Congressional Budget Office

Background Paper

The Effect of Tax Changes on Labor Supply in CBO's Microsimulation Tax Model

April 2007

THE CONGRESS OF THE UNITED STATES

Pub. No. 2756

CBO

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April 2007

The Congress of the United States ■ Congressional Budget Office

Notes

Unless otherwise indicated, the years referred to in this paper are calendar years.

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

Preface

This Congressional Budget Office (CBO) background paper provides details about one of the models that CBO uses to examine how changes in tax policies can affect the supply of labor to the economy. The paper explains CBO's methodology and discusses the key assumptions that affect the model's results. It then applies the model to a possible change in tax policy—extending many of the expiring tax provisions enacted since 2001—and estimates the resulting effects on the labor supply. Because the paper focuses only on labor-supply effects, it does not represent a complete macroeconomic analysis of that policy change. In particular, if the change was financed through larger budget deficits or smaller budget surpluses, the macroeconomic impact would be less positive than an analysis of labor-supply effects by itself would indicate. In keeping with CBO's mandate to provide objective, impartial analysis, this paper makes no recommendations.

Edward Harris of CBO's Tax Analysis Division wrote the paper under the direction of David Weiner, Roberton Williams (formerly of CBO), and Thomas Woodward. Robert Dennis, Douglas Hamilton, Arlene Holen, Donald Marron, and Kevin Perese provided useful comments on the analysis.

Christian Howlett edited the paper, and Kate Kelly proofread it. Maureen Costantino prepared the report for publication, Lenny Skutnik produced the printed copies, Linda Schimmel coordinated the print distribution, and Simone Thomas prepared the electronic versions for CBO's Web site (www.cbo.gov).

Peter R. Orszag
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April 2007

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The Effect of Tax Changes on Labor Supply in CBO's Microsimulation Tax Model

Introduction

Changes in tax policy can influence the economy, and those economic effects in turn can affect the federal budget. Determining the macroeconomic impact of tax policies is a complex and uncertain process; thus, conventional estimates of the budgetary effect of tax policies generally assume no change in economic output (although they incorporate various changes in people's behavior in response to a policy change).[1] In some of its work, however, the Congressional Budget Office (CBO) considers the potential macroeconomic effects of tax and spending policies.[2] When doing so, CBO uses simulations from various economic models.[3] For three of the models (the "textbook" growth model, the Macroeconomic Advisers model, and the Global Insight model), CBO uses estimates that are based on its microsimulation tax model as inputs. This paper provides details about one important part of those estimates: the effects on the supply of labor.

CBO's microsimulation tax model simulates the tax code for a representative group of taxpayers in order to estimate the impact of tax policies on people's willingness to work. This paper illustrates the methodology and results of that model by applying it to a possible change in tax policy: extending the provisions of the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA) and the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA), coupled with permanently increasing the exemption amount for the alternative minimum tax (AMT). Because those various tax provisions have widely differing effects on labor supply, the paper also presents results separately for each of the major provisions.

Although this report provides extensive detail about one aspect of CBO's macroeconomic analysis, it does not represent a complete macroeconomic analysis of the policy change in question, for several reasons. First, it focuses only on the impact on labor supply, ignoring other macroeconomic effects of the policy change, such as effects on national savings. For example, if tax changes are financed through higher budget deficits or lower budget surpluses, national saving will be reduced, creating a drag on economic growth that is not accounted for in this analysis. Second, in considering labor-supply effects, the analysis excludes behavioral responses other than working more or fewer hours, such as shifting income from wages to benefits. Third, this paper ignores how the method of financing a tax change could affect labor supply and how taxes could influence wage rates and interest rates. Finally, CBO's full macroeconomic analyses rely on results from several different models, whereas this paper discusses only the microsimulation tax model (which provides inputs for those macroeconomic models).

For all of those reasons, the results in this paper should not be interpreted as an overall macroeconomic analysis of extending EGTRRA, JGTRRA, and the higher AMT exemption. Instead, the analysis focuses on the more limited issue of how those changes could alter the number of hours that people work. If the extension of those

1. The revenue effects of potential changes in tax law are estimated by the Congress's Joint Committee on Taxation.

2. CBO's baseline budget projections include the expected macroeconomic impact of current law (projecting, for example, that tax-law changes scheduled to occur in 2011 will affect the levels of work and saving in the economy). CBO also regularly updates its economic baseline to reflect any expected effects of new laws. In addition, for the past several years, CBO has analyzed the potential macroeconomic effects of the President's budgetary proposals as part of its annual analysis of those proposals. Finally, CBO has conducted macroeconomic analyses of various stylized tax and spending programs.

3. For information about those models, see Congressional Budget Office, *An Analysis of the President's Budgetary Proposals for Fiscal Year 2008* (March 2007), Appendix D, and *How CBO Analyzed the Macroeconomic Effects of the President's Budget* (July 2003).

Box 1.

Measures of Tax Rates

Statutory tax rates are the schedule of six tax rate brackets—currently 10, 15, 25, 28, 33 and 35 percent—found in the individual income tax law. For any taxpayer, the portion of taxable income that falls in a given bracket is taxed at the rate for that bracket, regardless of the taxpayer's total income level.

Someone's **marginal tax rate** is the percentage of an *additional* dollar of income that he or she pays in taxes, taking into account all aspects of tax law. For most taxpayers, the effective marginal rate is the same as the statutory marginal rate—the rate that applies to the last dollar of a person's taxable income. The two rates can differ in some cases, however, because of the phasing in or out of particular tax provisions. A related measure, the **after-tax wage rate,** is the amount of income from working another hour that a taxpayer gets to keep. It equals the pretax wage rate times 1 minus the marginal tax rate. Analyses of tax changes often focus on the marginal tax rate, whereas substitution elasticities (described on page 3) measure the percentage change in hours worked for each percentage change in the after-tax wage rate.

In contrast to the marginal tax rate, the **average tax rate** equals the *total* amount of tax that someone pays divided by his or her total income. Income elasticities are generally measured with respect to the percentage change in **after-tax income,** which equals pretax income multiplied by 1 minus the average tax rate.

tax provisions was financed through larger deficits or smaller surpluses, the overall macroeconomic consequences would be less positive than an analysis of labor-supply effects alone would suggest.

Ways in Which Taxes Affect the Supply of Labor

Changes in tax policy create two countervailing pressures on people's willingness to work. Tax cuts reduce average tax rates, which increases the after-tax income from a given amount of work and allows people to maintain the same standard of living while working fewer hours. By itself, that *income effect* implies that a tax cut would decrease the number of hours that people work. At the same time, however, tax cuts often reduce marginal tax rates, which raises after-tax compensation for an additional hour of work and thereby makes work more attractive relative to other uses of a person's time. That *substitution effect* by itself suggests that a tax cut would increase the number of hours worked. (For a description of average, marginal, and other kinds of tax rates, see Box 1.) Since the income and substitution effects work in opposite directions, economic theory alone generally cannot predict how a tax change will affect labor supply—the outcome depends on the relative size of the two effects. Different tax changes can have very different income and substitution effects; hence, they can lead to significantly differing changes in labor supply. Some tax cuts (such as increases in the individual income tax's personal exemptions) raise after-tax income but have little or no impact on marginal rates and thus are likely to reduce labor supply through the income effect. Tax changes that alter marginal rates without affecting after-tax income (for instance, reductions in statutory rates financed by eliminating personal exemptions) increase the hours that people work through the substitution effect. Still other tax changes (such as reductions in statutory rates) affect marginal rates and after-tax income and thus have both income and substitution effects.

This paper's analysis of how taxes affect labor supply is based on estimates, drawn from a review of academic literature, about how workers respond to changes in after-tax income and wage rates.[4] Economists generally measure that responsiveness as an "elasticity." CBO's calculations rely on three related elasticities. The *income elasticity* measures the percentage change in total hours of work that would result from a 1 percent increase in the amount

4. See Congressional Budget Office, *Labor Supply and Taxes* (January 1996), for a more detailed discussion.

of after-tax income, holding constant the after-tax wage rate (see Box 1). The *substitution elasticity* measures the percentage change in hours worked from a 1 percent increase in the wage rate, holding the amount of after-tax income constant. The *total wage elasticity* is the sum of the two elasticities; it measures the percentage change in total hours of work that would result from 1 percent increases in both after-tax income and the after-tax wage rate.

The Potential Tax-Policy Change That CBO Analyzed

The Congress and the President have enacted several major tax laws in recent years, many of whose provisions are scheduled to expire by 2011. EGTRRA lowered statutory rates, increased credits, and lessened the impact of the marriage penalty and the alternative minimum tax. JGTRRA accelerated some of the provisions in EGTRRA, reduced taxes on capital gains and qualified dividends, and temporarily raised exemption levels for the alternative minimum tax. The Working Families Tax Relief Act of 2004 also accelerated some provisions of EGTRRA and extended other provisions of EGTRRA and JGTRRA. The Tax Increase Prevention and Reconciliation Act of 2005 (TIPRA) extended the reduced rates on capital gains and dividends through 2010 and increased the AMT exemption for 2006.

This paper compares the labor supply in 2011 under two alternatives for tax law. The base case is current law, under which recently enacted tax provisions expire as scheduled between now and 2011. The alternative envisions extending the provisions of EGTRRA and JGTRRA (see Table 1). That alternative is similar to the individual income tax extensions proposed in the President's budget for 2008. However, the President's proposal does not include any change to the AMT after 2007, whereas CBO's hypothetical policy makes permanent the higher AMT exemption amount set by TIPRA for 2006 and indexes that amount for inflation in later years.[5]

The Joint Committee on Taxation (JCT) has estimated the budgetary effects of a similar set of proposals. According to JCT, permanently extending the provisions of EGTRRA and JGTRRA (except those dealing with estate and gift taxes) would cost $186 billion in fiscal year 2012 and a total of $1.4 trillion between 2008 and 2017.[6] Combining that change with permanent indexation of the AMT for inflation would add $93 billion to that cost in 2012 and $1.0 trillion over the 2008–2017 period, JCT estimates.[7] That estimate includes the costs of indexing both the AMT's tax brackets and exemption for inflation, whereas the policy change considered in this paper would index only the exemption.

How CBO Estimated Labor-Supply Effects Using Its Microsimulation Tax Model

To estimate the impact of that possible tax change on the supply of labor, CBO began with a representative sample of taxpayers and adjusted the sample to account for expected demographic and economic changes by 2011. It then calculated taxes for each member of the sample under the two alternatives for tax law, determined the differences in average and marginal tax rates, and applied various assumed labor-supply elasticities to those differences to estimate the labor-supply effects of the policy change. Finally, CBO calculated taxes at the new level of labor supply.

CBO's Tax Model

Data from a representative sample of income tax returns, constructed by the Internal Revenue Service, form the core of CBO's microsimulation tax model. This analysis relied on a sample of almost 200,000 tax returns filed in 2002 (the most recent year for which data were available when the analysis was performed). CBO augmented the tax return data in various ways, such as using information from the Census Bureau's Current Population Survey to create records for households that do not file tax returns

5. The President's budget also contains proposals to substantially alter the tax treatment of health insurance. Those proposals are not included in this analysis. For a discussion of them, see Congressional Budget Office, *An Analysis of the President's Budgetary Proposals for Fiscal Year 2008*, Appendix C.

6. The figure for 2012 is important because that fiscal year is the first that would contain the full-year cost of extending the tax provisions. See Joint Committee on Taxation, *Description of Revenue Provisions Contained in the President's Fiscal Year 2008 Budget Proposal,* JCS-2-07 (March 2007).

7. See Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2008 to 2017* (January 2007), Table 1-5.

Table 1.

Details of the Potential Tax-Policy Change That CBO Analyzed

Provision	Base Case: Current Law in 2011 (EGTRRA and JGTRRA expired)	Policy Change: EGTRRA, JGTRRA, and AMT Relief Extended Through 2011
	Statutory Tax Rates and Brackets	
10 Percent Tax Bracket	n.a.	Applies to single filers with income up to $7,000; joint filers, up to $14,000; and heads of household, up to $10,000. Those thresholds indexed for inflation from 2003
Higher Tax Brackets (Percent)	15.0 28.0 31.0 36.0 39.6	15.0 25.0 28.0 33.0 35.0
	Child Credit and Dependent Care Credit	
Child Credit	Credit of $500, with limited refundability	Credit of $1,000, refundable to a maximum of 15 percent of earned income above $10,000; threshold indexed for inflation after 2001
Dependent Care Credit	Maximum expenditure eligible for credit is $2,400 for one child, $4,800 for two or more; maximum credit is 20 percent to 30 percent of expenditures	Maximum expenditure eligible for credit is $3,000 for one child, $6,000 for two or more; maximum credit is 20 percent to 35 percent of expenditures
	Limits on Itemized Deductions and Personal Exemptions	
Limits on Itemized Deductions	Deductions are reduced by 3 percent of amount of income above a threshold (to a maximum reduction of 80 percent)	No reduction in deductions
Personal Exemption Phaseout	Value of personal exemptions is reduced by 2 percent for each $2,500 of adjusted gross income above a threshold	No phaseout of exemptions

Continued

and using data from other sources to estimate how wage income is split between spouses in married couples that file joint returns.

Because this analysis estimates the effect of a tax change that would occur in 2011, but the underlying data for CBO's model come from 2002, CBO "aged" the sample to represent the population in 2011. That process involved adjusting the weighting of the sample to account for expected changes in the composition of the population and in employment levels. CBO then increased the amounts of different types of income on each tax record to projected levels for 2011. Wages, interest, and dividends were adjusted to be consistent with CBO's macroeconomic projections; Social Security and unemployment insurance benefits, to match CBO's outlay projections for those programs; and capital gains and retirement income, to be consistent with results from other projection models. The resulting sample should be representative of U.S. households in 2011, contingent on the accuracy of the underlying demographic and economic projections.

The microsimulation tax model contains a detailed income tax "calculator" that CBO used to compute individual taxpayers' liabilities for federal and state income taxes and federal payroll taxes under the two alternatives

Table 1.

Continued

Provision	Base Case: Current Law in 2011 (EGTRRA and JGTRRA expired)	Policy Change: EGTRRA, JGTRRA, and AMT Relief Extended Through 2011
	Relief from the Alternative Minimum Tax	
Exemption for the Alternative Minimum Tax	$33,750 for single filers, $45,000 for joint filers	$42,500 for single filers, $62,550 for joint filers in 2006; indexed for inflation thereafter
	Relief from Marriage Penalties	
Standard Deduction for Joint Filers	Standard deduction for joint filers is 167 percent of that for single filers	Standard deduction for joint filers is 200 percent of that for single filers
15 Percent Tax Bracket for Joint Filers	Upper threshold of bracket for joint filers is 167 percent of that for single filers	Upper threshold of bracket for joint filers is 200 percent of that for single filers
Earned Income Tax Credit for Joint Filers	Income level at which credit starts to phase out is indexed for inflation; end of phaseout range depends on number of children	Starting and ending points of phaseout range are increased by $3,000 for joint filers
	Taxation of Capital Income	
Tax Rate on Capital Gains	10 percent for taxpayers in the 15 percent statutory tax bracket or below; 20 percent for other taxpayers	Zero for taxpayers in the 15 percent statutory tax bracket or below; 15 percent for other taxpayers
Tax Rate on Dividends	Same as ordinary statutory tax rates	Zero for taxpayers in the 15 percent statutory tax bracket or below; 15 percent for other taxpayers

Source: Congressional Budget Office.

Note: EGTRRA = Economic Growth and Tax Relief Reconciliation Act of 2001; JGTRRA = Jobs and Growth Tax Relief Reconciliation Act of 2003; AMT = alternative minimum tax; n.a. = not applicable.

for tax law.[8] To calculate marginal tax rates, CBO increased each worker's earnings by $1,000 and recomputed income and payroll taxes under each law.[9]

Then, to estimate the net change in labor income, CBO multiplied the percentage change in a worker's after-tax wage rate by an assumed substitution elasticity and multiplied the percentage change in after-tax income by an assumed income elasticity.[10]

Assumptions About Workers' Responses

On the basis of academic literature, CBO assumed that different types of workers respond differently to changes in after-tax income and wage rates.[11] Research shows that married women are the most sensitive to those rates, with

8. The state tax calculator that CBO used was created by Professor Jon Bakija of Williams College. For more details, see Jon Bakija, *Documentation for a Comprehensive Historical U.S. Federal and State Income Tax Calculator Program* (working paper, Williams College Department of Economics, April 21, 2006), available at www.williams.edu/Economics/papers/bakijaDocumentation_IncTaxCalc.pdf.

9. Ideally, the marginal rate would be customized to measure the relevant labor-force decision. The marginal rate associated with small changes in hours worked may differ from the rate associated with larger changes, such as deciding whether to work at all, so CBO's approach may misstate the rate that is relevant to taxpayers who are making more-basic labor-force decisions.

10. CBO used an arc elasticity formula, applying the elasticity to the midpoint between the beginning and ending after-tax rates.

11. For a summary of that literature, see Congressional Budget Office, *Labor Supply and Taxes* (January 1996).

Table 2.

CBO's Mid-Level Assumptions About Labor-Supply Elasticities, by Earnings Group

	Income Elasticity	Substitution Elasticity	Total Wage Elasticity
All Earners			
Person-weighted	-0.101	0.229	0.129
Earnings-weighted	-0.062	0.141	0.079
Primary Earners			
Person-weighted	-0.070	0.140	0.070
Earnings-weighted	-0.038	0.076	0.038
By earnings group[a]			
Lowest decile	-0.168	0.336	0.168
Second decile	-0.126	0.252	0.126
Third and fourth deciles	-0.084	0.168	0.084
Fifth and sixth deciles	-0.063	0.126	0.063
Top four deciles	-0.028	0.056	0.028
Secondary Earners	-0.250	0.650	0.400

Source: Congressional Budget Office.

Notes: Income elasticity measures the percentage change in total hours worked that would result from a 1 percent increase in after-tax income, holding the after-tax wage rate constant. Substitution elasticity measures the percentage change in hours worked from a 1 percent increase in the after-tax wage rate, holding after-tax income constant. The total wage elasticity is the sum of the two elasticities; it measures the percentage change in hours worked that would result from 1 percent increases in both after-tax income and the after-tax wage rate.

CBO assigned an elasticity to each worker in 2002, the base year of the data. Each worker's elasticity was held constant for the 2002–2011 projection period, so as CBO's model "aged" the data, adjusting for demographic changes and assumed changes in the wage distribution, the aggregate elasticity changed slightly.

a. A decile is a tenth of the distribution of workers ordered by annual earnings.

much of their response taking the form of choosing whether to participate in the labor force.[12] Less evidence exists on how unmarried women react to changes in their after-tax income and wage rates. Among men, research shows that lower-income workers are more sensitive to those changes than higher-income workers are.[13] Because CBO's sample of taxpayers does not contain consistent information about the sex of workers, CBO used mens' labor-supply elasticity for "primary earners"—either single taxpayers or higher-earning spouses in married couples. That method assumed that single female workers would have the same response as men. Similarly, CBO applied the labor-supply elasticity for married women to all "secondary earners"—the lower-earning spouses in married couples—thus assuming that male secondary earners would have the same response as married women.

In CBO's assumptions, the average worker has a total wage elasticity of 0.129, implying that 10 percent increases in both after-tax income and the after-tax wage rate would cause a 1.29 percent increase in hours worked. That total elasticity equals the sum of an income elasticity of -0.101 and a substitution elasticity of 0.229 (see Table 2). For the average primary earner, CBO assumed a total wage elasticity of 0.07, the sum of an income elasticity of -0.07 and a substitution elasticity of 0.14. That average masks significant variation by earnings group. For example, primary earners in the lowest decile of the earnings distribution were assumed to have a total wage elasticity of 0.168, compared with just 0.028 for primary earners in the top four deciles.[14] Secondary earners were assigned a total wage elasticity of 0.40, the sum of an income elasticity of -0.25 and a substitution elasticity of 0.65.[15]

12. CBO does not explicitly model the decision to participate in the labor force, instead incorporating that decision into the elasticity for hours worked and applying that (higher) elasticity to workers.

13. However, some studies of the effect of taxes on taxable income, which consider a much broader array of behavioral responses, have found the largest response among high-income taxpayers. For a discussion of that research, see Seth H. Giertz, *Recent Literature on Taxable-Income Elasticities*, CBO Technical Paper 2004-16 (December 2004).

14. CBO's assumptions about elasticities by earnings group are based on Chinhui Juhn, Kevin M. Murphy, and Robert H. Topel, "Current Unemployment, Historically Contemplated," *Brookings Papers on Economic Activity*, no. 1 (2002).

15. In some earlier analyses, CBO assumed a higher total wage elasticity (0.5) and substitution elasticity (0.75) for secondary earners. CBO has lowered those estimates on the basis of evidence that secondary earners have become less responsive over time as their participation in the labor force has grown. See Francine D. Blau and Lawrence M. Kahn, *Changes in the Labor Supply Behavior of Married Women: 1980-2000*, Working Paper No. 11230 (Cambridge, Mass.: National Bureau of Economic Research, March 2005).

Translating a change in hours worked into a change in total earnings requires weighting each worker's change in labor supply by his or her wage. That earnings-weighted elasticity—the elasticity that can be used to compute the change in total labor income rather than in hours worked—is smaller than the person-weighted elasticities cited above because CBO assumes that higher-earning workers are less sensitive than lower-income workers to changes in after-tax income and wage rates. The person-weighted total wage elasticity of 0.129, coupled with CBO's different elasticities by earnings group, produces an earnings-weighted total wage elasticity of 0.079. Those two elasticities imply that 10 percent growth in both after-tax income and the after-tax wage rate would lead to a 1.29 percent increase in hours worked and a 0.79 percent rise in economywide wage income.

Because this analysis measures the macroeconomic effects of the potential tax-policy change in dollar terms, the earnings-weighted elasticity is a more important factor than the person-weighted elasticity. The fact that high-income taxpayers make a large contribution to earnings-weighted elasticities is a potential source of uncertainty in the analysis, since few studies have directly considered those workers' responsiveness to changes in their wage rates.[16]

The assumptions about labor-supply elasticity drive the results of this analysis, but a great deal of uncertainty surrounds the proper measurement of that elasticity. Academic studies reach no consensus about the size of the elasticity, reporting a wide range of estimates. To evaluate how such uncertainty might affect the results of this analysis, CBO also made higher and lower assumptions about the average worker's total wage elasticity. The higher assumption raised the average earnings-weighted total wage elasticity by roughly 90 percent (from 0.079 to 0.150), while the lower assumption reduced it by 90 percent (from 0.079 to 0.009). That range covers what CBO believes to be the plausible span of labor-supply elasticity estimates based on its review of the academic literature.

16. Most studies rely on survey data, which generally contain too few high-income taxpayers to accurately represent that population. CBO assumed that all taxpayers in the top four earnings deciles would have the same response, but if labor-supply elasticity instead varied across the upper part of the earnings distribution, labor-supply effects could differ significantly from those presented here.

The Revenue Offset from Changes in Hours Worked

To help put the labor-supply effect in context, CBO calculated how much of the initial revenue loss from the potential tax change would be offset by changes in income and payroll tax revenues stemming from taxpayers' altering their work hours. That revenue offset differs in several important ways from the revenue offsets presented in other CBO analyses, including the recent analysis of the President's 2008 budget.

- As noted above, the tax change that is the focus of this analysis differs from the President's proposals by including a higher AMT exemption amount that is indexed for inflation.

- The revenue offset in this analysis reflects only the shifts in labor supply, not other macroeconomic effects of the policy change, such as effects on national savings. For example, to the extent that the tax change was financed through bigger deficits or smaller surpluses, the revenue offset would tend to be smaller (or more negative) than shown here because the lower level of national saving associated with larger deficits or smaller surpluses would restrain economic activity, reducing tax revenues by more than an estimate excluding such macroeconomic effects would indicate.

- Likewise, the analysis ignores how the means of financing the tax change would affect the supply of labor.

- The revenue offset in this analysis was calculated as a percentage of a completely static revenue loss (computed by simply applying the policy change to initial income levels), not as a percentage of a conventional revenue estimate.[17]

- This analysis computed the revenue offset separately for each worker, applying that worker's marginal tax rate to his or her change in labor supply. In contrast, CBO's analysis of the President's budget applied one aggregate tax rate to the economywide change in labor supply.

17. In contrast, the conventional revenue estimates of tax proposals calculated by JCT generally incorporate behavioral responses by taxpayers that can occur without altering the level of gross national product, such as changes in the form and timing of income and deductions, or changes in tax compliance.

Table 3.

Overall Effects on Labor Supply in 2011 from Extending EGTRRA, JGTRRA, and AMT Relief

	Impact in 2011
Total Effect	
Change in Earnings	
Percent	0.55
Billions of 2011 dollars	41.9
Revenue Offset (As a percentage of revenue loss)	
Income tax offset	-2.3
Payroll tax offset	-1.7
Total	-4.0
Income Effect	
Average Tax Rate (Percent)	
Under current law, with EGTRRA and JGTRRA expired	30.1
Under those laws' extension	27.0
Difference (Percentage points)	-3.1
Change in After-Tax Income (Percent)	4.5
Change in Earnings (Percent)	-0.25
Effective Income Elasticity (Percentage change in earnings per percentage rise in after-tax income)	-0.055
Substitution Effect	
Marginal Tax Rate (Percent)	
Under current law, with EGTRRA and JGTRRA expired	41.6
Under those laws' extension	38.4
Difference (Percentage points)	-3.2
Change in After-Tax Wage Rate (Percent)	5.5
Change in Earnings (Percent)	0.80
Effective Substitution Elasticity (Percentage change in earnings per percentage rise in after-tax wage rate)	0.144

Source: Congressional Budget Office.

Notes: This analysis compares current law, under which the provisions of EGTRRA and JGTRRA expire as scheduled by the end of 2010, with an alternative in which those provisions and increases in the exemption amount for the AMT are extended. The estimates use CBO's mid-level assumptions about labor-supply elasticities (shown in Table 2). Tax rates include federal and state individual income taxes and payroll taxes. Marginal tax rates are weighted by earnings; average tax rates are weighted by total income.

EGTRRA = Economic Growth and Tax Relief Reconciliation Act of 2001; JGTRRA = Jobs and Growth Tax Relief Reconciliation Act of 2003; AMT = alternative minimum tax.

The revenue offset also includes revenue effects from offsetting labor-supply changes that are not captured in a net measure of labor supply. Provisions of EGTRRA and JGTRRA that cause some people to work more and others to work less affect revenues beyond the impact on net labor supply to the extent that those workers face different tax rates.

Limitations of the Analysis

As noted above, this analysis is focused on a limited issue: the impact of a potential tax-policy change on hours worked. It does not represent a full macroeconomic analysis, which would need to reflect several other key factors, such as the method of financing the change. Furthermore, people respond to tax changes in ways other than working more or fewer hours. Some workers might shift income between taxable and nontaxable forms, and some might simply change how much income they report to the Internal Revenue Service—effects that are included in conventional revenue estimates. Other people might choose to work harder or to pursue further education, although little empirical evidence exists about the size of those effects.

This analysis compares steady-state levels of labor supply under two different tax regimes without considering how the economy would move from one to the other or how long that transition would take.[18] In reality, people would not shift instantly to their newly desired number of work hours after a tax change. However, there is little evidence about how long such a transition would last. In part, the length of the transition would depend on whether workers anticipated the tax change.

The Overall Labor-Supply Effects of Extending EGTRRA, JGTRRA, and AMT Relief

Looking only at the impact on hours worked, CBO estimates that extending the provisions of EGTRRA and JGTRRA and increasing the AMT exemption would raise total earnings in 2011 by 0.55 percent—or about $42 billion—under the mid-level assumptions about labor-supply elasticities (see Table 3). The substitution effect from lower marginal tax rates would boost earnings by 0.80 percent, while the income effect from higher

18. CBO's analysis of the President's budget made explicit assumptions about how long such a transition would take.

after-tax income would reduce earnings by 0.25 percent. The substitution effect outweighs the income effect because the change in the after-tax wage rate would exceed the change in average after-tax income and because CBO assumes that the substitution elasticity is more than twice as large as the income elasticity.

The additional earnings from extending those tax provisions would in turn increase income and payroll tax revenues, offsetting a modest share of the static effect of the policy change. At the same time, the extension would shift earnings, causing some people to increase the hours they worked while others reduced their hours. CBO estimates that the change in tax revenues from the shift in labor supply would offset roughly 4 percent of the static revenue loss. Of that 4 percent, about 2.3 percentage points would come from higher income tax revenues and 1.7 percentage points from increased payroll tax revenues.[19] (State income tax revenues would also rise, but CBO did not calculate that effect because its models and sample are not designed to estimate tax changes at the state level.)

Extending the tax provisions would lower the earnings-weighted marginal tax rate by 3.2 percentage points and raise the after-tax return from additional work (the after-tax wage rate) by 5.5 percent. For each 1 percent increase in the after-tax wage rate, earnings would rise by 0.144 percent. That effective elasticity is just above CBO's assumed earnings-weighted substitution elasticity of 0.141 because extending the tax provisions would boost after-tax wage rates to a greater extent for more-responsive taxpayers than for less-responsive taxpayers, on average. (If the provisions increased after-tax wage rates by an equal percentage for all groups, the effective elasticity would equal the earnings-weighted elasticity.)

At the same time, the tax change would decrease the average tax rate by 3.1 percentage points, thus raising after-tax income by 4.5 percent. That increase in after-tax income would induce taxpayers to reduce their earnings by 0.25 percent—or 0.055 percent for each 1 percent change in after-tax income. That effective income elasticity is smaller than CBO's assumed earnings-weighted income elasticity of 0.062 because extending the tax provisions would boost after-tax income for less-responsive taxpayers (such as primary earners) to a lesser extent than it would for more-responsive taxpayers (such as secondary earners).

Because measurements of labor-supply elasticity are uncertain, CBO recalculated those results using alternative assumptions, with the earnings-weighted total wage elasticity roughly 90 percent higher or lower (0.150 or 0.009 rather than 0.079). The higher elasticity assumption raised the estimated total effect on earnings by about 60 percent, from a 0.55 percent increase to a 0.90 percent increase. The lower elasticity assumption reduced that effect by about 70 percent, to a 0.15 percent increase.

Under both the higher and lower elasticity assumptions, the change in the income effect is roughly proportional to the assumed change in income elasticity, and the change in the substitution effect is roughly proportional to the assumed change in substitution elasticity. The net change in labor supply, however, is not proportional to the change in total wage elasticity, because the relative importance of the income and substitution effects for the total wage effect differs from the relative importance of the income and substitution elasticities for the total wage elasticity.

The Labor-Supply Effects of Extending EGTRRA, JGTRRA, and AMT Relief, by Provision

Taken individually, the various tax provisions that CBO examined have differing effects on labor supply, for many reasons. At the most basic level, the size of a tax change influences its impact: Bigger changes can cause larger shifts in labor supply. In addition, the structure of a tax change plays a critical role in determining its labor-supply effect. Although the cost of a provision corresponds directly to the income effect on the average tax rate, provisions with comparable costs can have very different impacts on marginal tax rates and thus widely varying substitution effects. Finally, the distribution of a tax change among taxpayers influences its labor-supply effect. Policies that target secondary earners, whom CBO believes are the most responsive to tax changes, will cause greater changes in labor supply than will policies that affect higher-wage primary earners, whom CBO considers the least responsive.

The revenue offset (the change in tax revenues caused by the change in total earnings) also varies among the tax

19. As noted above, those revenue-offset figures would be different under a full macroeconomic analysis of the tax-policy change.

Table 4.

Effects on Labor Supply in 2011 from Extending EGTRRA, JGTRRA, and AMT Relief, by Provision

	All Provisions	Statutory Tax Rates and Brackets	Child Credit	Limits on Itemized Deductions and Personal Exemptions	Relief from the Alternative Minimum Tax	Relief from Marriage Penalties	Tax Rates on Capital Income
				Labor Supply Effects			
Percentage Change in Earnings	0.55	0.60	-0.06	0.11	-0.01	0.16	-0.01
Income effect	-0.25	-0.15	-0.03	-0.02	-0.04	-0.04	-0.01
Substitution effect	0.80	0.75	-0.03	0.13	0.03	0.21	*
Change in Earnings per Dollar of Static Revenue Cost	0.14	0.26	-0.17	0.33	-0.02	0.32	-0.01
Income effect	-0.06	-0.06	-0.09	-0.05	-0.08	-0.08	-0.02
Substitution effect	0.20	0.32	-0.09	0.38	0.06	0.40	0.01
Revenue Offset (As a percentage of revenue loss)	-4.0	-9.0	10.3	-13.1	6.0	-8.5	0.6
				Factors Affecting the Income Effect			
Change in Average Tax Rate (Percentage points)	-3.14	-1.81	-0.27	-0.26	-0.36	-0.40	-0.45
Percentage Change in After-Tax Income	4.50	2.58	0.39	0.36	0.52	0.57	0.64
High elasticity (Secondary earners)	4.83	2.81	0.37	0.42	0.73	0.91	0.47
Middle elasticity (Primary earners in first through sixth deciles)	3.16	1.56	0.75	0.05	0.11	0.38	0.41
Low elasticity (Primary earners in top four deciles)	4.59	2.78	0.27	0.46	0.65	0.60	0.50
Effective Income Elasticity (Percentage change in earnings per percentage rise in after-tax income)	-0.055	-0.058	-0.079	-0.047	-0.071	-0.076	-0.015
Distribution of Tax Cut (Percent)[a]	100.00	100.00	100.00	100.00	100.00	100.00	100.00
High elasticity (Secondary earners)	10.68	11.00	10.43	8.41	15.82	18.22	5.36
Middle elasticity (Primary earners in first through sixth deciles)	16.13	13.94	44.68	2.94	4.40	14.24	14.95
Low elasticity (Primary earners in top four deciles)	65.06	68.70	44.25	84.84	76.17	60.60	52.86
Nonearners	8.14	6.36	0.65	3.81	3.61	6.94	26.83

Continued

provisions, over and above the effects caused by the net change in labor supply. In part, that variation occurs because the amount of tax paid on additional earnings depends on how the tax change is distributed among taxpayers who face different marginal tax rates. Offsetting labor-supply effects can also cause the revenue offset to vary among the provisions. Provisions that cause some taxpayers to work more and others to work less can alter revenues but have little impact on net labor supply if those taxpayers face different tax rates.

Table 4.

Continued

	All Provisions	Statutory Tax Rates and Brackets	Child Credit	Limits on Itemized Deductions and Personal Exemptions	Relief from the Alternative Minimum Tax	Relief from Marriage Penalties	Tax Rates on Capital Income
				Factors Affecting the Substitution Effect			
Change in Marginal Tax Rate (Percentage points)	-3.23	-2.86	0.07	-0.49	-0.13	-0.60	-0.03
Change in Marginal Tax Rate per $100 Billion of Tax Cut	-1.05	-1.62	0.25	-1.97	-0.37	-1.53	-0.06
Percentage Change in After-Tax Wage Rate	5.54	4.89	-0.11	0.84	0.22	1.03	0.04
Taxpayers with lower marginal rates	9.48	7.76	15.12	3.62	10.93	16.04	1.78
Taxpayers with higher marginal rates	-6.59	-2.05	-10.47	-3.76	-6.61	-4.85	-0.75
Distribution of Tax Cut by Type of Change in Marginal Rate (Percent)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Taxpayers with lower marginal rates	67.73	77.96	14.78	91.10	39.82	15.33	25.80
Taxpayers with no change or nonearners	22.98	18.52	68.45	8.43	15.42	80.16	62.58
Taxpayers with higher marginal rates	9.29	3.52	16.76	0.47	44.76	4.51	11.62
Effective Substitution Elasticity (Percentage change in earnings per percentage rise in after-tax wage rate)	0.144	0.153	0.268	0.149	0.116	0.202	0.106
Taxpayers with lower marginal rates	0.140	0.145	0.156	0.139	0.155	0.186	0.121
Taxpayers with higher marginal rates	0.170	0.182	0.178	0.159	0.172	0.179	0.153

Source: Congressional Budget Office.

Notes: This analysis compares current law, under which the provisions of EGTRRA and JGTRRA expire as scheduled by the end of 2010, with an alternative in which those provisions and increases in the exemption amount for the AMT are extended. The analysis always extends the higher AMT exemption first. For other provisions, the analysis shows the effects if that provision was extended alone, after the AMT exemption.

The estimates use CBO's mid-level assumptions about labor-supply elasticities (shown in Table 2). Tax rates include federal and state individual income taxes and payroll taxes. Marginal tax rates are weighted by earnings; average tax rates are weighted by total income.

EGTRRA = Economic Growth and Tax Relief Reconciliation Act of 2001; JGTRRA = Jobs and Growth Tax Relief Reconciliation Act of 2003; AMT = alternative minimum tax; * = between zero and 0.01.

a. For couples filing joint returns, the tax change is split between spouses in proportion to their earnings.

Extending EGTRRA's reductions in statutory tax rates—the largest part of the law—would have the biggest impact on total earnings, raising them by 0.60 percent in 2011 (see the top of Table 4). Extending the law's marriage-penalty relief would increase earnings in that year by 0.16 percent, and eliminating the phaseouts of itemized deductions and personal exemptions would boost earnings by 0.11 percent. In contrast, continuing the higher child tax credit would cause labor income to shrink by a small amount, 0.06 percent. Extending the

lower rates on capital income or the increased AMT exemption would have almost no effect on labor supply.[20]

Scaling each provision's effect on earnings to its cost alters those rankings. Repealing the phaseouts of exemptions and deductions would have the largest effect relative to its cost, boosting earnings by 33 cents for each dollar of tax cut. Marriage-penalty relief would be a close second with a 32-cent increase. The reductions in statutory tax rates would have smaller effects per dollar of tax change, inducing 26 cents of additional labor income per dollar of tax cut. The AMT exemption and lower rates on capital income would have small negative effects, shrinking earnings by 2 cents and 1 cent per dollar of tax reduction, whereas the child tax credit provision would cause labor income to fall by 17 cents for every additional dollar of the credit.

Revenue offsets follow approximately the same pattern as changes in labor income (when the analysis is limited solely to the feedback from labor supply, as opposed to other macroeconomic forces, including national savings). Repealing the phaseouts would have the greatest effect, producing enough revenue to offset 13.1 percent of the static cost of repeal. Additional revenue from extending marriage-penalty relief and the statutory tax rate provisions would offset 8.5 percent to 9.0 percent of their costs. The revenue offset for capital income taxes would be close to zero, while the change in labor supply caused by the larger child credit and the higher AMT exemption would add 10.3 percent and 6.0 percent, respectively, to those provisions' costs.

Statutory Tax Rates and Brackets

EGTRRA reduced all statutory tax rates above the 15 percent bracket and created a new bottom bracket, lowering the tax rate on some income from 15 percent to 10 percent. Any taxpayer facing the regular rate schedule would see his or her average tax rate fall if those provisions of EGTRRA were extended. (Tax liability would be unchanged for families who faced the AMT in either case, who had no taxable income, or whose taxes were completely offset by nonrefundable tax credits.) Extending those rate provisions would also lower the marginal tax rate for most taxpayers. Everyone in a tax bracket above 15 percent and people in the new 10 percent bracket would generally experience reductions in their marginal rates. Marginal rates would be unchanged for taxpayers in the 15 percent bracket, those subject to the AMT, and people without positive income tax liability. Marginal rates would rise for some taxpayers, however, as the new tax rates lowered their ordinary income tax liability and thus pushed them onto the AMT, where they would generally face higher marginal rates.

Extending EGTRRA's tax rate reductions would boost earnings in 2011 by 26 cents per dollar of tax cut—one of the larger effects among the individual provisions. That figure reflects a substitution effect of 32 cents per dollar of tax cut and an income effect of -6 cents. Additional tax revenues generated by the increase in earnings would offset 9 percent of the static cost of extending the tax rate provisions.

The average taxpayer's after-tax income would rise by 2.6 percent in 2011 if those rate provisions were extended, leading to an income effect that would shrink earnings by 0.15 percent (or 6 cents per dollar of tax cut). For each 1 percent increase in after-tax income, earnings would drop by 0.058 percent—an effective income elasticity just below CBO's earnings-weighted income elasticity of 0.062. EGTRRA's tax rate provisions would generally raise after-tax income more for people in higher brackets, which disproportionately include families with two earners or a high-earning primary worker. By giving the largest income increases to the most and least elastic taxpayers (secondary earners and high-earning primary earners)—effects that would tend to offset each other—the extended rates would have an impact on labor supply that was comparable to that of an across-the-board increase in after-tax income.

Because they directly affect marginal rates, EGTRRA's rate reductions would produce one of the largest substitution effects of the provisions considered in this analysis (32 cents of additional earnings per dollar of tax cut).

20. Because some of the tax provisions interact, the effect attributed to each provision depends on the order in which they are implemented. CBO's analysis extends the larger AMT exemption first and assumes that other provisions are extended individually thereafter. That approach minimizes the impact of the AMT on the measured effects of the other provisions. Interactions among provisions other than the AMT exemption are captured only in the results for extending the tax provisions as a whole. Those overall results are smaller than the sum of the results for the individual provisions because of such interactions, especially between the statutory tax rates and both marriage-penalty relief and the elimination of phaseouts for itemized deductions and personal exemptions.

The reductions would decrease marginal rates for most taxpayers, with almost 80 percent of the total tax cut going to people who would see their marginal rates fall and less than 4 percent going to taxpayers who would see their rates rise. Those changes to statutory tax rates would therefore lead marginal rates to fall by more than any of EGTRRA's other provisions and would cause one of the largest drops per dollar of tax cut. For each 1 percent rise in their after-tax wage rate, workers would increase their earnings by 0.153 percent—an effective substitution elasticity slightly higher than CBO's earnings-weighted substitution elasticity of 0.141.

Child Tax Credit

EGTRRA doubled the child credit to $1,000 per child and made it refundable, so taxpayers who owe no taxes can claim the credit if their earnings exceed a threshold. If those changes were extended, virtually every family who claimed the credit, as well as some who would be newly eligible, would see their average tax rate fall.

For most taxpayers, extending the larger credit would reduce their tax liability without altering their tax bracket or marginal rate. Some lower-income taxpayers would see their marginal rate decline, however—either because they would receive a refundable credit at a rate of 15 percent on additional earnings, or because the larger credit would eliminate their income tax liability altogether, reducing their marginal rate to zero. At the same time, the larger credit would increase marginal rates for some high-income taxpayers by phasing out over a wider income range. If the child credit provisions were extended, people with income in that range (who would have received no credit without EGTRRA) would face the credit phaseout rate of 5 percent in addition to their statutory marginal tax rate.

Extending the child credit would reduce total earnings by 0.06 percent in 2011, or by 17 cents per dollar of tax cut. That figure partly reflects the largest income effect of any EGTRRA provision relative to its size: a decline in labor income of almost 9 cents for each dollar of tax reduction. In addition, because the larger child credit is the only provision that, on balance, increases marginal rates, extending it would produce a substitution effect that would reduce earnings by another 9 cents per dollar of tax cut. The impact on tax revenues from that decline in labor income would raise the static cost of extending the child credit by 10.3 percent.

The child credit has the largest estimated income effect because it is more targeted than other provisions are toward highly responsive families. The credit phases out for single filers with income above $75,000 and joint filers with income above $110,000, meaning that higher-income taxpayers are ineligible for it. Also, because taxpaying families with children are likely to have at least one earner, the expanded child credit is the EGTRRA provision most targeted toward earners (nonearners would receive less than 1 percent of the tax cut from extending it). Finally, families with children have a high proportion of secondary earners. Because of that distribution, extending EGTRRA's changes to the credit would cause workers to reduce their earnings by 0.079 percent for each 1 percent increase in after-tax income—the largest effective income elasticity of any provision in this analysis.

In addition, extending the larger child credit would, on balance, raise the overall earnings-weighted marginal tax rate, leading to a substitution effect that would further reduce labor income. That effect (-9 cents per dollar of tax cut) is among the smaller substitution effects, because extending the higher credit would have no impact on marginal rates for most taxpayers. About 68 percent of the tax reduction would go to taxpayers who would see no change in their marginal rates; the rest would be split roughly equally between taxpayers whose rates would rise and those whose rates would fall. In general, the rate cuts would exceed the rate increases, but the taxpayers facing rate increases earn much more than those facing rate decreases, producing a net rise in the earnings-weighted tax rate. The response to the rate increases would further exceed the response to the rate decreases because a higher proportion of secondary earners are affected by the credit's phaseout than by its refundability.

The estimated revenue offset from extending the child credit provisions—in this case not an offset but an additional revenue loss of more than 10 percent—is larger than for most other provisions in this analysis, even though the child credit has a relatively small effect on labor supply. The various effects on marginal rates from extending the larger credit would cause a shift in earnings from high-income, high-tax families to low-income, low-tax families. That shift would reduce tax revenues while having offsetting effects on labor income.

Limits on Itemized Deductions and Personal Exemptions

Before EGTRRA was enacted, tax law reduced the total itemized deductions that taxpayers could claim by 3 percent of the amount of their income above a threshold (up to a maximum reduction of 80 percent). Similarly, the size of the personal exemption was reduced by 2 percent for each $2,500 of income above another threshold (to the point at which the exemption was eliminated).

Certain provisions of EGTRRA temporarily eliminate the phasing out of itemized deductions and personal exemptions. Extending those provisions would cut average tax rates for any taxpayer affected by the phaseouts (in 2011, people with income of at least $170,000, depending on their filing status). In addition, because the phaseouts raise marginal tax rates in the income ranges to which they apply, eliminating them would lower marginal rates for most taxpayers in those ranges. Only taxpayers who had reached the end of the phaseout ranges—losing all of their exemptions or 80 percent of their itemized deductions—would experience no change in their marginal rates, although they would still see their average tax rates fall.

Eliminating the phaseouts would increase earnings in 2011 by 0.11 percent, or 33 cents per dollar of tax cut. The latter effect—the largest among EGTRRA's provisions—results from a combination of one of the smallest income effects (-5 cents per dollar of tax cut) and one of the largest substitution effects (38 cents per dollar of tax cut). Moreover, because of the sizable impact on earnings and the fact that the additional earnings would accrue to high-income workers, who face high marginal tax rates, eliminating the phaseouts would have the biggest revenue offset of any provision, reducing the static cost of the tax change by 13.1 percent.

The income effect from not limiting itemized deductions and personal exemptions would be small because the policy would mostly have an impact on high-income taxpayers, who are less responsive to tax changes. Although many two-earner couples would be affected, the concentration of the benefits among high-earning primary workers would drive down the effective income elasticity to below-average levels.

Eliminating the phaseouts would have a large substitution effect, however, despite the skewed distribution toward low-elasticity workers. The reason is that more than 90 percent of the tax cut would go to taxpayers who would see their marginal rates fall and who thus would have a substitution effect. Because of that targeting, eliminating the phaseouts would be the most cost-effective way to lower effective marginal tax rates, reducing them by about 2 percentage points per $100 billion of static tax change. That effect would more than compensate for the low elasticity caused by the distribution of the tax change, creating a large substitution effect.

AMT Exemption

In the potential tax-policy change that CBO examined, the larger exemption amount for the alternative minimum tax that was set by TIPRA would be made permanent and indexed for inflation after 2006. That action would benefit all taxpayers subject to the AMT who had not reached the end of the phaseout range for the exemption. It would also lower taxes for some taxpayers by pushing their AMT liability below their ordinary income tax liability, causing them to move from the AMT back to the regular income tax. Those taxpayers would generally see their marginal rates fall, because effective marginal rates are usually higher under the AMT than under the ordinary income tax schedule. At the same time, the larger exemption would phase out over a wider range of income, so taxpayers with income in the new part of that range would see their marginal rates rise.

Extending the larger AMT exemption would cause labor income to decline in 2011 by 2 cents for every dollar of the tax change. That effect would occur because the substitution effect would be too small to offset the income effect. The main reason for the small substitution effect is that the AMT exemption has a very small net impact on marginal tax rates (larger only than the child credit and the reduced tax rates on capital income.) Extending the larger AMT exemption would be almost as likely to increase marginal rates as to decrease them, with 45 percent of the tax cut going to taxpayers whose rates would rise and 40 percent going to taxpayers whose rates would fall.[21] Those effects largely offset each other, yielding a small net decrease in marginal tax rates and thus a small substitution effect from that change.

21. Because the size of those two effects depends critically on the nominal distribution of income, the substitution effect from extending the larger AMT exemption could vary substantially depending on the year being projected.

The change in tax revenue from the larger AMT exemption exceeds the change in earnings. Although extending that provision would have a small net impact on earnings, it would prompt larger shifts of labor income from high-tax to low-tax workers. Those who experienced declines in their marginal rates (taxpayers no longer subject to the AMT) would pay tax at a lower rate than those who experienced increases in marginal rates (taxpayers with income in the new, longer phaseout range for the AMT exemption). Consequently, tax revenues would decline even though the net effect on labor supply would be small.

Relief from Marriage Penalties

EGTRRA made several changes to reduce taxes for married couples who file joint returns. It increased the standard deduction for those couples to double the deduction for single taxpayers. Extending that change would decrease average tax rates for all couples claiming the standard deduction and would decrease marginal tax rates for some of those couples (by reducing their taxable income and dropping them into a lower tax bracket). EGTRRA also expanded the 15 percent bracket for joint filers to twice the size of the one for single filers. Continuing that provision would reduce both average and marginal rates for taxpayers whose income put them in the range for the larger 15 percent bracket; it would also reduce average, but not marginal, rates for married taxpayers in higher brackets. Finally, EGTRRA increased the income level at which the earned income tax credit (EITC) begins to phase out for joint filers. Extending that change would lower average tax rates for any EITC claimant with income above that level, as well as for some taxpayers who would become eligible for the EITC. It would also move some families out of the credit's phaseout range, cutting their marginal tax rates, while putting others into that range, raising their marginal rates.

Together, those marriage-penalty provisions would have one of the largest effects on labor income relative to their cost, raising earnings in 2011 by 32 cents per dollar of tax change. (Only the limits on itemized deductions and personal exemptions would have a greater impact on earnings relative to their cost.) That outcome results from an above-average income effect combined with the biggest substitution effect among the provisions in this analysis.

The above-average income effect is driven by the structure of the tax change: Because it applies only to married couples, it is targeted toward highly responsive secondary earners. In addition, two-earner married couples would receive larger boosts to their after-tax income, on average, than one-earner couples would. That distribution produces an effective income elasticity of -0.076 for those provisions—greater than the overall earnings-weighted income elasticity of -0.062 and exceeded only by the effective income elasticity of the child tax credit.

The substitution effect from extending EGTRRA's marriage-penalty provisions would add 40 cents to earnings for each dollar in tax reduction. That high degree of responsiveness occurs even though 80 percent of the tax cut would go to taxpayers who would experience no change in their marginal rates. Families whose rates did decline, however, would see large changes—typically, a drop from the 28 percent tax bracket to the expanded 15 percent bracket, increasing their after-tax wage rate by 16 percent. Consequently, the marriage-penalty provisions would reduce marginal tax rates by almost the same amount per dollar of static cost as EGTRRA's statutory rate reductions would. Because the cuts in marginal tax rates would be so targeted toward highly responsive secondary earners, the marriage-penalty provisions would have an effective substitution elasticity of 0.202—well above the economywide earnings-weighted substitution elasticity of 0.141. Those factors combine to produce the largest substitution effect (relative to cost) of any EGTRRA provision.

Extending the provisions for marriage-penalty relief would also produce the third-largest revenue offset, reducing the cost of the change by 8.5 percent. Although those provisions would have the largest impact on labor income per dollar of tax cut, the rate at which the additional income would be taxed would be lower than for many of the other provisions. Most taxpayers who would face a lower marginal tax rate would be in the 15 percent bracket, so the earnings generated by the change would be taxed at below-average rates. In contrast, taxpayers across the income distribution would see lower average tax rates from that change. Thus, the tax rate on the lost income from the income effect would exceed the tax rate on the additional income from the substitution effect, further reducing the total tax revenues from the higher earnings.

Tax Rates on Capital Income

In addition to accelerating some of EGTRRA's provisions, JGTRRA lowered tax rates on capital gains and qualified dividends. The primary macroeconomic effect

of those reduced rates comes from their impact on investment and savings behavior, which is beyond the scope of this analysis. The lower rates on capital income do have some direct effects on the supply of labor, however. They alter labor income by reducing average tax rates for most taxpayers with dividends or capital gains. Because the lower rates do not apply to labor income, most taxpayers would see no change in their marginal tax rates on earnings if those provisions were extended. In some cases, though, the lower rates on capital income could interact with other tax provisions, reducing marginal tax rates on earnings for some taxpayers and raising them for others.

Extending the capital-income provisions would provoke a smaller labor-supply response than any other provision in this analysis, both in absolute terms and relative to the cost of the provisions. Both the income and substitution effects would be small, changing earnings in 2011 by less than 2 cents per dollar of tax reduction. The estimated income effect is driven by the distribution of the tax change. Taxpayers with no earnings (who cannot decrease the amount they work) would receive 27 percent of the tax cut, a far greater proportion than from any other provision. Moreover, among earners, a smaller share of the tax cut would go to secondary workers than from any other provision. In terms of the substitution effect, the lower rates on capital gains and dividends alter the marginal taxation of labor income very little, so continuing those rates would reduce the marginal tax rate on earnings by just 0.03 percent—the smallest change of any provision, in absolute or relative terms. That modest impact, coupled with a low substitution elasticity caused by the distribution of the tax cut, would produce the smallest substitution effect of any provision that CBO analyzed.

The Labor-Supply Effects of Extending EGTRRA, JGTRRA, and AMT Relief, by Earnings Group

Extending the various tax provisions discussed above would have differing effects on labor supply among households at different income levels. Those effects would also vary according to the makeup of the household. CBO's elasticity assumptions incorporate the finding that secondary earners are more responsive than primary earners to changes in after-tax wage rates and that, among primary earners, responsiveness varies with earnings. Together, those effects cause the labor-supply implications of the potential change in tax policy to vary across the earnings distribution.

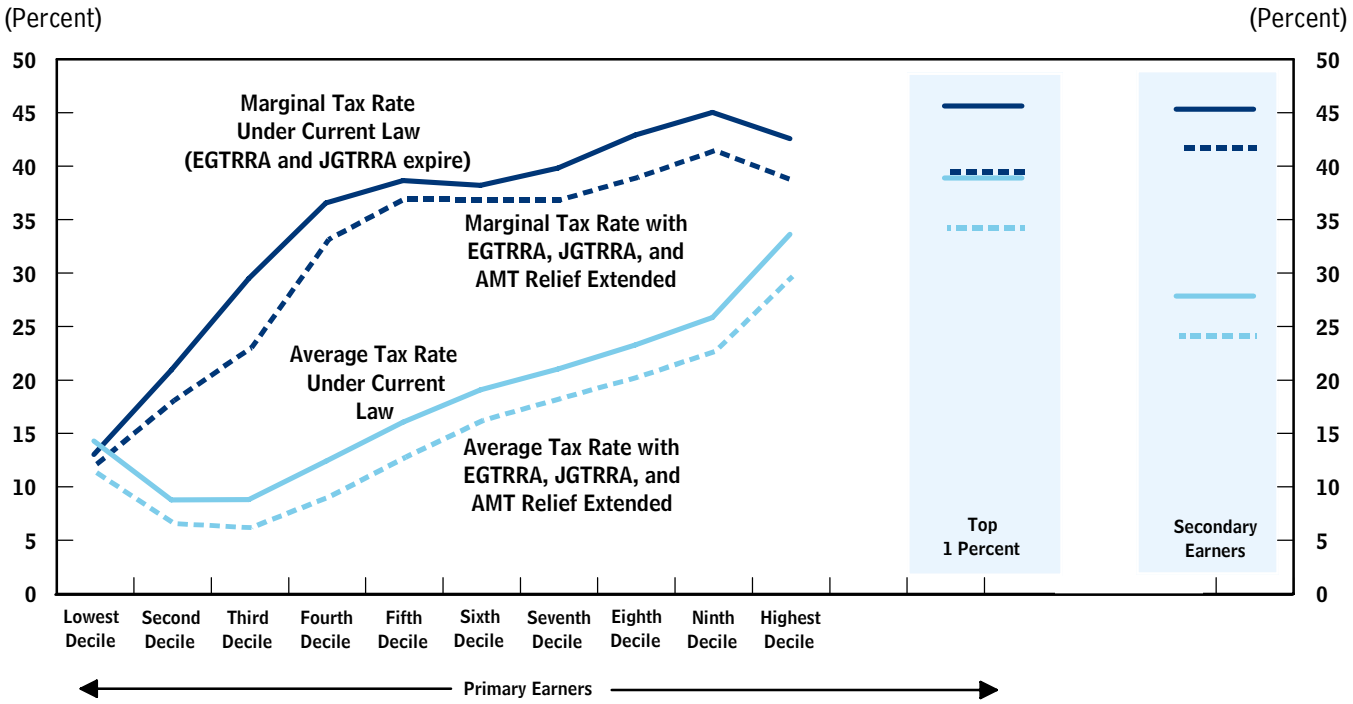
The effects on marginal tax rates would be particularly uneven for different income groups. Among primary earners, those at the lowest levels of earnings would see little change in marginal tax rates in 2011 if the tax provisions were extended (see Figure 1). Many of those taxpayers either owe no income taxes or receive refundable credits and thus would be unaffected by the extension of the provisions. As earnings rise, the effect on marginal rates grows, with primary workers in the third decile of the earnings distribution seeing one of the biggest changes. Taxpayers in that group would experience a significant reduction in their marginal tax rates because of the 10 percent bracket and the refundablity of the child credit. Through the next four deciles, the effect on marginal rates shrinks because taxpayers in the 15 percent bracket would see no change in their rates if the tax provisions were extended. The effect is larger for taxpayers in the top three deciles because EGTRRA's reductions in statutory tax rates would lower marginal rates as well. Taxpayers in the top 1 percent of the earnings distribution would experience the largest percentage-point decline in their marginal rates. Secondary earners' marginal tax rates would fall by an average of 3.3 percentage points if the tax provisions were extended, 0.1 percentage point more than the average for primary earners.

Changes in average tax rates from those provisions' extension would follow much the same pattern as changes in marginal rates. Some of the smallest changes would occur at the very bottom of the income scale, where many workers owe no taxes. The impact of the tax-policy change would grow as income rose through the fifth decile, then shrink in the sixth through eighth deciles, and finally widen again at the top of the earnings distribution. Secondary earners would see a bigger decline in their average tax rate than primary earners would: 3.5 percentage points versus 3.1 percentage points.

In CBO's analysis, secondary earners have much larger responses to the tax-policy change than primary earners do, despite facing roughly comparable changes in their tax rates (see Table 5). That result springs from CBO's labor-supply assumptions: that secondary earners have a combined total wage elasticity of 0.40, whereas primary earners have an earnings-weighted total wage elasticity of less than 0.04. If the tax provisions were extended, secondary earners would increase their earnings by about

Figure 1.

Effects on Marginal and Average Tax Rates in 2011 from Extending EGTRRA, JGTRRA, and AMT Relief, by Earnings Group



Source: Congressional Budget Office.

Notes: This analysis compares current law, under which the provisions of EGTRRA and JGTRRA expire as scheduled by the end of 2010, with an alternative in which those provisions and increases in the exemption amount for the AMT are extended. The estimates use CBO's mid-level assumptions about labor-supply elasticities (shown in Table 2). Tax rates include federal and state individual income taxes and payroll taxes. Marginal tax rates are weighted by earnings; average tax rates are weighted by total income.

A decile is a tenth of the distribution of workers ordered by annual earnings.

EGTRRA = Economic Growth and Tax Relief Reconciliation Act of 2001; JGTRRA = Jobs and Growth Tax Relief Reconciliation Act of 2003; AMT = alternative minimum tax.

2.9 percent, compared with just 0.25 percent for primary earners overall. Because of that large response, secondary earners would account for about 60 percent of the total change in labor income from extending the tax provisions—$25.3 billion out of $41.9 billion—despite having less than 12 percent of initial earnings.

Among primary earners, the labor-supply effects would vary significantly across the income distribution. Workers in the second through fourth deciles would have the largest total responses to the tax change, increasing their earnings between 0.52 percent and 1.25 percent. That effect occurs for two reasons: Those taxpayers would see relatively large changes in their marginal tax rates, and lower-earning workers are more responsive to changes in their after-tax wage rates than higher-income workers are. Taxpayers in the fifth through seventh deciles would alter their labor supply only a little, by no more than 0.2 percent, because they would experience only a small change in marginal tax rates. Taxpayers in the top three highest deciles would increase their labor supply between 0.21 percent and 0.27 percent, while the top 1 percent of earners would work about 0.40 percent more. When weighted by earnings, the smaller percentage changes of high-income workers translate into larger changes in labor income, so high-income workers account for most of the increase in earnings among primary workers. As a whole, primary workers would boost their earnings by $16.6 billion in response to the tax change; of that figure, the top 1 percent of primary earners would account for more than one-quarter, and primary earners in the two highest deciles would account for more than half.

Table 5.

Effects on Labor Supply in 2011 from Extending EGTRRA, JGTRRA, and AMT Relief, by Earnings Group

	Substitution Effect		Income Effect		Total Change in Earnings			
	Percentage Change in After-Tax Wage Rate	Percentage Change in Earnings	Percentage Change in After-Tax Income	Percentage Change in Earnings	Percent	Billions of 2011 Dollars	Share of Initial Earnings (Percent)	Share of Change in Earnings (Percent)
All Earners	5.5	0.80	4.4	-0.25	0.55	41.9	100.0	100.0
Primary Earners	5.5	0.38	4.2	-0.14	0.25	16.6	88.5	39.6
Lowest decile	0.7	0.34	3.1	-0.08	0.26	0.1	0.4	0.2
Second decile	3.3	0.97	2.1	-0.10	0.87	0.8	1.3	2.0
Third decile	8.8	1.41	2.6	-0.16	1.25	2.2	2.3	5.2
Fourth decile	5.0	0.81	3.6	-0.30	0.52	1.4	3.4	3.2
Fifth decile	2.3	0.31	3.6	-0.22	0.08	0.3	4.6	0.7
Sixth decile	1.8	0.26	3.3	-0.20	0.06	0.3	6.0	0.7
Seventh decile	4.6	0.27	3.2	-0.08	0.18	1.1	7.8	2.6
Eighth decile	6.4	0.36	3.6	-0.09	0.27	2.1	10.2	5.0
Ninth decile	6.0	0.32	3.9	-0.10	0.22	2.4	14.5	5.8
Highest decile	6.3	0.35	5.5	-0.14	0.21	6.0	37.9	14.2
Top 1 percent	10.8	0.58	7.3	-0.19	0.40	4.2	14.0	10.0
Seconday Earners	6.0	4.00	4.8	-1.09	2.91	25.3	11.5	60.4

Source: Congressional Budget Office.

Notes: This analysis compares current law, under which the provisions of EGTRRA and JGTRRA expire as scheduled by the end of 2010, with an alternative in which those provisions and increases in the exemption amount for the AMT are extended. The estimates use CBO's mid-level assumptions about labor-supply elasticities (shown in Table 2). Tax rates include federal and state individual income taxes and payroll taxes. Marginal tax rates are weighted by earnings; average tax rates are weighted by total income.

A decile is a tenth of the distribution of workers ordered by annual earnings.

EGTRRA = Economic Growth and Tax Relief Reconciliation Act of 2001; JGTRRA = Jobs and Growth Tax Relief Reconciliation Act of 2003; AMT = alternative minimum tax.