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A Note on the Taxable Income Elasticity and Revenues

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I. Introduction

The taxable income literature attempts to answer a key question in public finance, to what extent taxpayers' taxable incomes change in response to changes in their tax rates. The elasticity of taxable income with respect to the after-tax share, the so-called taxable income elasticity, summarizes in one statistic how the tax base expands or contracts in response to changes in tax rates. The impact of changes in labor supply and participation, savings and portfolio allocation, the form of compensation, the timing of income and deductions, and tax evasion and avoidance on the tax base are all subsumed in this one statistic. Consequently, the taxable income elasticity can be used to estimate to what extent taxpayer behavior offsets some of the static revenue loss (gains) of tax rate reductions (increases).

The taxable income elasticity is relevant to dynamic scoring because it encompasses many types of behavior important for the conventional micro-dynamic estimates and partially includes some macro-dynamic effects. Conventional revenue estimates assume that output and other key macro-economic aggregates remain fixed when considering changes in the tax law. While direct application of the taxable income elasticity imposes no such constraint, some macro-dynamic responses, such as investment and savings related supply-side effects and crowding out, are only partially captured in the taxable income elasticity and demand effects are generally not reflected at all. Also, the taxable income elasticity generally does not account for income shifting between the individual and corporate tax bases.

While large is in the eye of the beholder, the taxable income literature has generally found evidence of at least a modest behavioral response with some of the more recent studies

reporting taxable income elasticities of about 0.4. This note uses this 0.4 elasticity to simulate the revenue effect of a 10 percent across-the-board reduction in tax rates. The effect of the capital gains response on revenues is captured through a separate set of simulations.

This note is organized as follows. First, a brief overview of the literature is provided and the recently reported elasticity is suggested for use in the simulations. Next, this elasticity is used in simulations of the illustrative 10 percent across the board reduction in individual tax rates to provide a general sense of the magnitude of the behavioral response and its effect on revenues. These results are related to conventional micro-dynamic estimates and macro-dynamic estimates by discussing several approaches to abide by the so-called fixed output assumption used in conventional estimates and discussing what types of macro-dynamic responses are either absent from on only partially captured by the taxable income response.

II. The Literature

After consisting of only a few papers, interest in the overall taxable income response received increasing attention in the wake of the 1993 tax rate increases with a number of papers finding sizable tax rate effects. The elasticities reported in the literature range from 1.8 at the upper end of the spectrum (Lindsey, 1987) to 0.4 in several recent studies (Carroll, 1998; Gruber and Saez, 2002). Slemrod's (1998) review of the literature explores the methodological difficulties faced by the studies and highlights the uncertainty of estimates of the taxable income elasticity. There has been a clear evolution in the literature with the use of more comprehensive panel data, and more careful attention to mean reversion, and identification issues. Recent estimates of the taxable income elasticity in these more detailed studies are considerably smaller than those reported earlier. Nevertheless, the recent studies suggest a response that is significantly different from zero.

The major features of studies focusing on this parameter are outlined in Table 1. Lindsey (1987) and Navratil (1995) find evidence of tax-induced behavioral responses for ERTA, while Feldstein (1995) and Auten and Carroll (1999) find evidence of tax-induced responses for TRA. Gruber and Saez (2002) consider both ERTA and TRA. Studies by Sammartino and Weiner (1997), Goolsbee (2000a), and Carroll (1998), consider the response associated with the higher tax rates enacted in 1993.

Lindsey (1987), who found very large responses, did not use panel data, but instead created a synthetic panel by grouping similarly situated taxpayers by income and estimating elasticities based on differences across these groups. Studies that assume the level of income that would have been achieved absent the tax changes are suspect because all unexpected income changes are assumed to be due to tax changes and the counter factual assumption about income growth influences the estimated elasticities (Lindsey, 1987; and Gravelle, 1993).

Feldstein (1995) and Navratil (1995) use panel data to avoid some of these problems, but rely on samples of taxpayers that have relatively few high-income returns, and, similar to Lindsey (1987), may not adequately control for non-tax factors. Feldstein (1995) uses the difference-of-differences approach, which has the effect of attributing income changes not captured in a taxpayer's individual effect to changes in the after-tax share. Gravelle (1993), Goolsbee (2000b), and Auerbach and Slemrod (1997) suggest that the income changes of the 1980s may well have been the result of longer term trends that had little to do with changes in tax rates resulting in an upward bias in the estimates. Studies that focus on a period when tax rates where increased would instead be biased downwards.

Both Goolsbee (2000a) and Sammartino and Weiner (1997) find evidence that taxpayers likely changed the timing of income and that this temporary response may well have been large. Neither study finds evidence of a substantial permanent response to the 1993 Act. Goolsbee

(2000a), however, focuses on changes in the compensation of executives of publicly traded corporations. This study is not able to focus on the taxable income of the executives. Although Sammartino and Weiner (1997) focus on a broader set of taxpayers and definition of income, their panel data was only available through 1994, the year the increase in the wage cap for the Medicare Part A (HI) tax went into effect, and may, therefore, not fully reflect the effects of the 1993 Act. Carroll (1998) uses a panel of tax returns for the period 1989 through 1995 and found evidence of a modest behavioral response. This study reported an elasticity of taxable income with respect to the after-tax share of 0.4.

Gruber and Saez (2002) expand on the previous literature in a number of important ways. They use a panel of tax returns that spans several major shifts in tax rate regimes. This has several advantages. The variation in tax rates from the long time period covered by their panel allows them to more carefully examine and model mean reversion and consider heterogeneity with respect to income and other taxpayer characteristics. They find that higher income taxpayers exhibit substantially greater behavior than lower income taxpayers. The additional variation also allowed this study to separately estimate an income effects variable, and the compensated after-tax share elasticity. Because previous studies did not control for the income effects of tax changes, the taxable income elasticity estimated by the previous research estimated the uncompensated elasticity of taxable income with respect to the after-tax share. Nevertheless, Gruber and Saez find the coefficient on the income effect variable to be small, and conclude that it can largely be ignored (i.e., the compensated and uncompensated elasticities are similar). They report a taxable income elasticity of about 0.4. The study also finds that a great deal of the response is associated with non-wage income and, in particular, itemized deductions, rather than wages. The 0.4 elasticity is somewhat lower than some of the elasticity estimates of the earlier studies examining the tax reductions in the 1980s, but in line with research on the tax rate

increases enacted under the 1993 Tax Act (Carroll, 1998).[1]

A recent study by Saez (2003) uses bracket creep occurring during the high inflation environment of the late 1970s and early 1980s, rather than an explicit shift in tax rate regimes to identify the response of taxable income to changes in the after-tax share. This study reports a taxable income elasticity of 0.4, but finds that the elasticity of wages with respect to the after-tax share is close to zero, suggesting that much of the response is not associated with changes in labor supply.

The more recently reported estimates of the taxable income elasticity Carroll (1998) and, in particular, Gruber and Saez (2002), attempt to address the issues of mean reversion, identification, longer term trends correlated with changes in tax rates, and taxpayer heterogeneity. Moreover, Carroll (1998) considers a period when tax rates increased and Gruber and Saez (2002) focus on a period when tax rates fell. While not a central tendency estimate per se, the lower elasticity estimate of 0.4 reported by these studies seems to reflect an evolution in the literature and a reasonable starting point for the simulations.

III. Simulated Taxable Income Response

The effect of a 10 percent across the board reduction in tax rates on revenues is simulated using a taxable income elasticity of 0.4. This elasticity is applied to taxpayers with incomes above $15,000 in 2004 since most taxable income studies exclude very low income taxpayers to address mean reversion at the bottom of the income distribution. All simulations use CBO's individual tax microsimulation model and are for 2004 (results for 2013 are provided in Appendix A). The taxable income response is calculated as:

$$\text{Response} = \varepsilon * [(1-\tau_1) / (1-\tau_0)-1] * TI_0$$

where ε is the taxable income elasticity, τ_1 is the taxpayer's marginal tax rate after the tax rate

reduction[2], τ_0 is the marginal tax rate under current law, and TI_0 is the taxpayer's taxable income (excluding capital gains) under current law. Consistent with estimation of the elasticity in the literature, this formulation only applies the elasticity to non-gains taxable income. The capital gains response is discussed separately below.

The results for this base simulation are presented in Table 2. Overall, the average 10 percent reduction in tax rates results in average marginal tax rates falling from 29.7 percent to 27.4 percent, nearly 10 percent lower.[3] A taxpayer's marginal tax rate is calculated by adding $1,000 to their wages and other non-gains income and recalculating tax. Nonlinearities in the tax code relating to phase-in and phase-outs, various limitations, and the inclusion of state tax rates explain why the reduction in average marginal tax rates is lower than 10 percent.

The increase in a taxpayer's after-tax share is 3.2 percent overall and rises with income reflecting the progressivity of the income tax. Consequently, the taxable income response will be larger for taxpayers facing higher tax rates. The taxable income response is calculated to be $67.9 billion or a 1.48 percent increase in non-gains taxable income. This higher level of taxable income offsets $16.7 billion of the $89.3 billion in the static revenue loss (excluding capital gains taxes) from the lower tax rates translating into an 18.7 percent revenue offset.

Capital Gains Response. The simulations above only include non-gains behavior. Since the 10 percent reduction in tax rates also applies to capital gains, capital gains behavior also needs to be incorporated into the estimates. The capital gains literature reports a fairly wide range of estimates. Micro-based studies have found a range of elasticities. An early cross-sectional study by Feldstein, Slemrod, and Yitzhaki (1980), report a very high elasticity, while Auten and Clotfelter (1982) report a long-run elasticity of about -0.5. The panel study by Burman and Randolph (1996) find a large temporary response, but report long-run elasticity of about –0.2. Aggregate times series studies tend report higher elasticities and tend to be clustered in the range

of –0.5 to –0.9. This note incorporates the capital gains response by using two elasticities, -0.5 and -0.7, to roughly bound what might be called a central tendency estimate. Based on the wide range of estimates reported in the literature, responses within this range may in some respects be equally likely.

The capital gains response is model using a semi-log functional form given by:

$$\text{Gains Response} = (\exp[(\beta^*(\tau_1 - \tau_0)] - 1) * G_0$$

where β is the capital gains behavioral parameter, τ_1 is the taxpayer's marginal tax rate on long-term capital gains after the tax rate reduction, τ_0 is the marginal tax rate under current law, and G_0 is the taxpayer's initial level of long-term gains (in excess of short-term losses). The value for β is set to obtain an implied elasticity of –0.5 (-0.7) when evaluated from a tax rate reduction from 20 percent to 18 percent for the lower (higher) elasticity simulation. The point elasticities would be lower when evaluated at the newly enacted 5 percent and 15 percent tax rates on long-term gains.

The simulated capital gains responses are shown in Table 3. The 10 percent reduction in long-term capital gains rates results in a static revenue loss of –3.4 billion. The decline in the average marginal tax rate from 14.1 percent to 12.8 percent offsets 43 percent (61 percent) of the static loss in revenues under the lower (higher) elasticity. The top row in Table 4 combines the taxable income (net of gains) and capital gains responses. The combined response increases total taxable income by between 1.60 and 1.69 percent and results in a revenue offset of roughly 20 percent. The capital gains response is a relatively small part of the overall response for an across-the-board rate reduction.

Vary Taxable Income Elasticity with Income. As noted earlier, it has been recognized that high-income taxpayers are likely to be more responsive to changes in taxes than lower income taxpayers because they have much greater flexibility in their labor arrangements, receive more

realization-based income in the form of capital gains, dividends, and stock options, and have greater access to sophisticated tax planning advice. Gruber and Saez (2002) report sets of taxable income elasticities that allow for heterogeneity in total income and taxable income. Simulation results using these elasticities are provided in Table 4.

The simulation that allows the elasticities to vary by total income assigns taxpayers whose incomes are above $15,000 and below $130,400 (the threshold used by Gruber and Saez inflated to 2004 dollars) a taxable income elasticity of 0.15. An elasticity of 0.55 is used for taxpayers whose incomes exceed $130,400. Depending on the capital gains response, total taxable income increases by between 1.47 percent (lower gains response) and 1.56 percent (higher gains response). This income response translates into a revenue offset of between 19.6% percent (lower gains response) and 20.2 percent (higher gains response). The simulation that varies the elasticities by taxable income applies them to taxpayers depending on their regular tax rate bracket. The taxable income elasticity is 0.25 for taxpayers in the 25 percent or below regular tax bracket, and 0.5 for taxpayers in higher regular tax brackets.[4] The total response and associated revenue offset is somewhat lower than in the simulation that varies the elasticities by total income. These results indicate that accounting for income heterogeneity has little effect on the overall taxable income response and revenue offset for an across-the-board rate reduction -- the overall taxable income response is between 1.4 and 1.7 percent, which offsets roughly 18 percent to 20 percent of the static revenue loss.[5]

Expansion of the Tax Base or Income Shifting? The taxable income response simulations assume that the rise in a taxpayer's taxable income increases the tax base dollar for dollar. However, some of the increase in taxable income may reflect shifting of income from other taxable sources. Thus, the simulations presented above likely overstate the rise in aggregate taxable income and should be viewed as an upper bound of the revenue offset.

Shifting between the corporate and individual tax bases is perhaps the most obvious example of income shifting. Taxpayers could shift their reported incomes between these two tax bases to take advantage of the difference between the individual and corporate tax rates (Gordon and Slemrod, 2000). There is some evidence that the large reduction in individual tax rates relative to corporate tax rates under the Tax Reform Act of 1986 was followed by a large increase in the use of pass-through entities, such as S corporations (Feenberg and Poterba, 1993; Carroll and Joulfaian, 1997; Gordon and Slemrod, 2000). The S corporation assets increased from 1.6 percent of total corporate assets in 1985 to 4.1 percent by 1990. The net income of S corporations as share of total corporate net income rose from 5.8 percent in 1985 to 9.3 percent in 1990.

The reduction in individual income tax rates under the proposal considered above would advantage non-corporate organization forms (including S corporation status) relative to the C corporation form and likely lead to a shift from the corporate tax base to the individual tax base. Consequently, the lower corporate tax revenues from this income shifting would need to be taken into account to fully reflect the impact of the lower individual income tax rates on revenues. Shifts from the corporate tax base to the individual income tax base can also occur through changes in debt finance, whereby corporations increase their use of debt, thereby increasing interest deductions and lowering corporate taxable income, but also increasing the interest income of individuals. While the overall taxable income response is helpful to gauge the potential magnitude of the behavioral response, in practice, some decomposition of the response is necessary to account for shifting between differentially taxed activities.

Fixed Output Assumption for Conventional Estimates

When estimating the revenue effect of tax changes government economists typically are required to assume that gross domestic product, as well as other macro-economic aggregates, are

held constant. This "fixed-GDP" (and other macro-economic aggregates) convention is part of a budget process where proposals are estimated based on the most recent Administration or CBO economic forecast and the aggregate production of goods and services – and associated incomes from current production. According to Nester (1987), the macroeconomic variables that are held fixed include:

- Gross domestic product
- Interest rates
- Total employee compensation
- Total gross private domestic investment
- Overall price index
- Total level of state and local taxes.

The taxable income response estimated above holds neither output nor other major macroeconomic variables fixed. Nevertheless, the estimates probably exclude some macro-economic effects of tax rate changes. Near-term demand-side effects of the tax change that affect all taxpayers similarly are imbedded in the constant term in one-period models and in the year dummies in multi-period models. Supply-side effects that take more than several years to be reflected in taxable income are probably excluded because the specifications used to estimate the taxable income elasticities in the literature typically impose a lag structure that is of relatively short or of moderate duration.[6] Consequently, supply-side savings and investment effects are probably not captured to any large extent, while labor supply responses are more likely to be captured.

One approach to bridging the conventional micro-dynamic and macro-dynamic estimates is to use the taxable income elasticity to estimate the taxable income response and then subtract those types of responses that violates the fixed output convention. If the fraction of the total

response was associated with changes in macro-economic aggregates were known, the taxable income response could be scaled back proportionately; that is, the taxable income elasticity could simply be lowered proportionately.

Alternatively, some fraction of the aggregate change in taxable income could be reallocated among taxpayers in order to maintain the fixed output assumption. While the revenue estimating conventions do not dictate that taxable income be held constant, they do suggest that a substantial portion of the aggregate change in taxable income is shifted to other activities, albeit at a different tax rate. In the extreme, it could be assumed that the full change in aggregate taxable income would be taxed to some extent. Carroll (1998) used this general approach to illustrate the possible impact of the fixed output assumption on a conventional revenue estimate.[7]

Another approach is to identify and subtract the type of behavior included in the taxable income response that violates the fixed output convention. Since the taxable income response already excludes most investment and savings responses, labor supply is probably the primary real response included in the taxable income response in violation of the fixed compensation assumption.[8] As an illustration of this approach, the labor supply response was simulated using a population weighted wage and income elasticities of 0.14 and -0.07 for primary earners, and 0.75 and -0.25 for secondary earners.[9] The labor supply response increased taxable income by $24.9 billion or 0.5 percent and increased revenues by $5.4 billion. As shown in Table 4, removing this response from the base simulation reported above lowers the overall revenue offset by roughly one-third, to about 14 percent.

Of course, to what extent the taxable income response captures changes in labor supply is itself controversial. As mentioned above, Gruber and Saez (2002) and Saez (2003) suggest that changes in wages probably do not explain much of the taxable income response. Moreover,

Moffitt and Wilhelm (2000), find no evidence of increased labor supply of higher income individuals in response to the lower tax rates enacted under the Tax Reform Act of 1986.

IV. Conclusion

This note considers how the taxable income literature can be used to estimate the revenue effect of an illustrative 10 percent across-the-board reduction in tax rates. Giving greater weight to several more recent studies of the taxable income response, this note suggests that a taxable income elasticity of 0.4 is probably a useful starting place for simulations of the revenue effect. While direct application of this elasticity suggests that roughly 18 to 20 percent or the static revenue cost of a 10 percent rate reduction might be offset through the taxable income response, this estimate ignores several important issues. First, some of the response may take the form of income shifting between differentially taxed activities, especially between the corporate and non-corporate sectors. Income shifting can be expected to be especially important to the estimate under the fixed output assumption used for conventional revenue estimates, but is still relevant for fully dynamic estimates. Second, the taxable income response omits important aspects of fully dynamic estimates. Demand-side effects on taxable income are largely excluded from taxable income elasticities. Longer-term supply side investment and savings responses are at best only partially captured due to the relatively short lag structure used in taxable income studies. Nevertheless, estimates of the taxable income response do provide a useful framework, albeit incomplete, for estimating the potential size of the behavioral response to tax rate changes and their effect on revenues.

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TABLE 1

Taxable Income Studies

Study	Tax Reform	Empirical Strategy	Data Used	Elasticity
Lindsey (1987)	ERTA 1981	Develops procedure to project 1979 tax file to 1982, and then estimates behavioral response by comparing projected data to actual SOI data for 1982.	Synthetic panel constructed from SOI cross-sectional files around ERTA 81.	1.6 to 1.8
Feldstein (1995)	TRA 1986	Difference-of-differences; compared income changes for three income groups based on initial (1985) incomes.	Panel of tax returns; 1985 & 1988; random sample, not stratified by income; few high-income taxpayers.	1.04 to 3.05
Navratil (1995)	ERTA 1981	Difference of differences; compares the income changes of the same group of taxpayers over periods with and without tax changes.	Non-stratified panel of tax returns, not stratified by income; few high-income taxpayers.	About 0.8
Auten and Carroll (1999)	TRA 1986	Regression-based; controls for nontax factors including age and occupation of taxpayer.	Panel of tax returns; 1985 & 1989; stratified by income, but endogenous sample selection.	0.6
Carroll (1998)	OBRA 1991 and OBRA 1993	Regression-based, controls for nontax factors, uses tax rates based on average income to identify tax rate response.	Annual panel of tax returns, stratified by income, annual data from 1989 through 1995.	0.4
Goolsbee (2000a)	OBRA 1993	Regression-based, includes nontax factors, estimates both temporary and permanent responses.	Annual panel data of compensation of highly paid executives from SEC filings.	Permanent response close to zero.
Gruber and Saez (2002)	ERTA 1981 and TRA 1986	Regression-based, controls for mean reversion and nontax factors.	Panel of tax returns, 1979 through 1988, random sample with few high-income returns.	0.4
Saez (2003)	Bracket creep, 1979 through 1981.	Regression-based, uses bracket creep to identify response to after-tax share.	Panel of tax returns from 1979 through 1981, random sample with few high-income returns.	0.4

Table 2

Base Simulation: Taxable Income Response for 10 Percent Rate Reduction, 2004 1/

Statutory Rate Bracket	AMTR (%) (Current)	AMTR (%) (Proposal)	Percentage Change in After-tax Share (%)	Taxable Income (Current)	Taxable Income Response	Static Revenue Effect	Feedback Effect	Net Revenue Effect	Revenue Offset (%)
					$ in billions				
Results from tax model simulation:									
0	5.5	5.4	0.1	2	0.0	-0.1	0.0	-0.1	0.0
10	19.1	18.1	1.2	146	0.7	-1.5	0.1	-1.4	-7.0
15	21.6	20.1	1.9	1,323	11.9	-17.0	1.8	-15.2	-10.6
25	30.2	27.8	3.4	1,471	21.1	-25.0	4.9	-20.2	-19.5
28	33.6	30.8	4.1	488	8.6	-10.6	2.2	-8.4	-20.9
33	38.0	34.8	5.0	370	8.4	-9.6	2.4	-7.2	-25.2
35	38.2	34.9	5.2	783	17.2	-25.4	5.3	-20.1	-20.8
Total	29.7	27.4	3.2	4,584	67.9	-89.3	16.7	-72.6	-18.7

1/ Elasticity of 0.4 applied to all taxable income (net of capital gains). Taxable income amounts tabulated above exclude capital gains realizations.

Table 3

Base Simulation: Capital Gains Response for 10 Percent Rate Reduction, 2004 1/

Statutory Ordinary Tax Rate	Statutory Capital Gains Tax Rate	AMTR on Gains (%) (Current)	AMTR on Gains (%) (Proposal)	Change in AMTR (%)	Capital Gains 2/ (Current)
			$ in billions		
Results from tax model simulation -- lower elasticity					
0	0	2.3	2.0	-0.3	15.4
10	5	13.5	12.3	-1.2	88.1
15	5	13.6	12.5	-1.1	35.7
25	15	16.4	14.9	-1.5	34.5
28	15	16.9	15.4	-1.5	20.3
33	15	16.2	14.8	-1.4	22.9
35	15	14.8	13.4	-1.4	78.7
Total		14.1	12.8	-1.3	295.4

		Lower Gains Elasticity: -0.5			
		Static Revenue Effect	Effect of Behavior on Revenue	Net Revenue Effect	Revenue Offset (%)
0	0	0.0	0.0	0.0	0
10	5	-0.8	0.4	-0.4	-48
15	5	-0.3	0.2	-0.2	-51
25	15	-0.5	0.2	-0.3	-41
28	15	-0.3	0.1	-0.2	-42
33	15	-0.3	0.1	-0.2	-41
35	15	-1.1	0.4	-0.7	-38
Total		-3.4	1.5	-2.0	-43

		Higher Gain Elasticity: -0.7			
		Static Revenue Effect	Effect of Behavior on Revenue	Net Revenue Effect	Revenue Offset (%)
0	0	0.0	0.0	0.0	0
10	5	-0.8	0.6	-0.3	-68
15	5	-0.3	0.2	-0.1	-72
25	15	-0.5	0.3	-0.2	-58
28	15	-0.3	0.2	-0.1	-60
33	15	-0.3	0.2	-0.1	-57
35	15	-1.1	0.6	-0.5	-53
Total		-3.4	2.1	-1.4	-61

1/ The capital gains response is estimated using a semi-log functional form where the behavioral parameter is set to obtain an implied elasticity of -0.5 (low case) and -0.7 (high case) when evaluated for a reduction in the capital gains tax rate from 20 percent to 18 percent. The percentage response in gains is applied to long-term gains in excess of short-term losses.

2/ Long-term gains in excess of short-term losses.

Table 4

Summary of Results and Alternative Simulations for 10 percent Across-the-Board Reduction in Tax Rates

Simulation	Elasticities	% Chg in Taxable Income	Revenue Offset (%)
Base simulation	0.4 taxable income elasticity, 0.5 capital gains elasticity	1.60	-19.6
	0.4 taxable income elasticity, 0.7 capital gains elasticity	1.69	-20.3
Elasticity varies with total income	0.15 for incomes below $130,400 and 0.55 for higher incomes		
	0.5 capital gains elasticity	1.47	-19.6
	0.7 capital gains elasticity	1.56	-20.2
Elasticity varies with taxable income	0.25 for the 25% statutory rate bracket and below, and 0.5 for higher tax rate brackets		
	0.5 capital gains elasticity	1.41	-18.1
	0.7 capital gains elasticity	1.50	-18.8
Base simulation excluding labor supply effect	0.4 taxable income elasticity, 0.5 capital gains elasticity	1.09	-13.8
	0.4 taxable income elasticity, 0.7 capital gains elasticity	1.18	-14.4

Note: The taxable income elasticity is applied to taxable income net of capital gains. A zero elasticity is assumed for taxpayers with $15,000 of income or below. The capital gains response is estimated using a semi-log functional form where the behavioral parameter is set to obtain an implied elasticity of -0.5 (low case) and -0.7 (high case) when evaluated for a reduction in the capital gains tax rate from 20 percent to 18 percent. The percentage response in gains is applied to long-term gains in excess of short-term losses.

[1]Saez (2003) reports a near zero elasticity for wages, which is in line with the low permanent response reported by Goolsbee (2000a). Gruber and Saez (2002) report an elasticity for their adjusted gross income equation, suggesting a lower response for wages.

[2]Both federal and state tax rates are included. For simplicity, an average state tax rate of 5 percent is used and itemizers are assumed to benefit from the deductible of state and local taxes.

[3] The simulations are simplified somewhat by focusing on a 10 percent *across- the-board* tax rate reduction because both the AMT and regular tax rates are reduced proportionally. Consequently, there is not a large migration of taxpayers between the regular tax and the AMT. Indeed, of the number of taxpayers affected by the AMT (e.g., taxpayers with AMT liability or lost credit because of the AMT) in the base simulation increases by less than 2 percent.

If instead AMT rates remained unchanged, AMT liability and the number of taxpayers affected by the AMT would more than double because taxpayers regular tax liability fall, but their tentative AMT would remain unchanged, thereby increasing AMT liability. Under such a proposal marginal tax rates would increase for taxpayers who move from the 15 percent and 25 percent regular tax bracket to the 26 percent or 28 percent AMT rate brackets.

[4] Consistent with the simulations discussed above, taxpayers with incomes below $15,000 are assumed to have a zero elasticity. Of course, this assumption has very little effect on the estimated taxable income response and the revenue offset because these taxpayers report very little taxable income.

[5]It would, however, be important to use the elasticities that account for income heterogeneity when considering proposals that only apply to the top tax rates since they suggest the response is higher for these taxpayers.

[6] Feldstein (1995) uses a three year lag, Auten and Carroll (1999) use a four year lag, and Gruber and Saez (2002) use a three year lag, but obtain comparable results using other lag structures.

[7]This approach was used by Carroll (1998) to illustrate the effect of the fixed output assumption on conventional revenue estimates. In an illustrative simulation to show the possible effects of income shifting the aggregate change in taxable income associated with an increase in the top two tax rates was reallocated to taxpayers who faced the average tax rate. The revenue offset fell from nearly 40 percent to about 13 percent once income shifting was incorporated.

[8]Labor supply responses can be incorporated into conventional revenues estimates provided they reflect compositional changes in labor markets and maintain a fixed level of employee compensation.

[9]The labor supply elasticities used for these simulations are from a survey of the literature by the Congressional Budget Office (1996). Earnings weighted wage and income elasticities used are lower at 0.08 and –0.07, respectively.