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A DYNAMIC ANALYSIS OF THE
2001 AND 2003 BUSH TAX CUTS:
APPLYING AN ALTERNATIVE TECHNIQUE
FOR CALIBRATING MACROECONOMIC
AND MICROSIMULATION MODELS

TRACY L. FOERTSCH, PH.D., AND
RALPH A. RECTOR, PH.D.

*The
Heritage Foundation*

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Tracy L. Foertsch, Ph.D., and Ralph A. Rector, Ph.D.

The President's budget for fiscal year 2007 included a number of proposals to extend expiring tax provisions. The most significant involved extending the lower marginal rates on ordinary income enacted under the 2001 Economic Growth and Tax Relief Reconciliation Act (EGTRRA) and the preferential rates on individual net capital gains realizations and dividend income enacted under the 2003 Jobs and Growth Tax Relief Reconciliation Act (JGTRRA). The President's budget also proposed raising the alternative minimum tax (AMT) exemption amount and continuing the AMT's unrestricted use of some nonrefundable personal tax credits. Without such an AMT fix, extending EGTRRA and JGTRRA will spur significant growth in the number of taxpayers subject to the AMT.

The Tax Increase Prevention and Reconciliation Act (TIPRA) of 2005 partially fulfills the President's tax agenda.[1] It extends JGTRRA's preferen-tial rates on capital gains and dividend income, but only through the end of calendar year 2010. It also raises the AMT exemption amount, but only through the end of calendar year 2006. It includes no extension of those provisions of EGTRRA set to expire in 2010.

This paper uses The Heritage Foundation Center for Data Analysis microsimulation model of the federal individual income tax and the Global Insight (GI) short-term U.S. Macroeconomic Model[2] combined with calibration techniques to analyze the economic and budget effects of permanently extending some of EGTRRA's and JGTRRA's expiring provisions. The extension plan analyzed is similar to that considered by the Treasury Department's Office of Tax Analysis (OTA) in its recent dynamic analysis of the President's tax relief proposals.[3] The plan permanently extends:

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1. For additional details on TIPRA's provisions, see Joint Committee on Taxation, "Estimated Revenue Effects of the Conference Agreement for the 'Tax Increase Prevention and Reconciliation Act of 2005'," JCX-18-06, May 9, 2006, at *www.house.gov/jct/x-18-06.pdf* (July 10, 2006).

2. The Global Insight model is used by private-sector and government economists to estimate ways in which important changes in the economy and public policy are likely to affect major economic indicators. It contains several policy variables that can be used to simulate changes in tax policy. The methodologies, assumptions, conclusions, and opinions presented here are entirely the work of analysts at The Heritage Foundation's Center for Data Analysis. They have not been endorsed by, and do not necessarily reflect the views of, the owners of the Global Insight model.

3. See U.S. Department of the Treasury, Office of Tax Analysis, "A Dynamic Analysis of Permanent Extension of the President's Tax Relief," July 25, 2006, at *www.treasury.gov/press/releases/reports/treasurydynamicanalysisreporjjuly252006.pdf* (July 31, 2006).

- JGTRRA's preferential tax rates on capital gains and dividends,

- EGTRRA's lower marginal tax rates on ordinary income,[4] and

- EGTRRA's provisions raising after-tax income.

Those provisions include the $1,000 child tax credit, repeal of the phase-out of itemized deductions and personal exemptions, and marriage penalty relief. The extension plan reduces marriage penalties by raising the standard deduction and widening the 15 percent tax bracket for married couples filing a joint return.

The economic and budget effects of this extension plan are measured against the Congressional Budget Office (CBO) January 2006 baseline projections.[5] CBO's baseline projections embody the rules and conventions governing a current-services federal budget. Thus, they project gross domestic product (GDP), prices, individual and corporate incomes, and net federal saving, among other economic and budget variables, over the 10-year budget period assuming the continuation of current levels of federal spending.

They also assume current-law tax policy. Thus, CBO's January 2006 baseline projections assume that the preferential tax rates on individual capital gains and dividend income enacted under JGTRRA expire in 2008 and the lower marginal rates on ordinary income enacted under EGTRRA expire in 2010. As a result of its current-law assumptions, CBO projects a sharp increase in current-law federal income tax revenues and some slowdown in economic activity after 2010.

When compared to CBO's baseline, our results indicate that permanently extending EGTRRA and JGTRRA produces modest economic gains. Between 2011 and 2016, real (inflation-adjusted) GDP is on average over 0.5 percent higher and an average of over 700,000 new jobs are created. Individual incomes and the federal personal income tax base also expand, helping to reduce the cost of the extension plan to the Treasury.

The remainder of the paper is organized as follows. The next section discusses the extension plan in greater detail. The third section discusses our procedures for calibrating to CBO's baseline projections and for simulating the economic and budget effects of a change in tax policy. The fourth section considers the revenue and marginal rate effects of the extension plan as estimated using the microsimulation model. The fifth and sixth sections in turn consider the dynamic economic and budget effects of the extension plan. We estimate the dynamic budget effects using both the Global Insight model and the microsimulation model. The final section offers concluding remarks.

THE EXTENSION PLAN

The extension plan permanently extends a select set of the tax provisions enacted under the 2001 and 2003 tax laws. CBO's January 2006 baseline projections assume that most provisions of EGTRRA expire at the end of calendar year 2010. However, they assume that JGTRRA's preferential rates on capital gains and dividend income expire at the end of calendar year 2008. This is because TIPRA's two-year extension of JGTRRA's capital gains and dividend provisions was not current law at the time CBO prepared its January 2006 baseline projections. In this paper, "current law" refers to current law as defined by CBO in January 2006.

The extension plan includes three broad components.

Component #1: Permanently Extend JGTRRA's Preferential Tax Rates on Capital Gains and Dividend Income. With no change in current law, net capital gains tax rates for individuals are set to revert to 10 percent or 20 percent beginning in 2009. The extension plan permanently lowers the maximum capital gains tax rate to 15 percent. It reduces the capital gains tax rate to 0 percent for realizations otherwise taxed at the regular marginal income tax rate of 10 percent.

In addition, with no change in current law, individual dividend income will be taxed at ordinary

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4. For additional information on EGTRRA's expiring provisions, see Joint Committee on Taxation, "Summary of Provisions Contained in the Conference Agreement for H.R. 1836, The Economic Growth and Tax Relief Reconciliation Act of 2001," JCX-50-01, May 26, 2001, at *www.house.gov/jct/x-50-01.pdf* (June 9, 2006).

5. For additional details on CBO's January 2006 baseline projections, see Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2007 to 2016*, January 2006, at *www.cbo.gov/ftpdocs/70xx/doc7027/01-26-BudgetOutlook.pdf* (May 1, 2006). For a summary of the rules governing CBO's current-law federal budget baseline, see Christopher Williams, "What Is a Current-Law Economic Baseline?" Congressional Budget Office *Economic and Budget Issue Brief*, June 2, 2005, at *www.cbo.gov/ftpdocs/64xx/doc6403/EconomicBaseline.pdf* (August 7, 2006).

Projected 2011 Ordinary Income Tax Schedules for the Pre-EGTRRA Baseline and the Extension Plan

Single Filer				Married Couple Filing a Joint Return			
Pre-EGTRRA		Extension Plan		Pre-EGTRRA		Extension Plan	
Tax Rate	Taxable Income	Tax Rate	Taxable Income	Tax Rate	Taxable Income	Tax Rate	Taxable Income
15%	$1-34,500	10%	$1-8,500	15%	$1-57,650	10%	$1-17,000
		15%	$8,501-34,550			15%	$17,001-69,100
28%	$34,501-83,600	25%	$34,551-83,600	28%	$57,651-139,300	25%	$69,101-139,350
31%	$83,601-174,400	28%	$83,601-174,450	31%	$139,301-212,300	28%	$139,351-212,350
36%	$174,401-379,100	33%	$174,451-379,250	36%	$212,301-379,100	33%	$212,351-379,250
39.6%	Over $379,100	35%	Over $379,250	39.6%	Over $379,100	35%	Over $379,250

Note: EGTRRA = Economic Growth and Tax Relief Reconciliation Act. Taxable income bracket amounts are based on tax provisions and projected inflation under each plan.

Source: The Heritage Foundation, Center for Data Analysis.

income tax rates beginning in 2009. Under the extension plan, qualified dividends (generally those from domestic corporations and qualified foreign corporations) will be taxed at the same rates applying to capital gains.

Component #2: Permanently Extend EGTRRA's Lower Marginal Tax Rates on Ordinary Income. With no change in current law, ordinary tax rates are set to revert to their pre-EGTRRA levels in 2011. Pre-EGTRRA law includes five regular marginal tax rates—15 percent, 28 percent, 31 percent, 36 percent, and 39.6 percent. Table 1 shows our projections of the tax rate structure for single filers and married couples filing a joint return assuming no extension of EGTRRA's marginal rate provisions.

Under the extension plan, EGTRRA's 10 percent tax bracket is made permanent for a portion of income that would otherwise be taxed at the 15 percent rate. The 10 percent taxable income bracket is projected to end at $8,500 for singles and $17,000 for married couples in 2011. The end point for the 15 percent bracket remains roughly the same for singles but increases for married couples (see below). The widths of the remaining four brackets change very little.[6] However, the associated regular marginal

tax rates are reduced to 25 percent, 28 percent, 33 percent, and 35 percent, respectively.

Component #3: Permanently Extend Provisions of EGTRRA Increasing After-tax Income. With no change in current law, the child tax credit will fall to $500 in 2011 for each qualifying child under the age of 17. It will generally not be refundable except for families with three or more qualifying children. Under the extension plan, the child tax credit is $1,000 per child, and the credit is partially refundable.

In addition, with no change in current law, marriage penalties will increase. This is because the standard deduction and the 15 percent tax bracket are set to revert to their pre-EGTRRA levels in 2011. Under pre-EGTRRA law, the basic standard deduction for a married couple filing a joint return is 1.67 times the basic standard deduction for an individual filing a single return. Similarly, under pre-EGTRRA law, the top of the regular 15 percent tax bracket for a married couple filing a joint return is 1.67 times the top of the regular 15 percent bracket for a single filer. Under EGTRRA, the basic standard deduction and the top tax bracket amount for a married couple filing a joint return are twice the amount for a

6.   In Table 1, inflation adjustment accounts for small differences between projections of the pre-EGTRRA tax brackets and the extension plan tax brackets. In law, the base amount for the widths of the 25 percent, 28 percent, 33 percent, and 35 percent brackets do not change.

single filer. The extension plan makes permanent EGTRRA's increase in the standard deduction and widening of the 15 percent bracket.

Finally, with no change in current law, the phase-out of itemized deductions and personal exemptions will be reinstated. We project that most taxpayers with adjusted gross income (AGI) exceeding $169,550 in 2011 will have to reduce their itemized deductions. Single filers with AGI greater than $169,550 and married couples filing a joint return and having an AGI exceeding $254,300 will also have to reduce their personal exemptions. Under the extension plan, itemized deductions and personal exemptions will not phase out.

MODEL CALIBRATION AND TAX POLICY SIMULATIONS

We calibrate two models to CBO's baseline economic and budgetary projections.[7] We typically use both models to evaluate proposed changes in tax policy. The first model is the Global Insight short-term U.S. Macroeconomic Model. The second is a proprietary microsimulation model of individual income tax returns developed by analysts at The Heritage Foundation's Center for Data Analysis.

A CBO-like baseline forecast is constructed using the Global Insight model and the details that CBO publishes about its baseline economic and budgetary projections. We use the resulting CBO-like forecast to infer the implications of CBO's current-law assumptions for key macroeconomic variables like personal consumption, investment, employment, and the components of national income and product accounts (NIPA) personal income. In combination with Statistics of Income (SOI) data, the microsimulation model uses the CBO-like baseline revenue forecast and estimated relationships between NIPA personal income and non-NIPA taxable income to project individual income tax data that are consistent with CBO's published baseline projections.

By calibrating to a common baseline, we can directly compare revenue estimates from the macro-economic and microsimulation models. Such direct comparisons facilitate dynamic analyses of the interactions between taxes and the economy.

Calibrating the Macroeconomic Model. We first calibrate the Global Insight model to CBO's published economic projections and NIPA federal revenue and spending projections.[8] Calibrating the Global Insight model to CBO's current-law baseline involves iteratively adjusting a control forecast.[9] This is a multi-step process. In each step, we set variables in the GI model to replicate CBO's published baseline projections. We then solve the GI model so that those variables that have not been targeted adjust. In essence, we are using econometrically estimated relationships and accounting identities within the GI model to create a forecast that is consistent with what we know about CBO's baseline economic and budgetary projections.

Calibration of the Global Insight model to CBO's baseline projections proceeds in seven steps.

Step 1. We set key forecast assumptions and economic variables. Key forecast assumptions include the price of oil, the value of the trade-weighted U.S. dollar exchange rate, and the federal social insurance tax rate. Key economic variables include the unemployment rate, the 3-month Treasury bill rate, the 10-year Treasury note rate, and price levels.

Setting price levels early in the calibration procedure is critical because many exogenous federal spending (outlays) variables in the Global Insight model are in real terms. Thus, a price level variable is needed to convert CBO's nominal baseline budgetary projections for those variables into consistent real targets.

Step 2. We set federal spending net of federal interest payments. Federal spending broadly includes consumption spending, transfer payments, and other spending items in the federal government's budget.

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7. For additional details on our calibration procedure, see Tracy L. Foertsch and Ralph A. Rector, "Calibrating Macro-economic and Microsimulation Models to CBO's Baseline Projections," *The IRS Research Bulletin: Recent Research on Tax Administration and Compliance*, Publication 1500, forthcoming 2006. A more detailed working paper version of this publication is also available upon request.

8. Global Insight provided a detailed outline of a methodology for calibrating the GI model to CBO's baseline projections. We created a series of programs to automate the process based on that outline, making adjustments and additions to GI's basic methodology where appropriate. The routines are written in AREMOS, Global Insight's proprietary modeling language.

9. GI's February 2006 U.S. Macroeconomic forecast is used as the control. The February 2006 forecast is used because it was the first to include projections for 2016.

CBO publishes its projections for most—but not all—of the Global Insight model's NIPA federal spending variables. In those instances where CBO does not provide NIPA baseline projections, we derive needed targets using either the GI control forecast or CBO's published projections of budget (unified) federal outlays.

Step 3. We adjust the components of GDP so that they are consistent with not only CBO's projections of real GDP and real federal spending but also CBO's current-law assumptions. Thus, we consider the difference between current law and the control forecast when deriving a target for real personal consumption.

A target for real personal consumption obtained using information strictly from the control forecast is likely to be too high. This is because the control forecast assumes a partial extension of those tax relief provisions in EGTRRA and JGTRRA set to expire in 2010. As a result, the control forecast projects a far more gradual increase than does CBO in NIPA personal income tax revenues as a share of GDP. Unsurprisingly, it also projects higher levels of NIPA personal disposable income as a share of GDP—particularly after 2010.

We derive a target for real personal consumption using both statements from the *Budget and Economic Outlook* about CBO's expectations for annual rates of growth in personal consumption and some judgment about the likely impacts on personal saving of not extending EGTRRA's and JGTRRA's expiring provisions.

Step 4. We derive a target for potential (full-employment) GDP that is consistent with CBO's projections of the rates of growth in potential GDP and the potential labor force.[10] CBO does not regularly publish estimates of the levels of either variable.[11] Thus, we adjust the projected levels of both

potential GDP and the potential labor force in the control forecast to be consistent with CBO's published growth rate projections.

Step 5. We adjust the components of NIPA taxable personal income.[12] CBO's NIPA taxable personal income includes wage and salary income, personal interest income, personal dividend income, personal rental income, and proprietors' income. CBO typically publishes projections of only NIPA taxable personal income and wage and salary income.[13]

We rely primarily upon information from the control forecast when deriving targets for the remaining components of NIPA taxable personal income. To the extent possible, we also adjust any targets we derive for the components of NIPA taxable personal income so that they reflect CBO's current-law assumptions.

Step 6. We adjust the CBO-like forecast to be consistent with CBO's baseline projections of NIPA federal tax receipts. NIPA federal tax receipts include taxes from the rest of the world, taxes on production and imports, and taxes on personal and corporate incomes.[14] CBO publishes projections for all three.

Setting federal taxes on personal and corporate incomes in the CBO-like forecast requires that we separately target both average effective federal income tax rates and the GI model's federal personal and corporate income tax bases. In the GI model, the federal personal income tax base is a function of both NIPA taxable personal income and individual capital gains. We therefore adjust our target for the federal personal income tax base to reflect CBO's projections of capital gains.[15]

The GI model also includes an approximation of the federal corporate income tax base. It defines the federal corporate income tax base as before-

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10. See Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2007 to 2016*, January 2006, Table 2-2, p. 44, at *www.cbo.gov/ftpdocs/70xx/doc7027/01-26-BudgetOutlook.pdf* (May 1, 2006).

11. CBO published historical estimates of potential output since 1950, along with projections of potential output through 2011, in Robert Arnold, "CBO's Methods for Estimating Potential Output: An Update," A Congressional Budget Office Paper, August 2001, at *www.cbo.gov/ftpdocs/30xx/doc3020/PotentialOutput.pdf* (June 11 2006).

12. CBO publishes its projections of NIPA taxable personal income in the January release of *The Budget and Economic Outlook*. See Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2007 to 2016*, January 2006, Table 4-3, p. 86.

13. For its August 2006 economic and budgetary projections, CBO published for the first time details about how it forecasts the components of gross domestic income. See Angelo Mascaro, "How CBO Forecasts Income," Congressional Budget Office *Background Paper*, August 2006, at *www.cbo.gov/ftpdocs/75xx/doc7507/08-25-Income.pdf* (August 29, 2006).

14. Contributions for federal social insurance are also included in NIPA federal tax receipts. They are set to CBO's baseline revenue projections in step 1.

tax corporate (book) profits minus rest-of-world corporate profits and the profits of the Federal Reserve. We target CBO's published projections of corporate profits only indirectly by iteratively modifying the statistical discrepancy in the CBO-like forecast. We do so because corporate profits are a residual of gross national product (GNP) in the GI model and as such cannot simply be replaced in the CBO-like forecast with CBO's published projections.[16]

Step 7. We complete calibration of the GI model to CBO's baseline projections by setting the stock of publicly held federal debt to be consistent with CBO's published projections of unified federal surpluses. In addition, we fine tune average effective federal tax rates on personal and corporate incomes and for federal contributions to social insurance so that the final CBO-like forecast is consistent with CBO's published projections of federal tax receipts.

Calibrating the Microsimulation Model. We next calibrate the microsimulation model of individual income tax returns to CBO's baseline projections. The final CBO-like forecast provides income, price level, and some budgetary variables used in this calibration.

Primary Components of the Microsimulation Model. The microsimulation model consists of three primary components—the core base-year data, a federal income tax and payroll tax calculator, and an optimizing routine that ages (extrapolates) the core base-year data. The first component consists of individual tax return data and demographic data in the base year. The second component reads a data file and replicates the process of calculating individual income and payroll taxes in the base year and future years. The third component ages the base-year data to reflect projected changes in not only key demographic and economic aggregates but also the distribution of income.

Aging the core base-year data involves four major steps. In each, we target tax and non-tax variables in the microsimulation model.

Step 1. We use the CBO-like forecast to update all nominal income values on individual tax returns. We also update all targets for demographic variables.

Step 2. We sequentially target four broad measures of individual income by percentile class. Total income is divided into wages and salaries, business income, non-capital gains investment income, and income from other sources. It encompasses both gross income reported on individual tax returns (gross tax return income) and non-taxable income.[17]

Step 3. We target more detailed measures of the components of gross tax return income. Most of the targets are for components of NIPA personal income, with some important exceptions. Those exceptions include small business corporation (S-Corporation) net income, taxable pension and annuity income, net capital gains, and gains from the sale of other assets.[18]

The final CBO-like baseline forecast provides a number of NIPA measures of personal and business income. These include wage and salary income, investment income, proprietors' income, other business income, transfer payments to persons, and corporate profits.

We use NIPA data to estimate the amount of income reported on tax returns.[19] We also use NIPA data to estimate other NIPA-based components of gross tax return income. Those components include proprietors' (farm and non-farm) gains and net losses,[20] income from rents and royalties, income from trusts and estates, and the pass-through net income from S-Corporations that is included in NIPA corporate profits. Social Security income is introduced as a separate target because a portion of Social Security benefits are included in taxable income.

15. For CBO's projections of individual capital gains realizations, see Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2007 to 2016*, January 2006, Table 4-4, p. 92.

16. The Global Insight model defines corporate (book) profits as GNP net of consumption of fixed capital, taxes on production and imports, transfer payments by business, interest payments by business, net surpluses of government enterprises, employer-paid payroll taxes, wage and salary income, other labor income, proprietors' income, personal rental income, and the statistical discrepancy.

17. Gross tax return income here refers to a broad income measure that approximates the Internal Revenue Code's definition of gross income reported on Form 1040.

18. We obtain projections of capital gains realizations from Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2007 to 2016*, January 2006, Table 4-4, p. 92. We develop independent estimates for the remaining non-NIPA sources of personal income.

Differences between NIPA measures of personal income and measures of gross tax return income can be substantial. This is because NIPA personal income and gross tax return income are defined differently and are constructed using data from different sources. The Bureau of Economic Analysis (BEA) produces annual tables that compare the two measures of income. Those tables identify and provide estimates of the adjustments needed to reconcile the definitional and reporting differences. Those reconciliation adjustments are used to calculate an "adjusted" personal income that approximates AGI. The discrepancy between "adjusted" personal income and AGI is called the "AGI gap." We forecast a combination of data about personal income, reconciliation adjustments, and the AGI gap to develop separate estimates for the NIPA-based components of gross tax return income.

The sum of our forecasts of the components of NIPA-based income and non-NIPA-based income approximates the taxable income base that CBO uses to project federal receipts from the individual income tax. CBO does not provide its projections for most of the components of gross tax return income. As a result, there can be differences between income amounts we use and those projected by CBO.

Step 4. Finally, we compare CBO's projections of individual income tax collections with estimates of tax liability calculated by the microsimulation model. Tax payments are divided into withholding, estimated payments, and final payments. The payments are aggregated to estimate fiscal year revenue collections. An additional adjustment is made to reflect payments for fees, penalties, and other collections.

We modify our targets for the distribution of gross tax return income by size of income by marital filing status when there are material differences in the revenue projections. Adjustments may be needed because a large proportion of the total federal income tax is paid by a relatively small proportion of taxpayers at the top end of the income distribution. Slight changes in assumptions about the number of tax returns in the top classes can produce significant changes in total revenue projections.

Simulating the Economic and Budget Effects of a Change in Tax Policy. Calibrating a macroeconomic model of the U.S. economy and a microsimulation model of the federal individual income tax to a common baseline yields a consistent starting point for dynamic policy analysis. We apply an additional calibration process to ensure that final dynamic revenue estimates from the macroeconomic model are broadly consistent with revenue estimates from the microsimulation model.

We regularly calibrate both the Global Insight model and the microsimulation model to CBO's baseline projections. We also regularly use the calibrated macroeconomic and microsimulation models to analyze a variety of tax proposals. Tax data in the microsimulation model can be used to provide a "stand-alone" revenue estimate. A revenue estimate from the microsimulation model can also be introduced into the GI model to generate a "first-round" dynamic estimate of a proposal's economic and budget effects.[21]

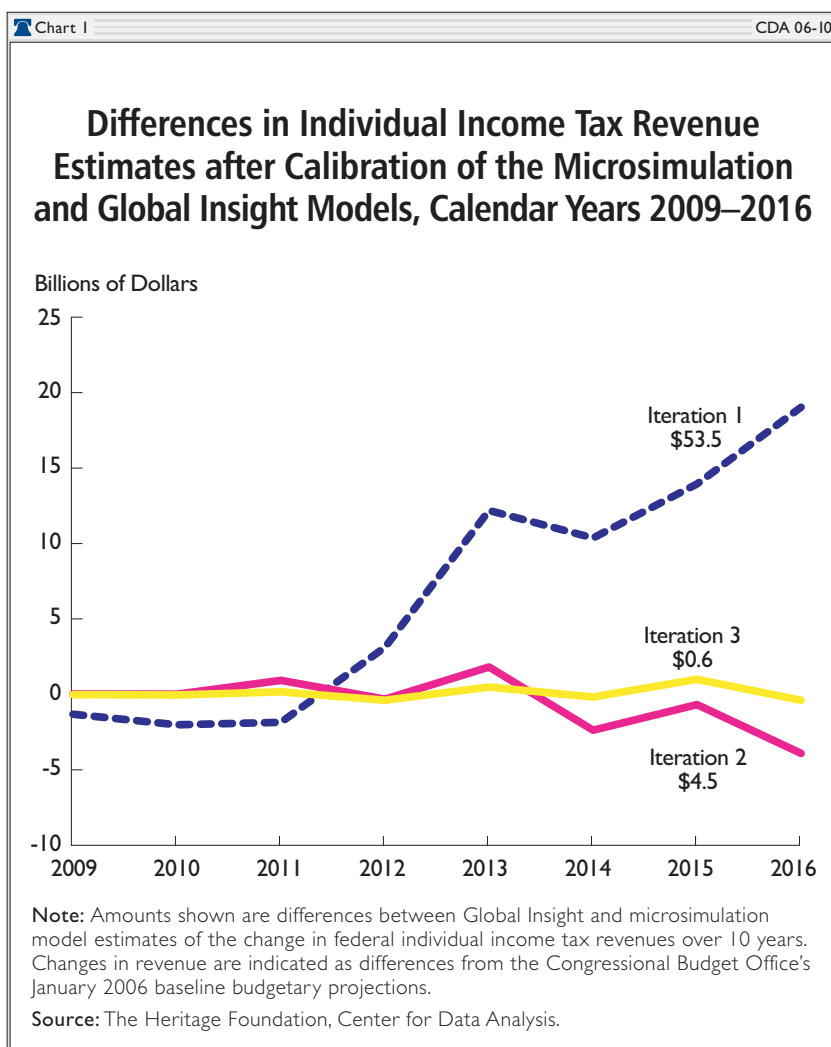A fully dynamic tax policy simulation proceeds in three steps.

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19. In estimating detailed personal income targets, we rely upon unpublished tables comparing the components of NIPA personal income and Internal Revenue Service (IRS) federal adjusted gross income. Those tables are available from the Bureau of Economic Analysis (BEA) upon request. We also rely upon annual *Survey of Current Business* articles describing the major categories used to reconcile the differences between personal income and federal AGI. Additional details can be found in Mark A. Ledbetter, "Comparison of BEA Estimates of Personal Income and IRS Estimates of Adjusted Gross Income, New Estimates for 2001, Revised Estimates for 1959-2000," *Survey of Current Business*, April 2004, pp. 8–22, at *www.bea.gov/bea/ARTICLES/2004/04April/0404PI&AG.pdf* (May 31, 2006). For a summary of the most recent reconciliation of NIPA personal income and IRS federal AGI, see U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts, Table 7.19 (Comparison of Personal Income in the National Income and Product Accounts with Adjusted Gross Income as Published by the Internal Revenue Service), at *www.bea.gov/bea/dn/nipaweb/SelectTable.asp?Selected=N#S7* (May 24, 2006). Table 7.19 appears periodically in the *Survey of Current Business*.

20. NIPA does not separately report the sum of gains and losses for proprietorships or other businesses. Losses are instead added to gains to derive an aggregate net amount of proprietorship income. This is problematic for purposes of estimating government revenues. Thus, we use IRS data to estimate the historical relationship between the aggregate amount of proprietors' income and the amount of net gains and losses.

21. For example, see Tracy L. Foertsch and Ralph A. Rector, "The Economic and Budgetary Effects of the Katrina Emergency Tax Relief Act of 2005," White Paper, September 21, 2005, at *www.heritage.org/Research/Taxes/wp20050921.cfm*.

First, we use the microsimulation model to estimate the revenue effects of the proposed change in tax policy under baseline economic assumptions. The proposed tax policy can involve a change in current-law federal income tax rates, a change in the federal individual income tax base, or both. The microsimulation model is used to estimate the change in federal income tax revenues. It also produces estimates of marginal tax rates on three types of income—ordinary income, long-term capital gains realizations, and dividend income—under the proposed policy and current law.

Second, we use the Global Insight model to estimate the dynamic revenue effects of the same policy change. Estimated changes in federal tax revenues and marginal tax rates from the microsimulation model are used as inputs into a simulation with the GI model. The macroeconomic simulation produces an alternative to the CBO-like baseline forecast. That alternative (non-baseline) forecast includes the dynamic effects of the proposed policy on GDP, prices, interest rates, employment, and personal and corporate incomes, among other variables.

Third, we update the microsimulation model to reflect the dynamic effects of the proposed tax policy on individual and business incomes. This is done using procedures similar to those developed for baseline calibration. Thus, NIPA components of individual and business income along with price level variables and some NIPA budget variables from the alternative forecast are used to estimate target values for non-taxable income and gross tax return income on individual income tax returns. We use those targets to update individual and business incomes in the microsimulation model so that they are consistent with the Global Insight model's alternative forecast for the components of NIPA personal income.

For major tax proposals, we typically continue to iterate between the microsimulation model and the Global Insight model.[22] Thus, we use revenue estimates and marginal rates from the updated micro-simulation model to adjust the alternative forecast from the GI model so that it better reflects the effects of the tax proposal.

We compare these revenue estimates when evaluating results from the Global Insight model and the microsimulation model. We consider the tax-policy simulation complete if differences between the estimated changes in federal tax revenues from the GI model and the microsimulation model are minimal or can be accounted for by definitional and other differences in the federal income tax bases.

We followed this iterative procedure in estimating the economic and budget effects of the extension plan. Revenue estimates from the two models converged quickly (see Chart 1). In the first iteration, the total change in personal income tax revenues implied by the Global Insight model exceeded the

Chart 1   CDA 06-10

Differences in Individual Income Tax Revenue Estimates after Calibration of the Microsimulation and Global Insight Models, Calendar Years 2009–2016

Billions of Dollars

Iteration 1 $53.5

Iteration 3 $0.6

Iteration 2 $4.5

Note: Amounts shown are differences between Global Insight and microsimulation model estimates of the change in federal individual income tax revenues over 10 years. Changes in revenue are indicated as differences from the Congressional Budget Office's January 2006 baseline budgetary projections.

Source: The Heritage Foundation, Center for Data Analysis.

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22. For example, see Tracy L. Foertsch and Ralph A. Rector, "Economic and Budget Effects of a Two-Period Revenue Neutral Flat Tax," Unpublished Working Paper, August 2006.

total change in estimated individual income tax revenues implied by the microsimulation model by almost $54 billion over 10 years. By the third iteration, well under $1 billion separated the estimated total changes in income tax revenues from the two models.

REVENUE ESTIMATES AND THE MARGINAL RATE EFFECTS OF THE EXTENSION PLAN

We show two sets of revenue estimates (see Table 2A).[23] Revenue estimates from the *baseline* forecast exclude the macroeconomic ("dynamic") effects of the extension plan on individual, non-corporate business, and corporate incomes. This is because the baseline simulation starts from CBO's January 2006 baseline income projections and gives the revenue effects of the extension plan under conventional assumptions. Thus, the revenue estimates assume that changes in tax policy have no effect on baseline projections of GDP, prices, incomes, or net federal saving, among other economic and budget variables.

Revenue estimates from the *income-adjusted* forecast include the macroeconomic effects of the extension plan on CBO's baseline projections. This is because the income-adjusted forecast updates the federal individual income tax base in the baseline forecast to reflect the economic and budget effects of extension. For the same change in tax policy, revenue estimates from the income-adjusted forecast can differ substantially from those from the baseline forecast.

Revenue estimates starting from CBO's baseline income projections put federal income tax revenues $1,048.8 billion below CBO's baseline revenue projections over the 10-year budget period (see From the Baseline Forecast in Table 2A).[24] In comparison, in February 2006, the Treasury Department estimated the revenue effects (including outlays for changes in net refundable credits) of extending EGTRRA's lower tax rates on ordinary income, JGTRRA's preferential tax rates on capital gains and dividend income, and EGTRRA's $1,000 child tax credit and marriage penalty relief at about –$1,022.4 billion.[25] The income-adjusted forecast implies a smaller reduction in federal income tax revenues (see From the Income-Adjusted Forecast in Table 2A). It puts federal income taxes $866.9 billion below CBO's baseline federal revenue projections over 10 years.

The estimated change in federal income tax revenues would be significantly higher—nearly twice as large in the income-adjusted forecast—if not for the change in revenues from the AMT. The extension plan includes no additional increases in

| Table 2A | | | | CDA 06-10 |

Estimated Change in Federal Individual Income Tax Revenues Under the Extension Plan, FY 2007–2016

	Change in Federal Income Tax Revenues*		Change in Alternative Minimum Tax Revenues	
	$billions	Share of Total Tax Revenues**	$billions	Share of Total Tax Revenues**
From the Baseline Forecast	-1,048.8	-5.4%	767.3	4.0%
From the Income-Adjusted Forecast	-866.9	-4.5%	797.3	4.1%

* Estimated changes in federal individual income taxes include net refundable credits. In the baseline forecast, refundable credits increase by roughly $56.9 billion over 10 years. In the income-adjusted forecast, they increase by around $54.3 billion. The Treasury recently put the total change in refundable credits from permanently extending the child tax credit and marriage penalty relief at $59.2 billion. For additional details, see U.S. Department of the Treasury, *General Explanations of the Administration's Fiscal Year 2007 Revenue Proposals,* February 2006, pp. 143–146, at *www.ustreas.gov/offices/tax-policy/library/bluebk06.pdf* (September 20, 2006).

** The share is calculated as the ratio of the change in tax revenues to total federal tax revenues. Total federal tax revenues are the sum of the Congressional Budget Office's January 2006 baseline projections of federal estate, business, and individual income tax revenues.

Note: The changes in federal income tax revenues and in alternative tax revenues are relative to current law.

Source: The Heritage Foundation, Center for Data Analysis.

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23. In Table 2A, estimated changes in federal individual income tax revenues include net refundable credits.

24. Here, baseline revenue projections are the sum of CBO's current-law projections of estate, business, and individual income tax revenues.

25. See U.S. Department of the Treasury, *General Explanations of the Administration's Fiscal Year 2007 Revenue Proposals*, February 2006, pp. 143–146, at *www.ustreas.gov/offices/tax-policy/library/bluebk06.pdf#search=%22general%20explanations%20of%20the%20administration's%20fiscal%20year%202007%22* (September 20, 2006).

the AMT exemption amount or indexing of the AMT brackets to inflation.[26] Without these, an ever larger number of middle- to upper-income taxpayers will fall prey to the AMT. For example, Treasury estimates that with permanent extension of EGTRRA and JGTRRA and no additional AMT relief, the number of individual AMT taxpayers will jump from 5.5 million in 2006 to almost 26 million in 2007 and over 56 million in 2016.[27]

For these taxpayers, the tax reductions under the extension plan have the effect of putting the regular income tax liability below the minimum tax liability, making the taxpayers subject to the AMT. The increased difference between the minimum tax liability and the regular income tax liability has been characterized as a "claw back."[28] The estimated change in federal income tax revenues is less than it otherwise would be because the AMT takes back tax reductions from the extension plan in this way.

Comparing the Extension Plan's Marginal Rate Effects to Treasury's Dynamic Analysis of the President's Tax Proposals. As part of its recent dynamic analysis of the President's tax proposals, the OTA simulated the effect on average marginal tax rates of permanently extending EGTRRA's lower marginal rates on ordinary income, JGTRRA's preferential rates on capital gains and dividend income, and EGTRRA's provisions raising after-tax income.[29] We estimate the effects of a similar extension plan. Between 2011 and 2016, the income-adjusted

Table 2B		CDA 06-10

Average Estimated Changes in Average Marginal Individual Income Tax Rates Under the Extension Plan, 2011–2016

	From the Income-Adjusted Forecast	From the Treasury's Analysis
Capital Gains	-24.1%	-23.7%
Dividend Income	-52.8%	-54.1%
Ordinary Income*	-7.8%	
Wages		-5.1%
Interest		-8.2%
Business Income**		-12.1%

* Ordinary income includes all income that does not qualify as a capital gain.

** Business income includes income from Internal Revenue Service Form 1040 Schedules C, E, and F.

Note: The table shows the average percent change in marginal tax rates from current law.

Sources: The Heritage Foundation, Center for Data Analysis, and U.S. Department of the Treasury, Office of Tax Analysis, "A Dynamic Analysis of Permanent Extension of the President's Tax Relief," July 25, 2006, p. 18, Table 1, at *www.treasury.gov/press/releases/ reports/treasurydynamicanalysisreporjjuly252006.pdf* (July 31, 2006).

forecast gives average percent changes in the marginal tax rates on capital gains and dividend income that are similar to those obtained by the OTA (see Table 2B). In addition, our estimated average percent change in the marginal tax rate on ordinary income is in line with OTA's estimated average percent changes in marginal tax rates on wages, interest income, and business income.[30]

DYNAMIC ECONOMIC EFFECTS OF THE EXTENSION PLAN

The extension plan has a positive economic impact (see Table 3). Between 2011 and 2016, total employment expands by an average of over

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26. TIPRA increased the individual AMT exemption amount and continued the AMT's unrestricted use of some nonrefundable personal tax credits through the end of calendar year 2006. Those credits include higher education credits and the child and dependent care credits.

27. See U.S. Department of the Treasury, Office of Tax Policy, "Tax Relief Kit—The Toll of Two Taxes: The Regular Income Tax and the AMT," 2006, at *www.ustreas.gov/offices/tax-policy/library/tax_relief_kit.pdf* (September 21, 2006).

28. As defined here, "claw back" is the result of a phaseout of the AMT exemption amount for taxpayers with high levels of AMT income. For additional details, see Gregg Esenwein, "The Alternative Minimum Tax (AMT): Income Entry Points and "Take Back" Effects," Congressional Research Service Report for Congress, Order Code RS21817, February 10, 2005.

29. See U.S. Department of the Treasury, Office of Tax Analysis, "A Dynamic Analysis of Permanent Extension of the President's Tax Relief." Permanently extending the 10-percent tax bracket, the $1,000 child tax credit, and marriage penalty relief has little effect on average effective marginal tax rates.

30. Business income here includes income from IRS Form 1040 Schedules C, E, and F.

| Table 3 | | | | | | | CDA 06-10 |

Extension Plan's Economic Effects Relative to the CBO Baseline Projections

	Fiscal Year						FY 2011-2016 Average
	2011	2012	2013	2014	2015	2016	
Real GDP[a]	67.8	97.2	85.5	78.8	70.2	60.2	76.6
Total Employment[b]	568	880	870	750	647	539	709
Unemployment Rate[c]	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1
Real Disposable Personal Income[a]	148	203	204	209	211	208	197
Real Personal Consumption[a]	73	115	122	125	125	123	114
Personal Saving Rate[d]	0.7	0.8	0.8	0.8	0.8	0.7	0.8
Real Gross Private Domestic Investment[a]	22.0	30.4	12.5	6.2	2.8	1.7	12.6
Real Non-Residential Investment[a]	12.8	21.4	11.6	4.1	1.5	2.0	8.9
Full-Employment Capital Stock[a]	18.7	39.0	47.6	46.7	44.8	44.0	40.1
CPI Inflation[e]	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Treasury Bill, 3-Month[f]	0.1	0.3	0.2	0.2	0.2	0.1	0.2
Treasury Bond, 10-Year[f]	0.1	0.3	0.2	0.2	0.2	0.2	0.2

[a] Difference in billions of inflation-adjusted dollars indexed to 2000 price levels.
[b] Difference in thousands of jobs.
[c] Difference in the percent of the civilian labor force.
[d] Difference in the percent of disposable personal income.
[e] Difference in the percent change from a year ago.
[f] Difference in an annualized percent.

Note: GDP = gross domestic product; CPI = consumer price index; CBO = Congressional Budget Office. The economic effects of the extension plan are measured relative to the CBO's January 2006 baseline economic and budgetary projections. A more detailed table is available upon request.

Source: The Heritage Foundation, Center for Data Analysis.

700,000 jobs annually, and the unemployment rate drops an average of 0.1 percentage point. That drop in the unemployment rate occurs despite the increase in the rate of labor force participation spurred by lower marginal tax rates on labor income.[31] Over the same period, real disposable income rises by nearly $200 billion, and personal saving climbs sufficiently to push the personal saving rate 0.8 percentage point above baseline levels.

Permanently extending JGTRRA's preferential rates on capital gains and dividend income permanently reduces the cost of capital to business. Real non-residential fixed investment responds positively, climbing an average of nearly $9 billion annually between 2011 and 2016. The economy's stock of productive capital is bolstered as a result, and real potential GDP expands in every quarter between 2009 and 2016. Reflecting that increase in the econ-omy's productive potential, real GDP exceeds CBO's baseline projections by $60.2 billion by 2016.

Two factors mitigate the economic benefits of the extension plan. First, in the simulations, rising output and falling rates of unemployment prompt the Federal Reserve to increase the federal funds rate despite little change in the rate of consumer price index (CPI) inflation.[32] Yields on Treasury notes and bills and on corporate and other debt rise as a result, increasing the cost of capital to business. Second, the ever expanding reach of the AMT nearly halves the size of the tax reduction under the extension plan (see Table 2A), curtailing gains in personal disposable income, personal consumption, and saving. It also boosts the average effective marginal tax rate on ordinary income, in some cases offsetting the incentives for supplying more labor.[33]

Minimizing the Disincentives Caused by Taxation. The dynamic economic effects simulated

31. The labor force participation rate is calculated by dividing the projected civilian labor force by the population aged 16 years and older. The increase in the labor force participation rate is forecast to average almost 0.2 percentage point in 2016.

32. We use an econometrically-estimated reaction function in the GI model that adjusts the effective interest rate on federal funds in response to changes in the unemployment rate and the rate of inflation in the CPI.

here stem primarily from reducing the disincentives to work, save, and invest created by the expiration of those provisions of EGTRRA and JGTRRA lowering marginal tax rates on capital gains, dividend income, and ordinary income. Permanently extending the $1,000 child tax credit, repeal of the phase-out of itemized deductions and personal exemptions, and marriage penalty relief also have some effect on economic activity. However, they tend to do so by increasing refundable credits and after-tax incomes.[34]

In general, tax relief measures that reduce marginal tax rates on capital and labor income will produce bigger gains in GDP than do measures that only tinker with the size of after-tax income. This is because cuts in marginal tax rates both increase the after-tax wage rate and lower the cost of capital. They therefore tend to encourage individuals to work more and businesses to invest. Increases in labor supply, saving, and the domestic capital stock follow.

New or bigger personal deductions and tax credits typically do not have the same incentive effects. They do little to spur employment and new business investment. And they boost after-tax incomes, not after-tax wage rates. Thus, individuals can increase or even maintain the same level of after-tax income by working the same or fewer hours.

Response of Labor to Permanently Extending EGTRRA's Lower Marginal Tax Rates on Ordinary Income. Permanently extending EGTRRA's reduction in the top four individual tax rates lowers overall effective marginal tax rates on labor income. Several of the Global Insight model's labor supply variables are adjusted to reflect the likely effects of lower marginal rates on labor force participation and average weekly hours worked. Those variables include the full-employment civilian labor force, the civilian labor force aged 16 years to 64 years, the civilian labor force aged 65 years and over, and the average work week under full employment in the non-farm, business sector.

All adjustments to the model's labor supply variables are small. For those aged 65 years and older, we assume a total wage elasticity between 0 and 0.3.[35] That total wage elasticity breaks down into a participation elasticity falling between 0.1 and 0.2 and an average-hours elasticity not exceeding 0.1. For those aged between 16 and 64 years, a participation elasticity not exceeding 0.15 is assumed. In this simulation, average hours worked are in turn taken to be unresponsive to changes in both payroll and personal income tax rates. For the full-employment labor force and hours worked, a weighted average of the above elasticities is used to determine labor's responsiveness to changes in tax rates. The weights applied equal each of the above age cohort's share of the total civilian labor force.

Average weekly hours worked (full-employment and actual) over all age groups generally rise, but only negligibly, between 2011 and 2016. The civilian labor force increases an average of about 0.4 percent between 2011 and 2016. For those aged between 16 years and 64 years, labor supply rises by roughly the same amount. In comparison, the OTA in its dynamic analysis of a similar extension plan simulates an increase in total labor supply averaging between 0.5 percent and 0.7 percent between 2011 and 2016.[36]

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33. The AMT is nearly a flat tax with two brackets, 26 percent and 28 percent. See Gregg Esenwein, "The Alternative Minimum Tax (AMT): Income Entry Points and "Take Back" Effects," Congressional Research Service *Report for Congress*, Order Code RS21817, February 10, 2005. For additional details on the impact of the AMT on average marginal tax rates and labor supply, see David Brauer, "CBO's Projections of the Labor Force," Congressional Budget Office Paper, September 2004, at *www.cbo.gov/ftpdocs/58xx/doc5803/09-15-LaborForce.pdf* (September 21, 2006). See also Joint Committee on Taxation, "Present Law and Background Relating to the Individual Alternative Minimum Tax," JCX-37-05, May 20, 2005, at *www.house.gov/jct/x-37-05.pdf#search=%22jct%20capital%20gains%20phase%20out%20range%22* (September 21, 2006).

34. We model refundable credits as a change in federal transfer payments to persons and, thus, a change in federal outlays.

35. A CBO memorandum puts the total wage elasticity for the population as a whole between 0 and 0.3. That total wage elasticity breaks down into a participation elasticity that falls between 0.1 and 0.2 and an average hours elasticity that does not exceed 0.1. See Frank S. Russek, "Labor Supply and Taxes," Congressional Budget Office Memorandum, January 1996, at *www.cbo.gov/ftpdocs/33xx/doc3372/labormkts.pdf* (June 26, 2006). All labor supply elasticities are further multiplied by 0.25 to obtain a quarterly pattern. All implied reductions in labor force participation and average hours worked are phased in over two years.

36. See U.S. Department of the Treasury, Office of Tax Analysis, "A Dynamic Analysis of Permanent Extension of the President's Tax Relief," Table 3, p. 20.

The Response of Investment to Permanently Extending JGTRRA's Preferential Rates on Capital Gains and Dividend Income. Permanently extending JGTRRA's preferential rates on capital gains and dividend income is simulated in the Global Insight model as a reduction in the firm's cost of capital. We introduce that reduction into the Global Insight model through an increase in the value of the Standard & Poor's (S&P) 500 index of common stocks, which lowers the dividend yield on the S&P 500 and thus the firm's cost of equity.

Predictions of any change in stock prices should perhaps be viewed with some skepticism. However, current taxes on corporate income, dividends, and capital gains likely play some role in reducing the value of the corporation to the shareholder and thus depress stock prices.[37] Lowering taxes on capital gains and dividend income should therefore have some positive effect on stock returns.

The "new" and "old" views of the economic effects of dividends are taken into account when calculating the increase in the S&P 500 in the Global Insight model.[38] Under the "new" view, the S&P 500 rises permanently. Under the "old" view, that same increase in the S&P 500 is phased out over the 10-year budget period. An average of the two views gives the change in the S&P 500 that is assumed to follow the permanent extension of JGTRRA's preferential rates on capital gains and dividend income.

Changes in the S&P 500 under both the old and new views are derived using an equation that links changes in the cost of equity with changes in marginal tax rates on capital gains and (S&P 500) dividends. A static estimate of the change in the cost of equity is obtained using a separate equation for the after-tax rental price of capital.[39] That equation expresses the after-tax price of—or return to—equity as a weighted average of the after-tax return to dividends and the after-tax return to capital gains. An explicit expression for the after-tax return to equity is obtained by equating that weighted average with the after-tax return to corporate debt.

We use data from various sources to obtain initial estimates of the change in the cost of equity likely under the extension plan. The microsimulation model is used to generate estimates of the marginal tax rates on individual capital gains and dividend income under current law and permanent extension of JGTRRA's lower rates on capital gains and dividends. We use those marginal tax rates on capital gains and dividend income to calculate the change in the after-tax return on equity. We set the before-tax return on corporate debt and the dollar value of S&P 500 dividends using baseline data from the final CBO-like baseline forecast. Finally, we use S&P 500 data to determine the share of firm investment financed with debt and the share of corporate income allocated to dividends.[40]

The implied static changes in the value of the S&P 500 have a noticeable effect in the simulations. Permanently reducing the tax rate on dividend income gives a static increase in the S&P 500 averaging roughly 1 percent under the old and new views combined between 2009 and 2016. Permanently lowering the tax rate on capital gains gives a static increase in the value of the S&P 500 averaging about 2.3 percent between 2009 and 2016.[41]

Those static changes in the value of the S&P 500 are adjusted if necessary so that the simulated change in the S&P 500 is in line with other

37. John E. Golob, "How Would Tax Reform Affect Financial Markets?" Federal Reserve Bank of Kansas City *Economic Review*, 1995, pp. 19–39, at *www.kc.frb.org/PUBLICAT/ECONREV/PDF/4q95golb.pdf* (June 26, 2006).

38. For a more detailed description of the treatment of the old and new views of the economic effects of dividends in macroeconomic models, see Ben Page, "How CBO Analyzed the Macroeconomic Effects of the President's Budget," A Congressional Budget Office Paper, July 2003, at *www.cbo.gov/ftpdocs/44xx/doc4454/07-28-PresidentsBudget.pdf* (May 16, 2006).

39. This analysis is based on a static comparison of the cost of equity under the extension plan and current law. The static analysis assumes that the extension plan has no effect on baseline levels of the economic and financial-market aggregates used to calculate the change in the value of the cost of capital and the S&P 500.

40. We use 10-year averages (1992–2002) for all publicly traded companies included in the Standard & Poor's *Compustat* database. We assume that 46 percent of all dividends paid out by corporations are subject to personal income taxes. See William G. Gale, "About Half of Dividend Payments Do Not Face Double Taxation," *Tax Notes*, November 11, 2002, p. 839.

41. An empirical literature links stock market reactions to capital gains tax policy. For a survey of empirical work on the impact of the 1997 Taxpayer Relief Act and the 1998 Internal Revenue Service Restructuring and Reform Act on equity values, see Douglas A. Shackelford, "Stock Market Reactions to Capital Gains Tax Changes: Empirical Evidence from the 1997 and 1998 Tax Acts," Presented at the National Bureau of Economic Research Fall 1999 Conference on Tax Policy and the Economy, September 1999.

estimates of the impact of capital gains and dividends tax cuts on the value of U.S. equities. In a frequently cited study by the American Council for Capital Formation, the Standard & Poor's chief economist, David Wyss, attributes about 7.5 percent of the increase in the S&P 500 between 1997 and 1999 to the 1997 Taxpayer Relief Act's (TRA 97) lower taxes on capital gains.[42] In a back-of-the-envelope calculation, James Poterba estimated that JGTRRA's 2003 dividend tax cuts could increase aggregate U.S. equity values by about 6 percent.[43]

We use much smaller estimates of the static effects on the value of the S&P 500 of permanently lowering dividend taxes. This is in part because there is some dispute in the literature regarding the magnitude of the impact of dividends tax cuts on equity values. For example, Alan Auerbach and Kevin Hassett find that a change in dividend taxes—particularly a permanent change—can have a significant effect on equity markets.[44] However, a Federal Reserve Board working paper using a similar methodology finds little evidence that cuts in capital taxation have boosted U.S. equity prices.[45]

Comparing the Extension Plan's Economic Effects to Treasury's Dynamic Analysis of the President's Tax Proposals. The OTA recently simulated the macroeconomic effects of permanently extending EGTRRA's lower marginal rates on ordinary income, JGTRRA's preferential rates on capital gains and dividend income, and EGTRRA's provisions raising after-tax income.[46] For the 2011 to 2016 period, our results are broadly similar to those obtained by the OTA for real GNP and personal consumption (see Table 4).

The OTA also estimates the impact on investment and capital accumulation of extending EGTRRA's and JGTRRA's expiring provisions. However, comparing our results to those of the OTA for both aggregates is somewhat problematic. This is because the OTA uses a large-scale intertemporal computable general equilibrium model.[47] In such models, the government is subject to an intertemporal budget constraint.

As a result, the government can initially—but not indefinitely—finance tax cuts or higher spending with new borrowing and deficits. In any given year, the sum of the government's expenditures on goods and services, transfer payments to individuals, net interest on the existing debt, and other spending can exceed total revenues from income and other taxes. However, in the long run, the government's overall deficit cannot grow faster than GDP (or GNP). Rather, the government's intertem-

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42. For example, see Margo Thorning, "Capital Gains Taxation and US Economic Growth," Testimony before the Standing Committee on Banking, Trade and Commerce of the Senate of Canada, December 16, 1999, at *www.accf.org/publications/testimonies/test-dec16-99.html*. Alternatively, Shackelford, et al. examine the effects of personal capital gains taxation on asset prices in the period surrounding the announcement of TRA 97's capital gains tax cuts. Their analysis incorporates both the demand-side capitalization effects and the supply-side lock-in effects of a change in the capital gains tax rate. Shackelford, et al. find evidence of initial price declines (a capitalization effect), followed by price increases after the official announcement of TRA 97's cuts in the tax rate on capital gains (a lock-in effect). Their results are still tentative but seem to suggest that the two effects approximately offset one another. See Shackelford, et al., "Capital Gains Taxes and Asset Prices: Capitalization or Lock-in?," February 16, 2006, at *www.public.kenan-flagler.unc.edu/taxsym/Dai-DMSZ.pdf* (June 26, 2006).

43. See James Poterba, "Taxation and Corporate Payout Policy," National Bureau of Economic Research *Working Paper* 10321, February 2004, at *www.nber.org/papers/W10321* (June 26, 2006). Poterba obtains this 6 percent estimate by using an S&P 500 price-earnings ratio to capitalize CBO projections of the annual flow of forgone dividend taxes.

44. See Alan J. Auerbach and Kevin A. Hassett, "The 2003 Dividend Tax Cuts and the Value of the Firm: An Event Study," June 2005, at *www.nber.org/papers/W11449* (June 26, 2006).

45. See Gene Amromin, Paul Harrison, Nellie Liang, and Steve Sharpe, "How Did the 2003 Dividend Tax Cut Affect Stock Prices and Corporate Payout Policy," Finance and Economics Discussion Series, Divisions of Research and Statistics and Monetary Affairs, Federal Reserve Board, Working Paper No. 57, September 2005, at *www.federalreserve.gov/pubs/feds/2005/200557pap.pdf* (June 26, 2006).

46. See U.S. Department of the Treasury, Office of Tax Analysis, "A Dynamic Analysis of Permanent Extension of the President's Tax Relief." The OTA includes an analysis of the long-run dynamic economic effects of the President's tax proposals.

47. For additional details, see John Diamond and George Zodrow, "Description of the Tax Policy Advisers' Model," Unpublished Working Paper, Rice University, March 15, 2005. The OTA uses a four-sector version of the Tax Policy Advisers' overlapping-generations computable general equilibrium model.

| Table 4 | CDA 06-10 |

Projected Effects of the President's Tax Proposals, 2011–2016

The Extension Plan (Percent Change)	
Real GDP	0.5
Real GNP	0.5
Full-Employment Capital Stock	0.2
Real Personal Consumption	1.2
Real Gross Private Domestic Investment	0.5

Treasury's Dynamic Analysis (Percent Change)		
	Financed by Cutting Future Government Consumption	Financed by Raising Future Income Taxes
Real GNP	0.5	0.8
Capital Stock	-0.3	0.6
Consumption	1.3	0.5
Investment	-3.0	1.8

Note: GDP = gross domestic product; GNP = gross national product. The economic effects of the extension plan are reported as a percent change from the Congressional Budget Office's January 2006 baseline economic and budgetary projections. The economic effects from Treasury's dynamic analysis of the President's tax proposals are reported as a percent change from an initial steady state.

Sources: The Heritage Foundation, Center for Data Analysis, and U.S. Department of the Treasury, Office of Tax Analysis, "A Dynamic Analysis of Permanent Extension of the President's Tax Relief," July 25, 2006, p. 20, Table 3, at *www.treasury.gov/press/releases/reports/treasurydynamicanalysisreporjjuly252006.pdf* (July 31, 2006).

How the government imposes its intertemporal budget constraint influences, among other factors, the timing of firms' investment decisions.[49] The simulated effects of the extension plan in this paper do not include intertemporal shifting in the timing of investment spending. This is because the Global Insight model is a large-scale macroeconometric model. It imposes the long-run structure of a neoclassical growth model but makes short-run demand dynamics a primary focus of analysis. With a forecast horizon that does not extend beyond 10 years, it does not require that the government's fiscal policy be sustainable in the long run and hence does not impose an intertemporal government budget constraint.
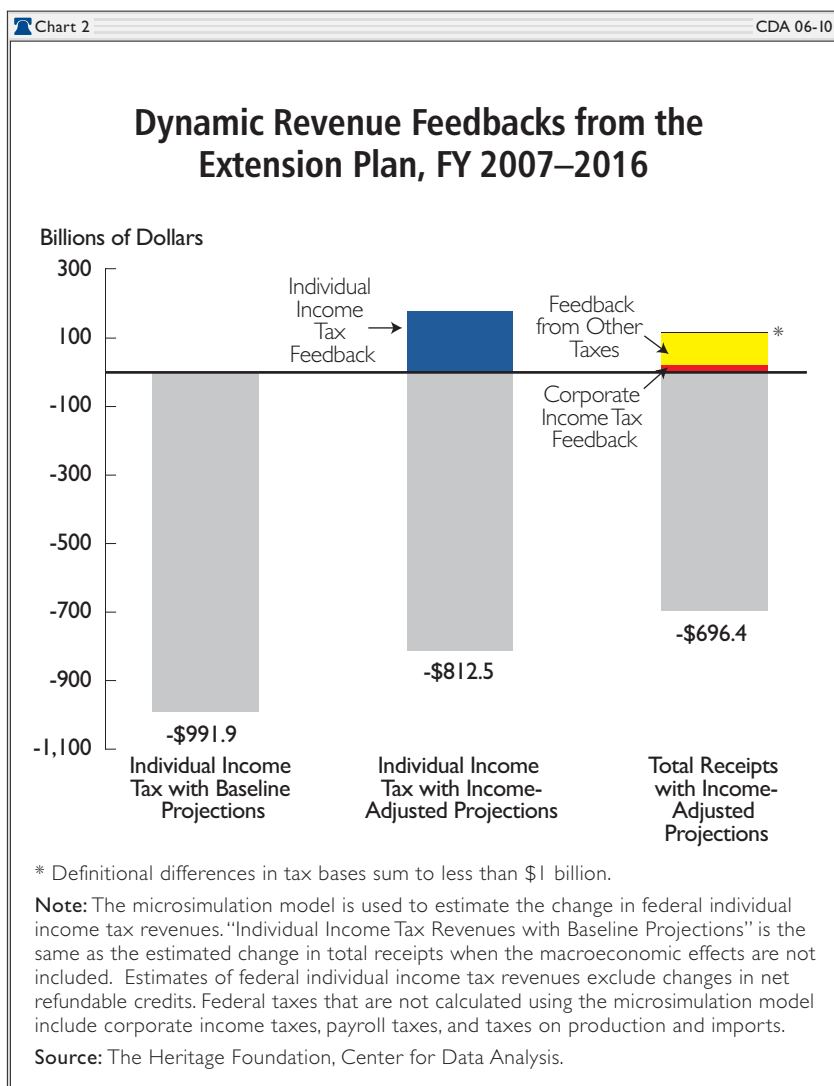
DYNAMIC BUDGET EFFECTS OF THE EXTENSION PLAN

The extension plan puts federal tax revenues $696.4 billion below CBO's baseline projections ("Total Receipts with Income-Adjusted Projections" in Chart 2). We estimate that the revenue loss to the Treasury would be much higher, $991.9 billion ("Individual Income Tax with Baseline Projections" in Chart 2), if not for the dynamic effects of the extensions on incomes and federal tax collections.[50] Over 10 years, the dynamic revenue feedbacks equal the difference between –$696.4 billion and –$991.9 billion. In 2009 and 2010, dynamic revenue feedbacks do not exceed about $9 billion. But they more than treble in size in each of the final 6 years, reaching $56 billion in 2016.

Such revenue feedbacks can be divided into three components: revenue feedbacks from the microsimulation model, revenue feedbacks from other federal taxes not calculated using the microsimulation model, and an adjustment attributable to differences in the individual income tax bases used

poral budget constraint requires that the government run a compensating budget surplus by raising taxes or cutting spending.

The OTA imposes the government's intertemporal budget constraint using "financing" rules. Between 2007 and 2016, the federal government finances the extension of EGTRRA's and JGTRRA's expiring provisions with deficits and new debt. However, beginning in 2017, it either cuts government consumption or proportionately increases tax rates on corporate, individual, and capital income to limit the growth rate of debt to the growth rate of GNP.[48] Tax relief is permanent if it cuts government consumption. Tax relief is only temporary if it proportionately increases income tax rates.

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48. This means that the model adjusts taxes or government consumption to hold the debt-to-GNP ratio constant at its 2017 value.

49. See Tracy L. Foertsch and Ralph A. Rector, "The Treasury Department's Dynamic Analysis of President Bush's Tax Relief Plan: A Summary and Evaluation," Center for Data Analysis, CDA06-06, August 16, 2006, at *www.heritage.org/Research/Taxes/cda06-06.cfm.*

50. In Chart 2, estimated changes in federal individual income tax revenues exclude net refundable credits.

Chart 2   CDA 06-10

Dynamic Revenue Feedbacks from the Extension Plan, FY 2007–2016

Billions of Dollars

Individual Income Tax Feedback

Feedback from Other Taxes

Corporate Income Tax Feedback

-$991.9
Individual Income Tax with Baseline Projections

-$812.5
Individual Income Tax with Income-Adjusted Projections

-$696.4
Total Receipts with Income-Adjusted Projections

*

* Definitional differences in tax bases sum to less than $1 billion.

Note: The microsimulation model is used to estimate the change in federal individual income tax revenues. "Individual Income Tax Revenues with Baseline Projections" is the same as the estimated change in total receipts when the macroeconomic effects are not included. Estimates of federal individual income tax revenues exclude changes in net refundable credits. Federal taxes that are not calculated using the microsimulation model include corporate income taxes, payroll taxes, and taxes on production and imports.

Source: The Heritage Foundation, Center for Data Analysis.

federal individual income tax revenues from the income-adjusted forecast with the baseline projections of federal tax revenues underlying the baseline forecast.

Revenue feedbacks from other federal taxes not calculated using the microsimulation model include corporate income taxes, payroll taxes, and taxes on production and imports. They are estimated using the Global Insight model. They exceed $116 billion over 10 years (the sum of "Corporate Income Tax Feedback" and "Feedback from Other Taxes" in Chart 2). Combining revenue feedbacks from the microsimulation model with revenue feedbacks from other federal taxes gives dynamic revenue feedbacks of $295.5 billion over 10 years.

That $295.5 billion in dynamic revenue feedbacks implicitly includes a small adjustment for differences in the federal income tax bases used in the Global Insight model and the microsimulation model. This adjustment sums to under $1 billion over 10 years. It is necessary because of measurement and definitional differences in the baseline levels of personal income in the Global Insight and individual income in the microsimulation models.

in the Global Insight model and the microsimulation model.

Revenue feedbacks from the microsimulation model total around $179.4 billion over 10 years ("Individual Income Tax Feedback" in Chart 2). They are obtained by subtracting the revenue effects from the income-adjusted and baseline forecasts.[51] Revenue effects from the two forecasts differ because the income-adjusted forecast updates incomes in the baseline forecast to reflect the extension plan's dynamic effects on incomes. The income-adjusted forecast implies a decline in federal individual income tax revenues totaling $812.5 billion over 10 years ("Individual Income Tax with Income-Adjusted Projections" in Chart 2). That $812.5 billion revenue loss is calculated by comparing estimated

CONCLUSION

We calibrate a macroeconomic model of the U.S. economy and a microsimulation model of the federal individual income tax to CBO's January 2006 baseline economic and budgetary projections. We then do a separate calibration of the two models to simulate the economic and budget effects of permanently extending some of EGTRRA's and JGTRRA's expiring provisions. In our simulations, the extension plan boosts economic activity. However, the AMT's expanding reach offsets some of the economic gains from the extension plan.

We plan to extend our calibration and simulation procedures in several directions. First, we plan

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51. Thus, this $179.4 billion is the difference between revenue effects from the income-adjusted forecast (−$812.5 billion) and the baseline forecast (−$991.9 billion).

to improve calibration of the Global Insight model to CBO's current-law projections of personal income. Second, we plan to increase the number and quality of the links between the microsimulation and macroeconomic models. Third, we plan to use the microsimulation model to improve estimates of behavioral effects. For example, we plan to use the microsimulation model to estimate the labor supply response to a change in average effective marginal tax rates and to use this as an alternative source for labor supply response in the macroeconomic model.

—Tracy L. Foertsch, Ph.D., is a Senior Policy Analyst and Ralph A. Rector, Ph.D., is a Senior Research Fellow and Project Manager in the Center for Data Analysis at The Heritage Foundation. This CDA Report is an expanded version of a methodological paper the authors prepared for the 2006 Federal Forecasters Conference, held in Washington, DC on September 28, 2006.