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**An Economic Evaluation of the Economic Growth and
Tax Relief Reconciliation Act of 2001**

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ABSTRACT

This paper summarizes and evaluates the Economic Growth and Tax Relief Reconciliation Act. Enacted in 2001, EGTRRA is the biggest tax cut in 20 years, and features income tax rate cuts, new targeted incentives and estate tax repeal. Our central conclusions are that EGTRRA will reduce the size of the future economy, raise interest rates, make taxes more regressive, increase tax complexity, and prove fiscally unsustainable.

I. Introduction

On June 7, 2001, President George W. Bush signed the Economic Growth and Tax Relief Reconciliation Act (EGTRRA, PL 107-16). The largest tax cut in 20 years, EGTRRA reduces income tax rates, repeals the estate tax, alters the taxation of children, marriage, saving, and education, and rescinds (or “sunsets”) all of its provisions in 2010. This paper provides a preliminary evaluation of the new law.

Section II summarizes the major provisions and revenue effects of the tax bill, and highlights two areas of significant unfinished business—the sunset rules and the dramatic increase in taxpayers who will face the alternative minimum tax (AMT). Few observers believe the sunset and AMT provisions will remain as currently legislated, but alternative ways of resolving these issues significantly affect analyses and conclusions regarding the tax cut. We generally analyze EGTRRA as if the sunsets are removed and the AMT is reduced to keep the number of AMT taxpayers the same as under pre-EGTRRA law.

Section III examines the tax cut relative to the federal budget. The notion that the federal government was running a large surplus at the beginning of 2001 was perhaps the most popular argument in favor of a tax cut. We show, however, that federal budgeting procedures misstate the underlying financial status of the government. After adjusting the budget figures to obtain a more meaningful measure of available resources, we find that the tax cut will cost more than the entire available surplus that was projected in spring 2001 for the next 10 years. Over longer time horizons, the government faced significant deficits even before the tax cut was enacted, and EGTRRA significantly exacerbates this problem. The difference between official and adjusted budget figures has several implications for the tax cut debate, most notably that EGTRRA is not fiscally sustainable and therefore implies some combination of future spending cuts or revenue

increases. In addition, our budgetary analysis shows that claims that tax cuts were needed to avoid paying off the public debt were incomplete.

Section IV examines distributional effects. By any reasonable measure, the tax cut makes the tax system less progressive with respect to current income and provides particularly large benefits to households in the top 1 percent of the income distribution. This redistribution comes just after a twenty-year period when pre- and post-tax income became significantly less equal. Two additional factors suggest that the tax cut may prove to be even more regressive than conventional analysis suggests. Resolution of the AMT problem may generate further tax cuts for high-income households. In addition, the distributional effects are related to the budget effects noted above; if the long-term financial pressures that EGTRRA creates results in reduced future spending, this would likely hurt lower- and middle-income households.

Section V focuses on economic growth. EGTRRA is a combination of improved tax incentives coupled with reductions in tax revenue. The improved incentives will increase economic activity by raising labor supply, saving and investment in human and physical capital. The revenue loss will reduce public and national saving. As a result, even after adjusting for changes in international capital flows, the capital stock will decline. We find that the impact of lower national saving dominates the effects of better incentives, and therefore that EGTRRA will slightly reduce the size of the economy by 2011. This finding, coupled with the increase in fiscal burdens noted above, suggests that EGTRRA will impose significant costs on future generations. We also review other perspectives that suggest the growth effects will be small.

Section VI explores other economic effects. We show that a wide variety of simulation models imply that EGTRRA will raise long-term interest rates. The most plausible simulation results suggest effects on the order of 10 to 60 basis points in the first year and between 75 and

110 basis points after 10 years.

We show that even very small interest rate effects are sufficient to raise the cost-of-capital for investments in equipment, structures, and residences, despite the reduction in marginal tax rates. Thus, EGTRRA will reduce investment. We also show that interest rate increases of 80-85 basis points imply that investment will fall by about the same amount as the decline in national saving net of capital flows. This links the results for saving, investment, and interest rates, and provides additional support for the view that EGTRRA will reduce output and raise interest rates.

Higher interest rates and lower investment, coupled with a small tax cut in 2001 and a weak consumer response to the 2001 cuts, suggests that EGTRRA may have depressed economic activity in 2001 and early 2002.

We find that EGTRRA will complicate taxes considerably. Besides the sunset provisions and the increase in AMT taxpayers, EGTRRA introduces complex provisions regarding the transition to a new estate tax regime and significantly complicates taxpayers' choices with regard to subsidies for higher education and retirement saving.

Reductions in marginal tax rates will raise economic efficiency, but these gains will be tempered. Two-thirds of taxpayers with positive liability will receive no reduction in marginal tax rates and the increases in complexity will raise compliance costs. Ultimately, the efficiency effects are related to the budget effects noted above. If the long-term financial shortfalls that EGTRRA creates are resolved by raising future tax rates, the efficiency gains will be lost, since smoothing tax rates over time is a fundamental premise of intertemporal efficiency.

A frequent justification for the tax cut is the hope that it would contain wasteful government spending. However, spending is already at its lowest share of the economy in

several decades, prior tax cuts were unsuccessful in reducing spending, and spending fell relative to GDP as revenues soared in the 1990s. We believe budget reform would be a more effective and less risky way to control spending than tax cuts and that a tax cut whose purpose is to contain outlays should favor the low- and middle-income households who would be most hurt by lower spending. Thus, efforts to control spending do not justify the size or features of EGTRRA.

Another frequent claim is that conventional revenue estimates overstate the costs of tax cuts by omitting the impact on changes in economic growth, taxable income and interest rates. We show that incorporating these factors barely alters the revenue losses and has no effect on any substantive conclusion.

Section VII provides a short conclusion. An appendix provides documentation and elaboration of many of the results noted above.

II. The new tax law: An overview

We highlight the major provisions in EGTRRA and their effective dates below and in table 1. Joint Committee on Taxation (2001d), Kiefer et al (this volume) and Manning and Windish (2001) provide additional information.

A. Individual income tax

The highest income tax rates fall by varying amounts over time. The top rate falls from 39.6 percent to 35 percent. The 28, 31, and 36 percent rates fall by 3 percentage points.¹ All four rates are reduced by 0.5 percentage points on July 1, 2001 and January 1, 2002, and 1 percentage point at the beginning of 2004. In 2006, the lowest three rates will fall by another percentage point while the top rate will fall by 2.6 percentage points.

¹ In 2001, the 28, 31, 36, and 39.6 tax brackets applied to taxable income above \$45,200, \$109,250, \$166,500, and \$297,350, respectively, for married couples.

A new 10 percent tax bracket is carved out of the 15 percent bracket. Whereas the cuts in the highest income tax rates phase in slowly over time, the 10 percent bracket is available immediately. Beginning in 2001, the new bracket applies to the first \$12,000 of taxable income for married couples (\$6,000 for singles, \$10,000 for heads of households). The brackets rise to \$7,000 for singles and \$14,000 married couples in 2007 and are indexed for inflation starting in 2009. In 2001, the 10 percent bracket was implemented by providing taxpayers with a one-time payment—the “rebate”—of the minimum of the taxpayer’s year 2000 income tax liability or \$600 for married couples (\$300 for singles, \$500 for heads of household).² Beginning in 2002, the new bracket is incorporated in withholding and tax tables.

The child credit is gradually increased from \$500 in 2001 to \$1,000 by 2010. The credit is made refundable to the extent of 10 percent of a taxpayer’s earned income above \$10,000 for 2001-2004 and 15 percent subsequently. The earnings threshold is indexed for inflation in 2002. The credit will no longer be limited by the AMT. The child and dependent care tax credit remains non-refundable, but the cap on eligible expenses rises to \$3,000 per child (from \$2,400) and the credit rate rises to 35 percent from 30 percent.

EGTRRA addresses marriage penalties in several ways. The standard deduction for married couples will rise from 174 percent to 200 percent of the standard deduction for singles in the years 2005 to 2009. The top income level in the 15 percent bracket for married couples gradually rises from 180 percent to 200 percent of the analogous level for singles from 2005 to 2008. The beginning and ending income levels of the EITC phase-out increase by \$3,000 by

²Taxpayers who in 2000 had low income or other circumstances such that the payment they received was less than what they should have received based on 2001 income are eligible to claim the difference when they file their income taxes for 2001. Taxpayers whose payment exceeded the amount they were entitled to based on 2001 income are not required to pay back the difference. The payment thus acts as an advance credit for 2001 taxes for the first group and a combination of an advance credit for 2001 taxes and a rebate of 2000 taxes for the second group (Esenwein and Maguire 2001).

2008, after which they are indexed for inflation.

EGTRRA provides several education subsidies. Taxpayers filing jointly with income below \$130,000 may take an above-the-line deduction for higher education expenses up to \$3,000 in 2002-3 and \$4,000 in 2004-5. Taxpayers filing jointly with income between \$130,000 and \$160,000 may take a deduction for up to \$2,500 in 2004 and 2005. Effective in 2002, the contribution limit on education IRAs rises to \$2,000 from \$500 and the definition of qualified expenses expands to include elementary and secondary school. Pre-paid tuition (“section 529”) programs will now allow tax-free withdrawals as long as the funds are used for education. Deductions for student loans are made more generous. The exclusion for employer-provided education assistance for workers’ education is extended.

The tax act makes the tax treatment of retirement saving significantly more generous. Contribution limits for Individual Retirement Accounts (IRAs) and Roth IRAs will rise gradually to \$5,000 by 2008 from \$2,000 under current law and will be indexed for inflation thereafter. Contribution limits to 401(k)s and related plans will rise gradually to \$15,000 by 2006 from \$10,500 under current law and then be indexed for inflation. Additional so-called “catch-up” contributions of up to \$5,000 per year for anyone over the age of 50 will be permitted. Roth 401(k) plans can be established starting in 2006. A non-refundable credit for retirement saving for low-income taxpayers will be available between 2002 and 2006.

EGTRRA also repeals the limitations on itemized deductions and phase-outs of personal exemptions. The repeal is phased in between 2005 and 2009. The tax act provides limited relief from the alternative minimum tax. Between 2001 and 2004 only, the exemption amount in the individual AMT is increased by \$2,000 for single taxpayers and \$4,000 for married taxpayers.

B. Estate tax

The new tax law gradually reduces and eventually repeals the estate tax and generation-skipping transfer tax and modifies the gift tax (see Burman and Gale 2001b and Kaufman 2001). Under previous law, the unified credit effective exemption amount for estates and gifts would have been \$700,000 in 2002, rising gradually to \$1 million in 2006. Under EGTRRA, the figure for estates rises to \$1 million in 2002, \$2 million by 2006 and \$3.5 million in 2009. The effective exemption for gifts remains at \$1 million. The top effective marginal tax rate on estates and gifts falls from 60 percent under previous law to 50 percent in 2002 and then gradually to 45 percent in 2009. In 2010, the estate and generation-skipping transfer taxes are repealed, the gift tax will have a \$1 million lifetime gift exclusion, the highest gift tax rate is set equal to the top individual income tax rate, and the step-up in basis for capital gains on inherited assets is repealed and replaced with a general basis carryover provision that has a \$1.3 million exemption per decedent and an additional \$3 million exemption on inter-spousal transfers.

C. Sunset provisions

The most novel aspect of EGTRRA is the general provision that the entire bill “sunsets” at the end of 2010. At that point, all provisions of the bill that had not already phased out are repealed, and the tax code reverts to what it would have been had the tax bill never existed. For example, at the beginning of 2010, the estate tax is repealed and basis step-up provisions are replaced with basis carryover rules. At the end of 2010, the estate tax is re-established as if EGTRRA had never existed, basis carryover is repealed, and basis step-up is reinstated.

Both the cause and the effect of the sunset provision merit discussion. Under the “Byrd Rule,” changes in revenues beyond the 10-year budget window require 60 percent of the vote in the Senate (Keith 1998). At the time EGTRRA was debated and passed, the budget window covered fiscal years 2002 through 2011. Because tax cuts in one year are estimated to have

spillover effects in subsequent years, and because calendar and fiscal years overlap, the provisions were repealed at the end of calendar year 2010 to avoid revenue losses extending beyond the end of fiscal year 2011.

The sunset provisions are one of many items designed to hide the long-term costs of EGTRRA. Others include the late starting date and slow phase-in of many provisions, the early termination of other provisions, the lack of adjustment of the alternative minimum tax (discussed below), and timing shifts related to corporate taxes.³ As a result of these provisions, one group of highly respected budget analysts concluded that EGTRRA “...appears to contain more budget gimmicks than any tax bill—and quite possibly any piece of major legislation—in recent history” (Friedman, Kogan, and Greenstein 2001). While such a statement is difficult to verify (or disprove), it accurately reflects the incredulity that greeted the gimmickry.

The sunset provisions complicate any analysis of EGTRRA. Virtually no one believes the bill will sunset as written. Other temporary tax provisions are typically extended at their scheduled expiration date, and the Administration has indicated the expectation and desire that the tax cuts be permanent.⁴ But exactly when or which parts of the bill might be extended is unclear. In our analysis, we generally assume the sunset provisions will be removed, and analyze the tax cut as if it were permanent.⁵

D. Interactions with the individual alternative minimum tax

³ EGTRRA delayed the due date for \$33 billion in corporate tax receipts by two weeks and thereby shifted the revenue from fiscal year 2001, which was outside the budget window, to fiscal year 2002, which was inside the window (JCT 2001c). The sole purpose was to increase the funds available to finance tax cuts in the 2002-2011 budget window even though there was no underlying improvement in government finances.

⁴ President Bush called for making the tax cuts permanent in his January 2002 State of the Union address (Bush 2002). But even before the tax cut was signed, Treasury Secretary Paul O’Neill indicated that “All these things are going to become permanent. They’ll all be fixed.” (USA Today 2001). Lindsey (2002) refers to the tax cuts as “permanent.”

⁵ Kiefer et al (this volume) make a similar assumption.

Another complicating factor is the problem the tax act creates with respect to the individual alternative minimum tax (AMT).⁶ Designed in the late 1960s and strengthened in 1986 to curb aggressive tax avoidance, the AMT operates parallel to the regular income tax system, using a broader measure of income, lower tax rates and a higher exemption. Taxpayers pay the AMT when their AMT liability exceeds their regular income tax liability. In other cases, taxpayers pay regular income tax but have their use of credits limited due to the AMT. We will refer to both groups as “on the AMT.”

EGTRRA made a few constructive changes relative to the AMT. Under the new law, the child credit will not push taxpayers on to the AMT. EGTRRA also slightly expands the AMT exemption, but only through 2004, which keeps the number of AMT taxpayers under EGTRRA about the same as under pre-existing law during that period.

Despite these changes, the AMT now faces two sets of problems. The first set pre-dates EGTRRA. The AMT is unduly complex⁷ and it has become poorly targeted: most taxpayers who face the AMT do so because of personal exemptions and deductions for state and local taxes, not because of aggressive tax sheltering. Under pre-EGTRRA law, the number of AMT taxpayers was projected to rise from 2 million in 2001 to 18 million in 2010 and almost 21 million in 2011. The primary cause of this increase is that the AMT is not indexed for inflation.

The second set of problems is created by EGTRRA. In 2004, the AMT exemption increase is repealed and individual income tax rates are cut further. The projected number of AMT taxpayers rises to 35 million by 2010 under EGTRRA, almost double the figure projected

⁶ See Tempalski (2001) and Kiefer et al (this volume) for further discussion of interactions between EGTRRA and the AMT and for background information on the AMT.

⁷ Besides taxpayers whose liabilities are affected by the AMT, the AMT also affects a third group, who are required under certain circumstances to fill out one or more lengthy forms to verify whether they are subject to the AMT.

under prior law. Among taxpayers with adjusted gross income (AGI) between \$75,000 and \$100,000, 54 percent will face the AMT in 2010 under EGTRRA, up from 28 percent under prior law. For taxpayers with AGI between \$100,000 and \$200,000, the corresponding figures are 85 percent and 35 percent, respectively (Tempalski 2001). In 2010, a hypothetical family of four with all income from wages and typical itemized deductions will face the AMT if its adjusted gross income is anywhere between \$80,000 and \$860,000 (Kiefer et al, this volume). The AMT will “take back” the regular income tax cuts in a haphazard and often severe manner across taxpayers over time (Davis 2001).

Thus, EGTRRA not only failed to address the pre-existing AMT problem, it significantly exacerbated those problems. As with the sunset provisions, no one seriously expects that Congress and the Administration will allow the AMT to expand as projected, but how the AMT problems are resolved will significantly influence the impact of the tax act. To the extent that the AMT itself is reduced, the size of the tax cut will rise, the distribution will be more tilted toward higher-income taxpayers, taxes will be simpler, and marginal tax rates will generally increase.

E. Revenue effects and budget effects

Table 2 reports Joint Committee on Taxation (JCT) estimates of the revenue effects of EGTRRA. The left panel shows that EGTRRA will reduce taxes by \$1.35 trillion between 2001 and 2011, about 0.9 percent of GDP. The tax cut rises over time, comprising about 0.5 percent of GDP in 2001-2 (not shown) and rising to 1.16 percent of GDP in 2010.⁸

The right panel of table 2 shows that extending EGTRRA to remove the sunsets and keep the number of AMT taxpayers at the same level as under previous law has a significant impact on the revenue estimates. The adjustments raise the tax cut by 29 percent to over \$1.7 trillion

⁸The fully phased-in effect of estate tax repeal first appears in 2011, even though the tax is slated for repeal in 2010, because estate tax payments in one year typically result from deaths in the previous year.

through 2011. In 2011, the AMT adjustment alone is one third as large as all of the other income tax cuts. If extended, the tax cut would amount to 1.75 percent of GDP in 2011, a figure we use below in calculating the long-term costs.

The tax cut would also affect the federal budget by raising the level of federal debt and increasing net interest payments, holding interest rates constant. We estimate this effect using data on expected interest rates from the Congressional Budget Office. EGTRRA would raise interest payments by \$383 billion through 2011, and the tax cut would cost the government \$1,731 billion. If the sunset and AMT provisions are amended as noted above, the tax cut and interest payments through 2011 would reduce federal surpluses by more than \$2.1 trillion.

The revenue estimates above omit the effects of tax-induced changes in GDP and interest rates (JCT 1997). In section VI, we show that adding these factors has little net impact on the revenue effects of EGTRRA.

III. Tax Cuts and Fiscal Policy⁹

The presence of large projected federal budget surpluses at the beginning of 2001 seemingly made tax cuts affordable and was perhaps the single most persuasive popular argument in favor of tax cuts. This section shows, however, that federal budgeting methods misrepresent the government's fiscal status, that more appropriate measures present a far bleaker picture, and that these findings imply a fundamental reconsideration of the wisdom, affordability, and economic implications of the tax cut.¹⁰

A. The next 10 years

⁹ This section is based largely on Auerbach and Gale (1999, 2000, and 2001).

¹⁰ Throughout this section, we focus on budget projections immediately before and after EGTRRA was enacted. Since the summer of 2001, the budget situation has deteriorated substantially for reasons that are unrelated to EGTRRA but that reinforce many of the points in this section (Gale, Orszag, Sperling 2001, Auerbach, Gale and Orszag 2002).

The January 2001 CBO budget baseline formed the basis of tax and fiscal policy discussions in the winter and spring of 2001. Under the baseline, the projected unified budget surpluses were \$5.6 trillion between 2002 and 2011, including \$2.5 trillion in the social security trust fund (table 3). Using these figures, it would be simple to conclude that tax cuts of \$1.35 trillion were easily affordable, since the revenue loss would fall far short of not only the overall surplus, but even the non-social security surplus. Unfortunately, this simple comparison is problematic because the CBO baseline does not provide a meaningful measure of the funds available for tax cuts or new spending.¹¹

The baseline uses cash-flow accounting. This is appropriate for many purposes but can distort the financial status of retirement programs when—as in the baseline—the budget horizon is limited to 10 years. Current projections show that trust funds for social security and medicare part A will run substantial cash-flow surpluses over the next decade, but substantial deficits over longer horizons.¹² Likewise, trust funds holding pension reserves for federal military and civilian employees are projected to run significant cash-flow surpluses over the next 10 years. Responsible accounting would include the accruing retirement liabilities in the budget. In the absence of that change, however, it is misleading to include the contributions as funds available for other purposes. For social security, this logic is codified in its off-budget status. But the logic applies with equal force to the other retirement programs.¹³

¹¹ Many of the budget methods that we criticize are stipulated by law. Thus, our criticisms are not of CBO per se, but of the laws that guide the formation of the baseline budget.

¹² Board of Trustees, Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds (2001). Board of Trustees, Federal Hospital Insurance Trust Fund (2001). The Administration attempted to argue that Medicare was running a deficit over the next 10 years by lumping together the part A and part B programs. However, part B is stipulated by law to be funded from current revenues and program fees, not from the part A trust fund. See Office of Management and Budget (2001) and Greenstein (2001).

¹³ Although our point relates to the economic logic of the treatment of retirement funds, it is appropriate to note that there has also been significant political support for the notion that retirement trust funds ought to be kept separate

A second problem with the baseline is the way it projects revenues and outlays. CBO assumes that “current policy” will continue and defines current policy subject to a variety of statutory requirements (CBO, 2001a). At least two aspects of current policy toward taxation merit reconsideration. As noted above, the number of AMT taxpayers was projected to rise dramatically even before EGTRRA took effect. The baseline is required to assume that this will occur. In our view, a more accurate representation of “current policy” would hold the share of taxpayers facing the AMT roughly constant at 2 percent, the level prevailing in 2002. A second issue relates to temporary tax provisions, a number of which are scheduled to expire over the next decade. For all taxes other than excise taxes dedicated to trust funds, the CBO baseline is required to assume that legislated expirations occur as scheduled. In the past, however, the temporary provisions have typically been extended another few years each time the expiration dates approached. In light of this practice, current policy is more aptly viewed as assuming that these so-called “extenders” will be granted a continuance.

The main issue regarding current policy toward outlays concerns discretionary spending. Because such outlays require appropriations every year, current spending choices do not have fixed implications for future spending. CBO assumes that real discretionary spending authority will remain constant over the budget period at the level prevailing in the first year. For the January 2001 baseline, this assumption implied that real discretionary spending would fall by 20 percent relative to the economy and by about 9 percent in per capita terms by 2011. In a growing economy with growing defense needs and other concerns, this seems to be a particularly

from funds available for other uses. Both political parties claim to support the notion of protecting the social security trust fund. Both Houses of Congress voted overwhelmingly in 2000 to support measures that protected the medicare trust fund from being used to finance other programs or tax cuts (Mohr 2001). A recent legislative proposal would provide similar protection to military pensions (U. S. House of Representatives 2001). Almost all states already separate their pension reserves from their operating budgets.

unrealistic projection. It would be more reasonable for real discretionary spending to grow with the population, to maintain current services on a per-person basis.¹⁴ An alternative, perhaps more realistic, baseline would let discretionary spending grow with GDP.

Table 3 shows the effects of adjusting the surplus for retirement trust funds and current policy assumptions as of January 2001. Removing the retirement trust fund surpluses from the budget reduces the available surplus by \$3.3 trillion, or almost 60 percent, between 2002 and 2011. Adjusting for the AMT and expiring tax provisions reduces the available surplus to \$2.2 trillion. If real discretionary spending were held constant on a per capita basis, the remaining available surplus would have been \$1.6 trillion. If discretionary spending were held constant as a share of GDP, the remaining available surplus would be \$1 trillion.

In contrast, table 2 shows that the revenue and interest costs of EGTRRA are \$1.7 trillion if the tax act sunsets and \$2.2 trillion if the sunsets are repealed and the AMT is reduced to keep the number of AMT taxpayers the same as under previous law. Each figure exceeds the entire available budget surplus shown in table 3.

Any doubts that EGTRRA substantially altered the fiscal framework were erased when CBO issued its mid-session update (CBO 2001b). The right panel of table 3 shows that the projected 10-year baseline surplus fell by \$2.3 trillion between January and August. Almost three-quarters of the decline is due to the tax cut plus interest costs (\$1.7 trillion, as shown in table 2). Table 3 shows further that the entire \$3.3 trillion baseline surplus vanishes if the retirement trust funds are moved off-budget.

Adjusting the baseline for “current policy” is slightly more complex after the tax cut than before. We assume the tax cut is made permanent, the number of AMT taxpayers is reduced

¹⁴ Indeed, as a Presidential candidate, George W. Bush made the same point, arguing that an “honest comparison” of spending growth should take inflation and population growth into account (Slater 1999).

from post-EGTRRA levels to 2 percent, and the expiring provisions are extended.¹⁵ With these adjustments, Table 3 shows that if real discretionary spending per capita were held constant, the available budget was in *deficit* to the tune of \$1.4 trillion. If real discretionary spending were held at a constant share of GDP, the available budget would face a deficit of \$2.0 trillion. Because the tax act with sunset and AMT adjustments costs \$2.2 trillion through 2011, the available budget would have been in balance in the August baseline if it were not for EGTRRA.

B. The long-term fiscal gap

The adjusted budget measures in table 3 provide a more accurate picture of the government's underlying financial status and are easily comparable to existing official figures, but they ignore the long-term implications of current fiscal choices. As noted above, social security and medicare face substantial deficits over the next 75 years (and beyond). In the context of an aging population and rapidly rising medical care costs, incorporating the future imbalances is necessary to obtain an accurate picture of the fiscal status of the government as a whole. One way to recognize these problems but still maintain cash-flow accounting is to extend the planning horizon to include the years when the liabilities come due

To implement this approach, analysts have estimated the “fiscal gap”—the size of the long-run increase in taxes or reductions in non-interest expenditures (as a constant share of GDP) that would be required immediately to keep the long-run ratio of government debt to GDP at its

¹⁵ The AMT adjustment is reported in two steps. The first step reduces the number of AMT taxpayers from the level under post-EGTRRA law to the level under pre-EGTRRA law. The second reduces the number of AMT taxpayers so that the share of AMT taxpayers remains at 2 percent. EGTRRA not only created the increase in AMT taxpayers addressed by the first step, it also made implementing the second step much more expensive (compare the \$113 billion for the January 2001 projection to the \$298 billion for the August 2001 projection) because it reduced regular income tax liabilities. In all, EGTRRA raised the cost of holding the share of AMT problem at 2 percent by \$442 billion.

current level.¹⁶ The fiscal gap measures the *current* budgetary status of the government, taking into account long-term influences.

Using a common set of baseline assumptions, CBO (2000) projects a fiscal gap of 0.8 percent of GDP through 2070, while Auerbach and Gale (2001) project a gap of 0.67 percent. The primary cause of the gap is that spending on social security, medicare and medicaid is projected to rise from about 8 percent of GDP in 2010 to 17 percent by 2040 (CBO 2000).¹⁷

If it is extended, EGTRRA will have a sizable impact on the fiscal gap. With the sunset and AMT provisions corrected, EGTRRA cuts taxes by 1.1 percent of GDP over the next decade and 1.75 percent of GDP in 2011 (table 2). If the tax cut remains a constant share of GDP in years after 2011, the tax cut will average about 1.64 percent of GDP over the next 70 years.¹⁸ Thus, EGTRRA would more than triple the fiscal gap reported above over the next 70 years.

C. Implications and Caveats

The most important caveat to these estimates is that budget projections face considerable uncertainty (CBO 2002). Longer-term estimates are sometimes even more uncertain than short-term estimates, but they should not be ignored. The serious consequences of a relatively bad long-term outcome should spur a precautionary response from policymakers now (Auerbach and

¹⁶ Over an infinite planning horizon, this requirement is equivalent to assuming that the debt-GDP ratio does not explode. See Auerbach 1994, 1997, Auerbach and Gale 1999, 2000, 2001, and Congressional Budget Office 2000.

¹⁷ CBO's baseline assumptions are that discretionary spending is constant in real terms until 2011 and constant as a share of GDP thereafter; taxes change as current law requires through 2011 and are a constant share of GDP thereafter; social security and medicare spending follow the intermediate projections of their respective trustees; Medicaid grows according to predictions of how population and health care technology will change; no new spending programs or tax cuts are enacted for the next 70 years. Fiscal gap estimates are sensitive to both spending assumptions and the time horizons employed. If discretionary spending remained a constant share of GDP starting in 2001, the fiscal gap would be 1.45 percent of GDP through 2070. Estimates through 2070, however, understate the longer-term problem because the budget is predicted to be in deficit in the years approaching and after 2070. The permanent fiscal gap is between 3.3 and 4.1 percent of GDP depending on assumptions about discretionary spending over the next decade (Auerbach and Gale 2001).

¹⁸ Kogan, Greenstein, and Orszag (2001) reach a similar conclusion through a somewhat more detailed calculation.

Hassett 2001). In addition, the longer-term budget problems are driven by demographic pressures that seem relatively likely to occur (CBO 2001d, Lee and Edwards 2001).

The substantial differences between official budget projections and adjusted measures that show pervasive deficits have sweeping implications for the tax cut debate. First, tax cuts are not simply a matter of returning unneeded or unused funds to taxpayers, but rather a choice to require other, future taxpayers to cover the long-term deficit, which the tax cut significantly exacerbates. Likewise, the notion that the surplus is “the taxpayers’ money” and should be returned to them omits the observation that the fiscal gap is “the taxpayers’ debt” and should be paid by them. Thus, the issue is not whether taxpayers should have their tax payments returned, but rather *which* taxpayers—current or future—will be required to pay for the spending obligations incurred by current and past taxpayers.

Second, the adjusted budget measures show that two common claims made by the Administration and by prominent tax cut advocates are mutually inconsistent. One claim is that large current surpluses make tax cuts affordable now (Bush 2001a, Feldstein 2001a and Hassett 2001a). The second claim is that social security faces a significant long-term deficit (Bush 2001a, Feldstein and Samwick 1997, Hassett 2001b). The problem with making both claims simultaneously is that the “surplus” that allegedly made tax cuts affordable existed only because budgeting procedures ignore the long-term deficit in social security and medicare. Moreover, over the next 75 years, the extended tax cut—at 1.6 percent of GDP—would reduce revenues by more than twice the size of the social security shortfall—0.7 percent of GDP.¹⁹ That is, the funds that finance the tax cut (presuming it is extended) would be more than sufficient to completely

¹⁹See Board of Trustees, Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds (2001, table VI.E5, p. 150) and Kogan, Greenstein and Orszag (2001). Over an infinite horizon, the extended tax cut is about the same size as the social security shortfall.

resolve the social security financing problem through 2075.

Third, a large fiscal gap—and the expansion of that gap by EGTRRA—implies either that taxes will rise or spending will fall in the future. These changes are likely to have important effects on economic efficiency and the distribution of government benefits, which should be considered part of the analysis of EGTRRA and are discussed further in subsequent sections.

Fourth, the results provide useful perspectives on Greenspan's (2001a) claim that tax cuts were needed to avoid having government pay off all available marketable Treasury debt by 2006. Greenspan and others feared the consequences of eliminating the market for Treasury bonds and of investing additional government surpluses in private assets. Some analysts have challenged the premise that these events would cause serious problems.²⁰ But even if the events would cause problems, the challenge for debt policy would be to meet two goals at the same time: maintain or *raise* the level of marketable debt—to assuage these fears—and maintain or *reduce* the amount of total debt (the sum of marketable debt and implicit debt such as future entitlements)—to assuage fears about the government's long-term fiscal status. Tax cuts increase marketable debt, but raise total debt, too. Higher spending has the same effect. Thus, the concerns raised by Greenspan do not justify tax cuts any more than they justify spending increases. Other policies could meet both goals simultaneously. For example, the government could exchange the Treasury bonds held by the retirement trust funds for private assets. Or it could convert implicit debt into marketable debt under proposals to cut social security benefits and siphon payroll taxes into private accounts or accounts managed by the government. Thus, tax cuts are neither necessary nor sufficient to meet the two goals of debt policy, and better

²⁰ Jackson (2001) estimates that the size of government investments relative to the market would be small. Munnell and Sunden (2001) note that state-managed funds earn competitive returns and have avoided creating political interference. Fuerbringer (2001) and Greenspan (2001b) note that the importance of Treasury securities has declined for some time and new benchmarks would surely arise if Treasuries were to disappear.

options exist.²¹

IV. Distributional effects

While the previous section focuses on the burdens EGTRRA places on future generations, this section examines the distribution of tax cuts across households in the current generation. We find that, by a variety of reasonable measures, the tax cut is disproportionately tilted toward high-income households.

A. Background

We use results from the Institute on Taxation and Economic Policy tax model (ITEP 1997). The model uses data from tax records and other sources to estimate the distribution of income, existing taxes and proposed changes. The model employs the tax filing unit as the unit of analysis, and sorts households by cash income. The model assigns the burden of the income tax to the payor, the corporate income tax to capital income, the payroll tax to labor income, and excise taxes to consumers. The estate tax is assigned to decedents, based on JCT (1993).²²

These specifications are generally similar to those in models used by the Treasury Department (Cronin 1999), the CBO (2001c) and the JCT (2001a). Appendix Tables 1 and 2 show that the ITEP, CBO, and Treasury models reach broadly similar conclusions regarding the distribution of income and existing taxes.²³ These similarities suggest that analysis of EGTRRA using the ITEP model produces results similar to what would be generated from the other

²¹ Also, even if the issues raised by Greenspan (2001a) did justify an eventual tax cut or spending increase, they did not justify one in 2001. It would have been simple and prudent to wait to see if the “problem” of paying off the debt were really going to materialize before placing fiscal policy on a significantly different course.

²² Tax filing units includes filers and non-filers. The consumption and income data are obtained by merging records from the Census Public Use Microdata Sample, income tax returns, and the Consumer Expenditure Survey.

²³ The cash income definition used in the ITEP model is narrower, so effective tax rates on high-income households are somewhat higher than in the other models (Appendix tables 1 and 2). The JCT model classifies households in different ways and so can not be easily compared to the other models.

models.²⁴ To further ensure comparability, we replace the ITEP distribution of estate taxes with the Treasury distribution (Cronin 1999, and Appendix Table 2).²⁵

With these assumptions, Table 4 reports the distribution of income and federal tax burdens in 2001 under pre-EGTRRA law. Average federal tax rates rise with income. Households in the top quintile earn almost 60 percent of all income and pay 68 percent of federal taxes; the top 1 percent earns 19 percent of income and pays 26 percent of federal taxes.

B. Distributional estimates

Our preferred measure of the distributional impact of the tax cut is the *percentage change in after-tax income*.²⁶ A tax cut or increase that gives everyone the same percentage change in take-home income is distributionally neutral—it holds the distribution of after-tax income constant before and after the policy change. Because the distribution of alternative federal taxes varies across income classes (Appendix Table 2), an informative distributional analysis needs to include a wide range of taxes. We include federal individual income, corporate income, payroll, excise, and estate taxes. We examine the distributional effects at 2001 income levels with fully-phased in values for EGTRRA (i.e., the tax cuts that would occur in 2010) adjusted for inflation to 2001 levels. These assumptions imply that the AMT exemption is set at its pre-EGTRRA level, since the temporary increase in the exemption level is scheduled to expire in 2005. We consider the impact of the AMT on the distributional effects below.

Table 5 shows that EGTRRA raises after-tax income by 6.3 percent for households in the top 1 percent of the income distribution, compared to 2.8 percent or less for other groups and less

²⁴ See also Sullivan (2001), who notes that the ITEP model is “of extremely high quality and in the past has produced results consistent with official Treasury findings.”

²⁵ Treasury’s estimated distribution of estate taxes is less progressive than ITEP’s and thus reduces the progressivity of the pre-EGTRRA tax system and reduces the estimated regressivity of the tax cuts in EGTRRA.

²⁶ Cronin (1999) and Gravelle (2001) reach similar conclusions.

than 1 percent for the bottom quintile. Hence, EGTRRA will make the distribution of after-tax income less equal. Both the income and estate tax contribute significantly to benefits for the top 1 percent. Estate tax repeal raises after-tax income by 2.3 percent, while the income tax cuts raise after-tax income by 4 percent, more than the total tax cut for any other group.

One way to measure the amount of redistribution in EGTRRA is to compare the tax cut households obtain under EGTRRA to their cut if everyone obtained the same percentage increase in after-tax income. Table 5 shows that households in the top 1 percent will receive \$24,000 more in tax cuts annually under EGTRRA than under a distributionally neutral tax cut. The other groups receive a smaller cut under EGTRRA than under a distributionally neutral tax change of the same overall magnitude as EGTRRA.

The table also reports other commonly used distributional measures. The top 1 percent receives 36.7 percent of the tax cut, which vastly exceeds its share of federal taxes paid under pre-EGTRRA law (26 percent, table 4).²⁷ Federal tax payments fall by more than 11 percent for the top 1 percent of households, larger than any other group.

We also report changes that relate directly to the measures reported in table 4. The annual tax cut exceeds \$45,000 for households in the top 1 percent. This value exceeds the 60th percentile of the *income* distribution shown in table 4. Average tax rates fall by 4.1 percentage points for the top 1 percent of households, compared to 2 percentage points or less for others. The share of taxes paid by the top 1 percent of households falls by 1 percentage point (or 4 percent); the share paid by the next four percent of households rises by 0.5 percentage points, because of the AMT. The other groups have minor changes. The share of post-tax income

²⁷ Social security taxes are loosely related to benefits, and thus may not be considered pure taxes (Feldstein and Samwick 1992). The top 1 percent pays 36.8 percent of all non-payroll taxes in the model, almost exactly equal to its share of the tax cut. But some payroll taxes, such as medicare taxes, are not linked to benefits. Thus, the share of non-social security taxes paid by the top 1 percent is less than their share of the tax cut.

received by the top 1 percent rises by 0.5 percentage points. Table 5 also shows that two-thirds of households in the bottom quintile and 20 percent overall receive no benefit from EGTRRA.

C. Discussion

The principal distributional effect of EGTRRA is a tax cut for the top 1 percent of households that is disproportionate relative to every criteria used in table 5. An alternative, potential rationale for large tax cuts for high-income taxpayers might focus on changes in effective tax rates over time (figure 1).²⁸ Households in the bottom 80 percent of the income distribution faced lower tax burdens in recent years than any year since 1983. Only among the top 20 percent did average tax burdens rise. A closer look, however, casts doubt on this potential rationale for high-income tax cuts. The main reason effective tax rates rose on the top 20 percent was their dramatic increase in income coupled with a progressive tax system. Even with higher tax rates, the top income groups experienced higher growth of *after-tax* income than other groups (figure 2). Thus, although the 1993 tax act raised tax burdens for the affluent, the 1997 capital gains tax cuts partly offset these changes, and the rise in income swamped tax policy in generating higher average tax burdens (Slemrod and Bakija 2000a). It is also worth noting, however, that even after EGTRRA the tax system will remain progressive (table 4). Given the variation in effective tax rates since 1979 (figure 1), both the pre- and post-EGTRRA tax systems are within the range of prior distributional outcomes.

The AMT plays an important role in the reported distributional effects. Although they receive large tax cuts in dollar terms, households in the 95th to 99th percentile of the income distribution do not fare as well as other households by other measures in table 5. The reason why is that in 2010 the vast majority of those households will be on the AMT and thus will have

²⁸ Figure 1 uses CBO (2001c) data on income and federal taxes (other than estate taxes). CBO reports data for 1979-1997 and provides an estimate that uses year 2000 law applied to 1997 income.

their regular tax cut reduced or eliminated. If the AMT were abolished, about 90 (52) percent of the benefits would accrue to households with income above \$100,000 (\$200,000), and the average tax cut for all households with income above \$200,000 would rise by \$11,000 (Tempalski 2001). Thus, AMT reforms could have important impacts on the ultimate distributional effects of EGTRRA.

The fiscal pressures that EGTRRA creates may reduce federal spending. A full measure of the distributional effects of the tax cut should include the impact of those changes. If such spending would otherwise have mainly helped lower- and middle-income households (Steuerle 2001), the net effect of the tax bill would be more regressive than shown in table 5.

The distribution of tax cuts enacted in 2001 differs substantially from the cuts slated for later years (JCT 2001b, Burman et al 2002). In 2001, households in the bottom 60 percent of the income distribution received over 70 percent of their ultimate tax cut; those in the top 1 percent received only 7 percent (table 5).²⁹ This pattern occurs because the 10 percent bracket phased in immediately, many of the tax cuts for low-income households are not indexed for inflation and thus decline over time, and estate tax repeal and the most significant income tax rate cuts phase in well after 2001.

Our distributional results are consistent with those in Burman et al (2002), but are difficult to compare to other findings. The Department of the Treasury (2001) ignores its own methodology for distributional analysis (Cronin 1999) and provides little useful information.³⁰ The Joint Committee on Taxation (2001b) does not distribute the corporate or estate taxes, and

²⁹ Households in the lower 60 percent of the income distribution received 35 percent of the cuts enacted in 2001, but will only receive 7 percent of the tax cuts in future years. In contrast, households in the top 1 percent received 7 percent of the 2001 cuts, but will obtain 51 percent of the cuts occurring after 2001 (not shown).

³⁰ See Burman (2001) and Shapiro (2001). Sullivan (2001) aptly describes the Treasury release as “low-grade campaign propaganda reproduced on Treasury letterhead.”

only provides analysis through 2006.

V. Economic Growth

EGTRRA will affect economic growth through many channels, directly increasing economic activity by reducing income tax rates, repealing the estate tax, and providing new subsidies for education and retirement saving, and indirectly reducing economic activity by reducing public saving. The interplay between these factors determines the net effect, which we estimate to be negative.

A. Background³¹

Income or output in period t , Y_t , can be written as a function of its inputs:

$$(1) \quad Y_t = K_t^\alpha L_t^\beta A_t,$$

where K_t is the capital stock, L_t is labor supply, and A_t represents the state of technical knowledge. Taxes can alter each of these variables and the coefficients, α and β . We see no reason, though, why EGTRRA should affect the rate of technical change or the coefficients on capital and labor. Thus, we focus on how EGTRRA will affect labor supply and the capital stock when all of its provisions are in effect (assuming the sunsets are repealed). Manipulating (1) yields:

$$(2) \quad \Delta Y/Y = \alpha * (\Delta K/K) + \beta * (\Delta L/L).$$

where Δ refers to the difference between values in 2011 under EGTRRA and prior law.³²

Equation (2) provides the basic framework for our analysis, and states that the percentage change in income or output in 2011 due to EGTRRA is a weighted average of the induced

³¹ Section A is based on Engen and Skinner (1996) and Elmendorf and Mankiw (1999).

³² Engen and Skinner (1996) note that in neoclassical models, tax cuts may have temporary effects on growth rates, but still have permanent effects on the size of the economy. By focusing on the size of the economy in 2011, we avoid having to deal with temporary effects of EGTRRA on growth rates.

percentage changes in labor and capital, where the weights are the factor shares in total income. We consider two components of the labor supply response—hours worked and human capital accumulation. We consider two measures of the capital stock. The first is the capital stock owned by U.S. residents. Changes in this measure are financed by changes in national saving. Increases in national saving increase American ownership of capital domestically and/or abroad and raise gross national product (GNP). The second measure is the capital stock employed in the U.S. Changes in this measure are financed by changes in the sum of national saving and net capital inflows. Increases in the domestic capital stock raise the productivity of domestic workers and thus raise gross domestic product (GDP).

B. Changes in effective marginal tax rates

The effects of EGTRRA on labor and capital will depend in part on the extent to which marginal tax rates change. A surprisingly large share of households will receive no reduction in marginal tax rates, including 76 percent of tax filing units (including non-filers), 72 percent of filers, and 64 percent of those with positive tax liability. These taxpayers account for 38 percent of taxable income (Kiefer et al, this volume, table 2).³³

As a result, effective marginal tax rates do not fall very much (table 7). Treasury data show the effective marginal rate falling by 1.6 to 2.4 percentage points for wages, interest, dividends, and sole proprietorship income. The effects of these changes generally depend on the percentage change in the *net-of-tax* returns, or 1 minus the tax rate. The implied increases in after-income-tax returns are between 2.2 and 3.4 percent. CBO (2001b) data imply that

³³ Among all tax filing units, about one-third would not file or would be in the zero percent bracket under pre-existing law and EGTRRA, 24 percent would be in the 15 percent bracket in either case, 8 percent would be on the AMT in either case, and 9 percent would not face the AMT under pre-existing law but would under EGTRRA, and would not receive a cut in marginal tax rates (Keifer et al, this volume, table 2).

EGTRRA raises the after-tax return to wages by 2.8 percent and capital income by 0.6 percent.³⁴ Thus, EGTRRA will raise the after-tax return to working by between 2.2 and 2.8 percent and the after-tax return to capital income generally by between 0.6 and 3.4 percent.

In general, the largest increases in net-of-tax returns occur for high-income groups (Kiefer et al, this volume). But this finding and the estimates above omit any AMT “fix.” Because the AMT has lower rates than the regular income tax at high income levels, cutting the AMT would *raise* marginal tax rates among high-income households.

C. Labor Supply

To estimate the impact of EGTRRA on hours worked, we set the uncompensated elasticity of hours worked with respect to wages at 0.05 for males and 0.30 for full-time female workers.³⁵ For other females, we set the elasticity at 0.8, to include the effect on hours and participation margins. The Appendix provides the rationale for these specifications. Weighting these figures by the shares of aggregate wages earned in 1999—66 percent for men, 27 percent for full-time female workers, and 7 percent for other females (U.S. Bureau of the Census 2000b)—generates an aggregate elasticity of 0.17. This estimate, combined with a 2.8 percent increase in the net-of-tax wage (table 7) implies that, when fully phased-in, the tax cut will raise hours worked by 0.48 percent.³⁶

Estimating the effects on human capital is less straightforward. The costs of human

³⁴ Relative to Treasury, CBO obtains a higher percentage reduction in the net-of-tax rate on labor income because more taxes are included in the initial calculation.

³⁵ We focus on uncompensated elasticities because EGTRRA reduces overall tax burdens. Revenue-neutral tax changes may be better analyzed using compensated elasticities.

³⁶ In comparison, Saez (1999) estimates an aggregate elasticity of wages with respect to the net-of-tax rate of 0.10, and CBO (2001b) finds that EGTRRA will raise labor supply by between 0.1 and 0.4 percent. One reason our estimates are larger is that our earnings data are top-coded and thus understate the share of earnings earned by full-time workers. Similar calculations using data from the 1998 Survey of Consumer Finances, which includes a high-income household supplement, imply smaller aggregate elasticities.

capital accumulation include out-of-pocket schooling expenses and forgone after-tax wages. The benefits include higher eventual wages (Boskin 1977, Heckman 1976). EGTRRA affects these costs and benefits in several ways. Lower tax rates raise forgone after-tax wage costs and future wage benefits. Because it is regressive and income rises after people complete their education, EGTRRA raises future wage benefits more than the costs, which should raise human capital. But, as discussed below, we find that EGTRRA will raise interest rates, which would reduce the present value of future wages and thus reduce human capital investment. We are aware of no empirical work on these issues.³⁷

The expansion of education IRAs and pre-paid tuition program may raise saving for college but is unlikely to influence enrollment rates (Kane 1998). In contrast, the tuition deduction and the exclusion for employer educational assistance could affect enrollment. The net effect depends on interactions with other education subsidies, the extent to which state governments and educational institutions adjust their own policies to claim some of the benefits, and the share of benefits accruing to the families of students who would attend college anyway.

Given these factors, our primary qualitative conclusion is that EGTRRA will have little effect on human capital accumulation. For purposes of quantifying the growth effects, the Appendix documents two (admittedly rough) estimates, based on Dynarski (1999, 2000), that the tuition deduction and employer exclusion will raise human capital by 0.21 percent by 2011. Thus, we estimate that EGTRRA will raise the supply of labor by 0.69 percent in 2011, including a 0.48 percent increase in hours worked and a 0.21 percent increase in human capital.

D. The supply of capital

Rather than directly estimate the percentage change in the capital stock, it turns out to be

³⁷ In addition, the reduction in tax rates will raise the net-of-federal-tax cost of state-level spending on education programs because the value of the itemized deduction for state and local taxes will shrink.

more straightforward to proceed in several steps. First, we estimate the cumulative change in public and private saving through 2011, scaled relative to GDP from 2002 to 2011. Second, we determine the change in international capital flows, given the change in national saving. Third, we convert all of these figures to percentage changes in the capital stock.

The change in national saving is the sum of changes in public and private saving. The cumulative decline in public saving through 2011 is 1.58 percent of GDP from 2002 to 2011.³⁸

The tax cut will affect private saving in numerous ways. The net after-tax return to taxable saving will rise because of lower tax rates and higher interest rates. The new subsidies for education and retirement saving may also increase private saving. The distribution of after-tax income will shift toward high-income households, who tend to save more. If the elasticity of saving with respect to net-of-tax returns is 0.2, if half of all new education and retirement saving contributions are net saving, and if the shift in the distribution of income raises saving according to estimates in Dynan, Skinner, and Zeldes (2000), cumulative private saving will rise by 0.36 percent of GDP between 2002 and 2011 (see the Appendix).

Estate tax repeal may also affect private saving. The impact on saving by potential donors of wealth depends on why people give bequests, which remains a controversial subject (Gale and Slemrod 2001). Evidence suggests that higher estate taxes reduce donors' reported wealth, but the findings are fragile and may represent either tax avoidance or saving behavior (Kopczuk and Slemrod 2001, Holtz-Eakin and Marples 2001). For potential transfer recipients, evidence suggests that larger inheritances received raise consumption (Weil 1994, Brown and Weisbenner 2001). Thus, if higher estate taxes reduce saving by donors, bequests fall, which

³⁸ This figure is the ratio of the cumulative decline in the budget surplus (\$2,162 trillion, table 2) to projected GDP in 2002-11 (\$136,525 billion, CBO 2001b). The figure represents the decline in saving by the federal government. We ignore any induced effects on saving by state and local government.

reduces consumption (i.e., raises saving) by transfer recipients. As a result, both the sign and magnitude of the net effect of estate tax repeal on saving are unclear (Gale and Perozek 2001). Thus, we are unable to produce a defensible quantitative estimate of the effects of estate tax repeal on saving. Instead, we simply assume that estate tax repeal raises private saving by the same amount that it reduces public saving, 0.13 percent of GDP between 2002 and 2011.

Thus, we estimate that EGTRRA raises cumulative private saving by 2011 by 0.49 ($=0.36+0.13$) percent of GDP between 2002 and 2011, or about one-third of the cumulative decline in public saving. As a result, cumulative national saving falls by 1.09 ($=-1.58 + 0.49$) percent of GDP from 2002 to 2011.

The change in national saving determines the change in the capital stock owned by Americans. The change in the capital stock employed within the United States depends on national saving and net international capital flows. Evidence suggests that, although gross international capital flows are large, net flows are significantly smaller and capital markets appear to be somewhat segmented (Feldstein 1994, Gordon and Bovenberg 1996). Over the long-term, between 25 and 40 percent of changes in national saving tend to be offset by net international capital flows (CBO 1997, Dornbusch 1991, Feldstein and Bacchetta 1991, Feldstein and Horioka 1980, Obstfeld and Rogoff 2000). Our base case assumption is that one-third of a decline in national saving is offset by net capital inflows. This implies that the capital stock employed domestically falls by -0.73 ($= -1.09 + 0.36$) percent of GDP between 2002 and 2011.

To convert the figures above to percentage changes in the capital stock, we multiply by 2.95, the ratio of estimated GDP from 2002 to 2011 divided by the estimated capital stock in 2011 (see the Appendix). This implies that the capital stock owned by Americans will fall by 3.22 percent by 2011 ($=2.95$ times the 1.09 percent of GDP decline in national saving) and the

domestic capital stock will fall by 2.16 percent (2.95 times the 0.73 percent of GDP decline in the sum of national saving and international capital flows.)

E. Net effects on economic growth

Table 7 presents estimates of the effects of EGTRRA on the size of the economy in 2011, based on parameterization of equation (2). We set $\alpha = 0.35$ and $\beta = 0.65$ based on recent averages of capital and labor shares in national income. The percentage change in labor supply and the capital stock is discussed above. Our specifications imply that EGTRRA will *reduce* GDP in 2011 by 0.3 percent. GNP declines by almost 0.7 percent of GNP. The calculations are documented in the appendix text and appendix table 3.

The intuition behind these results is noteworthy. Our results do *not* show that reductions in tax rates have no effect, or negative effects, on economic behavior. Rather, the improved incentives—analyzed in isolation—unambiguously increase economic activity, by raising labor supply, human capital, and private saving. Indeed, these factors raise the size of the economy in 2011 by almost 1 percent. But EGTRRA is a set of tax incentives *financed by reductions in public saving*. The key point for understanding the growth effects is that the tax-induced increase in private saving is only a small fraction of the decline in public saving, so that national saving falls substantially. The decline in national saving reduces the capital stock, even after adjusting for international capital flows, by sufficient amounts to reduce GDP and GNP. Thus, the notion that aggregate tax cuts reduce national saving is central to our findings.³⁹

To gauge the sensitivity of the results, column 2 examines a substantially more optimistic scenario. In this scenario, we double the estimated effect of EGTRRA on private saving and

³⁹ Lindsey (2001) argues against this view, claiming instead that “the facts show that raising taxes in the 1990s generated a decline in national saving.” Gale and Sabelhaus (1999) show, however, that Lindsey’s assertion is flawed: national saving—defined conventionally or in economically more satisfactory ways—rose after 1993.

human capital, and assume that international capital flows offset two-thirds of any decline in national saving. In this case, GDP rises by 0.38 percent after a decade. It is worth noting, however, how large the behavioral responses have to be to obtain this result. The saving elasticity is set at 0.4, consistent with Boskin (1978), the highest estimate in the literature. The share of 401(k) contributions that represents net saving is set at 100 percent, consistent with Poterba, Venti, and Wise (1995), the highest estimate in the literature. The private saving response due to the changing distribution of after-tax income is twice the effect estimated by Dynan, Skinner, and Zeldes (2000). The response of international capital flows is well outside the range of historical experience. All of these results are at or beyond the limits of established research findings.⁴⁰

We therefore view each individual response as unduly optimistic and the likelihood that all of them hold simultaneously as extremely unlikely. Nevertheless, even with these behavioral assumptions, cumulative national saving falls by 0.6 percent of GDP over the decade, the annual growth rate of GDP would only be 0.04 percentage points higher over the decade, and national income—GNP—would remain virtually unchanged. For purposes of long-term national welfare, GNP is more relevant than GDP, because capital inflows have to be paid back in the future and therefore represent a mortgage against future output.

Thus, our central estimate suggests that EGTRRA will reduce the size of the economy by 2011. Even in what we view as a very optimistic scenario, the estimated effect on GDP after 10 years is only 0.4 percent and there is no impact on national income.

F. Other perspectives on taxes and growth

⁴⁰ In addition, the private saving response to estate tax repeal has to be double the estimated gain in tax savings and the share of the tuition deduction that goes to new students has to be twice what we estimate based on Dynarski (1999, 2000). These behavioral estimates, however, are not as rigorous as the others noted in the text.

Our methodology for estimating growth effects is similar to Engen and Skinner (ES, 1996). Yet ES find that a hypothetical immediate, permanent 5 percentage point reduction in income tax rates would raise annual growth rates by 0.28 percentage points for 10 years, while we find virtually no effect on growth from EGTRRA. The main difference between the two studies is that we include the impact of lower public saving and hence lower national saving on capital accumulation. There are also differences in the direct impact of tax incentives. For hours worked, our findings are similar to ES. For human capital, ES cite Trostel (1993) to estimate that tax cuts would increase human capital sufficiently to raise the annual growth rate by 0.10 percentage points. We believe an effect of this size is highly unlikely for EGTRRA, for reasons discussed above and in the Appendix.⁴¹ ES also find that their tax cut would fuel sufficient research and development to raise the growth rate by .075 percentage points. We see no impact of EGTRRA through this channel. ES predict increased investment, whereas we project a decline, due to higher interest rates.

Our conclusion that EGTRRA is likely to have no significant impact on the level of economic activity after 10 years conflicts with claims that tax cuts are a potent tool for raising growth (Calomiris and Hassett, this volume; Jones et al 1993; National Commission on Economic Growth and Tax Reform 1996). In light of this controversy, we present eight additional perspectives, each of which suggests the growth effects are likely to be small.

First, historical data show huge shifts in taxes with no observable shift in growth rates (table 8). Most strikingly, from 1870 to 1912 the U. S. had no income tax and tax revenues were just 3 percent of GDP. From 1947 to 2000, the highest income tax rate averaged 66 percent and

⁴¹ Also, it is worth noting that Trostel (1993) obtains large increases in human capital under tax rate cuts that are financed by increases in lump sum taxes. But using the same model, Trostel (1995) obtains large declines in human capital accumulation if the tax rate cuts reduce public saving and raise interest rates. The latter paper models a more plausible description of EGTRRA than the former.

revenues were 18 percent of GDP. Nevertheless, the growth rate of real GDP per capita was identical in the two periods. In formal tests, Stokey and Rebelo (1995) find no evidence of a break in growth patterns around World War II. Obviously, many factors affect economic growth rates, but if taxes were as crucial to growth as is sometimes claimed, the large and permanent historical increases in tax burdens and marginal tax rates should appear in growth statistics.

A second approach comes from studies of the impact of previous tax reforms on growth. Feldstein (1986b) and Feldstein and Elmendorf (1989) find that the 1981 tax cuts had virtually no net impact on economic growth. The 1981 tax cut, like EGTRRA, featured marginal tax rate cuts and significant reductions in national saving.

A third approach examines the growth effects of fundamental tax reform. Altig et al (2001) develop the most complete model of tax reform and find that the flat tax with transition relief would raise national income by 0.5 percent after 15 years.⁴² EGTRRA cuts marginal tax rates by far less than conversion to a flat tax would, and EGTRRA reduces national saving while the flat tax modeled in Altig et al (2001) does not. Thus, the Altig et al (2001) estimates provide very generous upper bounds on EGTRRA's effects on growth.

A fourth approach uses results from large-scale simulation models. CBO (2001b) concludes that EGTRRA may raise or reduce the size of the economy, but the net effect is likely to be less than 0.5 percent of GDP in 2011, even if the sunset is repealed. A simple extrapolation based on published results from the Federal Reserve Board model of the U.S. economy implies that EGTRRA will raise GDP by between 0.12 percent and 0.16 percent after 10 years.⁴³

⁴² The results with transition relief are most comparable to income tax cuts. Without transition relief, converting to a flat tax imposes a one-time lump-sum tax on existing capital that generates a significant impact on growth estimates. EGTRRA features no such lump-sum taxes. See also Auerbach (1996), Joint Committee on Taxation (1997), and Judd (2001).

⁴³ Reifschneider et al (1999) show that in the Fed model a permanent 1 percent of GDP increase in federal income taxes reduces the size of the economy by 0.1 percent after 10 years, if the Fed follows a Taylor (1993) rule for

A fifth source is simulations based on endogenous growth models. Jones et al (1993) estimate that removal of all taxes would raise growth rates by 8 percentage points! Even a cursory glance at table 8 rejects this conclusion. Stokey and Rebelo (1995) show that the result is sensitive to a number of parameter choices and that the most defensible parameter values imply that flatter tax rates have little impact on growth.⁴⁴ Lucas (1990) obtains a similar result.

A sixth approach uses estimates of how income responds to tax changes. Gruber and Saez (2000) estimate an elasticity of “broad income”—a measure that includes more income than AGI—with respect to net-of-tax returns is 0.12, and not statistically different from zero. Broad income comprises about 63 percent of GDP (Orszag 2001). Thus, EGTRRA’s 3 percent increase in net-of-tax returns will raise broad income by 0.36 percent and GDP by 0.23 percent. This overstates the effect, though, because some tax-induced rises in broad income—e.g., shifting income from corporations to households or from fringe benefits to cash income—do not raise GDP. Also, this estimate captures the behavioral response to improved tax incentives, but not the aggregate effect of declines in public saving.

The seventh approach uses results from aggregate studies of taxes, spending, and economic growth across countries. (See Slemrod (1995) for a masterly critique of this literature.) Evidence shows that pooling data from developed and developing countries is inappropriate because the growth processes differ (Garrison and Lee 1992, Grier and Tullock 1989) and that taxes have little or no effect on economic growth in developed countries. Mendoza et al (1997) and Garrison and Lee (1992) find no tax effects on growth in developed

monetary policy. By extension, a tax cut that reduces revenues by between 1.2 and 1.6 percent of GDP (table 2) should raise GDP by 0.12 to 0.16 percent after 10 years.

⁴⁴ Stokey and Rebelo (1995) find that Jones et al (1993) significantly overstate the elasticity of labor supply and depreciation rates for human and physical capital, all of which lead to overstatements of the impact of taxes on growth. In one simulation, for example, Jones et al (1993) find that labor supply broadly defined (specifically, non-leisure activities) would rise by 48 percent if taxes were repealed.

countries. Padovano and Galli (2001) find that a 10 percentage point reduction in marginal tax rates raises the growth rate by 0.11 percentage points in OECD countries. By extension, EGTRRA would raise growth by about 0.03 percentage points.⁴⁵ Engen and Skinner (1992) find significant effects of taxes on growth in a sample of 107 countries, but the tax effects are tiny and insignificant when estimated on developed countries.⁴⁶

The eighth approach simply asks economists what they think. In a recent survey of 134 public finance and labor economists, the estimated median effect of the Tax Reform Act of 1986 on the long-term size of the economy was 1 percent (Fuchs et al 1998). These findings are consistent with our results. TRA 86 did not reduce public saving, so the growth effect was entirely due to changes in tax incentives, which we estimate as just below 1 percent for EGTRRA (table 7). The median response also suggested that the 1993 tax increases had no effect on economic growth. The 1993 act raised tax rates, which reduces growth, but also increased national saving, which raises growth.

VI. Other economic effects

A. Interest rates

Under the conventional view of fiscal policy, increased public debt and deficits raise the overall supply of debt relative to demand, and thus reduce the price—that is, raise the interest rate or yield—on such debt.⁴⁷ However, under certain theoretical conditions, deficits do not

⁴⁵Folster and Henrekson (2001) find no tax effects on growth in OECD countries. When they extend the sample to include high-income, non-OECD countries, they find a significant effect. But the regressions using tax variables do not control for spending, so it is not clear what the tax variable is capturing.

⁴⁶Engen and Skinner (1992, table 4, column 4). Statistical insignificance might be attributed to the fact that there are only 21 developed countries, but several of the other variables—including investment rates, initial income, labor force growth, and government spending growth—continue to be estimated precisely in the sample of developed countries.

⁴⁷For excellent reviews of the issues regarding fiscal policy and interest rates, see Barro (1989), Bernheim (1987, 1989), Congressional Budget Office (1987), and Elmendorf and Mankiw (1999). We borrow the conventional view

affect interest rates. Barro (1974) shows that if links between households and their descendants are both operative and altruistic, changes in the timing of tax collections (i.e., tax cuts now followed by tax increases later) do not affect interest rates. Households foresee the increase in future tax liabilities and thus save the tax cut. Numerous tests of household saving behavior, however, conclude that households do not follow the dictates of this model (Bernheim 1989).

Even in the absence of Ricardian equivalence, deficits would not affect interest rates if the supply of financial capital from other countries were perfectly elastic. As discussed above, this does not appear to be the case. Indeed, even simulation models that are carefully designed to emphasize forward-looking expectations and open economy interactions find that changes in domestic fiscal policy have significant and lasting effects on domestic real interest rates (Bryant et al 1993, McKibbin and Bagnoli 1993, Taylor 1993).

Economic growth is a third reason why some deficits might not affect interest rates. If public debt, private wealth, the money supply, and domestic and foreign GDP all grow at the same (real) rate, and if no one's willingness to hold government debt changes, then the rise in the supply of debt over time would be matched by an equal rise in the demand for debt from domestic and foreign investors and the central bank, and interest rates would remain constant (McCallum 1984, Calomiris and Hasset this volume). Even under these conditions, however, tax policy changes that raise the growth rate of debt can raise interest rates by increasing the supply of debt relative to demand, and slower debt growth can reduce interest rates.

Empirical estimates are mixed, and "it is easy to cite a large number of studies that support any conceivable position" (Bernheim 1989). The main conclusion we draw from the empirical literature is the difficulty of pinning down the effects. First, identifying exogenous

terminology from Elmendorf and Mankiw.

variation in debt or deficit measures is difficult, raising questions about causality. Second, defining and measuring the government's net fiscal position is difficult (Auerbach, Gokhale and Kotlikoff 1992, Elmendorf and Mankiw 1999), but mismeasuring the fiscal position biases the results toward finding no effects of deficits on interest rates even if an effect exists. Third, interest rates are likely to depend on expected *future* outcomes, but data on expected outcomes are sparse.⁴⁸ Fourth, as Bernheim (1989) notes, interest rates are determined in general equilibrium. As a result, interest rate equations are either quasi-reduced form and thus subject to the Lucas (1976) critique, or they impose strong maintained assumptions that are not tested.⁴⁹

In light of these findings and the absence of any published findings on the impact of EGTRRA on interest rates, we summarize in table 9 the implied effects of the tax cut on real interest rates from several simulation models. We emphasize that the table reports our own interpretations and extrapolations based on findings that were developed in other contexts. The appendix summarizes our calculations.

The sources in table 9 employ a wide variety of methods and approaches. The CEAs use simplified calculations from aggregate growth frameworks. CBO and the Federal Reserve use large-scale simulation models that are among the most extensive and sophisticated in existence. The Taylor and McKibbin Sachs Global models are among the most highly regarded academic efforts to integrate rational expectations among market participants and detailed structural

⁴⁸ A notable exception in this regard is Feldstein (1986a), who finds that a 1 percentage point increase in the five-year projected ratio of budget deficits to GNP raises the long-term government bond rate by about 120 basis points.

⁴⁹ For these and other reasons, Elmendorf and Mankiw conclude (1999) that "...this literature...is not very informative. Examined carefully, the results are simply too hard to swallow." In particular, both Bernheim (1989) and Elmendorf and Mankiw (1999) note that Plosser (1982, 1987) and Evans (1987a, 1987b), which are often cited as evidence that deficits do not affect interest rates, suffer from several flaws (besides the generic ones listed above): the empirical findings are sensitive to sample period and specification; some of the results suggest negative effects of deficits on interest rates; the regressions explain only a small portion of the variation in interest rates; and the tests have little power against alternative hypotheses.

modeling of open economy financial and trade flows.

All of the estimates in table 9 suggest EGTRRA will raise long-term interest rates. The short-term effects are variable, with estimates between 10 and 60 basis points. The long-term effects are substantial, with all of the estimates indicating that long-term rates will rise by 75 basis points or more over 10 years, except the estimate using the methodology endorsed by the Bush Administration CEA (Hubbard 2001). That estimate generates small interest rate effects (34 basis points) because it relates interest rates to the *current* capital stock; it does not allow anticipated future tax cuts or changes in deficits to affect current interest rates (see the Appendix). The Fed model produces somewhat larger interest rate effects than the others because it assumes that monetary policy follows a Taylor rule. Under this rule, the Fed tightens the money supply after a tax cut and puts additional pressure on interest rates (Taylor 1993, Judd and Rudebush 1998).

In light of the difficulty of generating convincing empirical results, we believe the simulation results summarized in table 9 provide the best available evidence on how EGTRRA will affect interest rates.⁵⁰ We interpret that evidence as implying that EGTRRA raised long-term rates by between 10 and 60 basis points in its first year and will raise long-term rates by between 75 and 110 basis points over the next decade.

B. Investment and stock market valuations

By reducing marginal income tax rates and repealing the estate tax, EGTRRA will

⁵⁰ Recent trends in interest rates could in principle, but do not in practice, provide definitive information on the effects of EGTRRA. Recent long-term rates have been low relative to their historical values but high relative to short-term rates, even compared to other periods when the Fed was cutting short-term rates (Greenspan 2001c, 2002, Orszag 2002). Calomiris and Hassett (this volume) argue that recent trends in Japan and the United States show that public debt does not affect interest rates, but their analysis: compares gross debt for Japan to net debt for the U.S.; ignores accruing implicit liabilities and other adjustments; constructs real interest rate measures inconsistently across the two countries; and ignores several other general equilibrium determinants of interest rates, such as monetary policy, saving rates, and overall economic performance.

encourage investment. But the increase in interest rates noted above will serve to reduce investment. Using standard cost-of-capital formulas (see the Appendix), we show in table 10 that even small increases in interest rates outweigh the beneficial effect of lower tax rates on the cost of capital. We conclude that EGTRRA will raise the cost of capital and reduce investment.

Although the tax act does not change corporate taxes, lower individual tax rates on dividends reduce the corporate cost of capital. If interest rates are constant, corporate user costs would fall by 2.1 percent. If interest rates rise by 50 basis points, though, the corporate cost of capital will rise, especially for structures. EGTRRA will also affect the valuation of corporate stock. With no change in interest rates, the tax cut would raise price-to-earnings ratios by 1 percent, due to lower individual taxes. If interest rates rise by 50 basis points, EGTRRA will reduce price/earnings ratios by about 9 percent.

For sole proprietors, the cost of capital will generally rise if interest rates rise by 30 basis points or more.⁵¹ Estate tax repeal may boost investment by entrepreneurs, but these effects are uncertain (Gale and Slemrod 2001, Holtz-Eakin 1999).

EGTRRA *raises* the user cost of capital for housing for taxpayers that itemize their deductions, since interest rates rise and lower tax rates reduce the value of interest deductions.

The user cost of housing will also rise for non-itemizers if interest rates rise at all.

These findings suggest that EGTRRA will raise the cost of capital across many sectors of the economy and thus dampen investment. These results, of course, are qualitatively consistent with our earlier finding that EGTRRA will reduce the capital stock.

⁵¹ These conclusions are in sharp contrast to Carroll et al (1998) who find that lower tax rates after the Tax Reform Act of 1986 increased investment by small businesses. The difference in the results stems from the fact that Carroll et al hold interest rates constant, whereas we impute an increase in interest rates. Each assumption is appropriate for the tax cut considered: TRA 86 was revenue-neutral, whereas EGTRRA cuts public saving significantly.

The investment results also provide an independent way to verify the capital stock and interest rate effects obtained above. Specifically, we found that EGTRRA reduces *financing* for the domestic capital stock (national saving net of international capital flows) by 2.16 percent (appendix table 3) and raises interest rates by 75 to 110 basis points (table 9). If these estimates are roughly accurate, the decline in investment caused by interest rate increases in the range of 75 to 110 basis points should be sufficient to reduce the capital stock by about 2.16 percent. In the appendix, we show—using the cost-of-capital estimates in table 10—that an 80 basis point increase in interest rates implies that investment will fall enough to reduce the capital stock by 2.04 percent by 2011. If interest rates rise by just under 85 basis points, investment would fall sufficiently to reduce the capital stock by 2.16 percent.

These findings verify and link the results of EGTRRA for investment demand, investment financing and interest rates. Notably, the cost-of-capital methodology we use to calculate the change in investment is completely independent of our approach to examining the impact on national saving and net capital flows. Thus, the fact that the two approaches give similar results lends credence to the views that the capital stock will fall and interest rates will rise substantially due to EGTRRA.

C. Economic stimulus

A particular goal of EGTRRA was to spur the economy in the short-term (Bush 2001b), but it seems unlikely to have achieved that goal. Only a small share of the rebates was spent in a timely manner. The rebates were mailed between late July and late September, 2001. In August, personal disposable income rose by 1.9 percent, with the rebate responsible for much of the rise, but personal consumption expenditures rose by only 0.1 percent (Bureau of Economic Analysis 2002c). Shapiro and Slemrod (2001) report that only 22 percent of households receiving the

rebate expected to spend it.

The failure of the rebate to motivate much spending is somewhat surprising. Previous research has found significant responses to temporary rebates (Blinder 1981, Poterba 1988). The rebate was billed as the first installment of a permanent tax cut, and both theory and evidence suggest that the propensity to spend out of permanent tax cuts is higher than for temporary tax cuts (Friedman 1957, Souleles 2001). Shapiro and Slemrod (2001) present evidence suggesting that taxpayers doubt whether the tax cut will prove permanent.

More broadly, though, several factors suggest that the rebate was unlikely to stimulate the economy. First, discretionary tax policy has a weak record in stimulating short-term economic activity (Lindsey 1990, Modigliani and Steindel 1977, Taylor 2000). Second, the entire rebate equaled just 0.4 percent of GDP in 2001. Even if half of it were spent, the stimulus would have been small. Third, the Fed was engaged in expansionary monetary policy and possibly would have reduced interest rates by more if the rebates had not existed. If so, the net stimulus due to the rebate would be close to zero regardless of how consumers responded. Fourth, lower-income households have a higher propensity to consume out of current income than others.⁵² But 75 percent of households in the bottom income quintile and 37 percent in the second quintile did not receive a rebate (Citizens for Tax Justice 2001a). In addition, the rebate was paid as a lump sum whereas evidence suggests households are more likely to save lump-sums than other payments (Souleles 1999, 2001). Finally, other parts of EGTRRA due to be enacted after 2001 probably had a negative effect on short-run economic performance. Large, back-loaded tax cuts can hurt the economy in the short run. They do not generate much new aggregate demand because

⁵² Surveys undertaken by Shapiro and Slemrod (1995, 2001) do not show that lower-income households expect to spend more, but econometric analysis in Dynan, Skinner, and Zeldes 2000, Parker 1999, and McCarthy 1995 shows that marginal propensities to spend are higher among low-income households.

consumers do not spend tax windfalls until they receive them (Souleles 2001), but the cuts have an immediate impact on interest rates as noted above, and can thereby reduce investment.

D. Tax Complexity⁵³

The new tax law simplifies taxes in several ways. Lower tax rates simplify tax planning and compliance by reducing the incentive to avoid or evade taxes. Repealing the limitations on itemized deductions and the phase-out of personal exemptions will simplify taxes for some high-income taxpayers. Simplifying EITC rules and interactions between the child credit and the AMT will reduce compliance costs for some low- and middle-income households.

Despite these specific changes, the net effect of EGTRRA will be to significantly complicate overall tax compliance and planning.⁵⁴ The first problem relates to timing issues. As long as the sunset provisions remain in effect, taxpayers will face difficult planning choices. Variations in effective starting and ending dates and slow phase-ins for many provisions give taxpayers incentives to shift the level, form, and timing of income and deductions.

Second, the AMT is complex in itself, and uncertainty about its evolution adds further complications. As noted above, even under pre-EGTRRA law, the number of AMT taxpayers was scheduled to rise dramatically. EGTRRA not only did very little to fix this problem—offering only slight AMT relief for the first four years, when the problem is not particularly severe—it made the problem far worse and more expensive to resolve (table 3).

Third, although estate tax repeals sounds like simplification, in practice it may not be.⁵⁵ Even ignoring the sunset provisions—which would revoke estate tax repeal after 12 months—

⁵³This section is based on Burman and Gale (2001a) and Gale (2001b).

⁵⁴ Crenshaw (2001) summarizes the predominant effects aptly: “The new tax law doesn’t make planning unnecessary, it just makes it impossible...the new bill turns the tax code into a kind of perpetual motion machine, with rates shifting, benefits coming and going, provisions phasing in and out...”

⁵⁵ Kiefer et al (this volume) reach a similar conclusion.

both the transition to the new regime and the new regime itself create complexity. The legislated estate tax phase-out is slow and involves several significant changes to the exemption, the rates, and special provisions. This will make effective estate planning difficult between 2002 and 2009. The new regime will create additional problems. Under current law, when an heir receives an asset from an estate, the basis price is “stepped up” (increased to the current asset value). The new bill features “basis carryover:” heirs inherit an asset’s original basis price. Implementing carryover basis may raise some vexing issues. For example, some families would have to keep records for generations to keep track of asset purchase prices and improvements. A carryover basis provision was enacted in the late 1970s, but was repealed before it took effect because taxpayers complained about the new complexities and implementation problems (Bartlett 1999, Lav 2000). It is difficult to see why such issues would be significantly easier to deal with now.

A fourth area of concern is “choice complexity,” which occurs when taxpayers must choose among different tax subsidies.⁵⁶ EGTRRA increases choice complexity for retirement saving, the child credit, and—especially—education. Each dollar of higher-education spending may benefit from at most one of the following programs: education IRAs, section 529 plans, the HOPE credit, the lifelong learning credit, or the tuition deduction. It is not at all clear that the net social benefits of having so many choices outweighs the private time and monetary costs of determining the best options.

Finally, EGTRRA reduces prospects for future simplification efforts. Other things equal, political factors suggest that simplification would be easier to achieve as part of an overall tax cut than in a revenue-neutral change that raised some people’s taxes and lowered others’. However, EGTRRA puts significant pressure on the budget and hence reduces both the prospects

⁵⁶ We thank Al Davis for suggesting this terminology.

and the desirability of another significant tax cut.

E. Economic Efficiency

By reducing marginal income tax rates and repealing the estate tax, EGTRRA has a *prima facie* claim to raising efficiency, but the eventual efficiency gains may prove illusory. Even among those with positive tax liability, almost two-thirds will receive no marginal tax rate cut, and the projected changes in effective marginal tax rates are small (Kiefer et al, this volume). Some taxpayers will face *higher* marginal rates, because of the AMT.⁵⁷ Costs related to planning and income-shifting will rise, especially if the sunset and AMT provisions are not resolved quickly. The reduction in tax progressivity may reduce the implicit income-insurance provided by the tax system (Kniesner and Ziliak 2001, 2002).

More fundamentally, Barro (1979) shows that optimal tax policy would meet long-term revenue needs by smoothing marginal tax rates over time. Cutting tax rates initially only to raise them later is inefficient. If the financing problems created by EGTRRA force future tax rate increases, the most basic efficiency claims for the income tax rate cuts will be void.

Estate tax repeal also has efficiency consequences.⁵⁸ Standard optimal tax theory shows that alternative uses of labor income should be taxed at different rates only to the extent that the goods consumed are more or less complementary to leisure, which is untaxed. Consumption and bequests represent two uses of labor income, with the estate tax placing heavier burdens on bequests. On pure efficiency grounds, this would be optimal if and only if bequests were more complementary to leisure than lifetime consumption is. This strong theoretical conclusion,

⁵⁷ Kiefer et al (this volume, table 3) show that marginal tax rates will be the same or higher under EGTRRA than under prior law for a family of four with all income from wages at all income levels between \$42,000 and \$370,000, except for those with income between about \$77,500 and about \$80,000.

⁵⁸ The estate tax discussion is based on Gale and Slemrod (2001), who use insights from Kaplow (2001).

however, may be tempered by several factors. In particular, the efficiency implications of taxes on intergenerational transfers depend on why people give transfers and bequeath wealth, a factor that is not considered in the standard model mentioned above and is not well understood.⁵⁹

F. Government spending

Becker (2001) and others argue that the best reason for a tax cut is to reduce the official budget surplus and thereby restrict government spending. In the context of EGTRRA, this argument has three parts: spending is or would be too high without a tax cut; a tax cut is the best way to restrict spending; and EGTRRA is the best tax cut to achieve that goal. We examine each claim below.

Whether spending is too high must ultimately be based on judgments, but recent trends can provide useful information.⁶⁰ Federal outlays were 18.2 percent of GDP in 2000, the lowest share in 34 years (figure 3). Non-interest outlays show how much government spends on its current programs and were just 15.9 percent of GDP in 2000, the lowest share since 1957. Thus, government spending is hardly high relative to prior norms.

Would tax cuts effectively restrict spending? Past U.S. experience does not make a strong positive case.⁶¹ The tax cuts of 1964 and 1981 did not lead to sustained declines in spending (figure 3). From 1992 to 2000, tax revenues rose by 3 percent of GDP, but federal spending *fell* by 4 percentage points of GDP (figure 3, 3 percentage points if net interest is excluded). The decline occurred across all major components of government spending. Defense

⁵⁹ For example, to the extent that bequests are “unintended,” the estate tax is a highly efficient method of raising funds. In contrast, if households are altruistic, optimal policy may subsidize or tax gifts, depending on the availability of commitment mechanisms.

⁶⁰ Whether spending is too high is distinct from whether some spending is wasteful. It would be desirable to eliminate wasteful spending, regardless of how actual and optimal spending compare.

⁶¹ Becker (2001) discusses the experience in other countries. See also Becker and Mulligan (1998).

outlays were at their lowest share of GDP since before World War II. Other discretionary spending—the source of “pork”—was at its lowest share since at least 1964. Mandatory spending was at its lowest share of GDP since 1989 and the same as its share in the mid-1970s. Thus, the data suggest that declines in government spending relative to GDP helped *produce* the budget surpluses of the late 1990s, not that the revenue surge prompted massive spending.⁶²

It is not difficult to see why tax cuts may prove ineffective in restraining spending. About 70 percent of spending in 2000 was for social security, medicare, medicaid, defense, and net interest (CBO 2001a). A significant reduction in spending would require substantial cuts in these programs or massive cuts in others, both of which seem difficult politically. As a result, tax cuts represent a fiscal gamble: if the cuts do not effectively restrain spending, the government could find itself in a difficult fiscal position, as it did after 1981.

A better way to keep spending in check would be to reform the federal budget so that it reports outcomes similar to the available surplus measure used in table 3. Like tax cuts, this would reduce the reported surplus. Unlike tax cuts, reforming budget procedures would provide a more accurate picture of the government’s finances, and would not create deeper fiscal problems if it failed to restrain spending. Thus, if the goal is to restrict spending, budget reform would likely be at least as effective and significantly less risky than tax cuts.⁶³

Even if it is believed that tax cuts restrain spending and are preferred to budget reform,

⁶² Calomiris and Hassett (this volume) estimate that shocks to nominal revenue raise nominal discretionary spending by economically and statistically significant amounts between 1985 and 2000. Their methodology, however, assumes that all differences between forecast and actual spending are due to legislative changes, even though they could be due to inflation or other factors. In addition, the calculation of the spending “surprise” assumes the discretionary spending baseline is a realistic estimate of probable future spending, a notion that CBO (2001a) explicitly rejects. Lastly, it is worth noting that during the sample period they examine, positive revenue surprises predominated, yet non-defense discretionary spending fell by 14 percent relative to GDP (from 3.8 percent to 3.2 percent), while non-social insurance tax revenues rose by 13 percent relative to GDP (from 11.3 percent to 12.8 percent) (CBO 2002).

⁶³ Gale (2001a) outlines a proposal for budget reform. It seems plausible that the federal budget rules in effect

this does not support the features of EGTRRA. Government spending predominantly benefits low- and middle-income households (Steuerle 2001). On fairness grounds, a tax cut whose goal and/or effect is to cut spending should offset the negative impact on low- and middle-income households by giving them a disproportionately large share of the tax cut. EGTRRA, however, does just the opposite—it tilts benefits toward high-income households.

If tax cuts do reduce government spending, an important question is whether that decline raises GDP (Calomiris and Hassett 2001). Barro (1991) and others find cross-country evidence that government spending reduces economic growth, but a number of caveats apply. The results differ across developing and developed countries (Grier and Tullock 1989) and across types of spending. A number of econometric problems make disentangling the effects of government spending particularly difficult (Slemrod 1995). In addition, government spending was 15 percentage points higher as a share of GDP in the post-War era than before World War I, but real per-capita growth rates were the same in the two periods (table 8). Finally, spending may also affect other aspects of economic well-being (e.g., the environment) or the distribution of income. Hence, a full analysis of spending should account for more than just the impact on growth.

G. Dynamic revenue estimates

Feldstein (1995, 1998) and others argue that the standard revenue effects described earlier and used throughout this paper significantly overstate the cost of tax cuts because they do not include so-called “dynamic” responses, including the effects on economic growth and taxable income. In this section, we show that incorporating these factors and the effects on interest rates has little impact on the overall revenue effects.

Our results suggest EGTRRA will reduce the size of the economy slightly. This would

during the 1990s played an important role in restricting spending (Poterba 1997, Reischauer 1997).

normally reduce tax revenues, but we ignore this effect and thereby overstate the dynamic revenue estimates. Tax cuts can affect taxable income, however, even in the absence of economic growth. Feldstein (1995) finds elasticities of taxable income with respect to the net-of-income-tax rate as high as 2 to 3. Gruber and Saez (2000) show that others estimate elasticities between 0 and 0.8. They improve on previous methods and estimate an elasticity of 0.4. Since EGTRRA raises the net-of-income-tax rate by about 3 percent when fully phased in, the Gruber-Saez elasticity implies that taxable income will rise by 1.2 percent. With an average effective marginal tax rate of 25 percent, revenues would rise by 0.3 percent of taxable income, or 0.12 percent of GDP.⁶⁴

This overstates the amount by which the revenue effects need to be adjusted, for two reasons. First, the official revenue estimates already include estimates of how the timing and composition of income changes (JCT 1997). They do not include estimates of how labor supply or investment will change, but as noted above, we expect those changes to be small and negative, respectively. Second, the Gruber-Saez estimates are based on evidence from the 1980s, when individual rates fell below corporate rates, and thus may include significant shifting of income from corporate to non-corporate form. These shifts do not represent increases in overall taxable income (Slemrod 1996, Gordon and Slemrod 2000, Carroll 1998).

Despite these concerns, we assume that revenues would rise by 0.12 percent of GDP, based on the original Gruber-Saez estimate, or by about \$20 billion in 2011. Because the tax cut phases in slowly over time, we allow this response to grow linearly, starting from \$2 billion in 2001. The resulting cumulative rise in revenues is \$121 billion with \$29 billion in interest savings, thus increasing the surplus by \$150 billion through 2011.

⁶⁴ Taxable income averaged about 40 percent of GDP in recent years (Council of Economic Advisers 2002, Internal Revenue Service 2001).

We also address the effects of higher interest rates. CBO (2002) estimates that a 100 basis point increase in interest rates beginning in 2002 would reduce the surplus by \$246 billion through 2011. If EGTRRA raises interest rates by an average of 50 basis points over the decade, the surplus would fall by \$123 billion.

Thus, a simple dynamic revenue estimate reduces the estimated 10-year revenue loss by \$27 billion (150-123). This is a trivial amount relative to the estimated revenue loss and interest costs of \$2.16 trillion, and it is an overestimate for reasons noted above. Thus, incorporating dynamic revenue estimates has no effect on any substantive conclusion above.

VII. Conclusion

Our central conclusions are that EGTRRA reduces the size of the future economy, raises interest rates, makes taxes more regressive, increases tax complexity, and was fiscally unsustainable even before the economic downturn and the terrorist attacks slowed the economy in 2001. These conclusions are premised on the optimistic assumption that the sunset and AMT provisions are resolved quickly, simply, and equitably. The major bright spot for EGTRRA is that reductions in tax rates raise economic efficiency. But even that outcome may be diluted by increased tax complexity and the fact that most households will receive no marginal tax rate cut, and it could be reversed if the fiscal pressures that EGTRRA creates eventually result in tax rate increases.

These are, of course, preliminary conclusions, based on applying what is known from the existing economics literature to the features of EGTRRA. Over time, the availability of new data will provide a more reliable basis for analysis. In the meantime, however, even preliminary analyses can prove helpful in framing key questions, highlighting areas of concern, and shedding light on the likely implications of the tax act.

Appendix

This appendix provides supporting material for issues presented in the main text.

A. Hours worked

An enormous literature documents a small uncompensated elasticity of hours worked with respect to wages for American males. Pencavel (1986, tables 1.19, 1.21) lists 22 studies, all of which have elasticities between -0.17 and 0.21 . He offers a best point estimate of -0.10 , but notes the diversity and imprecision of the findings. Blundell and MaCurdy (1999) show that Hausman (1981), MaCurdy et al (1990) and Triest (1990) find uncompensated elasticities between 0 and 0.05. We set the elasticity at 0.05, consistent with the above literature and with the median response in a survey of 134 public finance and labor economists (Fuchs et al 1998).

Our specification is also consistent with evidence from the 1981 and 1986 tax changes. Bosworth and Burtless (1992) detect no impact of the tax changes for males. Eissa (1996b) estimates the changes raised male hours worked by 2 percent. Ziliak and Kniesner (1999) place the figure at 3 percent. The tax changes in the 1980s raised the net-of-tax rate $(1-t)$ by a much greater percentage than EGTRRA did for two reasons: marginal rates were higher, and the percentage reduction in tax rates was larger, in the 1980s than in 2001.⁶⁵ Thus, the expected impact of EGTRRA on labor supply should be significantly smaller than in previous tax changes.

The overall labor supply elasticity for women is the sum of elasticities of participation and of hours worked among workers. Killingsworth and Heckman (1986) show that overall elasticities are larger and more uncertain for married women than for men. They also find that

⁶⁵For example, the highest tax rate on labor income was 50 percent in 1980 and 33 percent after the 1986 changes phased in. This raised the after-tax wage by 34 percent (from .50 to .67 of the pre-tax wage). In contrast, even accounting for the PEP and Pease changes, EGTRRA will reduce the top tax rates from about 42 percent to 35 percent, a 12 percent increase in the after-tax return. See Burman, Gale, and Weiner (1998) and Poterba and Mitrusi (1999) for changes in tax rates in the 1980s and the 1990s and Hausman and Poterba (1987) for the distribution of tax changes in the 1986 act.

most of the response is due to participation effects, and that the most careful studies (e.g., Mroz 1987) often find very small elasticities for hours worked among workers, with estimates as low as 0.1. Triest (1990) finds overall elasticities of 1.0 for samples of working and non-working married women, and hours elasticities of 0.2 and 0.3 when the sample is restricted to workers. Eissa (1995) uses the 1986 tax changes to estimate that women married to husbands who are in the top 1 percent of the income distribution have an overall labor supply elasticity of about 0.8, divided roughly equally between participation and hours responses. Eissa (1996a) finds no effects on hours worked, and participation elasticities between 0.3 and 0.8, in analysis of the 1981 tax cuts. Meyer and Rosenbaum (2001) estimate an elasticity of labor force participation with respect to the net return from working of 0.83 to 1.07 for single women. They find small and insignificant effects on hours worked among workers.

For female workers, we set the elasticity of hours with respect to wages at 0.3 for full-time workers, based on Mroz (1987), Triest (1990), and Eissa (1995, 1996a), and 0.8 for other workers, based on Meyer and Rosenbaum (2001), Eissa (1995, 1996a) and Triest (1990).

B. Human capital accumulation⁶⁶

We develop two rough estimates of how the tuition deduction and the extension of the exclusion for employer-paid education benefits will affect human capital accumulation. Both estimates are rough, but they provide remarkably similar, small estimates of the impact of EGTRRA on human capital.

The first estimate proceeds in several steps. First, the expected revenue loss is \$39 billion if the two programs are extended through 2011 (JCT 2001c, 2001e). Applying an effective tax rate of 25 percent implies that expected qualifying tuition expenditures equal \$156

⁶⁶ This section is based on Kane (1994, 1995, 1999), Dynarski (2000) and McPherson and Schapiro (1997).

billion. We use a relatively high tax rate of 25 percent rate because households facing marginal federal income tax rates of 15 percent or less would benefit more from either the Hope or the Lifetime Learning tax credits than the tuition deduction. Thus, users of the tuition deduction are likely to be families with income high enough to be in the 28 percent bracket prior to EGTRRA but low enough to be under the income caps for the program.

Second, Dynarski (2000) shows that 20 percent of the benefits of a Georgia scholarship aimed at students from middle- and high-income households accrued to students who would not have attended college otherwise. She notes that an even larger share would likely go to inframarginal students under a federal program. One reason why is that college attendance rates in Georgia were 30 percent lower than in surrounding states. If college attendance rates were the same in Georgia as in the surrounding states, and the estimated program effect was the same as Dynarski estimates, about 15 percent of the benefits of the Georgia scholarship would have accrued to families of students who would not have attended college otherwise. Dynarski (2000) also notes other reasons why a federal program would generate a smaller marginal effect than a state program. Most importantly, the legislative body that sets financial aid rules in a state also has control over state-run educational institutions. For a federal program, any such control is much weaker. Hence, Dynarski speculates that state governments and institutions of higher education would be able to appropriate a larger share of the benefits of a federal program via changes in their own tuition and financial aid rules.⁶⁷ We assume these factors reduce the share of funds going to new students by half, implying that new students would account for 7.5 percent of qualifying tuition expenditures, or \$11.7 billion.

Third, using the growth rate of tuition and fees based on data from 1990 to 1996, we

⁶⁷ See also McPherson and Schapiro (1997), who suggest that federal higher education subsidies are most aptly viewed as federal grants to states, and who outline how financial aid rules would likely change.

project overall tuition expenditures of \$1,416 billion between 2002 and 2011, not counting the impact of EGTRRA (U.S. Bureau of the Census 2000d). Thus, we estimate the tuition deductions will raise net tuition expenditures by 0.83 percent ($11.7/1,416$) over the next decade. This implies (loosely) that the cohort that attends college between 2002 and 2011 will have 0.83 percent more education than otherwise. If this 10-year cohort is considered one quarter of the labor force and possesses one quarter of the human capital, this implies (very loosely!) that aggregate human capital rises by 0.21 percent.

Our second estimate also proceeds in several steps. First, we note the observation in Dynarski (1999, 2000) that several studies have found that a \$1,000 increase (in 1998 dollars) in financial aid raises college enrollment rates of the affected group by about 4 percentage points. Second, we note that, presumably by coincidence, the value of the tuition deduction will be up to roughly \$1,000 per user. Only students or families who are in the 28 percent bracket or higher and who have income below the program caps—\$130,000 in 2002-3 or \$160,000 in 2004-5—will use the tuition deduction. For these households, the net value will be about \$1,000, since the deduction is capped at \$3,000 in 2002-3 and \$4,000 in 2004-5 and $.28 * 3,500 = 980$. Thus, ignoring the difference between 1998 dollars and 2002 dollars and following Dynarski (1999, 2000), we assume the deduction raises the enrollment rate of high-income students (defined to include both students who have income and students from high-income families) by four percentage points.

Third, we estimate the share of students whose tuition expenditures will qualify. One method for doing so examines the income level of students. Our extrapolations from Digest of Education Statistics 2000, table 317, imply that about 20 percent of students will use the deduction. A second method looks at the share of tuition payments that qualifies for the

deduction, which we project to be 11 percent (\$156 billion/\$1,416 billion) and doubling it to account for the fact that qualifying tuition is capped. This generates an estimate that 22 percent of students would qualify. Fourth, a 4 percent increase in the enrollment rate of the roughly 21 percent of students who would benefit overall enrollment by 0.84 percent, a figure that is remarkably close to the 0.83 percent increase obtained in our first approach.

Simulation models provide interesting but contradictory information about taxes and human capital. Judd (2000) finds that a 10 percent cut in the cost of acquiring human capital generates up to a 6 percent increase in steady state output. Likewise, Trostel (1993) finds that lower income tax rates financed by lump sum taxes raise human capital accumulation. Trostel (1995), however, using the same model, finds that income tax cuts financed by higher deficits sharply *reduce* human capital accumulation, because of the effect on interest rates. The last model, of course, captures the features of EGTRRA most closely. All of the models above use infinitely-lived agents, which seems inappropriate, since human capital—unlike physical capital—disappears when a person dies. In contrast, Heckman et al (2000) use an overlapping generations model and find that large changes in tax policy—including a flat tax and fully deductible tuition—have little impact on human capital accumulation or economic growth in general equilibrium.

C. Private Saving

Higher interest rates and lower tax rates will raise the after-tax returns to saving and will raise saving. If the pre-tax rate of return rises by 80 basis points (table 9), from 7 percent to 7.8 percent, the net-of-income-tax rate on interest income rises by 3 percent (table 6), the saving elasticity is 0.2 (an average of 0.4 (Boskin 1978) and zero (Howrey and Hymans 1978)), and personal saving is 3 percent of GDP (which is larger than in recent years), personal saving would

rise by 0.09 percent of GDP due to higher after-tax returns. This estimate assumes that EGTRRA is fully phased in immediately. Accounting for the scheduled phase-in of provisions would cause only a slight downward adjustment in the estimated impact, which we ignore.

Households with higher income tend to save more, so the regressive nature of the tax cut is likely to raise saving. To calculate the impact, we use estimated propensities to save by income group from Dynan, Skinner, Zeldes (DSZ 2000). DSZ estimate the median average propensities to save by income groups. To use their results, we are forced to assume that these findings also represent the mean marginal propensities to save. DSZ (tables 3, 4, and 5) present 17 saving equations with varying data sets, instruments, and saving definitions. We use the three equations that estimate active saving from the PSID because DSZ (table 2) show that this saving measure generates average saving propensities equal to observed NIPA saving rates during sample time period. Applying the distribution of the tax cut in table 5 above to the saving rates by income class in DSZ implies that between 6.3 percent and 8 percent of the tax cut would be saved. Since the tax cut is about 1.2 percent of GDP, this implies that private saving will rise by between 0.076 percent and 0.096 percent of GDP. We use the larger figure.

The new incentives for saving for college and retirement could increase private saving as well, but the bill is not well-targeted for that purpose. Evidence suggests that saving incentives have much smaller impacts on the net saving of high-income households than low-income households (Benjamin 2001, Engelhardt 2001, Engen and Gale 2000). Yet EGTRRA features increases in contribution limits, which will mainly help only those who contribute to the limit already. Almost all of these households have high income (Gale and Scholz 1994, General Accounting Office 2001). A second potential problem is that the increase in IRA limits may reduce pension coverage among workers in small businesses, since the increase will make it

easier for small business owners to meet their own retirement needs through IRAs without incurring the costs of setting up a pension plan. The tax credit for pension saving by low- and moderate-income households has more promise to raise saving, but it is not refundable and so will be unavailable to many households.

To estimate the effects of the education and retirement provisions on saving, we note that the expected revenue costs are \$66 billion if all of the provisions are extended through 2011 (JCT 2001c, 2001e). If the contributions are deductible at a 25 percent tax rate (the marginal tax rate on interest income in table 6), the implied contributions are \$264 billion. We assume half of the contributions represent new private saving. This is a rough average of the extreme findings in Benjamin (2001), Engelhardt (2001), Engen and Gale (2000), Pence (2001), and Poterba, Venti, Wise (1995), who find, respectively, that 50, 0, 30, 0 and 100 percent of 401(k) contributions are net saving. The share of contributions induced by EGTRRA that represent net additions to private saving is likely to be lower than the average 401(k) contribution since almost all of the new contributions will come from people who are already contributing to the limit. In any case, with our assumption, which we believe overstates the net saving effects, net saving rises by \$132 billion, or just under 0.10 percent of GDP over the decade.

The three items noted above raise contributions to private saving by 0.29 percent of GDP ($=.09+.10+.10$). Rather than attempting to estimate the interest accruals on these contributions, we simply assume that the ratio of contributions to interest accruals for private saving is the same as the ratio of revenue loss to interest expense for the federal government in table 2. This implies that total private saving rises by 0.36 percent of GDP over the decade.

D. Net effects on economic growth

The impact on economic growth is determined by plugging values into equation (2). To

calculate α and β , we define income following Elmendorf and Mankiw (1999) and obtain $\alpha = 0.35$ and $\beta = 0.65$ based on recent years' data.⁶⁸ Our estimates of the increase in labor supply are given in the main text and the appendix above.

To calculate the percentage change in the two capital stock measures, we multiply (a) the estimated change in the capital stock measure as a share of GDP from 2002 to 2011, by (b) projected GDP from 2002 to 2011, and then divide by (c) the projected capital stock in 2011. The change in the capital stock measures as a share of GDP is derived in the text and appendix above. Estimated GDP for 2002 to 2011 is \$136,525 billion (CBO 2001b, table 1-2). Our estimate of the capital stock in 2011 under pre-EGTRRA law is \$46,200 billion. This equals the product of estimated 2011 GDP (\$16,935 billion, CBO 2001b), the ratio of national income plus depreciation to GDP (which has been roughly constant at 0.88 in recent years, footnote 68), and the ratio of the capital stock to the sum of national income plus depreciation (which has been 3.1 in recent years, footnote 68).

Appendix table 3 shows details of the calculations of the capital stock measures and changes in GDP and GNP. The growth effects can be separated into effects of the decline in public saving, the role of international capital flows and the impact of tax incentives. For example, the effect of lower public saving is $\alpha*(-1.58 \text{ percent})(2.95) = -1.63 \text{ percent}$, where the first number is the decline in public saving as a percent of GDP from 2002-11 and the second is the ratio of GDP in 2002-11 to the capital stock in 2011. The tax incentives raise GNP and GDP

⁶⁸ Gross capital income is defined as the sum of proprietors' income, rental income and corporate profits, all with inventory and capital consumption adjustments, plus net income, plus depreciation and amortization for corporations and non-farm sole proprietorships. Gross income is national income plus depreciation and amortization for corporations, nonfarm sole proprietorships and partnerships. The capital stock is produced assets (see Bureau of Economic Analysis (2002a) Tables 1.14, 5.16, 8.22). Some data for depreciation and amortization are unavailable (1999 and 2000 for corporations and 2000 for other entities). We impute these values by assuming that the ratio of depreciation and amortization to capital stock was the same in those years as the average in the preceding five years.

by $\alpha \cdot (0.49) (2.95) + \beta (0.69) = 0.95$ percent.

E. Interest rates

To allow for extrapolations of interest rate effects based on other studies, we note that EGTRRA (with sunsets repealed and AMT provisions resolved) can be described as: (a) a reduction in *tax revenues* averaging 1.2 percent of GDP over the first 10 years and 1.6 percent in the long run, (b) a reduction in the cumulative *budget surplus* of 1.5 percent of GDP over 10 years, or (c) an increase in *public debt* of \$2.16 trillion after 10 years.

Reifschneider et al (1999, table 4) use the FRBUS model and find that a permanent tax increase of 1 percent of GDP would reduce the real federal funds rate by 20 basis points after 1 year and 70 basis points over 10 years. By extension, a tax cut of 1.2 percent of GDP would raise the federal funds rate by 24 basis points after 1 year and 84 basis points after 10 years. Using the estimated changes over time in the federal funds rate and the expectations theory of the term structure (as described in Reifschneider et al 1999), the implied yields on 10-year bond rates rise by 60 basis points in the first year and by 84 basis points after 10 years. For a tax cut of 1.6 percent of GDP, all of the interest rate figures are one-third higher.

CBO (1995) estimates that reducing cumulative deficits by 2.2 percent of GDP between 1996 and 2002 would reduce yields on 10-year Treasury bonds by 20 basis points after 1 year and 170 basis points after 5 years. We estimate that the policy CBO examined would reduce deficits by 2.6 percent of GDP over 10 years,⁶⁹ and adjust the interest rate results above by 1.5/2.6 to obtain the figures in table 9.

⁶⁹ CBO (1995, Tables B-1 and 4) provides deficit reduction figures for 1996 to 2002 and projected GDP for 1996 to 2000. We develop our projection in several steps. First, because projected nominal GDP growth is between 5.14 percent and 5.24 percent each year from 1997 to 2000, we project a 5.2 percent growth rate through 2005. Second, we note that the deficit reduction package, as a percentage of GDP, is 0.5, 1.0, 1.4, 2.3, 2.7, 3.1, and 3.4 from 1996 to 2002. We extrapolate that the package would be worth 3.7, 4.0, and 4.3 percent of GDP, respectively, in the next three years. Third, using these numbers, the implied cumulative deficit reduction over the 10-year period is 2.6 percent of the implied GDP figure.

Taylor (1993, table 7.4) estimates that a permanent decline in government spending that grows to 3 percent of GDP over 5 years and averages 2.4 percent of GDP over 10 years reduces real long-term rates by 100 basis points after 1 year and 150 basis points after 5 years. We obtain the figures in table 9 by multiplying these figures by 1.2/2.4.

McKibbin and Bagnoli (1993, table 1, figure 3) use the McKibbin Sachs Global model to estimate that a cumulative decline in deficits of 2.6 percent of GDP would reduce 10-year bond rates by 160 basis points over 10 years. Thus, a tax cut that raised deficits by 1.5 percent of GDP would raise 10-year bond yields by 92 basis points.

The Council of Economic Advisers (1994) under the Clinton Administration uses the Solow growth model to conclude that an increase in government saving that totaled about 1.5 percent of GDP over the first 10 years would reduce long-term rates by about 110 basis points after 10 years.⁷⁰ By extension, a tax cut that reduces government saving by 1.5 percent of GDP over 10 years would raise long-term rates by 110 basis points. The CEA also estimates, using the same model, that raising government saving by 1.75 percent of GDP would reduce interest rates by 200 basis points in the long-term. Thus, a permanent tax cut of 1.6 percent of GDP would raise long-term rates by at least 182 basis points ($=1.6*200/1.75$). The full effect—including interest costs—would be larger, but is not estimated.

Hubbard (2001) invokes research by Elmendorf and Mankiw to estimate that a bill passed by the House of Representatives in October 2001 would raise “long-term” interest rates by

⁷⁰ We obtain this estimate as follows. According to the CEA, 40 percent of an increase in government saving is offset by reduced capital inflows, and the remaining 60 percent is channeled into new investment. They assume that investment rises, relative to baseline, by 0.4, 0.7, and 0.8 percentage points of GDP in the first three years after the policy that increases government saving is announced and by 1 percentage point of GDP thereafter. We divide these figures by (1-0.4) to obtain the implied increase in government saving, which turns out to be 1.5 percent over the decade. The reduction in interest rates is based on CEA (1994, p. 85), which notes that interest rates fall by 100 basis points after 8 years in the policy they examine. Chart 2-15 (page 86) indicates that the decline is roughly linear in that time frame, so that 110 basis points is a lower bound for the size of the interest rate effect after 10 years.

between 3 and 5 basis points. Elmendorf and Mankiw note that if the economy is represented by a Cobb-Douglas production function with α as the coefficient on capital, the gross marginal product of capital can be written as $MPK = \alpha Y/K$, where Y is current output and K is the current capital stock.⁷¹ This formula relates changes in the current capital stock to changes in interest rates. The approach is simple, but has an important shortcoming: anticipated future changes in the capital stock have no effect on interest rates in this formulation. Thus, the model implicitly ignores the existence of forward-looking behavior by market participants.

To apply this approach, we estimate the effects of EGTRRA on interest rates in 2011. We set $\alpha=0.35$. Following Elmendorf and Mankiw (1999), we define Y as national income plus depreciation. We estimate that $Y = \$14,903$ —the ratio of national income plus depreciation to GDP (.88 in recent years) multiplied by the CBO (2001b) projection of GDP (\$16,935 billion). As noted above, we estimate that $K = \$46,200$ billion. These values imply $MPK = 0.1129$ before EGTRRA. Under the base case listed in table 7, EGTRRA would reduce the domestic capital stock by \$996 billion ($= 0.0073 * \$136,525$ billion) by 2011. This reduces K to \$45,204 billion and raises MPK to 0.1154, an increase of 25 basis points. Note that this ignores the impact on interest rates of any future deficits caused by the tax cut.

We also estimate a long-term effect of EGTRRA. To avoid having to project a long-term GDP level, we use Y and K for 2011 and assume that the tax cut was 1.6 percent of GDP per year from 2001 to 2011. This implies a decline in revenues of \$2,349 billion and a decline in total public saving of \$3,084 billion, or 2.26 percent of GDP from 2002 to 2011. Private saving would rise by 0.76 percent of GDP,⁷² so national saving would fall by 1.50 percent of GDP and,

⁷¹ We thank Doug Elmendorf for several clarifying discussions.

⁷² Private saving rises by 0.09 percent of GDP due to higher after-tax returns—this is the same effect as in the base case, because that effect assumed EGTRRA was fully phased in immediately. Private saving rises by 0.10 percent

adjusting for capital inflows, the domestic capital stock would fall by 1.00 percent of GDP, or \$1,365 billion. Thus, after the reform, $K = \$44,835$ ($= 46,200 - 1,365$) and $MPK = .1163$, an increase of 34 basis points over the original value.⁷³ Like the previous estimate, this ignores the impact of any tax cuts after 2011 on interest rates.

F. Investment and stock market valuations

Equity-financed corporate investments are taxed at the corporate and individual level, and the cost of capital is given by:

$$C = (1-z\tau) (r+d)/(1-t_E) (1-\tau).$$

where z is the present value of depreciation deductions per dollar of investment, τ is the corporate tax rate (.35), r is the required after-tax return, d is the rate of economic depreciation, and t_E is the average marginal individual income tax rate on returns to corporate equity. To estimate the effects of EGTRRA, we set t_E as the average of the tax rate on dividends and on capital gains from Kiefer et al (this volume, table 5) and use values from before and after EGTRRA. We set r at 0.07 before EGTRRA and consider different changes in interest rates. For equipment, $z=0.83$ and $d=0.15$; for structures $z=0.54$ and $d=0.03$.

For sole proprietors, the cost of capital for an equity-financed project is

$$C = (1-zt) (r+d) / (1-t)$$

of GDP due to the retirement and education saving incentives—this is the same as in the base case because those incentives were assumed to be fully phased in the base case. Private saving rises by 0.13 percent (.08*1.6 percent of GDP) due to the shift in after-tax income—this is higher than the base estimate of 0.10 because the overall tax cut is larger in this case. Thus, total contributions to private saving rise by 0.32 percent. Applying interest on those contributions in the same proportion as federal interest payments to federal revenue losses implies that the income tax changes raise private saving by 0.38 percent of GDP. Immediate repeal of the estate tax would raise private saving by the revenue cost of the repeal, or 0.38 percent of GDP (based on CBO 2001a, 2002).

⁷³ Using this methodology, we are able to replicate Hubbard's findings. JCT (2001g) estimates that the tax bill discussed by Hubbard would reduce revenues by \$159 billion over 10 years. With the added interest costs, we calculate the total reduction in the surplus (increase in public debt) would be \$260 billion. Assuming that roughly half of this reduction turns into a reduction in the capital stock (consistent with table 3), K falls to \$46,070 billion and MPK rises to 0.1132, an increase of 3 basis points.

where t is the effective marginal personal income tax rate, and r , z , and d are defined above. To obtain the results in table 10, we use values of t pre- and post-EGTRRA from table 7 for sole proprietors and adjust r by varying amounts.

The user cost of capital for owner-occupied housing is given by:

$$C = (1-I*t_D) (i+t_p) + x,$$

where I is a indicator for whether the household itemizes, i is the nominal mortgage interest rate (we assume $i=.10$ under pre-EGTRRA law), t_D is the marginal tax rate against which itemized deductions are taken, t_p is the local property tax rate, and x is the sum of depreciation, risk premium for housing investments, and maintenance less expected inflation. Following Poterba (1990), we set $t_p = .02$ and $x = .049$. We consider values of t_D pre- and post-EGTRRA (Kiefer et al, this volume, table 5).

The value of a corporate stock is the after-tax income received by shareholders after all corporate income and individual income taxes. Price-to-earnings ratios for stocks may be approximated by

$$P/E = (1-(1-\phi)t_E) (1-\tau) / (r-g),$$

where t_E , τ , and r are defined above (we assume $r=.07$ under pre-EGTRRA law), g is the real growth rate of pre-tax earnings ($=.025$), and ϕ is the share of stocks held by tax-exempt entities (pensions and non-profits, e.g.). The results in the text assume that $\phi = 0$, but are not sensitive to the assumption that $\phi = 0.5$.

The text notes that if interest rates rise by 80 basis points, changes in investment would reduce the capital stock by 2.04 percent after 10 years. This result is obtained by multiplying four items for each type of capital (equipment, structures, and housing), and summing across capital types. The four items are (a) the share of that form of capital in the aggregate capital

stock; (b) the percentage change in user cost; (c) the elasticity of the desired capital stock with respect to the user cost; and (d) the amount of adjustment toward the desired capital stock that occurs within 10 years. For (a), equipment, structures, and housing account, respectively, for about 16, 24 and 38 percent of the aggregate U.S. capital stock—the rest being government capital (U.S. Bureau of Economic Analysis 2002b). For (b), with a 80 basis point increase in interest rates, we assume, based on table 10, that user costs rise by 2 percent, 6 percent and 5 percent for equipment, structures and housing, respectively. For (c), we note that the elasticity of the long-run desired capital stock with respect to the user cost of capital is 1 in Cobb-Douglas models (Hall and Jorgensen 1967). For (d), we assume that equipment adjusts fully to its new desired capital stock within 10 years. Because of longer active lives, capital stocks for structures and housing adjust more slowly. We assume that structures and housing adjust 75 percent and 25 percent, respectively, of the way toward their new desired capital stock within 10 years.⁷⁴

Thus, our calculation is $(.16*.03*1*1) + (.24*.06*1*.75) + (.38*.05*1*.25) = 2.04$.

⁷⁴ Glaeser and Gyourko (2001) discuss the slow adjustment of the housing stock to exogenous changes.

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Table 1**The Economic Growth and Tax Relief Reconciliation Act:
Effective Dates of Selected Provisions**

<u>Provision</u>	<u>Phase-in Begins</u>	<u>Phase-in Complete</u>	<u>Phased Out By</u>	<u>Years Fully Phased In</u>
Reduce marginal income tax rates	July 1, 2001	Jan. 1, 2006	Dec. 31, 2010	5
Create 10 percent bracket	Jan. 1, 2001	Jan. 1, 2001	Dec. 31, 2010	10
Increase child credit	Jan. 1, 2001	Jan. 1, 2010	Dec. 31, 2010	1
Benefits for Married Couples				
Increase standard deduction	Jan. 1, 2005	Jan. 1, 2009	Dec. 31, 2010	2
Expand 15% bracket	Jan. 1, 2005	Jan. 1, 2008	Dec. 31, 2010	3
Expand EITC	Jan. 1, 2002	Jan. 1, 2008	Dec. 31, 2010	3
Benefits for Education				
Deduction for Education Expenses	Jan. 1, 2002	Jan. 1, 2004	Dec. 31, 2005	1
Contribution limit on education IRAs	Jan. 1, 2002	Jan. 1, 2002	Dec. 31, 2010	9
Prepaid tuition programs	Jan. 1, 2002	Jan. 1, 2004	Dec. 31, 2010	7
Student loan deductions	Jan. 1, 2002	Jan. 1, 2002	Dec. 31, 2010	9
Pension and IRA Provisions				
IRA contribution limits	Jan. 1, 2002	Jan. 1, 2008	Dec. 31, 2010	3
401(k) contribution limits	Jan. 1, 2002	Jan. 1, 2006	Dec. 31, 2010	5
Catch-up contributions	Jan. 1, 2002	Jan. 1, 2006	Dec. 31, 2010	5
Roth 401(k)s	Jan. 1, 2006	Jan. 1, 2006	Dec. 31, 2010	5
Nonrefundable credit	Jan. 1, 2002	Jan. 1, 2002	Dec. 31, 2010	9
Repeal restrictions on itemized deductions and personal exemptions	Jan. 1, 2006	Jan. 1, 2010	Dec. 31, 2010	1
Increase AMT exemption	Jan. 1, 2001	Jan. 1, 2001	Dec. 31, 2004	4
Repeal estate tax	Jan. 1, 2002	Jan. 1, 2010	Dec. 31, 2010	1

Source: Joint Committee on Taxation (2001d), Manning and Windish (2001) and Friedman, Kogan, and Greenstein (2001).

Table 2**Tax Cuts and Interest Costs in EGTRRA
(in \$ billions)**

<u>Provision</u>	<u>As Legislated</u>			<u>With Sunset and AMT Adjustments¹</u>		
	<u>2001- 2011</u>	<u>2010</u>	<u>2011</u>	<u>2001- 2011</u>	<u>2010</u>	<u>2011</u>
Marginal tax rate cuts	420.6	63.0	19.0	466.0	63.0	64.4
10 percent bracket	421.3	46.0	13.9	454.2	46.0	46.7
Child tax credit	171.8	25.2	26.2	178.3	25.2	32.7
AMT	13.9	0.0	0.0	261.0	55.9	61.4
Other income tax adjustments	182.9	29.2	16.5	223.4	34.1	35.9
Estate tax	138.0	23.5	53.9	151.2	26.8	54.7
Total tax cut	1,348.5	187.0	129.5	1,734.1	251.0	295.9
Addenda:						
Tax cut as a percent of GDP	0.92	1.16	0.76	1.18	1.56	1.75
Interest cost	383	73	86	428	84	104
Total budget cost	1,731	260	216	2,162	336	400
Budget cost as a percent of GDP	1.18	1.62	1.27	1.47	2.08	2.36

Source: Congressional Budget Office (2001b), Joint Committee on Taxation (2001c, 2001e), and the CBO debt service matrix (August 2001).

¹The sunset adjustment repeals the expiration of all provisions of EGTRRA. The AMT adjustment reduces the AMT to keep the number of AMT taxpayers the same as under pre-

Table 3**Baseline and Adjusted Budget Outcomes for 2002-2011****(\$ Billions)¹**

Projection Date	January 2001	August 2001
CBO Unified Baseline Surplus ²	5,610	3,397
-Adjustment for Retirement Funds		
Social Security ³	2,491	2,551
Medicare ³	392	404
Government Pensions ³	419	469
=Surplus or deficit, adjusted for retirement funds	2,308	-27
-Adjustment for current policy		
Repeal sunset provisions ⁴	---	136
Reduce AMT taxpayers to pre-EGTRRA law levels ⁴	---	247
Reduce AMT taxpayers from pre-EGTRRA law to 2 percent ⁵	113	298
Extend expiring provisions ⁶	69	96
Hold real discretionary spending/person constant ⁷	379	383
Interest ⁸	110	189
=Surplus or deficit, adjusted for retirement funds and current policy with real discretionary spending/person constant	1,636	-1,376
-Further adjustment if discretionary spending/GDP constant		
Outlays ⁷	527	550
Interest ⁸	90	92
=Surplus or deficit, adjusted for retirement funds and current policy, with discretionary spending/GDP constant	1,020	-2,019

¹Due to rounding, columns may not sum to total.²Congressional Budget Office (2001a) Table 1-1, Congressional Budget Office (2001b) Table 1-1.³Congressional Budget Office (2001a) Table 1-7, Congressional Budget Office (2001b) Table 1-8.⁴Joint Committee on Taxation (2001e).⁵Joint Committee of Taxation (2001e), Rebelein and Tempalski (2000) Table 2, Tempalski (2001) Table 8, and authors' calculations.⁶Congressional Budget Office (2001a) Table 3-12 and Joint Committee of Taxation (2001e, 2001f). The figures apply to all expiring provisions other than those relating to the AMT or to EGTRRA.⁷Congressional Budget Office (2001a) Table 4-4, Congressional Budget Office (2001b) Table 1-5, U.S. Bureau of the Census (2000a), and authors' calculations.⁸CBO debt service matrix (January 2001, August 2001).

Table 4**Distribution of Income and Tax Burdens Pre- and Post-EGTRRA**

Income Group	<u>Lowest</u> <u>Quintile</u>	<u>Second</u> <u>Quintile</u>	<u>Third</u> <u>Quintile</u>	<u>Fourth</u> <u>Quintile</u>	<u>Next 15%</u>	<u>Next 4%</u>	<u>Top 1%</u>	<u>Total</u>
Income Range Ends At	15,000	27,000	44,000	72,000	147,000	373,000	---	---
Average Pre-Tax Income	9,300	20,600	34,400	56,400	97,400	210,000	1,117,000	57,800
Share of Pre-Tax Income	3.2	7.1	11.8	19.4	25.1	14.4	19.2	100.0
<u>Pre-EGTRRA</u>								
Average Federal Tax Payment (\$)	845	3,255	7,023	13,531	26,271	61,858	395,552	15,190
Average Federal Tax Rate	9.1	15.8	20.4	24.0	27.0	29.5	35.4	26.3
Share of Federal Taxes	1.1	4.3	9.2	17.7	25.8	16.2	25.9	100.0
Share of Post-Tax Income	3.9	8.1	12.8	20.0	24.9	13.8	16.8	100.0
<u>Post-EGTRRA</u>								
Average Federal Tax Payment (\$)	778	2,887	6,453	12,580	24,293	58,532	349,837	13,945
Average Federal Tax Rate	8.4	14.0	18.8	22.3	24.9	27.9	31.3	24.1
Share of Federal Taxes	1.1	4.1	9.2	17.9	25.9	16.7	24.9	100.0
Share of Post-Tax Income	3.8	8.0	12.7	19.8	24.8	13.7	17.4	100.0

Source: Citizens for Tax Justice (2001b), Cronin (1999), and authors' calculations.

Table 5**Alternative Measures of the Distributional Effects of EGTRRA**

<u>Income Groups</u>	<u>Lowest Quintile</u>	<u>Second Quintile</u>	<u>Third Quintile</u>	<u>Fourth Quintile</u>	<u>Next 15%</u>	<u>Next 4%</u>	<u>Top 1%</u>	<u>Total¹</u>
Percentage Change in After-Tax Income	0.8	2.1	2.1	2.2	2.8	2.2	6.3	2.9
Change in Taxes Relative to a Distributionally Neutral Tax Cut	180	139	230	301	100	1,001	-24,642	0
Percentage Change in Tax Payments	-7.9	-11.3	-8.1	-7.0	-7.5	-5.4	-11.6	-8.2
Share of Tax Cut	1.1	5.9	9.2	15.3	23.8	10.7	36.7	100.0
Change in Tax Payments (dollars)	-67	-368	-570	-951	-1,978	-3,326	-45,715	-1,245
Change in Average Tax Rate (percentage points)	-0.7	-1.8	-1.7	-1.7	-2.0	-1.6	-4.1	-2.2
Change in Share of Federal Taxes	0.0	-0.2	0.0	0.2	0.1	0.5	-1.0	0.0
Change in Share of Post-Tax Income	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.5	0.0
Percent of Tax Filing Units with No Tax Cut	67.9	22.3	8.1	1.1	0.6	2.9	17.8	20.8
Percent of Total Cut Received Via 2001 Changes	84	73	71	60	37	30	7	33

Source: Citizens for Tax Justice (2001b), Cronin (1999), and authors' calculations.

¹Due to rounding, columns may not sum to total.

Table 6**Effects of EGTRRA on Effective Marginal Tax Rates**Congressional Budget Office

	<u>Wages</u>	<u>Capital Income</u>
Pre-EGTRRA MTR	36.2	18.3
Post-EGTRRA MTR	34.4	17.8
Percentage Point Change in MTR	-1.8	-0.5
Percent Change in MTR	-5.0	-2.7
Percent Change in (1-MTR)	2.8	0.6

Treasury

	<u>Wages</u>	<u>Interest</u>	<u>Dividends</u>	<u>Sole Proprietors</u>
Pre-EGTRRA MTR	26.0	25.3	28.8	25.7
Post-EGTRRA MTR	24.4	23.2	26.4	23.9
Percentage Point Change in MTR	-1.6	-2.1	-2.4	-1.8
Percent Change in MTR	-6.2	-8.3	-8.3	-7.0
Percent Change in (1-MTR)	2.2	2.8	3.4	2.4

Source: CBO (2001b) pp. 34-5. Includes federal income and payroll taxes and state and local income taxes for labor income and federal income and corporate taxes and state and local income taxes for capital income. Kiefer et al (this volume) Table 5. Includes federal income taxes only.

Table 7

Effects of EGTRRA on the Size of the Economy in 2011

	<u>Base Case</u>	<u>Optimistic Scenario</u>
<u>Measure of Economic Activity</u>		
Percentage change in GDP	-0.31	0.38
Percentage change in GNP	-0.68	-0.04
<u>Components of change</u>		
Decline in public saving	-1.63	-1.63
Incentive effects of tax changes	0.95	1.60
International capital flows	0.37	0.41

Source: See Appendix text and Appendix Table 3.

Table 8**Taxes, Spending, and Growth in Historical Perspective**

<u>Years</u>	<u>Federal Taxes as a</u>		<u>Federal Spending as</u>	<u>Annual Growth Rate</u>
	<u>Share of GDP</u> (percent)	<u>Average Top Income</u> <u>Tax Rate (percent)</u>	<u>a Share of GDP</u> (percent)	<u>of GDP per Capita</u> (percent)
1870-1912	3.0	0.0	2.7	2.2
1947-1999	17.8	66.3	19.5	2.2
1912-1929	3.9	37.8	5.1	1.2
1929-1941	5.2	61.9	8.0	2.0
1941-1947	15.2	88.3	29.3	3.2
1947-1973	17.3	83.3	17.8	2.4
1973-1992	18.1	53.0	21.5	1.7
1992-1999	18.7	38.5	20.4	2.7

Source: Office of Management and Budget (2001) Table 1.2, Bureau of Economic Analysis (2002a) Table 1.2, Slemrod and Bakija (2000b) Table A.5, U.S. Bureau of the Census (1975) Series Y352-357, Series F1-5, Series F10-16, and Series A6-8 and U.S. Bureau of the Census (2000c).

Table 9**Effects of EGTRRA on Real Interest Rates:
Implied Estimates from Alternative Sources¹**

<u>Source²</u>	<u>Interest Rate Measure</u>	<u>Implied Effects (Basis Points)</u>		
		<u>After 1 Year</u>	<u>After 10 Years</u>	<u>Long-Term</u>
Hubbard/Elmendorf/Mankiw	"Long-term"	---	25	34
Clinton Council of Economic Advisors	"Long-term"	---	110	182
Congressional Budget Office	10-Year Treasury	11	98	>=98
Federal Reserve Model	10-Year Treasury	60-80	84-112	84-112
McKibbon-Sachs Global Model	10-Year Treasury	---	92	>=92
Taylor	Long-term government bonds	50	75	>=75

¹The table reports our estimates of the impact of EGTRRA on interest rates based on our own interpretations of six existing sources that examine other hypothetical tax policies. We model EGTRRA with sunset provisions repealed and the number of AMT taxpayers kept the same as under pre-EGTRRA law.

²Hubbard (2001), Council of Economic Advisors (1994), Congressional Budget Office (1995), Reifshneider et al (1999), McKibbon and Bagnoli (1993), Taylor (1993).

Table 10**Effects of EGTRRA on the Cost of Capital
(Percentage change)**

<u>Type of Investment</u>	<u>Change in Interest Rate (Basis Points)</u>			
	<u>0</u>	<u>30</u>	<u>50</u>	<u>80</u>
<u>Corporations</u>				
Equipment	-2.1	-0.7	0.2	1.5
Structures	-2.1	0.9	2.8	5.8
<u>Sole Proprietors</u>				
Equipment, Expensed	0	1.4	2.3	3.6
Equipment	-0.5	0.8	1.7	3.1
Structures	-1.3	1.7	3.7	6.6
<u>Housing</u>				
Owner-Occupied Housing, Itemizer	0.9	2.6	3.7	5.4
Owner-Occupied Housing, Non-Itemizer	0.0	1.8	3.0	4.7

Source: Authors' calculations described in the appendix.

Appendix Table 1

Distribution of Income and Federal Taxes Pre-EGTRRA: Three Models

Income Group	Share of Pre-Tax Income			Average Federal Tax Rate			Share of Federal Taxes		
	CBO	Treasury	ITEP	CBO	Treasury	ITEP	CBO	Treasury	ITEP
Lowest Quintile	4.0	2.7	3.2	5.3	5.9	9.1	0.9	0.7	1.1
Second Quintile	9.0	7.2	7.1	12.8	11.7	15.8	5.2	3.9	4.2
Middle Quintile	13.9	12.6	11.8	16.7	17.4	20.4	10.4	10.2	9.2
Fourth Quintile	20.2	21.3	19.4	20.0	20.1	24.0	18.1	19.9	17.6
Highest Quintile	53.2	56.7	58.7	27.4	24.6	30.4	65.4	65.1	67.7
Overall	100.0	100.0	100.0	22.3	21.5	26.3	100.0	100.0	100.0
Top 10%	38.7	40.5	n.a.	29.1	25.7	n.a.	50.4	48.5	n.a.
Top 5%	28.9	29.5	33.6	30.5	26.6	33.0	39.4	36.5	42.1
Top 1%	15.8	14.8	19.2	32.7	29.1	36.1	23.1	20.1	26.3

Source: Congressional Budget Office (2001c) Tables G-1a, G-1b, and G-1c uses 1997 data and 2000 law. Cronin (1999) uses 2000 data and law. Citizens for Tax Justice (2001b) uses pre-EGTRRA 2001 law.

Appendix Table 2

Distribution of Particular Taxes by Income Class Pre-EGTRRA: Three Models

Income Groups	Average Tax Rate (percent)											
	Individual Income Tax			Corporate Income Tax			Payroll Tax			Estate Tax		
	CBO	Treasury	ITEP	CBO	Treasury	ITEP	CBO	Treasury	ITEP	CBO	Treasury	ITEP
Lowest Quintile	-5.3	-2.4	-3.5	0.5	0.9	0.8	7.4	6.7	8.1	n.a.	0.0	0.0
Second Quintile	1.3	0.8	1.8	0.7	1.4	1.2	9.2	8.7	10.5	n.a.	0.0	0.0
Middle Quintile	4.8	5.6	6.5	1.1	1.6	1.4	9.7	9.3	11.0	n.a.	0.0	0.0
Fourth Quintile	7.5	7.8	9.7	1.4	1.6	1.4	10.2	9.8	11.9	n.a.	0.0	0.0
Highest Quintile	15.8	13.7	17.9	4.4	2.8	3.9	6.7	6.7	7.3	n.a.	0.5	0.8
Overall	10.5	10.1	13.2	2.9	2.3	2.9	8.1	7.9	8.9	n.a.	0.3	0.5
Top 10%	17.8	15.4	n.a.	5.4	3.3	n.a.	5.4	5.5	n.a.	n.a.	0.7	n.a.
Top 5%	19.5	16.9	21.5	6.3	3.8	5.6	4.2	4.1	4.3	n.a.	0.9	1.4
Top 1%	22.3	20.2	24.3	8.0	4.6	7.4	2.1	2.1	2.1	n.a.	1.3	2.2

Income Groups	Share of Taxes Paid (percent)											
	Individual Income Tax			Corporate Income Tax			Payroll Tax			Estate Tax		
	CBO	Treasury	ITEP	CBO	Treasury	ITEP	CBO	Treasury	ITEP	CBO	Treasury	ITEP
Lowest Quintile	-2.0	-0.6	-0.9	0.7	1.1	0.9	3.6	2.3	2.9	n.a.	0.0	0.0
Second Quintile	1.1	0.5	1.0	2.3	4.3	2.9	10.3	7.9	8.3	n.a.	0.0	0.0
Middle Quintile	6.4	6.9	5.8	5.5	9.2	5.8	16.6	14.9	14.7	n.a.	0.0	0.0
Fourth Quintile	14.5	16.3	14.3	9.8	14.9	9.5	25.5	26.4	25.9	n.a.	0.8	0.0
Highest Quintile	80.0	76.6	79.8	82.1	70.6	80.6	44.0	48.3	48.2	n.a.	99.2	100.0
Overall	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	100.0
Top 10%	65.6	61.3	n.a.	72.7	59.1	n.a.	26.1	28.2	n.a.	n.a.	96.2	100.0
Top 5%	53.8	49.1	54.8	63.6	49.7	66.0	15.1	15.4	16.4	n.a.	91.0	100.0
Top 1%	33.6	29.5	35.3	43.7	30.3	49.6	4.2	4.0	4.5	n.a.	64.2	91.0

Source: Congressional Budget Office (2001c) Tables G-1a, G-1b, and G-1c uses 1997 data and 2000 law. Cronin (1999) uses 2000 data and law. Citizens for Tax Justice (2001b) uses pre-EGTRRA 2001 law.

Appendix Table 3

Background for Effects of EGTRRA on the Size of the Economy in 2011

	<u>Base Case</u>	<u>Optimistic Scenario</u>
<u>As a percent of GDP, 2002-2011</u>		
(1) Change in Public Saving	-1.58	-1.58
(2) Change in Private Saving	0.49	0.98
(3) Change in National Saving ¹	-1.09	-0.60
(4) Change in International Capital Flows	0.36	0.40
(5) Change in capital stock owned by Americans	-1.09	-0.60
(6) Change in domestic capital stock	-0.73	-0.20
<u>In 2011</u>		
(7) Percentage change in capital owned by Americans ²	-3.22	-1.77
(8) Percentage change in domestic capital stock ³	-2.16	-0.59
(9) Percentage change in hours worked	0.48	0.48
(10) Percentage change in human capital	0.21	0.42
(11) Percentage change in labor supply ⁴	0.69	0.90
(12) Percentage change in GNP ⁵	-0.68	-0.04
(13) Percentage change in GDP ⁶	-0.31	0.38

Source: Authors' calculations as described in the text.

¹Line(1) + Line(2)

²Line(5) * (136,525/46,200) (GDP 2002-2011/Capital stock in 2011)

³Line(6) * (136,525/46,200) (GDP 2002-2011/Capital stock in 2011)

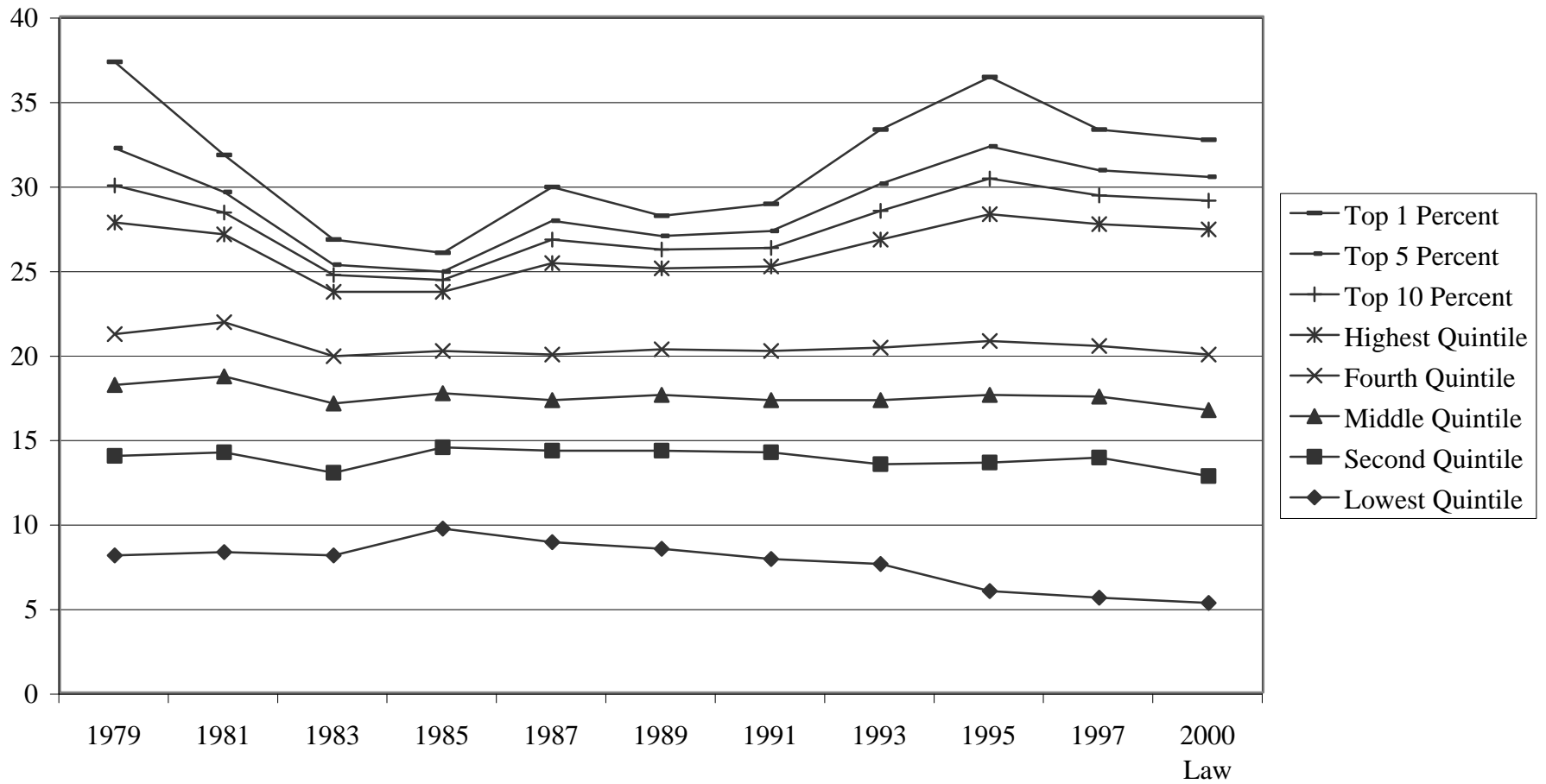
⁴Line(9) + Line(10)

⁵[0.35 * Line(7)] + [0.65 * Line(11)]

⁶[0.35 * Line(8)] + [0.65 * Line(11)]

Figure 1

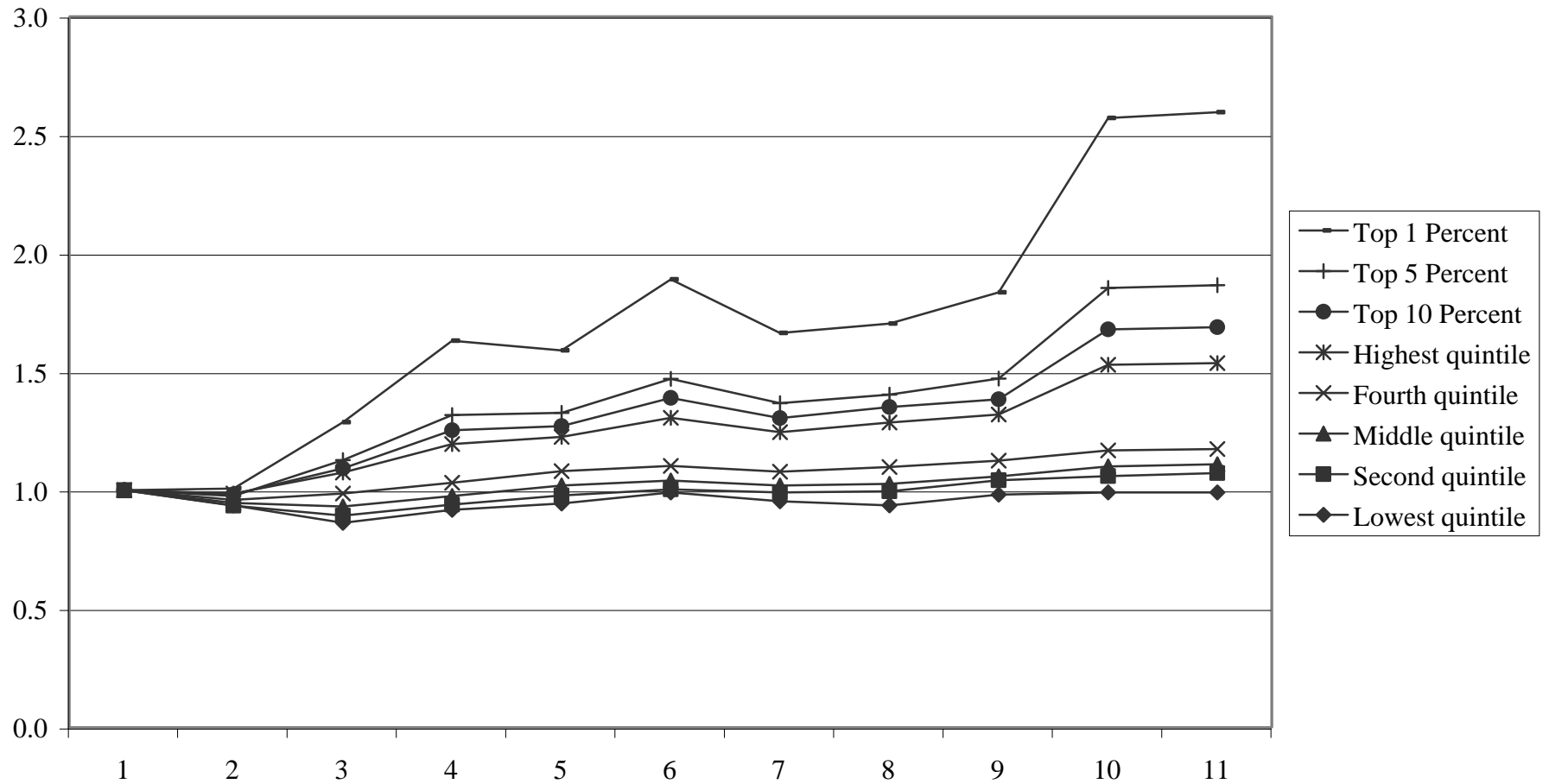
Effective Federal Tax Rates for All Households Using Comprehensive Household Income
Adjusted for Household Size, 1979-1997



Source: Congressional Budget Office (2001c) Table G-1a. The individual income tax, corporate income tax, social insurance (payroll) tax, and excise tax comprise the federal taxes used here. The estate tax is excluded.

Figure 2

After-Tax Income Growth for All Households by Income Quintile, Using Comprehensive Household Income Adjusted for Household Size, 1979-1997



Source: Congressional Budget Office (2001c) Table G-1c and authors' calculations.

Figure 3
Federal Revenues, Spending, and Non-Interest Spending as a Percent of GDP, 1950-2000



Source: Congressional Budget Office (2001a) Tables F-5 and F-9, Office of Management and Budget (2001) "Historical Tables: Fiscal Year 2002." Tables 1.2 and 3.1.