Economic Analysis of the House Budget Resolution by the Center for Data Analysis at The Heritage Foundation

April 5, 2011

Congressman Paul Ryan (R-WI), chairman of the Committee on the Budget of the U.S. House of Representatives, requested by letter that the Center for Data Analysis (CDA) undertake an economic analysis of the House Budget Resolution for federal fiscal year 2012 through 2021.[1] The Chairman specifically asked the CDA to perform conventional and dynamic budget analysis, or analysis that is based on largely "static" budget models and on economic models with dynamic economic properties. These economic models estimate the likely effects of policy change on the major components of economic activity—supply of resources, prices, demographic change, and so forth—which might affect federal fiscal results through revenues and outlay costs.

This report summarizes the results of the CDA's analysis of the House Budget Resolution using these models. As a general matter, the CDA found that implementing the policy changes behind the Budget Resolution would significantly strengthen economic performance throughout the economy and dramatically improve federal fiscal results. This analysis demonstrates that significant actions can be taken now to reform our tax code and rein in the drivers of fiscal imbalances.

Indeed, our work shows that those steps can be taken with a strong confidence of ultimate success.

Analysis of the Budget Resolution

CDA employed its tax models and the U.S. Macroeconomic Model of IHS Global Insight, Inc., to estimate the fiscal and economic effects of the House Budget Resolution.[2] Center analysts primarily employed the CDA Individual Income Tax Model for its analysis of the effects of tax law changes on a representative sample of taxpayers based on IRS Statistics of Income (SOI) taxpayer microdata. Data for these taxpayers are extrapolated or "aged" to reflect detailed taxpayer characteristics. These data are aged for consistency with the Congressional Budget Office (CBO) baseline forecast in order to produce effective and marginal tax rate

[1] A copy of this request is attached to this report as Appendix 1.

[2] The U.S. Macroeconomic Model is owned and maintained by IHS Global Insight, Inc., the leading economic forecasting firm in the United States. The Global Insight model is used by private-sector and government economists to estimate how changes in the economy and public policy are likely to affect major economic indicators. The methodologies, assumptions, conclusions, and opinions presented here are entirely the work of analysts in the Center for Data Analysis at The Heritage Foundation. They have not been endorsed by, and do not necessarily reflect the views of, the owners of the Global Insight model.

estimates with which to forecast the dynamic economic and fiscal effects stemming from changes in tax burden.[3]

Staff of the House Budget Committee supplied the CDA with sufficient detail on the House Budget Resolution to allow Center analysts to simulate the fiscal effects of changes in tax law and major programs and outlay categories. Details on the steps taken to incorporate these policy changes in the model are contained in Appendix 2 to this report.

What does policy simulation mean? Model simulation of public policy change requires two sets of data. First, estimates of how the changes affect outlays and revenues, which become the policy inputs to the dynamic model. Second, analysts need a baseline of economic and fiscal data that do not contain these policy changes. The model then calculates the difference it makes to the baseline when public policy changes. Thus, when we report, for example, that Gross Domestic Product increased by an annual average of $150 billion because of the policy changes contained in the Budget Resolution, this means that the dynamic model has estimated much more economic output over the amount contained in the baseline.

The baseline economy and fiscal world within which CDA simulated the policy changes of the House Budget Resolution is the Alternative Fiscal Scenario developed by the Congressional Budget Office. The CBO described the Alternative Fiscal Scenario in the following way in its June 2010 report, *The Long-Term Budget Outlook*:

> The *alternative fiscal scenario* embodies several possible changes to current law that would continue certain tax and spending policies that people have grown accustomed to (because the policies are in place now or have been in place recently). Versions of some of the changes assumed in the scenario—such as those related to the AMT and Medicare's payments to physicians—have regularly been enacted in the past. Those and certain other changes included in the scenario—such as changes related to the tax cuts enacted in 2001 and 2003—are widely expected to be made in some form over the next few years.[4]

Revenues may rise under the Alternative Fiscal Scenario, but not as much as under CBO's other and more frequently cited forecast, the Extended Baseline Scenario. Under the Alternative forecast, fiscal imbalances worsen as the years go by and Congress repeatedly fails to address the main drivers of ballooning deficits: the mandatory spending programs, largely for retired Americans. Some of these fiscal problems are assumed to be fixed in the Extended Baseline.

---

[3]Additional information on the CDA Individual Income Tax Model and how Center analysts implemented the tax provisions of the House Budget Resolution is provided in Appendix 2 of this report.

[4]Congressional Budget Office, *The Long-Term Budget Outlook*, June 2010, p. 2, at *http://www.cbo.gov/ftpdocs/115xx/doc11579/06-30-LTBO.pdf* (April 2, 2011).

Thus, the Alternative Scenario is better suited for analyzing the House Budget Proposal than the Extended Baseline. It provides a baseline reflecting a largely unreformed tax code and persistently worsening fiscal results stemming from the absence of any major budgetary or program reforms.[5] In short, the policy changes behind the Budget Resolution stand in very sharp contrast to an economic and fiscal world without reform.

Center analysts introduced these microsimulation results into the U.S. Macroeconomic Model that has been specially adapted to work with the Alternative Fiscal Scenario. Details on how this adaptation occurred are contained in Appendix 2 of this report.

Economic and Fiscal Results

The tax and program changes behind the Budget Resolution produce much stronger economic performance when compared to the rate and level of economic activity in the baseline.[6] Lower taxes stimulate greater investment, which expands the size of business activity. This expansion fuels a demand for more labor, which enters a labor market that contains workers who themselves face lower taxes. Consequently, significantly higher employment ensues.

Gains in employment along with lower taxes lead to higher household incomes. The growth of business enterprise coupled with the increase in disposable income fuels more extensive savings and investment by households, which results in the growth of household assets. The stock and value of residential structures increases, as does the volume of household net worth.

As a consequence of the growth in the size of the economy (for example, $1.5 trillion over ten years in additional economic output results from the budget plan), the income base from which the federal government draws its taxes grows significantly. The growth in federal tax revenues under the budget plan matches the growth in the baseline, despite a significant drop in the tax rate and other changes in tax policy favorable to taxpayers.

This obvious strengthening in the tax base and in federal receipts is accompanied by substantially improved fiscal results on the outlay side. Total outlays fall by a total of $9.3 trillion over the ten-year period, 2012 to 2021. This significant decrease leads to a sharp reduction in the total amount of federal debt: By 2021, publicly held debt is $9.9 trillion lower than in the baseline, which forecasts an economic and fiscal scenario without the policy changes of the Budget Resolution. The yields on 10-year Treasury notes fall by 84 basis points by 2021, and the effective interest rate on the Federal Reserve's interbank borrowing rate is nearly a full percentage point lower than it is in the baseline.

[5]While forecasting dire fiscal results in the Alternative Fiscal Scenario, the CBO paradoxically did not worsen its economic forecast after 2020 over that contained in the Extended Baseline Scenario. This lack of parallel treatment with the fiscal results raises challenges for a dynamic simulation using the Alternative forecast. CDA made an effort to introduce a more comparable set of economic outcomes to the baseline that align with the fiscal forecasts made by CBO. See Appendix 2 for details.

[6]Detailed results of this simulation for major economic and fiscal indicators are contained in Appendix 3 to this report.

These are highly positive results, but more steps need to be taken to rein in spending by reforming the drivers of fiscal imbalances. The period 2012 through 2021 is the opening scene in the nation's long struggle to fund the retirement of the most numerous generation ever to retire while keeping the economy moving forward for those Americans who are below 30 years of age today. To achieve such fiscal sanity given these changes in demography, the tax code and the mandatory spending programs need substantial reform.

Nevertheless, this model-based analysis of the House Budget Resolution and the policy changes underneath it clearly show that a solid step toward a stronger economic and fiscal future can be taken with every confidence of success.

Summary Results

A simulation of the House Budget Resolution using the U.S. Macroeconomic Model from IHS/Global Insight produced the following results for the period 2012 through 2021:

Major Economic Indicators

- **Employment:** Private employment grew by an annual average of 1.6 million jobs above the CBO alternative budget baseline. Total employment grew by an average of 1.3 million jobs, which indicates shrinkage of public-sector employment of 300,000 on average.

- **Economic Output:** The Gross Domestic Product grew by an average, inflation-adjusted amount of $149.5 billion above baseline over the 10-year period. By 2021, GDP is $401 billion higher than baseline.

- **Disposable Income:** The after-tax, inflation-adjusted disposable income of households by 2021 is $164 billion higher than the baseline. Lower taxes and a friendlier economy led to the formation of an average of 123,000 more households per year.

- **Savings and Investment:** Stronger economic growth led individuals to increase private savings by an average of $202 billion over the ten-year period.

    - This increase in private savings was matched by increases in investment in residential structures ($110 billion on average), non-residential equipment ($216 billion on average), and non-residential structures ($30 billion on average).

- **Interest Rates and Inflation:** Interest rates are generally lower than in the baseline. The yield on ten-year Treasury notes fell by an average of 37.6 basis points. The Consumer Price Index was virtually unchanged.

- **Household Net Worth:** The net worth of households increases by an annual average of $564 billion after inflation across this ten-year period.

Major Fiscal Indicators

- **Federal Debt to GDP Ratio:** The ratio of publicly held debt to GDP in 2021 (the end of the 10-year budget window) is projected to stand at 65 percent. Without the policy changes of the House Budget Resolution it would stand at 107 percent of GDP.

- **Federal Revenues:** Total federal revenues as a percent of GDP remain virtually unchanged from the baseline over the forecast period despite significant tax policy change: The House plan is 0.2 basis points (less than 1 basis point) lower on average than the forecast.

    - Total receipts are $591 billion higher over the ten-year forecast period.

    - On personal taxes, the income tax base grows on average by $279 billion, and personal tax receipts are $681 billion higher over the ten-year period.

    - Corporate tax receipts are lower by $355 billion over the ten-year period.

- **Federal Outlays:** Total federal outlays are $703 billion lower on average over the ten-year period 2012 through 2021. In total, there are $9.3 trillion fewer dollars spent by the federal government over this ten-year period.

    - Non-Defense Discretionary Purchases fall by an average of $118 billion per year.

    - Defense Purchases fall by an average of $128 billion per year.

A Note about Interest Rates, Debt and the House Budget

The House Budget significantly reduces the deficit in the ten year (2012-2021) time frame compared to its current policy fiscal path. The tax reform policies lower rates on labor and capital, which provide incentives to supply more of these productive resources. This causes revenues from these sources to be higher than a static estimate would project. Reductions in government spending lower expectations of future higher taxes and encourage greater investment in private sector enterprises versus precautionary savings in risk-free bonds. The lower supply of government bonds puts downward pressure on interest rates.[7]

[7] Lower supply raises the price of bonds all else equal and bond prices and interest rates move in opposite directions.

However, the strong economic growth resulting from the tax and spending reforms also puts upward pressure on interest rates. A dynamic analysis shows that the net effect is lower interest rates from their current trajectory but higher than a static score predicted.

The static score of the House Budget seems to use much lower interest rates in the net interest payment calculation. The rates assumed are consistent with the current deflationary and slow growth economy, but would not be reasonable to assume these rates would continue especially if the economy begins to exhibit robust growth.

This again highlights the need for dynamic scoring to better understand the interactive effects of a complex economic system and take account of them. This will help better guide policies by (a) guiding expectations of deficits so as to minimize surprise budgetary needs (b) allows for better allocation of resources to meet the budgetary needs and (c) undertaking greater budget reforms that are in their direct control to offset effects that are not.

Appendix 1

PAUL RYAN, WISCONSIN
CHAIRMAN

AUSTIN SMYTHE, STAFF DIRECTOR
(202) 226-7270

CHRIS VAN HOLLEN, RANKING MEMBER

THOMAS S. KAHN, MINORITY STAFF DIRECTOR
(202) 226-7200

U.S. House of Representatives
COMMITTEE ON THE BUDGET
Washington, DC 20515

February 28, 2011

Mr. William Beach
Director
Center for Data Analysis
The Heritage Foundation
214 Massachusetts Ave NE
Washington, D.C. 20002-4999

Dear Mr. Beach:

The Committee on the Budget requests that The Heritage Foundation provide technical advice or assistance to the Committee for the use of all its Members with respect to budget proposals provided by the Committee, furnishing the Committee in writing with specific information on budget scoring, in conventional and dynamic forms, of such proposals, together with such nonpartisan analysis, study and research as the Foundation may have that is relevant to such proposals (see 2 U.S.C. 1602(8)(B)(viii), 26 U.S.C. 4911(d)(2), and 26 CFR 56.4911-2(c)(1) and (3) and 53.4945-2(d)(2)).

Sincerely,

Paul D. Ryan
Chairman

(202) 226-7270 207 Cannon House Office Building e-mail: budget@mail.house.gov

Appendix 2

Simulation Methodology

IHS Global Insight March 2011 Long-Term Model

CDA analysts used a version of the IHS Global Insight March 2011 Long-Term Model of the U.S. economy to estimate the overall net economic effects of the House Budget.[8] The adjusted GI March 2011 long-term model baseline represents the most likely path of the U.S. economy if the federal government extended policies consistent with those economic and budgetary assumptions underlying the Alternative Fiscal Scenario forecast as published by the CBO Long-Term Budget Outlook Report.

Description of the Adjusted GI March 2011 Long-Term Baseline

CDA analysts used a version of the GI March 2011 long-term model (referred to as the adjusted GI long-term baseline) of the U.S. economy to estimate the overall net effects of the House Budget plan. This adjusted GI long-term model of the U.S. economy reflects as close as possible to the Alternative Fiscal Scenario (AFS) forecast published in the June 2010 Long-Term Budget Outlook Report by the Congressional Budget Office.[9]

Economic Variables Underlying the Adjusted GI Long-Term Baseline. The economic projections in the CBO Long-Term Alternative Fiscal Scenario forecast are the same as those underlying the CBO Long-Term Extended Baseline Scenario forecast.[10]

For the 10-year fiscal outlook, the adjusted GI Long-Term model used the detailed assumptions in the 10-year Economic and Fiscal Outlook as published by the Congressional Budget Office (CBO). Thus, the economic projections underlying the adjusted GI March 2011 long-term model are exactly the same as those underlying the CBO's Budget and Economic Outlook for the 2011 to 2022 projection period.[11]

---

[8]The Global Insight model is used by private-sector and government economists to estimate how changes in the economy and public policy are likely to affect major economic indicators. The methodologies, assumptions, conclusions, and opinions presented here are entirely the work of analysts in the Center for Data Analysis at The Heritage Foundation. They have not been endorsed by, and do not necessarily reflect the views of, the owners of the Global Insight model.

[9]See Congressional Budget Office, *The Long-Term Budget Outlook*, June 2010, at *http://www.cbo.gov/ftpdocs/115xx/doc11579/06-30-LTBO.pdf* (March 30, 2011).

[10]Note that the economic projections underlying the alternative fiscal scenario forecast in *The Long-Term Budget Outlook* are the same assumed for the Long-Term Extended Baseline Scenario forecast. *Ibid.*

[11]See Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2011 to 2021*, January 2011, Appendix D-1 and D-2, at *http://www.cbo.gov/ftpdocs/120xx/doc12039/01-26_FY2011Outlook.pdf* (March 30, 2011).

The economic projections underlying the adjusted GI long-term baseline in the years 2022 to 2041 trend to the percentage change in the series applied to the value of the previous quarter beginning with 2021 Quarter 3. There is less detailed economic projection data underlying the CBO long-term alternative fiscal scenario forecast, so where possible the adjusted GI long-term baseline corresponds to the economic projection data assumed by the CBO.[12]

Demographic Variables Underlying the Adjusted GI Long-Term Baseline. The assumptions on the demographic variables in the adjusted GI long-term baseline are the same as those underlying the CBO Alternative Fiscal Scenario forecast.[13]

Spending Assumptions Underlying the Adjusted GI Long-Term Baseline. The adjusted GI long-term baseline used the same assumptions on federal government spending as detailed for the CBO long-term AFS forecast.[14]

Medicare. Medicare consumption in the adjusted GI long-term baseline was adjusted in two components: the amount assumed in the long-term CBO Alternative Fiscal Scenario forecast for Medicare premium payments and then by the forecast of the general amount of projected Medicare mandatory spending as a percent of GDP.[15] The payment rates to physicians are assumed to grow with the Medicare economic index, and the several policies that are proposed to restrain program spending are assumed to never take effect.[16]

Medicaid, CHIP, and Exchange Subsidies. The spending on these programs in the adjusted GI long-term baseline was the same assumed spending as a percent of GDP in the CBO long-term AFS.[17] Under current law there is assumed policy that would "slow the growth of subsidies for health insurance coverage" which is not assumed in the CBO long-term AFS. Therefore, the assumption underlying the spending in Medicaid, CHIP, and Exchange subsidies accounts for the 1 percent of GDP difference between the long-term Extended baseline scenario and the AFS forecasts.[18]

---

[12]See Congressional Budget Office, *The Long-Term Budget Outlook*, Supplemental Data (Economic Variables), June 2010, at *http://www.cbo.gov/ftpdocs/115xx/doc11579/LTBO-2010data.xls* (March 30, 2011).

[13]See Congressional Budget Office, *The Long-Term Budget Outlook*, Appendix B.

[14]See Congressional Budget Office, *The Long-Term Budget Outlook*, p. 3.

[15]See Congressional Budget Office, *The Long-Term Budget Outlook*, June 2010, p. 3, at *http://www.cbo.gov/ftpdocs/115xx/doc11579/LTBO-2010data.xls* (March 30, 2011). See also Congressional Budget Office, *The Long-Term Budget Outlook*, Supplemental Data (Summary Alt. Fiscal Scenario), June 2010, at *http://www.cbo.gov/ftpdocs/115xx/doc11579/LTBO-2010data.xls* (March 30, 2011).

[16]See Congressional Budget Office, *The Long-Term Budget Outlook*, p. 3.

[17]See Congressional Budget Office, *The Long-Term Budget Outlook*, Supplemental Data (Fig. 2-2).

[18]The difference is 0.1 percent of GDP in 2020 as well as 2035, so the adjusted GI baseline adjusts the overall mandatory spending on Medicaid by this difference beginning in 2020. Since the exchange subsidies begin in 2014, the spending from 2014 through 2019 on overall mandatory spending in Medicaid as a percent of GDP is adjusted

Social Security. Spending in Social Security in the adjusted GI long-term baseline was assumed to grow at the same percent of GDP in the CBO Alternative Fiscal Scenario forecast.[19]

Other Non-interest Spending. GI variables that reflect aggregate federal defense and non-defense real spending were generally assumed to change by the last value (in fiscal-year terms) applied to a ratio of the real baseline value to the last real value (in fiscal-year terms) in the adjusted GI long-term baseline using detailed budgetary targets from 2011 to 2021.[20]

Net Interest Payments. The federal net interest payments in the adjusted GI long-term baseline reflect that assumed in the CBO long-term alternative fiscal scenario.[21]

Revenue Assumptions Underlying the Adjusted GI Long-Term Baseline. The adjusted GI long-term baseline used the same underlying assumptions about federal government revenues as those underlying the CBO's long-term AFS forecast.[22] Second, the policy alternatives that affect the tax code as outlined in the 10-year Budget and Economic Outlook are assumed in the adjusted GI long-term baseline. The changes used as targets in adjusting the baseline are the effect on the deficit and the debt service to extend certain income tax and estate and gift tax provisions scheduled to expire on December 31, 2012, and index the AMT for inflation and also to extend other expiring tax provisions.[23]

Description of the Dynamic Simulation

CDA analysts conducted the dynamic macroeconomic simulation using the static estimates of the tax and spending levels as provided by the House Budget Committee. The GI long-term model, as stated before, is a dynamic model of the U.S. economy that is designed to estimate how the general economy is reshaped by policy reforms, such as the tax reform and spending changes proposed in the House Budget plan.

The relationships in the model are calibrated by historical U.S. data and mainstream economic theory. The model is a tool that provides insight into likely magnitudes and the direction of economic variables due to policy changes. A dynamic analysis of a policy change is important because in an ever-changing and market-based economy, indirect and feedback effects need to be taken into account to obtain a true estimate of the likely overall economic impact.

---

up by a fraction of the 0.1 difference between the CBO Extended baseline and the CBO Alternative Fiscal Scenario. See Congressional Budget Office, *The Long-Term Budget Outlook*, pp. 3 and 7.

[19]See Congressional Budget Office, *The Long-Term Budget Outlook*, Supplemental Data (Summary Alt. Fiscal Scenario).

[20]See Congressional Budget Office, *The Budget and Economic Outlook*, p. 54.

[21]See Congressional Budget Office, *The Long-Term Budget Outlook*, Supplemental Data (Summary Alt. Fiscal Scenario).

[22]See Congressional Budget Office, *The Long-Term Budget Outlook*, p. 3.

[23]See Congressional Budget Office, *The Budget and Economic Outlook*, p. 22.

Direct effects happen, for example, when many individuals make small changes in their labor and leisure trade-off decisions. These changes, in turn, change capital-labor trade-offs made by businesses. The macroeconomic model estimates these changes in relative prices dynamically such that these changes affect investment and output levels. Tax-rate changes, as an example, also affect personal disposable income and demand variables.

These have further feedback effects with supply variables as well as interaction with the fiscal revenues and spending variables. The feedback effects further increase or decrease the longer-term impact of the policy, providing a quantitative picture of whether the economy would tend to be stronger or weaker if the proposal were implemented compared to its baseline.

The adjusted GI long-term model produces dynamic responses from the CBO long-term Alternative Fiscal Scenario forecast as a result of the proposed revenue and spending changes in the House Budget Resolution.

Static Revenue Estimates. The IHS GI long-term model contains a number of variables that are used to conduct the macroeconomic simulation of the House Budget plan. CDA analysts made the following changes regarding tax inputs in the adjusted GI model to account for static estimates provided by the House Budget Committee:

Average Marginal Tax Rates. In the macroeconomic model, overall average marginal tax rates were changed by the amount simulated by the microsimulation tax model for individual filers. CDA analysts adjusted the GI variable (RTXPMARGF) that directly measures the average federal marginal income tax using percent changes from the baseline instead of the actual estimate (in the microsimulation tax model) to minimize biases in the estimate due to slightly different baseline values between the micro-model and macro-model.

Average Effective Personal Tax Rates. The add factor on the average effective federal personal income tax rate was changed by the percentage change from the baseline estimated in the microsimulation model. Adjusting the add factor allows for the dynamic indirect effects could continue to influence the average effective tax rate. The simulation was solved in stages. The final stage endogenously re-estimated the add factor on the average effective rate in order to target the percentage of revenue to GDP outlined in the House Budget Resolution.

Maximum Marginal Tax Rate on Personal Capital Gains. CDA analysts made an adjustment to the GI variable (RTXCAPGMAX) that measures the maximum marginal tax rate on capital gains given by the House Budget Committee.

Statutory Federal Corporate Income Tax Rate. The statutory federal corporate income tax rate variable was adjusted to the rate outlined in the tax policy specification of the House Budget Resolution.

Difference Between Effective and Statutory Corporate Income Tax Rate. CDA analysts made an adjustment on the GI variable (RTXCGFRES) that measures the difference between the effective and statutory corporate income tax rates to account for modest base-broadening proposed by tax policy specifications in the House Budget Resolution.

Static Spending Estimates. Static spending estimates for the House Budget Resolution were obtained from the House Budget Committee. The macroeconomic model has broad spending categories for Mandatory and Discretionary Spending. CDA analysts made changes to these variables as follows.

The changes in federal government Medicare and Medicaid spending were given in percent of GDP terms compared to the CBO baseline. The difference between the baseline percentage of GDP and the House Budget Resolution spending as a percent of GDP was used to find the spending reduction equivalents in the macro-model variables.

Real Medicare Payments on Behalf of Individuals. The spending level for Medicare was adjusted by computing the static difference in spending by applying the percent difference to the GDP in the adjusted GI long-term model baseline. This nominal dollar difference was then divided by the GI variable (JPCSVHC) measuring the health care services price deflator to obtain real values on the change to the variable YPTRGFSIHR.

Real Federal Medicaid Grants to State and Local Governments. The spending level for Medicaid transfers was changed using the same methodology as the Medicare spending given the percent of GDP changes supplied by the House Budget Committee. CDA analysts made an adjustment to the GI variable (GFAIDSLSSMEDR) that measures the real federal Medicaid grants to state and local governments by deflating the nominal dollar difference.

The inputs for the macroeconomic changes to OASDI, other mandatory spending, and the federal non-defense and defense outlay spending were provided by the House Budget Committee in nominal dollar amounts over the ten-year time frame 2012 to 2021. CDA analysts converted these amounts to a percent of GDP and applied the same methodology used to adjust the Medicare and Medicaid variables. This static difference in percent of GDP was applied to the adjusted GI long-term model baseline. Then, the nominal dollar change was adjusted to real dollar change by dividing by the relevant price deflator for that GI variable. Finally, the annual amounts were changed to quarterly inputs by applying the quarterly weighted average value to the annual value. The following variables were used to make these adjustments.

Federal Government OASDI Payments. CDA analysts adjusted the add-factor on Federal Government OASDI Payments (YPTRGFSISS) in order to allow indirect effects to continue to play a role in the spending level.

Real Federal Non-Medicaid Grants to State and Local Governments. CDA analysts made an adjustment to the GI variable (GFAIDSLOR) that measures real federal non-Medicaid grants to state and local governments.

Real Federal Defense and Non-Defense Discretionary Spending. The spending changes for non-defense and defense discretionary spending were adjusted by the spending level given by the House Budget Committee. The GI model has three broad discretionary categories for defense and three categories for non-defense spending. CDA analysts made adjustments to these variables by apportioning the total change in the budget by the historical weight of total spending in each of the three categories. This was done for both defense and non-defense category variables.

The variables directly affected by the changes to the tax, entitlement, and spending changes were also adjusted to simulate the policy reforms.

Dynamic Economic Estimates. *Labor Participation Rates.* Taxes on labor affect labor-market incentives. Aggregate labor elasticity is a measure of the response of aggregate hours to changes in the after-tax wage rate. These are larger than estimated micro-labor elasticities because they involve not only the intensive margin (more or fewer hours), but also, and even more so, the extensive margin (expanding the labor force).[24]

The change in the labor supply variables were adjusted by the macro-labor elasticity of two, which is a middle estimate of the ranges. The adjustment to the add factors allowed the variable to continue to be affected both positively and negatively by other indirect effects.

In the final stage of the simulations the add factors were endogenously recalculated in order to take account of the new estimates of the average tax rates mentioned above.

Cost of Capital. The cost of capital changes are affected directly and indirectly by the dynamic effects. (1) Lower corporate tax rates reduces the value of the interest rate deduction, which can put upward pressure on the cost of capital. (2) Lower corporate tax rates, though increase the after-tax rate of return to capital, which puts downward pressure on its cost. (3) Lower government spending decreases the demand for borrowed funds, which puts downward pressure on the cost of funds. (4) Labor and capital trade-offs as labor supply increases also plays an indirect role. These effects were all allowed to operate and then an adjustment was made to the

[24]For discussion and estimates of the range for these elasticities, see Richard Rogerson and Johanna Wallenius, "Micro and Macro Elasticities in a Life Cycle Model with Taxes," *Journal of Economic Theory*, Vol. 144, No. 6 (November 2009), pp. 2277–2292, and Riccardo Fiorito and Giulio Zanella, "Labor Supply Elasticities: Can Micro Be Misleading for Macro?" Working Paper, August 19, 2009, at *http://works.bepress.com/cgi/viewcontent.cgi?article=1000&context=riccardo_fiorito* (April 1, 2011).

federal funds rate, ten-year treasury rate, and corporate triple-A bond rate for the estimated percentage change in government debt. The model was then re-solved with this adjustment.[25]

Private Investment. Economic studies repeatedly find that government debt crowds-out private investment although the degree to which it does so can be debated.[26] The structure of the model does not allow for this direct feedback between government spending and private investment variables. Therefore, the add factors on private investment variables were also adjusted to reflect percentage changes in publicly held debt. This can also put upward pressure on the cost of capital (thus helping the model balance the demand and supply effects on the cost of capital).

Further details of the simulation are available upon request.

CDA analysts principally responsible for this report are:

William Beach, Director, report preparation,
Karen Campbell, Ph.D., Senior Policy Analyst, macroeconomic simulation,
John Ligon, Policy Analyst, macroeconomic simulation and methodology, and
Guinevere Nell, Research Programmer, microsimulation.

[25]Thomas Laubach. "New Evidence on the Interest Rate Effects of Budget Deficits and Debt," *Journal of the European Economic Association*,

[26]Eric M. Engen and R. Glenn Hubbard, "Federal Government Debt and Interest Rates," in NBER Macroeconomics Annual 2004, Volume 19, Mark Gertler and Kenneth Rogoff, eds. (Cambridge, MA: MIT Press, April 2005), at *http://www.nber.org/chapters/c6669* (April 1, 2011).

Appendix 3
Macroeconomic Simulation Results

How the House Budget Resolution Would Affect Major Economic Indicators

(Estimates by the Center for Data Analysis of The Heritage Foundation. Baseline created from the Alternative Fiscal Scenario of the Congressional Budget Office)
April 5, 2011

Economic Indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012 to 2021
Real Gross Domestic Product					Billions of 2005 Dollars						Average
House Budget Resolution	14,066.2	14,527.6	15,015.7	15,580.5	16,073.7	16,518.4	16,983.0	17,469.8	17,961.9	18,430.8	16,262.7
Baseline without Budget Resolution	14,032.5	14,466.9	14,979.2	15,542.9	16,014.9	16,419.1	16,814.3	17,213.2	17,619.6	18,029.7	16,113.2
Difference	33.7	60.7	36.5	37.6	58.8	99.3	168.7	256.6	342.3	401.1	149.5
Employment--Total Non-Farm Payrolls					Millions						
House Budget Resolution	134.706	137.756	140.483	143.329	145.668	147.072	148.340	149.701	151.021	151.981	145.006
Baseline without Budget Resolution	133.875	136.597	139.337	142.253	144.609	145.989	147.057	148.078	149.077	149.889	143.676
Difference	0.831	1.159	1.146	1.076	1.059	1.083	1.283	1.623	1.945	2.092	1.330
Employment--Private Non-Farm Payrolls					Millions						
House Budget Resolution	112.522	115.275	117.560	119.993	122.108	123.294	124.359	125.551	126.566	127.446	121.467
Baseline without Budget Resolution	111.619	114.027	116.300	118.736	120.765	121.866	122.711	123.561	124.237	124.950	119.877
Difference	0.902	1.248	1.261	1.257	1.343	1.429	1.648	1.989	2.330	2.496	1.590
Real Disposable Income					Billions of 2005 Dollars						
House Budget Resolution	10,551.7	10,993.1	11,448.1	11,906.9	12,322.5	12,731.6	13,137.9	13,562.2	13,994.0	14,417.9	12,506.6
Baseline without Budget Resolution	10,547.3	10,923.1	11,371.6	11,851.5	12,280.4	12,691.2	13,082.2	13,469.6	13,854.9	14,253.6	12,432.5
Difference	4.4	69.9	76.5	55.4	42.1	40.4	55.7	92.6	139.1	164.3	74.0
Number of Households					Millions						
House Budget Resolution	120.359	122.236	124.082	126.002	127.746	129.160	130.530	131.868	133.202	134.542	127.973
Baseline without Budget Resolution	120.284	122.157	124.038	125.981	127.728	129.119	130.432	131.682	132.914	134.163	127.850
Difference	0.075	0.079	0.044	0.021	0.018	0.041	0.098	0.187	0.288	0.379	0.123
Gross Private Savings					Billions of 2005 Dollars						
House Budget Resolution	2,869.7	3,006.7	3,393.2	3,660.4	3,969.0	4,365.8	4,754.0	5,137.5	5,574.3	6,009.0	4,274.0
Baseline without Budget Resolution	2,578.9	2,843.3	3,188.4	3,481.9	3,821.1	4,204.0	4,582.7	4,943.4	5,341.5	5,735.4	4,072.1
Difference	290.8	163.4	204.7	178.5	147.9	161.8	171.3	194.1	232.7	273.5	201.9
Real Private Investment--Non-Residential Structure					Billions of 2005 Dollars						
House Budget Resolution	305.7	347.4	399.4	448.2	476.6	490.6	501.0	511.4	522.3	527.7	453.0
Baseline without Budget Resolution	303.3	332.9	380.0	424.0	448.1	457.6	464.2	468.9	475.0	477.8	423.2
Difference	2.3	14.5	19.4	24.3	28.4	33.0	36.8	42.5	47.3	49.9	29.8
Real Residential Investment--Structures					Billions of 2005 Dollars						
House Budget Resolution	510.0	620.9	682.5	716.9	725.7	730.6	733.6	742.0	751.3	753.6	696.7
Baseline without Budget Resolution	421.1	522.2	578.5	608.5	613.0	617.4	620.2	625.8	631.4	630.6	586.9
Difference	88.9	98.7	104.1	108.4	112.7	113.2	113.5	116.2	119.9	123.0	109.9
Real Non-Residential Investment--Equipment/Software					Billions of 2005 Dollars						
House Budget Resolution	1,344.5	1,431.4	1,553.9	1,647.4	1,735.3	1,844.2	1,964.8	2,105.4	2,250.4	2,397.7	1,827.5
Baseline without Budget Resolution	1,316.7	1,378.4	1,465.8	1,528.2	1,572.5	1,631.4	1,692.7	1,766.7	1,841.5	1,917.6	1,611.2
Difference	27.7	53.1	88.1	119.1	162.8	212.8	272.1	338.7	408.9	480.1	216.3

Economic Indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012 to 2021
Real Residential Investment in Equipment					Billions of 2005 Dollars						
House Budget Resolution	11.6	12.4	12.6	13.0	13.3	13.6	14.0	14.4	14.9	15.5	13.6
Baseline without Budget Resolution	11.5	12.0	12.2	12.4	12.7	13.0	13.2	13.5	13.9	14.3	12.9
Difference	0.1	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.2	0.7
Yield on 10-Year Treasury Notes					Percent						
House Budget Resolution	3.740	4.125	4.465	4.768	5.027	4.985	4.872	4.763	4.660	4.561	4.596
Baseline without Budget Resolution	3.750	4.150	4.550	4.950	5.325	5.400	5.400	5.400	5.400	5.400	4.972
Difference	-0.010	-0.025	-0.085	-0.182	-0.298	-0.415	-0.528	-0.637	-0.740	-0.839	-0.376
Consumer Price Index, All Urban					Percent						
House Budget Resolution	2.247	2.287	2.332	2.377	2.427	2.481	2.535	2.588	2.644	2.703	2.462
Baseline without Budget Resolution	2.243	2.278	2.320	2.366	2.418	2.475	2.532	2.590	2.648	2.709	2.458
Difference	0.004	0.009	0.012	0.011	0.009	0.006	0.002	-0.002	-0.004	-0.006	0.004
Federal Debt Held by the Public					Billions of Dollars						
House Budget Resolution	11,503.4	12,212.2	12,706.6	13,128.9	13,610.7	14,041.9	14,442.8	14,912.2	15,423.4	15,903.4	13,788.6
Baseline without Budget Resolution	11,845.7	12,898.1	13,946.9	15,145.1	16,588.6	18,123.8	19,772.8	21,630.0	23,676.3	25,846.3	17,947.4
Difference	-342.3	-685.9	-1,240.3	-2,016.2	-2,977.9	-4,081.9	-5,330.0	-6,717.9	-8,252.8	-9,942.9	-4,158.8
Federal Grants in Aid to State and Local Governments					Billions of Dollars						
House Budget Resolution	468.2	461.8	446.4	409.8	397.9	417.8	435.6	466.0	504.9	541.0	4,549.2
Baseline without Budget Resolution	483.8	498.8	547.5	589.4	630.4	658.3	686.3	723.5	765.1	814.7	6,397.8
Difference	-15.6	-36.9	-101.1	-179.6	-232.6	-240.5	-250.7	-257.5	-260.2	-273.6	-1,848.5
Federal Medicaid Grants to State and Local Governments					Billions of Dollars						
House Budget Resolution	249.8	267.8	290.8	307.6	325.0	336.5	352.8	376.0	402.3	431.8	3,340.4
Baseline without Budget Resolution	264.7	289.1	339.9	382.6	424.7	453.7	482.0	516.6	554.1	599.3	4,306.8
Difference	-14.9	-21.2	-49.0	-75.0	-99.7	-117.2	-129.2	-140.6	-151.8	-167.5	-966.3

Economic Indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012 to 2021
Federal Non-Defense Purchases of Goods and Services					Billions of Dollars						
House Budget Resolution	381.5	356.9	372.3	385.7	406.6	431.9	453.0	472.3	505.6	530.7	4,296.5
Baseline without Budget Resolution	418.9	432.3	468.4	495.2	530.5	566.3	595.5	621.5	660.5	691.6	5,480.7
Difference	-37.4	-75.4	-96.1	-109.5	-124.0	-134.4	-142.5	-149.2	-154.9	-160.9	-1,184.2
Federal Personal Income Tax Base					Billions of Dollars						Average
House Budget Resolution	6,403.8	7,330.7	7,945.4	8,374.0	8,761.3	9,127.4	9,565.4	10,021.7	10,528.7	11,096.8	8,915.5
Baseline without Budget Resolution	6,302.2	7,147.8	7,740.2	8,140.8	8,509.2	8,883.4	9,288.4	9,683.5	10,104.1	10,563.7	8,636.3
Difference	101.6	182.9	205.2	233.2	252.1	244.0	277.0	338.2	424.6	533.0	279.2
Federal Corporate Tax Receipts					Billions of Dollars						Total
House Budget Resolution	355.9	354.4	376.2	391.7	396.2	402.1	411.1	417.6	437.1	446.8	3,989.2
Baseline without Budget Resolution	379.6	400.7	414.8	425.1	433.4	436.5	445.2	451.4	472.0	485.1	4,343.9
Difference	-23.7	-46.4	-38.6	-33.4	-37.2	-34.4	-34.1	-33.8	-34.9	-38.3	-354.7
Federal Personal Tax Receipts					Billions of Dollars						
House Budget Resolution	1,229.3	1,326.3	1,397.7	1,513.0	1,614.3	1,704.3	1,798.8	1,902.1	2,008.9	2,125.3	16,620.0
Baseline without Budget Resolution	1,162.6	1,215.1	1,313.5	1,427.2	1,540.9	1,645.5	1,744.9	1,849.5	1,961.3	2,078.9	15,939.4
Difference	66.8	111.2	84.2	85.8	73.4	58.8	53.9	52.6	47.6	46.4	680.6
Real Household Net Worth					Billions of 2005 Dollars						Average
House Budget Resolution	55,011.0	57,518.4	59,330.4	61,871.2	64,684.6	68,013.6	70,847.0	73,639.0	76,647.0	79,620.2	66,718.2
Baseline without Budget Resolution	54,420.8	56,713.6	58,492.1	61,109.5	64,026.0	67,424.3	70,325.7	73,224.1	76,319.4	79,478.9	66,153.4
Difference	590.2	804.8	838.3	761.7	658.6	589.3	521.3	414.9	327.6	141.3	564.8
Real After-Tax Corporate Profits					Billions of 2005 Dollars						
House Budget Resolution	1,521.4	1,765.8	1,815.4	1,749.5	1,728.0	1,693.0	1,666.3	1,649.8	1,655.6	1,692.4	1,693.7
Baseline without Budget Resolution	1,150.3	1,416.1	1,411.8	1,332.4	1,321.0	1,279.7	1,253.3	1,235.3	1,234.9	1,268.9	1,290.4
Difference	371.1	349.7	403.6	417.1	407.0	413.3	413.0	414.5	420.7	423.5	403.4
Real Before-Tax Corporate Profits Excluding IVA					Billions of 2005 Dollars						
House Budget Resolution	1,904.8	2,149.9	2,213.7	2,150.9	2,122.8	2,081.5	2,051.1	2,029.9	2,042.1	2,078.6	2,082.5
Baseline without Budget Resolution	1,535.9	1,823.7	1,823.3	1,741.3	1,726.6	1,675.9	1,645.2	1,621.8	1,628.1	1,663.9	1,688.6
Difference	368.9	326.2	390.4	409.6	396.2	405.6	405.9	408.0	413.9	414.7	393.9
Non-Farm Proprietors Income					Billions of Dollars						
House Budget Resolution	1,199.6	1,279.6	1,386.6	1,496.4	1,613.9	1,718.1	1,832.6	1,952.1	2,084.1	2,222.9	1,678.6
Baseline without Budget Resolution	1,159.3	1,217.3	1,303.7	1,395.0	1,490.6	1,571.3	1,660.6	1,750.3	1,847.7	1,947.7	1,534.4
Difference	40.3	62.3	82.8	101.4	123.3	146.9	171.9	201.8	236.4	275.2	144.2

Economic Indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012 to 2021
Wage & Salary Disbursements by the Private Sector					Billions of Dollars						
House Budget Resolution	5,908.2	6,203.0	6,609.2	7,000.0	7,374.6	7,717.1	8,107.9	8,529.0	8,955.8	9,398.4	7,580.3
Baseline without Budget Resolution	5,856.0	6,121.9	6,527.2	6,923.1	7,297.4	7,636.9	8,008.9	8,390.7	8,763.3	9,149.9	7,467.5
Difference	52.2	81.2	82.0	77.0	77.3	80.2	99.0	138.3	192.5	248.4	112.8
Real Net Exports of Goods & Services					Billions of 2005 Dollars						
House Budget Resolution	-474.1	-405.7	-340.8	-260.7	-186.5	-92.2	-0.2	75.6	128.0	180.4	-137.6
Baseline without Budget Resolution	-392.0	-313.3	-248.5	-172.1	-97.2	-1.5	99.3	196.1	279.6	363.2	-28.6
Difference	-82.1	-92.4	-92.3	-88.6	-89.3	-90.7	-99.5	-120.5	-151.6	-182.8	-109.0
Foreign Assets in the US--Current Cost					Billions of Dollars						
House Budget Resolution	24,290.2	25,998.8	27,954.3	30,201.3	32,780.4	35,568.6	38,445.3	41,401.0	44,477.2	47,695.2	34,881.2
Baseline without Budget Resolution	24,147.8	25,682.9	27,471.3	29,565.4	32,025.1	34,742.0	37,612.0	40,636.1	43,851.5	47,295.1	34,302.9
Difference	142.4	315.9	483.0	635.9	755.3	826.6	833.3	765.0	625.8	400.2	578.3
Chained Price Index--Health Care					Index						
House Budget Resolution	120.1	122.4	124.7	127.2	130.1	133.2	136.3	139.5	143.0	146.8	132.3
Baseline without Budget Resolution	120.0	122.5	125.3	128.5	132.1	136.0	139.7	143.6	147.6	151.8	134.7
Difference	0.2	-0.1	-0.6	-1.2	-2.1	-2.8	-3.5	-4.1	-4.6	-5.0	-2.4
Federal Tax Receipts--Unified Budget Basis					Billions of Dollars						Total
House Budget Resolution	2,741.9	2,962.9	3,215.2	3,389.6	3,522.6	3,734.8	3,915.0	4,107.1	4,323.7	4,564.5	36,477.3
Baseline without Budget Resolution	2,684.3	2,878.2	3,150.5	3,319.6	3,469.0	3,692.1	3,872.0	4,055.4	4,265.7	4,499.4	35,886.0
Difference	57.7	84.8	64.7	70.0	53.6	42.7	43.0	51.7	58.0	65.1	591.3
Federal Outlays--Unified Budget Basis					Billions of Dollars						
House Budget Resolution	3,603.7	3,604.6	3,636.1	3,727.3	3,917.4	4,082.4	4,224.6	4,472.8	4,725.5	4,930.6	40,925.1
Baseline without Budget Resolution	3,692.8	3,876.1	4,135.8	4,443.9	4,835.7	5,153.6	5,441.3	5,823.8	6,220.3	6,575.6	50,198.8
Difference	-89.1	-271.5	-499.6	-716.6	-918.2	-1,071.2	-1,216.7	-1,351.0	-1,494.8	-1,645.1	-9,273.7
Effective Federal Personal Income Tax Rate					Rate						Average
House Budget Resolution	0.187	0.176	0.171	0.176	0.179	0.182	0.183	0.185	0.186	0.187	0.181
Baseline without Budget Resolution	0.184	0.170	0.170	0.175	0.181	0.185	0.188	0.191	0.194	0.197	0.184
Difference	0.003	0.006	0.001	0.000	-0.002	-0.003	-0.005	-0.006	-0.008	-0.010	-0.002
Real Household Income					Dollars						
House Budget Resolution	87,961.4	90,267.5	92,627.4	94,887.3	96,878.9	99,025.8	101,150.2	103,401.9	105,674.0	107,841.0	97,971.5
Baseline without Budget Resolution	87,686.4	89,418.6	91,678.7	94,073.9	96,145.0	98,291.0	100,299.5	102,288.9	104,240.0	106,240.9	97,036.3
Difference	275.0	848.9	948.7	813.3	733.9	734.9	850.7	1,113.1	1,434.0	1,600.1	935.3