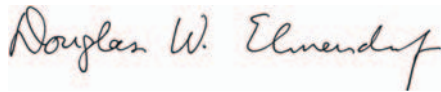
13. In its estimates using the life-cycle model, CBO assumed a labor supply response to changes in after-tax wages roughly in the middle of the range estimated in academic research, rather than incorporate a range of assumptions about that responsiveness, as it did last year.

About This Document

This report is the second of two analyses, both prepared at the request of the Senate Committee on Appropriations, that the Congressional Budget Office (CBO) has done of the President's 2013 budget (which was released on February 13, 2012). The first—*An Analysis of the President's 2013 Budget*, released last month—used CBO's economic assumptions and estimating techniques, rather than the Administration's, to project how the proposals in the President's budget would affect federal revenues and outlays. This second analysis projects how the President's proposals would affect the U.S. economy (relative to what would occur under current law) and, in turn, indirectly affect the federal budget. In keeping with CBO's mandate to provide objective, impartial analysis, the report makes no recommendations.

Charles Whalen and Ben Page of CBO's Macroeconomic Analysis Division wrote the report, under the supervision of Wendy Edelberg and William Randolph. The underlying economic and tax modeling was conducted by Paul Burnham, Ed Harris, Jonathan Huntley, Valentina Michelangeli, Larry Ozanne, Felix Reichling, Frank Russek, Marika Santoro, Kurt Seibert, and David Weiner.

John Skeen edited the report, and Jeanine Rees prepared it for publication. An electronic version is available on CBO's Web site (www.cbo.gov).



Douglas W. Elmendorf
Director

April 2012