CBO

A Macroeconomic Analysis of the President's 2016 Budget

AUGUST 2015

Notes

Unless this report indicates otherwise, all years referred to in describing the budgetary effects of the President's budget proposals are federal fiscal years, which run from October 1 to September 30 and are designated by the calendar year in which they end. All years referred to in describing the economic effects of the proposals are calendar years.

The analysis in this report is based on the economic projections published by the Congressional Budget Office in January 2015. The estimates of the budgetary effects of the President's budget proposals are relative to CBO's March 2015 baseline projections, adjusted for the subsequent enactment of the Medicare Access and CHIP Reauthorization Act of 2015.

Numbers in the text and tables may not add up to totals because of rounding.

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Summary

Each year, after the President releases his budget request, the Congressional Budget Office analyzes the proposals in that request. Using its own economic projections and estimating procedures, CBO projects what the federal budget would look like over the next 10 years if the President's proposals were adopted. CBO usually provides that information in two reports. The first examines the proposals' direct effects on the budget; the second, which takes more time to prepare, shows the effects that the proposals would have on the economy and how those macroeconomic effects would, in turn, feed back into the budget.

As this second report explains, CBO estimates that, under the President's proposals, the nation's real (inflation-adjusted) gross national product (GNP) would be 0.4 percent higher, on average, during the 2016–2020 period, and 1.7 percent higher during the 2021–2025 period, than under current law.[1] After incorporating the proposals' macroeconomic feedback into the budget, CBO estimates that deficits under the President's proposals would be $1.4 trillion smaller during the 2016–2025 period than in CBO's baseline, which is a projection of the paths that federal revenues and spending would take over the next decade if current laws generally remained unchanged. The inclusion of the macroeconomic feedback has changed the estimated deficits under the President's proposals only slightly from those

that CBO estimated in its first report; changes in law that have occurred since the release of that report have changed the estimated deficits more significantly.

What Did CBO Previously Report About the President's 2016 Budget?

CBO and the staff of the Joint Committee on Taxation (JCT) estimated in the first report (which was published on March 12) that deficits under the President's proposals would total $6.0 trillion between 2016 and 2025, $1.2 trillion less than the deficits in CBO's baseline.[2] In each of the years from 2016 through 2018, the deficit would equal 2.0 percent or 2.1 percent of gross domestic product (GDP), and it would then increase to an average of 2.9 percent during the second half of the 10-year projection period. Under what was then current law, deficits would have been larger—starting at 2.3 percent to 2.4 percent of GDP in the next few years and then rising to 3.8 percent in 2025.

CBO's first report about the President's proposals typically does not include macroeconomic feedback. This year, however, a proposal related to immigration would affect the economy more directly than Presidential proposals usually would—by increasing the size of the labor force and changing the legal status of some current workers—and the feedback from that increase would result in significantly higher receipts from income and payroll taxes. Therefore, this year's version of the first report included that feedback, as did CBO's cost estimate for similar immigration legislation that was proposed in 2013.[3]

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1. For this analysis, CBO focused on effects on GNP—the total market value of goods and services produced in a given period by the labor and capital supplied by a country's residents, regardless of where the labor and capital are located—instead of the more commonly cited gross domestic product (GDP). GNP excludes foreigners' earnings on domestic investments and includes domestic residents' foreign earnings; in a large, 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 cause some foreign income of U.S. residents to be effectively untaxed.

2. Congressional Budget Office, *An Analysis of the President's 2016 Budget* (March 2015), www.cbo.gov/publication/49979.

3. For the cost estimate, see Congressional Budget Office, letter to the Honorable Patrick J. Leahy providing an estimate for S. 744, the Border Security, Economic Opportunity, and Immigration Modernization Act (July 3, 2013), www.cbo.gov/publication/44397.

Figure 1.

Deficits Projected Under CBO's Baseline and Under the President's Proposals

Percentage of Gross Domestic Product
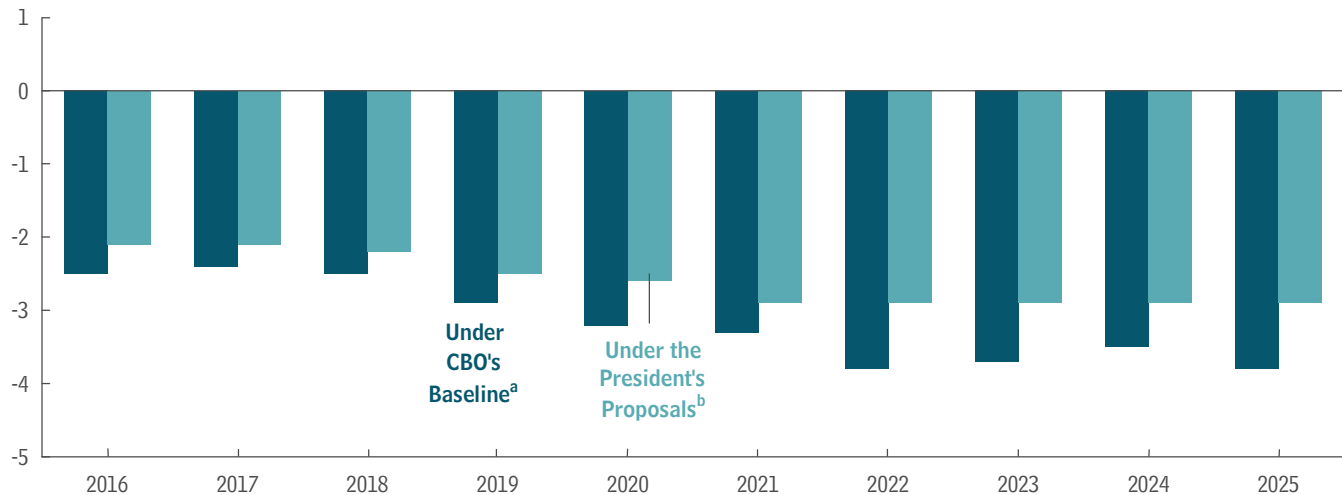
Source: Congressional Budget Office.

a.   These projections have been adjusted from CBO's March 2015 baseline for the subsequent enactment of the Medicare Access and CHIP Reauthorization Act of 2015.

b.   These projections include all macroeconomic feedback that would result from the President's proposals.

What Does CBO Now Report About the President's 2016 Budget?

This second report shows all of the effects that the President's proposals would have on the economy and the feedback of those macroeconomic effects into the budget (rather than just some of the feedback effects of the immigration proposal). Over 10 years, deficits would differ by less than $40 billion from those estimated in the first report, and they would be almost identical as a percentage of GDP, rising from 2.1 percent in 2016 to 2.9 percent in 2025 (see Figure 1).

However, mostly because CBO's baseline has been adjusted for this report to account for recent legislation, the agency now estimates that from 2016 through 2025, the President's proposals would make deficits $1.4 trillion smaller than they are in the baseline—rather than $1.2 trillion smaller, as the first report estimated (see Table 1). After the first report was released, the Medicare Access and CHIP Reauthorization Act of 2015 was enacted. That law supersedes a proposal in the President's budget to increase Medicare's payment rates for physicians; therefore, in the current analysis, CBO included its effects in the projection of the deficit under current law, rather than including them as part of the President's proposals.[4] In CBO's first report, the President's proposal

regarding those payment rates increased projected deficits by a total of about $168 billion from 2016 through 2025; in this second report, incorporating the effects of the law into CBO's baseline (rather than treating it as a proposal by the President) increased the net savings attributable to the President's budget by the same amount.

CBO estimates that the additional macroeconomic effects analyzed in this second report would not significantly alter the net budgetary impact of the President's proposals over the 2016–2025 period because their two most important influences on the budget would largely offset one another. On the one hand, the smaller deficits under the President's budget would raise national saving, investment, and output in the long run; that higher output would generate more tax revenue. On the other hand, the workers added to the labor force under the President's immigration proposal would increase the ratio of labor to capital, raising the rate of return on capital and therefore

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4.   The Medicare Access and CHIP Reauthorization Act of 2015 became law on April 16, 2015. It increased Medicare payments for physicians' services and reauthorized the Children's Health Insurance Program. CBO estimates that its cumulative cost will be similar to that of the President's proposal. Incorporating the law into CBO's baseline projections boosted projected deficits over the 2016–2025 period from $7.2 trillion to $7.4 trillion.

Table 1.

Projected Deficits

Trillions of Dollars, by Fiscal Year

	2016–2020	2021–2025	2016–2025
Deficits Under CBO's March 2015 Baseline[a]	-2.8	-4.6	-7.4
Deficits Under the President's Proposals			
With some macroeconomic feedback[b]	-2.3	-3.7	-6.0
With all macroeconomic feedback[c]	-2.4	-3.6	-6.0

Source: Congressional Budget Office.

a. These baseline projections have been adjusted for the subsequent enactment of the Medicare Access and CHIP Reauthorization Act of 2015. Projected deficits under the unadjusted March 2015 baseline totaled $7.2 trillion over the 2016–2025 period.

b. These are the estimates provided in the March 2015 analysis of the budgetary effects of the President's proposals, adjusted for the subsequent enactment of the Medicare Access and CHIP Reauthorization Act of 2015. See Congressional Budget Office, *An Analysis of the President's 2016 Budget* (March 2015), www.cbo.gov/publication/49979.

c. These estimates include macroeconomic feedback that was not included in CBO's March 2015 analysis.

raising interest rates throughout the economy; those higher interest rates would raise federal borrowing rates and thus federal interest payments.

All told, under the President's proposals, the nation's real GNP would be 0.4 percent higher, on average, during the 2016–2020 period and 1.7 percent higher during the 2021–2025 period than under current law, CBO estimates. Employing different estimates of certain key factors, the agency projects that the increase in GNP would probably be between 0.2 percent and 0.5 percent over the 2016–2020 period and between 1.1 percent and 2.3 percent over the 2021–2025 period. Those ranges reflect some aspects of the uncertainty of the proposals' macroeconomic effects—including uncertainty about the effect of changes in aggregate demand on output, the effect of marginal tax rates on the supply of labor, and the effect of increased immigration on total factor productivity (the efficiency with which labor and capital are used to produce goods and services). However, many other aspects of the economic and budgetary projections are uncertain, and actual outcomes could lie outside the ranges of probable outcomes estimated by CBO.

GNP *per person* would be lower after 2016 under the President's proposals than under current law, primarily because of the immigration-related increase in the size of the population.[5] According to CBO's analysis, the President's proposals would reduce per capita GNP by about 0.5 percent over the 2016–2020 period, on average, and by about 0.7 percent over the 2020–2025 period.

How Government Policies Can Affect the Economy

Changes in the federal government's tax and spending policies can affect the economy in both the short term and the long term. In the short term, changes in fiscal policies affect the amount of economic output primarily by changing the overall demand for goods and services by consumers, businesses, and governments. In the long term, changes in fiscal policies affect output by altering *potential* output, which is the economy's maximum sustainable level of production. They do so by changing people's incentives to work, save, and invest and by changing productivity.

CBO employs different methods for estimating those short-term and long-term effects, and the agency gradually shifts from short-term analysis to long-term analysis

5. The estimated reduction in per capita GNP does not necessarily imply that current U.S. residents would be worse off under the President's proposals than under current law. That lower per capita GNP would be for all U.S. residents under the proposals, including not only people who would be residents under current law but also the additional people who would come to the country under the immigration proposal. And as CBO explained in its analysis of S. 744—the comprehensive immigration legislation passed by the Senate in 2013 to which the President's immigration proposal is similar—those additional people would have lower income, on average, than other residents, which would pull down average income and thus pull down per capita GNP. CBO has not analyzed the effects of the President's immigration proposal on the income of people who would be U.S. residents under current law. See Congressional Budget Office, *The Economic Impact of S. 744, the Border Security, Economic Opportunity, and Immigration Modernization Act* (June 2013), www.cbo.gov/publication/44346.

as it projects the effects over time of a proposed policy change.[6] For one year, starting when the change would take effect, CBO's estimates of the change's effects on output reflect only the short-term analysis. For the next three years, the estimates place increasing weight on the long-term analysis. For the remaining years of the projection period, the estimates are based entirely on the policy change's long-term effects on potential output.[7]

Changes in fiscal policies are not the only way that the federal government can affect the economy. For this analysis, CBO also considered how comprehensive changes to immigration laws would alter the economy's actual output and potential output, in both the short term and the long term, mainly by changing the size of the population and the supply of labor (that is, the number of hours of labor that workers provide).

Tax and Spending Policies in the Short Term

Changes in fiscal policies affect the economy in the short term largely by influencing the overall demand for goods and services. For example, cuts in taxes and increases in government transfer payments boost demand by raising the amount of money that people have available to spend; increases in the government's own purchases of goods and services also add to demand. Such increases in demand encourage businesses to boost production and hire more workers than they would have otherwise. Conversely, increases in taxes and cuts in government spending reduce demand and have the opposite effects on businesses.

The effect that a proposed change in fiscal policy would have on overall demand depends on several factors: the

particular policy being considered; the state of the economy when the change would occur; and the way the Federal Reserve, which sets monetary policy, would react to the change. The third factor is closely related to the second, because the Federal Reserve's reaction would depend heavily on the state of the economy. For example, when output is well below its potential level and inflation is low (as has been the case in recent years), the Federal Reserve may keep short-term interest rates near zero to encourage investment and consumer spending and thus raise output. At such times, tax cuts and increases in government spending generate a larger boost in demand than at times when the Federal Reserve reacts by increasing interest rates—because the higher rates depress output, offsetting to some extent the effects of the fiscal changes.

Fiscal policies that increase demand in the short term are likely to reduce output in the long term, all things being equal. In general, such policies directly increase deficits by some combination of raising spending and reducing revenues. (Although the boost to demand tends to increase output and taxable income—and thus revenues—in the short term, those changes are generally not big enough to offset the direct increase in deficits.) As a result, such policies tend to raise the total amount of government borrowing—which, in the long term, causes the nation's saving and capital stock to be smaller than they would be otherwise. That effect, which is described in more detail below, reduces output.

Some researchers have reached a different conclusion. They maintain that policies that raise demand in the short term—especially during a deep recession or slow recovery, when labor is underused—can have positive economic effects in the long term as well, because an increase in demand for labor can prevent workers' skills from eroding and preserve their attachment to the labor force. That effect could increase long-term potential output by enough to outweigh the negative economic and budgetary effects of greater federal borrowing.[8] Because of uncertainty about the ways in which a short-term

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6. For a discussion of CBO's estimating methods, see Congressional Budget Office, *How CBO Analyzes the Effects of Changes in Federal Fiscal Policies on the Economy* (November 2014), www.cbo.gov/publication/49494.

7. To be consistent with its March report, CBO assumed for this analysis that the President's proposals would have been enacted at the beginning of the third quarter of 2015. Therefore, CBO's estimates for the third quarter of calendar year 2015 through the second quarter of 2016 are based only on the short-term economic effects of the President's proposals, which are largely changes in demand; estimates for the following three one-year periods are weighted averages of the short-term effects on demand and the long-term effects on potential output in which the weights on the short-term effects fall from 0.75 to 0.50 to 0.25; and estimates for the third quarter of 2019 and beyond are based entirely on effects on potential output.

8. See, for example, Dave Reifschneider, William Wascher, and David Wilcox, *Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy*, Finance and Economics Discussion Series Paper 2013-77 (Board of Governors of the Federal Reserve System, November 2013), http://go.usa.gov/5rZP; and J. Bradford DeLong and Lawrence H. Summers, "Fiscal Policy in a Depressed Economy," *Brookings Papers on Economic Activity* (Spring 2012), pp. 233–290, http://tinyurl.com/ccu2sgb.

increase in demand could raise potential output in the long term, CBO does not incorporate such effects into its analyses, although the agency continues to investigate the issue.

Changes in fiscal policies can affect output in the short term not only by influencing overall demand but also by influencing the supply of labor; CBO incorporates such effects into its analyses, but their size depends on the state of the economy.[9] For instance, when unemployment is high and actual output is much lower than potential output, a policy that leads some workers to leave the labor force (say, a policy that makes disability insurance payments larger) may simply enable unemployed people to fill those workers' former jobs, resulting in no effect on output. However, when unemployment is low and actual output is close to its potential level, the same policy might reduce the total number of people who are employed and thus reduce output.

Tax and Spending Policies in the Long Term

The key determinant of economic output over the long term is the nation's potential to produce goods and services. That potential output, in turn, depends on three factors:

- The size and quality of the labor force;

- The stock of productive capital (such as factories, vehicles, and computers); and

- Total factor productivity—that is, the efficiency with which that labor and capital produce goods and services.

The government's fiscal policies change those factors in three principal ways: by affecting the total amount of saving in the economy; by altering individuals' and businesses' incentives to work and save; and by changing the amount of public investment.

National Saving. The total amount of saving in the economy, called national saving, is the sum of public saving and private saving. Public saving consists of all surpluses of state and local governments and the federal government, minus

all deficits; private saving consists of saving by households and businesses. National saving, along with net borrowing from abroad, finances the nation's investment in its capital stock—which, again, helps determine how much output the economy can produce.

An increase in the federal budget deficit reduces public saving. In the long run, it also raises private saving—in part because when the government borrows more, interest rates rise throughout the economy, encouraging people to save—and it raises net borrowing from abroad as well, for the same reason.[10] However, the increases in private saving and in net borrowing from abroad only partly offset the decline in public saving. (In its analyses of the long-term effects of changes in deficits, CBO uses ranges of the sizes of those offsets.)[11] Therefore, the net effect of higher deficits in the long run is a smaller capital stock, which reduces output.[12]

Incentives to Work and Save. Tax and spending policies can also affect the economy's potential output by altering incentives. Changes in tax rates, for example, alter people's willingness to work and save, affecting the supplies of labor and capital in the long term. Similarly, changes in government spending on transfer payments, such as unemployment insurance and Social Security benefits, can increase or decrease people's willingness to work and save, again affecting the size of the labor force and the capital stock.

In CBO's assessment, an increase in the effective marginal tax rate on labor income—that is, the rate that would apply to an additional dollar of an employee's earnings—

9. For more discussion, see Congressional Budget Office, *How CBO Analyzes the Effects of Changes in Federal Fiscal Policies on the Economy* (November 2014), pp. 5–6, www.cbo.gov/publication/ 49494.

10. Private saving also increases for two other reasons. One is that some people anticipate that policymakers will raise taxes or cut spending in the future to cover the cost of paying interest on the additional accumulated debt, so those people increase their own saving to prepare for paying higher taxes or receiving less in benefits. The other is that the policies that give rise to deficits (such as tax cuts or increases in government transfer payments) put more money in private hands, and some of that money is saved.

11. See Jonathan Huntley, *The Long-Run Effects of Federal Budget Deficits on National Saving and Private Domestic Investment*, Working Paper 2014-02 (Congressional Budget Office, February 2014), www.cbo.gov/publication/45140.

12. Although increased net borrowing from abroad mitigates the effect of rising deficits on the capital stock, it also means that more profits and interest payments will flow overseas. Part of the income resulting from the larger capital stock will consequently not accrue to U.S. residents.

causes the supply of labor to be smaller than it would be otherwise.[13] That is the result of two countervailing pressures created by the higher tax rate: a substitution effect and an income effect. The increase in the marginal tax rate reduces the after-tax income from an additional hour of work, making work less valuable in relation to other uses of a person's time; by itself, that substitution effect would reduce the number of hours that people work. At the same time, however, the reduction in after-tax income from a given amount of work requires people to work more hours to maintain the same standard of living; by itself, that income effect would increase the number of hours that people work. After reviewing the empirical evidence, CBO has concluded that the substitution effect outweighs the income effect, meaning that an increase in the marginal tax rate on labor income decreases the total supply of labor that workers provide. CBO uses a range of estimates of how much the size of the labor supply changes when the marginal tax rate on labor income changes.

Similarly, an increase in the marginal tax rate on income from capital—such as stock dividends, realized capital gains, and owners' profits from businesses—has countervailing effects on saving. Higher tax rates on capital income reduce the returns that people earn on their savings (which tends to discourage saving) but also increase the amount of savings that people need to achieve a given future income (which encourages saving). In CBO's assessment, an increase in the marginal tax rate on capital income makes private saving smaller, on balance, than it would be otherwise; the result, other things being equal, is a smaller capital stock.

Public Investment. The federal government pays for many goods and services that are expected to increase potential output some years in the future. Those purchases are called public investment. Spending on education can help develop workers' skills, improving the quality of the labor force; spending on research and development (R&D) can prompt innovation, raising total factor productivity; and spending on physical capital, such as roads and airports, can facilitate commerce, likewise raising productivity.[14] The federal government can boost potential output by making investments that the private

sector would not have made on its own or would have made in smaller amounts than their broad public benefits might justify.

Considerable uncertainty exists, however, about the size of the increase in potential output that results from each additional dollar of federal investment. Some past federal investments have generated much higher returns than others, and returns have varied significantly by historical period. For example, in a study of transportation and water infrastructure, CBO has concluded that average returns are lower than they once were because returns derived from additional spending on a mature infrastructure network are typically smaller than those derived from the investments that established that network in the first place.[15] Moreover, federal investment can discourage investment by private entities or state and local governments by raising the price of investment goods and by allowing those governments to redirect their own funds to other purposes. If that happened, the net effect of federal investment on output would be smaller. To account for those and other types of uncertainty, CBO's analyses incorporate a range of estimates of the effect of federal investment on output.[16]

CBO estimates that returns on federal investment accrue more slowly than returns on private investment do because many federal investments differ in nature from private ones. From 1988 to 2008, for example, 33 percent of nondefense federal investment was for education and 23 percent was for R&D, whereas most private-sector investment was for physical capital. In the agency's assessment, education and R&D take considerably longer to boost private-sector output than investment in physical capital does. For this analysis, CBO assumed that 10 percent of the federal investment proposed in the President's budget would become productive within one year, that an additional 20 percent would become productive in each of the following two years, and that an additional 10 percent would become productive each year thereafter until the entire investment was productive. The investment (like private-sector investment) would

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13. For details about how changes in tax and spending policies affect the supply of labor, see Congressional Budget Office, *How the Supply of Labor Responds to Changes in Fiscal Policy* (October 2012), www.cbo.gov/publication/43674.

14. See Congressional Budget Office, *Federal Investment* (December 2013), www.cbo.gov/publication/44974.

15. See Congressional Budget Office, *Public Spending on Transportation and Water Infrastructure, 1956 to 2014* (March 2015), p. 5, www.cbo.gov/publication/49910.

16. Details about CBO's estimates of the effect of federal investment on output will be presented in Congressional Budget Office, *The Macroeconomic and Budgetary Effects of Federal Investment* (forthcoming).

also depreciate over time, so that its returns gradually diminished and eventually faded out completely.

Immigration Policies

Changes in immigration policies can alter the size and quality of the nation's labor supply, which are major determinants of both actual and potential output. If a change in immigration policies led to an increase in the labor supply (and everything else stayed the same), the amount of employment and output in the economy would rise. The increase in the labor supply would also tend to make average wages slightly lower than they would be under current law over the next decade, mostly because the amount of capital available to workers would not increase as rapidly as the number of workers. If the new workers were less skilled and had lower wages, on average, than the labor force under current law, that would also tend to reduce average wages.

In addition, the rate of return on capital would tend to be higher under such a change in immigration policies than under current law. At least in the first several years, growth in the workforce would render the existing stock of capital scarce (compared with the supply of labor) and more productive (because the existing capital would be used more intensively). As a result, the rate of return on capital would increase over time and spur additional investment, which in turn would expand the stock of capital and further increase output.

CBO estimates that an increase in immigration—particularly an increase in the immigration of highly skilled workers—would also raise total factor productivity, because some of the immigrants would contribute to the development of technological advancements, such as inventions and improvements in production processes.[17]

How the Proposals in the President's Budget Would Affect the Economy

If enacted, the policies proposed in the President's 2016 budget would affect the economy in five main ways. They would:

- Increase the size of the U.S. population, thus expanding the labor force and boosting total factor productivity;

- Reduce federal budget deficits, which would reduce overall demand and also, in the long term, increase national saving and private investment;

- Raise marginal tax rates on labor income, on average, thereby discouraging work;

- Raise marginal tax rates on capital income, on average, thereby discouraging saving; and

- Increase federal investment, thereby increasing productivity and the skill level of the workforce.[18]

Increasing the Size of the U.S. Population

The President's budget would alter laws related to immigration, taking an approach similar to the one that the Senate took when it passed comprehensive immigration legislation in 2013. In July of that year, CBO and JCT estimated that enacting that legislation would increase the number of legal residents and the size of the labor force, which would boost tax receipts and spending for federal benefit programs and have various other economic and budgetary effects.[19] On the basis of that analysis, CBO estimates that by 2025, the President's proposal would make the total number of people residing in the United States 11 million (or about 3 percent) higher than projected under current law (see Figure 2).

For the purposes of this analysis, CBO and JCT have updated their estimates of the budgetary effects of the Senate's immigration legislation to incorporate changes to CBO's baseline, including changes to average per capita benefits for certain programs and the effects of the Administration's deferred-action programs for unauthorized

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17. Although the determinants of total factor productivity are poorly understood, a substantial body of research suggests a link between it and increases in the number of highly skilled immigrants; a smaller body of research quantifies the effects of immigration on output in general. For more discussion, see Congressional Budget Office, *The Economic Impact of S. 744, the Border Security, Economic Opportunity, and Immigration Modernization Act* (June 2013), www.cbo.gov/publication/44346.

18. The President's budget also includes a proposal to give states grants that would expand access to child care for low- and middle-income families. In principle, those grants could lead to increased labor force participation among affected parents. However, the Administration has not provided enough detail to allow CBO to estimate the proposal's effects.

19. CBO's analysis of that legislation is summarized in Congressional Budget Office, letter to the Honorable Patrick J. Leahy providing an estimate for S. 744, the Border Security, Economic Opportunity, and Immigration Modernization Act (July 3, 2013), www.cbo.gov/publication/44397. See also Congressional Budget Office, *The Economic Impact of S. 744, the Border Security, Economic Opportunity, and Immigration Modernization Act* (June 2013), www.cbo.gov/publication/44346.

Figure 2.

How the President's Proposals Would Affect Population and Output

By changing immigration law, the President's proposals would make the population and real GNP larger than they are under CBO's baseline—but because the first would rise faster than the second, real GNP per capita would be smaller than it is under the baseline.

Percentage Difference From CBO's Baseline, by Calendar Year
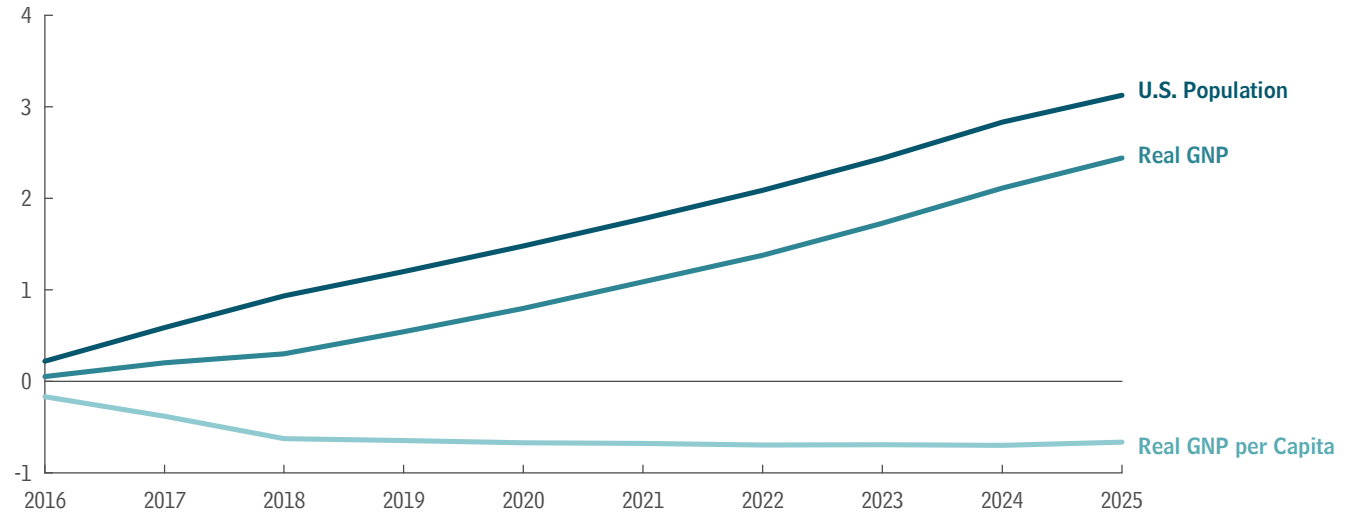
Source: Congressional Budget Office.

Notes: Real GNP excludes the effect of inflation.

Percentage changes for GNP are based on CBO's central estimates, which use values at the midpoints of estimated ranges for key inputs.

GNP = gross national product.

immigrants.[20] CBO and JCT now estimate that enacting such legislation would reduce deficits by $173 billion, on net, over the 2016–2025 period; in 2013, the agencies estimated that it would reduce deficits by $158 billion, on net, over the 2014–2023 period.[21] That small change

in budgetary impact did not significantly affect CBO's estimate of the economic effects of the legislation. As a result, CBO's analysis of the economic effects of the President's immigration proposal are consistent with CBO's previous analysis of the Senate's comprehensive immigration legislation.

The increase in the population that would result from the President's proposal would expand the labor force and boost employment. At first, as employment increased, less capital would be available per worker, and workers' average output would therefore be lower for a time. In addition, the new workers would be less skilled, on average, than the labor force under current law. Through the end of the 10-year period covered by this analysis, those factors would make average wages lower than they would be under current law—although that reduction does not necessarily imply that average wages would be lower for people who would be residents under current law. CBO has not

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20. Deferred-action programs delay possible removal proceedings for unauthorized residents. Those who are approved for deferred action are considered lawfully present in the country for a limited period; they can receive authorization to work here, and most do. The number of people eligible for deferred action was expanded in November 2014, when the President announced a series of changes to immigration policy by means of executive action. That action, CBO estimates, will reduce the number of people whose legal status would change if immigration reform modeled on S. 744 was enacted. In February 2015, after a group of states brought a lawsuit challenging the President's expansion of deferred action, a federal judge issued a preliminary injunction prohibiting the Administration from implementing the expansion during the litigation. That injunction has since been upheld on appeal by the U.S. Court of Appeals for the Fifth Circuit; see *Texas v. United States*, No. 15-40238, 2015 U.S. App. LEXIS 8657 (5th Cir. May 26, 2015). Because of the injunction, CBO has assumed that the expansion will not be implemented until 2016.

21. See Congressional Budget Office, *An Analysis of the President's 2016 Budget* (March 2015), www.cbo.gov/publication/49979.

analyzed the effects of the President's immigration proposal on the income of those people.

Over time, the increases in the labor force and in employment would raise capital investment, primarily because the return that people earned on a given amount of investment would be higher under the immigration proposal than it would be under current law. The increased rate of return on capital investment would occur because the larger labor force would make the existing stock of capital scarcer relative to the supply of labor, which would make each unit of capital—a single computer, for example—more productive. The increase in the rate of return on investment would moderate over time, however, as the stock of capital grew. The greater rate of return on investment would also mean that the federal government, which competes with the private sector for investors' money, would have to pay higher interest rates to sell its debt securities than it would under current law.

The President's immigration proposal would lead to higher total factor productivity, CBO anticipates, because some immigrants—highly skilled immigrants in particular—would contribute to the development of technological advancements. That increase in total factor productivity would tend to push up output, wages, and interest rates. Because the effect of immigration on total factor productivity is particularly uncertain, CBO included a range of those effects in this analysis. The agency's central estimate was that immigration would boost total factor productivity by rising amounts each year; by 2025, the increase would amount to 0.7 percent.[22] The likely range of effects for 2025 is between zero and an increase of 1.4 percent.

Finally, the increase in the size of the population would boost the demand for goods and services. However, CBO expects the rise in demand to be roughly equal to the increase in the supply of goods and services resulting from more employment, capital, and total factor productivity. In other words, CBO does not expect the increase in the population to change the gap between actual output and potential output significantly.

Reducing Federal Deficits
The President's proposals would reduce federal budget deficits, thereby shrinking aggregate demand, which would tend to decrease output in the short term. The

deficit reduction would be accomplished mainly by raising tax revenues. The proposals include limiting the extent to which certain deductions and exclusions limit tax liabilities; increasing taxes on dividends and capital gains; and imposing a onetime tax on certain foreign earnings. Those proposals would reduce people's disposable income and thus their demand for goods and services. That decrease in demand would be partly offset by increases in demand stemming from other proposals, such as increasing the limits on discretionary spending established by the Budget Control Act of 2011 and subsequent amendments, a change that would directly raise overall demand by boosting the government's purchases of goods and services.[23]

The net change in overall demand would depend not only on whether the proposals, taken together, would raise or lower the deficit but also on the proposals' per-dollar effects on government and household spending. Increases or decreases in federal purchases alter government spending dollar for dollar. Taxpayers and recipients of government transfers, by contrast, tend to adjust their spending by less than one dollar for each one-dollar change in their income. Furthermore, the adjustment in spending tends to be smaller for high-income households, which would be disproportionately affected by the President's revenue proposals, than for low-income households. Nevertheless, in the case of the President's proposals, the effect of the revenue proposals is estimated to outweigh that of the increase in government spending, leading to a reduction in overall demand.

In the long term, the decrease in deficits under the President's proposals would have an additional macroeconomic effect. It would represent an increase in public saving and thus in national saving, which would increase domestic investment and the nation's capital stock—and therefore output and income.

Raising Marginal Tax Rates on Labor Income
CBO estimates that the President's proposed changes to the taxation of labor income would make the effective tax rate on an additional dollar of a taxpayer's earnings higher throughout the 2016–2025 period than it would be

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22. CBO's central estimates are the effects predicted when key inputs to an analysis are at the midpoints of their ranges.

23. CBO did not incorporate into its economic analysis the effects of the President's proposal to increase Medicare's payment rates for physicians' services, which would have increased demand in the short term and raised deficits throughout the 2015–2025 period. That proposal has since been superseded by the Medicare Access and CHIP Reauthorization Act of 2015.

Table 2.

Projected Marginal Federal Tax Rates

By Calendar Year

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
					Effective Tax Rate on Labor Income						
Rate Under the President's Proposals (Percent)	28.8	30.0	30.2	30.4	30.5	30.7	30.8	31.0	31.2	31.3	31.5
Rate Under Current Law (Percent)	28.8	29.8	29.9	30.0	30.1	30.1	30.3	30.5	30.7	30.8	31.1
Difference											
Percentage points	0	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4
Percent	0	0.9	0.9	1.5	1.5	1.8	1.7	1.7	1.7	1.5	1.4
					Effective Tax Rate on Capital Income						
Rate Under the President's Proposals (Percent)	18.0	19.8	20.0	20.0	20.1	20.1	20.2	20.2	20.2	20.2	20.3
Rate Under Current Law (Percent)	18.0	18.1	18.1	18.1	18.2	18.3	18.4	18.3	18.3	18.3	18.4
Difference											
Percentage points	0	1.7	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.8	1.9
Percent	0	9.5	10.5	10.4	10.6	10.1	10.0	10.0	10.3	10.0	10.2

Source: Congressional Budget Office.

Notes: The effective marginal tax rate on income from labor is the share of an additional dollar of such income that is paid in federal individual income taxes and payroll taxes, averaged among taxpayers with weights proportional to their labor income.

The effective marginal tax rate on income from capital is the share of the return on an additional investment made in a particular year that will be paid in taxes over the life of that investment. Rates are calculated for different assets and industries and then averaged over all assets and industries with the shares of total asset values used as weights.

under current law. In CBO's baseline, the effective marginal tax rate on labor income is projected to rise from 28.8 percent this year to 31.1 percent in 2025, as people's income grows faster than inflation and as the provisions of the Affordable Care Act are fully implemented (see Table 2).[24] The President's proposals would increase the effective marginal tax rate on labor income by amounts ranging from 0.3 percentage points to 0.5 percentage points each year between 2016 and 2025, CBO estimates, which would cause the supply of labor to be smaller than it would be otherwise.[25]

Most of that increase in marginal rates stems from a proposal to limit the tax savings from certain income

exclusions and itemized deductions. Specifically, the proposal would allow taxpayers to reduce their income tax liability by no more than 28 percent of those exclusions and deductions. Also contributing to the estimated increase in marginal rates is the President's proposal for a new minimum tax on high-income taxpayers. That proposal would replace the existing schedule of marginal rates with a flat 30 percent marginal rate for people subject to the new minimum tax, which would increase marginal rates for some taxpayers while decreasing them for others. On net, CBO estimates, the proposal would increase the marginal tax rate on labor income.

Some of the smaller tax proposals, such as a "second-earner" credit for married couples with two earners, an expansion of the earned income tax credit for childless adults, and expansions of the child and child care tax credits, would also have a mixed effect on marginal tax rates, decreasing them for some workers but increasing them for others. In CBO's estimation, the net effect of those provisions would probably be small.

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24. For CBO's estimates of the effects of the Affordable Care Act on labor markets, see Congressional Budget Office, *The Budget and Economic Outlook: 2014 to 2024* (February 2014), Appendix C, www.cbo.gov/publication/45010.

25. For details about how changes in tax and spending policies affect the labor supply, see Congressional Budget Office, *How the Supply of Labor Responds to Changes in Fiscal Policy* (October 2012), www.cbo.gov/publication/43674.

Raising Marginal Tax Rates on Capital Income

The President's budget contains some policy proposals that would raise the tax rate on an additional dollar of a taxpayer's investment income; it also contains proposals that would lower that rate. Taken together, CBO estimates, the proposals would increase the effective marginal tax rate on capital income, averaged over all types of investment, by 1.7 percentage points in 2016 and by slightly larger amounts thereafter, ranging from 1.8 percentage points to 1.9 percentage points (see Table 2).[26] In CBO's estimation, those increases would make private saving—and thus investment and output, eventually—lower than they would be otherwise.

The proposal that would produce the largest increase in the marginal tax rate on capital income would increase the maximum tax rate on dividends and capital gains to 28 percent. Another proposal would cap at 28 percent the extent to which itemized deductions and certain exclusions from income could reduce a taxpayer's income tax liability. (That is the same proposal as the one described above in relation to labor income.) Most of the increase from that proposal would result from reducing the tax benefits to some people of deducting mortgage interest and property taxes. Other proposals that would increase the marginal tax rate on capital income, beginning in 2016, include imposing a new minimum tax on high-income taxpayers (which was likewise described above); taxing carried interest at the higher rates used for ordinary income rather than at the lower rate used for capital gains; limiting the accrual of assets in tax-favored retirement accounts; and reinstating a tax on corporate income that once helped finance the Superfund program.[27] A proposal to establish a "financial crisis responsibility fee," which would be assessed on the liabilities of various financial institutions, would also raise the marginal tax rate on capital income.

A few of the President's proposals would make the marginal tax rate on capital income lower than it would be under current law. The proposal with the largest such effect would allow employers to enroll their workers automatically in individual retirement accounts and would create or expand tax credits to encourage small businesses to do that. Other proposals would make more projects eligible to be financed with tax-exempt bonds and create or expand tax credits for producing advanced-technology vehicles and energy-efficient homes.

Economic activity is affected not only by the average of the effective marginal 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 do, additional resources will be directed to the former even if the latter would be more productive. The proposal of the President's that would most significantly affect the uniformity of capital taxation is the increase in taxes on capital gains and dividends, which would affect only certain types of capital income. In particular, that proposal would increase tax rates on income in the corporate sector, which already faces high effective marginal tax rates relative to other types of capital income. Mostly because of that proposal, CBO estimates that the President's proposals as a whole would make capital taxation slightly less uniform, reducing output slightly in comparison with what it would be otherwise.

CBO did not include the President's proposal to increase estate and gift taxes in its calculation of the effective tax rate on capital income, because those taxes and income taxes may affect incentives to save in different ways. Instead, CBO analyzed the effect of the estate and gift tax proposals separately, estimating that each increase of a dollar in estate and gift taxes would raise national saving by about 5 cents because of increased saving by potential recipients of bequests and gifts.[28]

CBO also did not account for any changes in taxpayers' behavior resulting from the President's proposal to impose a onetime tax on certain foreign earnings. CBO estimates that the proposal would have little impact on incentives to work, save, and invest.

Finally, the President's budget included a number of proposals as part of a reform of business taxes. The

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26. For a description of CBO's method of estimating the effective marginal tax rate on capital income, see Congressional Budget Office, *Computing Effective Tax Rates on Capital Income* (December 2006), www.cbo.gov/publication/18259.

27. Carried interest is a type of compensation typically received by a general partner in a private equity or hedge fund; it usually consists of a share of the profits from the assets under management. The Superfund program cleans up abandoned hazardous waste sites.

28. For more discussion, see Congressional Budget Office, *Federal Estate and Gift Taxes* (December 2009), www.cbo.gov/publication/41851.

Administration has stated that the reform would have no net effect on revenues in the long run. However, the Administration has not specified all of the components needed to accomplish that goal, and the effect of such reform on the effective tax rate on capital income would depend crucially on the components that have not been specified. Therefore, CBO did not incorporate any effect of business tax reform proposals into its estimates of effective tax rates on capital.

Increasing Investment by the Federal Government

The President's proposals would increase federal investment by boosting spending on surface transportation, education, and job-training programs and by expanding and permanently extending the tax credit for companies' research and experimentation costs. To that end, the President has proposed increasing the existing limits on discretionary spending for 2016 through 2021 and setting limits for the 2022–2025 period that would be higher than the amounts projected in CBO's baseline. CBO estimates that under the President's proposals, federal investment would be about $360 billion greater over the 2016–2025 period than the amounts projected in the baseline. Such an increase would boost the economy's potential output by raising the productivity and the skill level of the workforce, in CBO's assessment.

The Economic Effects of the President's Proposals and Their Feedback Into the Budget

If the policy changes proposed in the President's budget were implemented, economic output would be higher throughout the 2016–2025 period than it would be otherwise, CBO estimates. The comprehensive changes to immigration laws would raise total GNP throughout the period; the President's other proposals, taken together, would reduce total GNP throughout the period, but by smaller amounts. Unlike total GNP, per capita GNP would be lower between 2016 and 2025 under the President's budget than it would be under current law. CBO also estimates that the President's proposals would boost interest rates.

Those economic effects would feed back into the budget and make deficits smaller, on balance, than they would otherwise be.[29] The largest instance of such feedback would be the income and payroll taxes paid by the additional people who would be working in the United States under the immigration proposal. The impact of those

taxes on the deficit was included in CBO's March estimates of the budgetary effects of the President's proposals. The other feedback effects of the President's proposals would be small and essentially offsetting.

With all macroeconomic feedback included, CBO estimates that over the 2016–2025 period, implementing the President's proposals would make revenues $1.9 trillion higher, and outlays $0.6 trillion higher, than the agency projects under current law (see Table 3). Therefore, CBO estimates, the President's proposals would reduce the cumulative deficit for the 10-year period by roughly $1.4 trillion—by $0.4 trillion over the 2016–2020 period and by $1.0 trillion over the 2021–2025 period.[30]

Those estimates include the effects on federal interest payments of the proposals' changes both to interest rates and to the amount of federal debt. (The report that CBO issued in March, by contrast, did not incorporate the effects of the proposals on interest rates.) In analyses whose scope is the budget as whole, CBO generally includes the effects on interest payments of such broad proposals' changes to the amount of federal debt—though it does not include such effects in cost estimates for specific pieces of legislation, to be consistent with long-standing procedures used by the Congress for budget enforcement purposes.[31]

Effects Through 2020

CBO estimates that from 2016 through 2020, the President's proposals would make real GNP higher than it would have been under CBO's baseline by an average of 0.4 percent; the impact would increase over time (see Table 4 and Figure 2 on page 8). During that period, the President's proposals would boost economic output mainly by expanding the workforce each year through changes to immigration laws. A larger supply of workers would cause the capital stock, and therefore output, to be greater than projected in CBO's baseline.

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29. CBO estimated those effects on the budget through a simplified analysis that accounted for changes in taxable income, interest rates, and prices, among other things. However, the agency did not perform a detailed, program-by-program analysis of the effects on the budget, as it does in constructing its budgetary baseline and cost estimates for proposed legislation.

30. That estimate includes an adjustment for the enactment of the Medicare Access and CHIP Reauthorization Act of 2015.

31. The effects on federal interest payments of the proposals' changes to the total amount of federal debt boost projected savings from $1.2 trillion to $1.4 trillion over the 2016–2025 period.

Table 3.

Estimated Budgetary Effects of the President's Proposals

Billions of Dollars, by Fiscal Year

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2016- 2020	2016- 2025
					Effects With Some Macroeconomic Feedback[a]							
Effects on Outlays	22	76	110	79	59	45	-39	1	59	-31	346	380
Effects on Revenues	108	141	176	189	195	158	178	195	211	229	809	1,780
Effect on the Deficit[b]	**86**	**65**	**66**	**110**	**136**	**113**	**217**	**194**	**152**	**260**	**463**	**1,400**
					Effects of Additional Macroeconomic Feedback[c]							
Effects on Outlays	*	1	3	6	10	16	22	29	37	46	21	171
Effects on Revenues	-6	-7	-11	-9	1	12	21	32	44	58	-32	135
Effect on the Deficit[b]	**-6**	**-8**	**-14**	**-15**	**-10**	**-4**	**-1**	**3**	**7**	**12**	**-53**	**-36**
					Effects With All Macroeconomic Feedback							
Effects on Outlays	22	77	114	86	69	60	-18	30	97	15	367	551
Effects on Revenues	102	134	165	180	196	170	199	227	255	287	777	1,915
Effect on the Deficit[b]	**81**	**57**	**52**	**94**	**126**	**110**	**216**	**197**	**158**	**272**	**410**	**1,364**
Memorandum:												
Projected Deficits Under CBO's March 2015 Baseline[d]												
Billions of dollars	-473	-478	-506	-620	-707	-777	-917	-925	-917	-1,055	-2784	-7,376
Percentage of GDP	-2.5	-2.4	-2.5	-2.9	-3.2	-3.3	-3.8	-3.7	-3.5	-3.8	-2.7	-3.6
Projected Deficits Under the President's Budget With All Macroeconomic Feedback												
Billions of dollars	-392	-422	-454	-525	-581	-667	-701	-728	-758	-783	-2,374	-6,012
Percentage of GDP	-2.1	-2.1	-2.2	-2.5	-2.6	-2.9	-2.9	-2.9	-2.9	-2.9	-2.3	-2.9

Source: Congressional Budget Office.

Note: GDP = gross domestic product; * = between zero and $0.5 billion.

a. These are the estimates provided in the March 2015 analysis of the budgetary effects of the President's proposals, adjusted for the subsequent enactment of the Medicare Access and CHIP Reauthorization Act of 2015. See Congressional Budget Office, *An Analysis of the President's 2016 Budget* (March 2015), www.cbo.gov/publication/49979.

b. Positive numbers indicate a decrease in the deficit; negative numbers indicate an increase in the deficit.

c. These comprise all feedback effects not included in CBO's March 2015 analysis.

d. These baseline projections have been adjusted for the subsequent enactment of the Medicare Access and CHIP Reauthorization Act of 2015.

When estimating the macroeconomic effects of the President's budget, CBO also generated ranges of possible outcomes, using likely ranges for key variables. The agency estimates that the average increase in real GNP from 2016 through 2020 would range from 0.2 percent to 0.5 percent. That range primarily reflects uncertainty about the effect of changes in fiscal policies on the overall demand for goods and services. There is also uncertainty about other effects of the President's proposals on the economy, including the number and earnings of additional immigrants. However, that uncertainty is not reflected in CBO's ranges (either for this period or for later years), so those ranges probably underestimate the total uncertainty surrounding the projected economic effects of the proposals.

Table 4.

Estimated Effects of the President's Proposals on Real GNP

Percentage Difference From CBO's Baseline, by Calendar Year

	2016–2020	2021–2025	2016–2025
Central Estimate	0.4	1.7	1.1
Range	0.2 to 0.5	1.1 to 2.3	0.7 to 1.4

Source: Congressional Budget Office.

Notes: Real GNP excludes the effect of inflation.

CBO's central estimates are the effects predicted when key inputs to an analysis are at the midpoints of their ranges.

GNP = gross national product.

The President's proposals other than the one related to immigration would have little effect on real GNP in 2016, according to CBO's analysis, but they would combine to decrease it slightly from 2017 through 2020. By reducing deficits, they would raise private investment, boosting output somewhat; however, that boost would be outweighed by the proposals' increases in marginal tax rates on labor and capital income, which would dampen output. In addition, the proposals would reduce overall demand, on balance. Both revenues and spending would be higher than under current law, but the higher revenues would reduce demand more than the higher spending would boost it.

Although the President's proposals would boost total GNP, they would have the opposite effect on per capita GNP. Specifically, real per capita GNP would be an average of 0.5 percent lower between 2016 and 2020 under the President's budget than under current law, CBO estimates (see Figure 2 on page 8). The main reasons for the reduction are that the number of new workers stemming from the proposals' changes to immigration laws would increase more rapidly than the additional amount of capital available to workers, and that the new workers would be less skilled and have lower wages, on average, than the labor force under current law.

The President's proposals would increase interest rates in the short term, primarily because they would raise the level of economic activity—and also in the long term (which receives full weight in CBO's results by 2020), primarily because the immigration proposal would increase the rate of return on capital. Over the 2016–2020 period, interest rates would be about 0.1 percentage point higher, on average, than they would be under current law.

The macroeconomic changes caused by the President's policies would feed back into the budget and, on net, increase the extent to which the policies reduced the deficit from 2016 through 2020. The feedback effects may be grouped into two categories:

■ The first category consists of feedback effects that were included in CBO's March estimates of the effects of the President's budget. The largest such effect over the 2016–2020 period stems from the increase in the workforce under the immigration proposal, which would increase receipts from income and payroll taxes. The category also includes some smaller effects on revenues from the immigration proposal.[32]

■ The second category consists of feedback effects that were not included in the March estimates. They include the effects on the budget of changes in total factor productivity, the income earned by capital, and wage differences among workers with different skills. They also include a reduction in the labor supply stemming from the higher marginal income tax rates proposed by the President, which would reduce revenues and lead to an increase in deficits. And they include the budgetary effects of changes in interest rates, which would raise the cost of interest on the government's debt. On net, the feedback effects not included in the earlier estimates would increase projected deficits and thus shrink the estimated deficit reduction resulting from the President's proposals by a total of $53 billion over the 2016–2020 period (see Table 3 on page 13).

Effects After 2020

In the second half of the 10-year projection period, the President's proposals would have economic effects of the same types that they would have toward the end of the first half, and for the same reasons that were described

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32. First, gaining legal status would induce a greater proportion of workers to file tax returns, further increasing revenues. In addition, CBO expects that currently unauthorized workers who obtained legal status would see an increase in their average wages, both because such workers would have a stronger bargaining position with their employers and because they would be able to find jobs that better fit their skills and education and thus be more productive. As a consequence, changes in the legal status of some current workers would increase federal revenues and reduce deficits; see Congressional Budget Office, *The Economic Impact of S. 744, the Border Security, Economic Opportunity, and Immigration Modernization Act* (June 2013), www.cbo.gov/publication/44346.

above. Those effects would be larger, however, during the 2021–2025 period. In addition, during that period, the additional immigration under the President's proposals would begin to have an appreciably positive effect on total factor productivity, CBO estimates.

If the President's proposals were enacted, real GNP would be 1.7 percent higher, on average, from 2021 through 2025 than under current law, according to CBO's central estimate; that increase could range from 1.1 percent to 2.3 percent higher, according to CBO's likely ranges for key variables. That span primarily reflects uncertainty about the effect of increased immigration on total factor productivity, but it also reflects uncertainty about the effect of deficits on the capital stock owned by U.S. residents, the effect of marginal tax rates on the supply of

labor, and the role of households' expectations about future policies. (See the appendix for more information about CBO's ranges of estimates for the 2021–2025 period.) Interest rates would be about 0.3 percentage points higher, on average, from 2021 through 2025 than they would be under current law.

Those developments, taken together, would reduce projected deficits during the 2021–2025 period. The largest feedback effect would again be taxes paid on the wages earned by additional workers under the immigration proposal. And CBO estimates that the other economic effects of the President's proposals—those not included in the agency's March analysis—would, from 2021 through 2025, add $17 billion to the deficit reduction that the agency projected in March.

Appendix:
Ranges of Estimates of How the President's Budget Would Affect GNP From 2021 Through 2025

Each calendar year from 2021 through 2025, the President's budget proposals for fiscal year 2016 would make gross national product (GNP) about 1.7 percent larger than it would be under current law, according to the Congressional Budget Office's central estimate. That estimate is subject to considerable uncertainty, so CBO has also calculated estimates using two economic models and various estimates of particularly uncertain factors. The full span of estimates suggests that the President's budget proposals would increase GNP from 0.7 percent to 2.4 percent over the 2021–2025 period, on average. However, in CBO's view, a more probable range is between 1.1 percent and 2.3 percent, and that is the range reported in the main body of this report.

CBO's Approach to Estimating Ranges

The two economic models that CBO used were a Solow-type growth model and a life-cycle growth model.[1] The models differ in a number of respects, but perhaps the most important is the way they incorporate people's expectations:

- The Solow-type model incorporates the assumption that people's decisions about working and saving are determined not by their expectations of particular future developments but by their general expectations of future fiscal policy—which in turn are determined in the same way that they have been in the past.

- The life-cycle model, by contrast, incorporates an assumption that people's decisions about working and saving reflect their expectations of particular future

economic conditions, and it does not account for the ways in which expectations have historically been formulated. As a result, the life-cycle model requires the user to specify future fiscal policies. In addition, those policies must put federal debt on a sustainable path over the long run—because forward-looking households, according to the model, would not hold government bonds if they expected that debt as a percentage of the economy would rise without limit. Different assumptions about those future policies have little effect on CBO's estimates, however. CBO has found that people's current choices to work and save are only modestly different under various assumptions about what they believe will happen to the government's tax and spending policies sufficiently far into the future.

Because of the uncertainty surrounding the effects of the President's immigration proposals, CBO used both the Solow-type model and the life-cycle model with three different estimates—derived from the agency's study of the economics literature—of the effect that those proposals would have on total factor productivity (the efficiency with which labor and capital are used to produce goods and services). Those three estimates were a "weak effect" estimate that the proposals would not change productivity, a central estimate that they would increase productivity by 0.7 percent in 2025, and a "strong effect" estimate of a 1.4 percent increase in 2025.[2] CBO's analysis indicates that the uncertainty surrounding the effects of immigration policy accounts for most of the variation in estimates of how the President's budget would affect GNP from 2021 to 2025.

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1. For a detailed discussion of those models, see Congressional Budget Office, *How CBO Analyzes the Effects of Changes in Federal Fiscal Policies on the Economy* (November 2014), www.cbo.gov/publication/49494.

2. For details about how CBO constructed the central estimate, see Congressional Budget Office, *The Economic Impact of S. 744, the Border Security, Economic Opportunity, and Immigration Modernization Act* (June 2013), www.cbo.gov/publication/44346.

Table A-1.

Estimates of How the President's Proposals Would Affect GNP From 2021 to 2025 Under Various Models

Percentage Difference From CBO's Baseline, by Calendar Year

	Weak Effects of Immigration on Productivity	Strong Effects of Immigration on Productivity
	Solow-Type Growth Model	
Weak Effect of Deficits on Investment		
Weak labor supply response	1.4	2.4
Strong labor supply response	1.1	2.3
Strong Effect of Deficits on Investment		
Weak labor supply response	1.3	2.3
Strong labor supply response	1.0	2.2
	Life-Cycle Growth Model	
Federal Debt Stabilized by Reducing Government Spending After 2030		
Interest rates determined by the domestic economy	0.9	2.0
Interest rates determined by the world economy	0.8	2.2
Federal Debt Stabilized by Increasing Tax Revenues After 2030		
Interest rates determined by the domestic economy	0.8	1.9
Interest rates determined by the world economy	0.7	2.1

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.

GNP = gross national product.

CBO also used the Solow-type model with two different estimates (again, weak and strong) of the effect that deficits have on private investment—which in turn influences interest rates—and two different estimates (also weak and strong) of how changes in marginal tax rates on labor income affect the supply of labor. In the case in which immigration had a weak effect on total factor productivity, the result was four possible outcomes for the 2021–2025 period, with the estimated reduction in real (inflation-adjusted) output over that period ranging from 1.0 percent to 1.4 percent (see Table A-1). In the case in which immigration had a strong effect on total factor productivity, the result was, again, four possible outcomes, with the estimated reduction in real output over the period ranging from 2.2 percent to 2.4 percent. (Central estimates for the effects of immigration on productivity, the effects of deficits on investment, and the effects of marginal tax rates on the supply of labor are not shown in the table because they do not alter the high and low extremes of the resulting ranges.)

With the life-cycle model, CBO used two different ways that people may believe that the federal government will stabilize its debt: by reducing spending (making equal cuts in transfer payments and in purchases of goods and services) or by raising revenues (collecting equal amounts from higher effective marginal tax rates and from other sources).[3] The choice of policies that will stabilize federal debt has only a modest effect on the outcomes of the 10-year estimates. CBO also used two different assumptions about how interest rates are determined: within the domestic economy or within the world economy. In the case in which immigration had a weak effect on total factor productivity, applying the model therefore resulted in four possible outcomes for the 2021–2025 period, with estimated reductions in real output ranging from

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3. In both approaches, the policies that will stabilize federal debt are phased in over a 10-year period, starting in the sixth year after the end of the 10-year estimation period—in the current analysis, 2031.

0.7 percent to 0.9 percent. In the case in which immigration had a strong effect on total factor productivity, applying the model resulted again in four possible outcomes, with estimated reductions in real output ranging from 1.9 percent to 2.2 percent.

CBO's Approach to Reporting Ranges

In CBO's view, the full span of estimates reported in Table A-1 overstates the extent of uncertainty about the economic effects of the President's budget. For example, if labor supply responses to marginal tax rates are at the high end of the likely range of the estimates found in the economics literature, if the effect of deficits on private investment is also at the high end, and if the effect on productivity from large increases in immigration is at the low end, the Solow-type model estimates that the President's budget would boost GNP by only 1.0 percent, on average, over the 2021–2025 period. If all of those parameters are at the other ends of their likely ranges in the economics literature, the boost to GNP would be 2.4 percent. However, the likelihood that all three parameters would simultaneously be at the ends of their likely ranges is smaller than the likelihood that any individual parameter would be at the end of its likely range.

CBO therefore focused on uncertainty about the two parameters in the Solow-type model that had the largest budgetary effects. Specifically, the agency examined cases in which two parameters were equal to the ends of their likely ranges and the other parameter was equal to its central estimate, identified the cases that resulted in the most favorable and least favorable budgetary outcomes, and used those cases to construct the reported range of likely results for GNP.

CBO tried to choose parameters for the Solow-type model so that its results would cover about two-thirds of the range of likely economic effects if the budgetary effects estimated in CBO's first report on the President's budget in March (adjusted for the enactment of the Medicare Access and CHIP Reauthorization Act of 2015) were realized. That is, this analysis does not account for uncertainty in those earlier estimates or the factors that underlie them, such as the number and earnings of additional immigrants. In the agency's assessment, it is easier to interpret a range of results from the Solow-type model as covering a certain percentage of the range of likely results than it is to do the same for a combination of results from the Solow-type and life-cycle models. CBO therefore used only the estimates produced by the Solow-type model in constructing such a range.

About This Document

This report is the second of two analyses, both conducted at the request of the Senate Committee on Appropriations, that the Congressional Budget Office has done of the President's budget request for fiscal year 2016, which was released on February 2, 2015. The first report—*An Analysis of the President's 2016 Budget*, published in March—used CBO's economic projections 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 and how those economic effects would, in turn, affect the federal budget. In keeping with CBO's mandate to provide objective, impartial analysis, this report makes no recommendations.

Keith Hall
Director

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