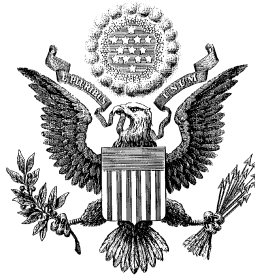


Optimal Capital Gains Tax Policy: Lessons from the 1970S, 1980S, and 1990S

A JOINT ECONOMIC COMMITTEE STUDY



**Jim Saxton (R-NJ)
Chairman**

**Joint Economic Committee
United States Congress**

June 1997

Abstract

This study analyzes data from previous changes in the capital gains tax rate and concludes that the current capital gains tax rate is too high. The study shows that a reduction in the capital gains tax would generate large revenue gains in the short run and would be roughly revenue neutral in the long run. In addition, a lower capital gains tax rate would improve the efficiency of capital markets and benefit the entire economy. Furthermore, failure to adjust capital gains for inflation results in excessively high effective capital gains tax rates, imposing an unfair burden on taxpayers even when the inflation rate is relatively low.

Joint Economic Committee
G-01 Dirksen Building
Washington, DC 20510
Phone: 202-224-5171
Fax: 202-224-0240

Internet Address:
<http://www.house.gov/jec/>

OPTIMAL CAPITAL GAINS TAX POLICY: LESSONS FROM THE 1970S, 1980S, AND 1990S*

*James D. Gwartney**
Randall G. Holcombe****

The federal capital gains tax has been the subject of substantial debate for more than a decade. Prior to the Tax Reform Act of 1986 long-term capital gains were taxed at a lower rate than ordinary income, but since that tax reform, they have been taxed at the same rate. Advocates of capital gains tax cuts argue a lower rate would stimulate investment and benefit the economy. Those who argue against the cuts say that any stimulus would be small, that the Treasury cannot afford the revenue losses that would result from rate cuts, and that reducing the capital gains tax rate would provide an unfair benefit to upper-income taxpayers who pay most of the capital gains taxes.

A number of the major issues surrounding the capital gains tax debate can be analyzed by examining the data on capital gains taxation during the past two decades. This period is particularly interesting to an analyst because the capital gains tax rates were altered several times. In 1974 the highest marginal tax rate on capital gains was 35 percent, and a series of cuts lowered it to 20 percent by 1982. The 20 percent rate remained in effect until 1987, when it was raised to the current 28 percent level. The response to these rate changes can be used to estimate the actual effects of changes in capital gains tax rates on the tax base and the revenue derived from the tax. In turn, this information can guide us as we search for an optimal capital gains tax policy.

The analysis that follows unambiguously concludes that the current capital gains tax rate is too high. Analysis of data from previous changes in the capital gains tax rates indicates that a reduction in the capital gains tax rate from 28 percent to 20 percent will result in a substantial increase in capital gains tax revenue in the short run. In the long run, revenue may either increase or decrease slightly. If there are any revenue losses in the long run, they will be exceedingly small because revenue reductions due to the lower rate will be offset by revenue enhancements resulting from increased capital gains realizations. A lower capital gains tax rate will both (1) release capital resources that many investors continue to hold in order to delay or avoid a tax liability and (2) reduce an impediment to the purchase and sale of capital assets. Both of these factors will improve the efficiency of capital markets and benefit the entire economy. Furthermore, the current failure to adjust capital gains for the effects of inflation leads to exceeding high effective capital gains tax

*The authors gratefully acknowledge the research assistance of Jennifer Platania.

**Professor of Economics and Policy Sciences, The Florida State University.

***Professor of Economics, The Florida State University.

rates and imposes an unfair burden on asset owners earning only modest capital gains returns. As we will demonstrate, this is true even when the inflation rate is relatively low. The effective capital

gains tax rate is *highest* for those taxpayers earning the *lowest* rates of return on their ownership of capital assets. This inverse relationship between rate of return and the effective tax rate is both unfair and inefficient. Indexing would eliminate this discriminatory element of the current system. Based on this analysis, we conclude that the capital gains tax rate should be cut substantially, and that capital gains should be indexed to adjust for the effect of inflation.

Capital Gains Tax Rates and Revenues

Straightforward economic reasoning shows that in principle tax rates could be so high that lowering them would expand the tax base sufficiently to increase the revenue derived from the tax. While there is little debate that this effect could, in theory, exist, there is a great deal of debate on how high tax rates must rise before it takes place in practice. Skeptics argue that rates would have to reach 80 percent or 90 percent before an increase in tax rates would reduce tax revenues. On the other hand, some would argue the revenue maximum rate is much lower, perhaps as low as 30 percent in the case of the personal income tax.¹

When examining the effects of tax rates on revenues, the issue can sometimes be clouded by the fact that, because of deductions and other special provisions, income from different sources can be taxed at different effective rates. Capital gains income provides a good example. The degree to which capital gains tax revenues are sensitive to rate changes has been the subject of debate among economists for decades. Feldstein, Slemrod, and Yitzhaki (1980) argued that a capital gains tax cut would increase revenues, and a decade later, Slemrod and Skobe (1990), in an environment where the rate was lower, argued that this remained true in the short run, and possibly in the long run as well. Auten and Clotfelter (1982) found no strong support for an inverse relationship between capital gains tax rates and revenues, but even this suggests that the rate is too high. At the other end of the spectrum, Auerbach (1988) suggests that after any transitory effects from rate changes are accounted for, there is no strong evidence that changes in capital gains tax rates have any effect on capital gains realizations.

The capital gains tax rate has exhibited large fluctuations since the late 1970s, providing a substantial amount of evidence that capital gains realizations are very sensitive, both in the short run and in the long run, to changes in the capital gains tax rate. Table 1 shows the maximum marginal tax rate on ordinary capital gains from 1974 to 1994, along with realized capital gains in current dollars and in constant 1992 dollars.² The numbers in parentheses show the amount of capital gains that was included in adjusted gross income (AGI). Prior to 1978 long-term capital gains were taxed at half the rate of ordinary income, and the rate was computed simply by dividing actual capital gains by two so that only half of long-term capital gains income was added to adjusted gross income for tax purposes. Thus, adjusted gross income excluded half of the long-term capital gains income and the top rate was 35 percent (half of the 70 percent maximum marginal personal income tax rate applicable at the time). The exclusion was upped to 60 percent

in 1979, lowering the maximum effective capital gains tax rate to 28 percent (40 percent of the 70 percent top rate). In 1982 the maximum personal tax rate was lowered to 50 percent and the 60 percent exclusion was retained, lowering the maximum capital gains tax rate to 20 percent. The Tax Reform Act of 1986 treated capital gains as ordinary income, but placed a cap on the rate at 28 percent. Despite increases in ordinary income tax rates since then, the maximum capital gains tax rate has remained capped at 28 percent.

Table 1: Nominal and Real Capital Gains: 1974-1994

	Top Marginal Rate Applicable to Ordinary Capital Gains	Nominal Capital Gains (Amount Included in AGI is in parentheses)^a (billions of dollars)		Real Capital Gains (Amount Included in AGI is in parentheses) (billions of dollars)	
1974	35.0	\$30.8	(15.4)	\$83.2	(41.6)
1975	35.0	30.9	(15.8)	77.3	(39.5)
1976	35.0	39.5	(20.2)	93.4	(47.8)
1977	35.0	45.4	(23.4)	100.7	(51.9)
1978	33.8	50.5	(26.2)	112.0	(54.1)
1979	28.0	73.4	(31.3)	139.0	(59.3)
1980	28.0	75.0	(33.1)	128.2	(56.7)
1981	23.7	80.9	(34.7)	127.0	(54.5)
1982	20.0	90.1	(38.5)	133.7	(57.1)
1983	20.0	122.0	(52.4)	173.0	(74.3)
1984	20.0	140.0	(58.9)	191.5	(80.6)
1985	20.0	171.0	(72.2)	225.6	(93.5)
1986	20.0	331.0	(135.0)	424.4	(173.1)
1987	28.0	144.2		178.0	
1988	28.0	161.9		192.1	
1989	28.0	153.5		173.6	
1990	28.0	123.8		133.3	
1991	28.0	111.4		115.1	
1992	28.0	126.7		126.7	
1993	28.0	152.3		148.4	
1994	28.0	152.7		145.3	

Source: Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns* (various years) and *SOI Bulletin* (various issues). The consumption expenditure component of the GDP deflator was used to convert the nominal data to real 1992 dollars.

^aPrior to 1987, only a portion of long-term capital gain was included in AGI. During 1974-77, 50 percent of the long-term capital gains was included in AGI. That figure was reduced to 40 percent in 1979 and remained at that level through 1986.

The inflation-adjusted capital gains realizations, in constant 1992 dollars, are also shown in Table 1. The impact of rate changes on the realization of capital gains is clearly observable. Legislation passed in 1978 cut the top capital gains rate from 35 percent to 33.8 percent in 1978

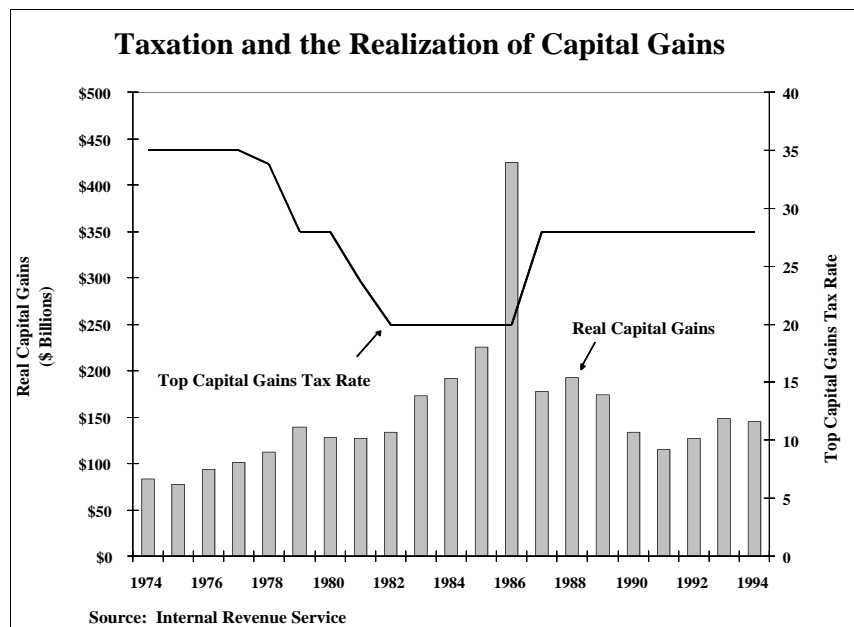
and 28 percent in 1979 when the rate reduction became fully effective. Capital gains realizations rose from \$100.7 billion in 1977 to \$112 billion in 1978, an increase of more than 11 percent. Then in 1979, the first full year of the lower rate, capital gains increased by an additional 24 percent (to \$139 billion).³ The cumulative two-year increase was 38 percent, far larger than increases in prior years. After this short-run impact, growth slowed, but capital gains realizations remained well above the levels they had exhibited under the 35 percent rate.

Although everybody does not pay the maximum effective rate, one can roughly estimate the percent change in revenue as the result of the rate reduction by multiplying the maximum effective rate by the amount of realized gains (measured in constant dollars). This implies tax collections of about \$35 billion in 1977 and \$39 billion in 1979, strongly suggesting that the 35 percent rate of 1977 was higher than the revenue-maximizing capital gains rate, at least in the short run. Realized capital gains in 1981 were \$127 billion, implying capital gains taxes of \$36 billion, calculated the same way, indicating that even in the long run, the lower rate expanded tax revenue.

When the rate was decreased to 20 percent in 1982, realized capital gains increased again even though the economy was in the midst of a very severe recession. For purposes of comparison, look at the average capital gains realizations in the three years following the rate reduction compared to the three years just prior to the rate cut. Measured in 1992 dollars, capital gains averaged \$166 billion during the three years following the rate reduction to 20 percent, compared to \$131 billion during 1979-1981. Multiplying by the effective tax rate yields collections of about \$33 billion for the 20 percent rate, compared to \$37 billion under the 28 percent rate. This suggests a revenue-maximizing rate of between 20 and 28 percent, but note the steep cost involved in going from a 20 percent rate to a 28 percent rate. Tax revenues are only 12 percent higher, but the tax rate is 40 percent higher. When one considers the excess burden of taxation, it is likely that even the 20 percent capital gains tax rate is higher than optimal. Furthermore, the steep recession in 1982 surely lowered capital gains realizations and reduced tax revenues from this source during the year.

The increase back to a 28 percent capital gains tax rate in 1987 gives even stronger evidence that the 28 percent tax rate is higher than the revenue-maximizing tax rate. The higher rate was instituted as a part of the Tax Reform Act of 1986, providing taxpayers with notice of the impending higher capital gains tax rate, and in 1986 capital gains realizations were \$424.4 billion, which is more than twice as high as any subsequent year. Taxpayers realized their capital gains when they saw higher future rates, and have been reluctant to realize capital gains since. Despite substantial income growth in the intervening decade, capital gains realizations at the 28 percent top rate were substantially lower in the early 1990s than they were a decade earlier when the top rate was 20 percent.⁴

This graph plots both the realized capital gains in constant dollars and the top capital gains tax rate from Table 1 to help visualize the changes that took place over the time period. Note the substantial growth in capital gains realizations in the early 1980s that correspond with sharp cuts in the tax rate. When legislation passed in 1986 which increased in the capital gains rate beginning in 1987, there was a huge one-year increase in realizations, followed by an even sharper reduction.



When considering the long-run effect of capital gains tax rates on revenues, one cannot fail to be struck by the fact that, even though there was substantial income growth over that decade, the capital gains realizations were lower in the early 1990s than during the early 1980s when the capital gains tax rate was 20 percent. Compare realized capital gains in 1982, 1983 and 1984, with realized gains in 1992, 1993, and 1994. The average capital gains realization for the 1982-84 period was \$166 billion. Over the next decade real GDP grew by 20.4 percent, and if capital gains realizations had kept up with income growth, they would have averaged \$200 billion.⁵ Yet the actual average for 1992, 1993, and 1994 was \$140 billion. This admittedly rough calculation suggests that a lower capital gains tax rate of 20 percent would have produced about 43 percent more realized capital gains than the 28 percent rate. Applying a 20 percent rate to \$200 billion would have yielded \$40 billion in capital gains taxes, while the 28 percent rate applied to \$140 billion would yield \$39 billion. These calculations suggest that the higher capital gains tax rates mandated by the 1986 legislation yielded no additional revenue for the Treasury, and may have even reduced capital gains tax revenues.

Linear regression analysis suggests the same thing. Using the log of real capital gains realizations as the dependent variable, and the log of the capital gains tax rate as an independent variable, the coefficient will be the elasticity of capital gains realizations with respect to the capital gains tax rate. Table 2 presents the results of two regressions. The additional independent variables are the growth rate of GDP, to account for the fact that capital gains realizations are procyclical (thus they will increase when the rate of growth is higher), the log of real GDP, included to capture the effect of long-term income growth on realized capital gains, and two dummy variables for the years 1986 and 1987. These are included because after the Tax Reform Act of

1986, the owners of assets with unrealized capital gains knew that they could realize the gains in 1986 and pay a 20 percent capital gains rate, after which the rate would increase to 28 percent.

Table 2: **Taxation and Realization of Real Capital Gains: Regression Analysis of 1974-1994 Data**

Independent Variables	Dependent Variable: Log of Real Capital Gains in 1992 dollars (T-ratios in parentheses)	
	(1)	(2)
	Top Marginal Capital Gains Rate (log)	-1.11 (5.54)
Growth of Real GDP	0.038 (2.37)	0.035 (2.88)
Real GDP in 1992 dollars (log)	—	0.64 (3.58)
Dummy: 1986	0.80 (4.37)	0.81 (5.81)
Dummy: 1987	0.31 (1.79)	0.24 (1.80)
Constant	8.45 (12.70)	6.86 (10.19)
R ²	.80	.89
n	21	21

The first regression equation shown in Table 2 is run without the GDP level variable, and shows an elasticity of -1.11. All of the variables except for the 1987 dummy are significant at the .05 level or better, and that dummy is significant at the .10 level. The second regression includes the level of GDP, and gives similar results, with an elasticity of -0.94. **Like our earlier calculations, regression analysis indicates that, within the range of capital gains tax rates imposed during 1974-1994, the changes in the capital gains tax rates were almost exactly offset by changes in the tax base, leaving revenues unaffected.**

These results unambiguously point to the desirability of lowering the capital gains tax rate. Reducing the rate to 20 percent, the lower limit of the past 20 years, would not have an adverse effect on revenues. In the short run, the lower rate would increase revenues as people find it worthwhile to realize capital gains that they were previously holding unrealized to avoid the tax. In the long run, there would be little impact on the stream of revenue derived from the taxation of capital gains. Most important, however, the lower tax rate would reduce the excess burden of the tax, which would encourage capital market transactions and enhance the performance of the economy.

The Revenue-Maximizing Tax Rate Versus the Optimal Tax Rate

It is vitally important to distinguish between the revenue-maximizing tax rate and the optimal tax rate. The revenue-maximum rate is the rate that will raise the most tax revenue for the government. The optimal tax rate weighs the economic cost of the higher rate against the benefits of more revenue. At the optimal rate, the marginal benefits derived from the revenue generated by a little higher rate are just equal to the marginal cost in the form of loss of productive economic activity squeezed out by the rate increase. Thus, the optimal rate is the rate that is best for the economy. Even though the difference between these two rates is relatively simple, ambiguity in this area is often a source of confusion. Therefore, the topic deserves some elaboration.

As any tax rate is increased, it has an increasingly larger disincentive effect on the tax base. At low rates, a tax will have a modest effect on economic activity, but at higher rates, the tax discourages more and more of the taxed activity. At some point the disincentive effect reduces the tax base so much that further increases in the tax rate will lower tax revenues because the shrinkage of the tax base will more than offset the rate increase. As rates are increased and the revenue-maximizing point approached, rate increases will add less and less to tax revenue, but they will impose larger and larger costs on the economy. Such rate increases are highly inefficient because even though they raise only a little more revenue, they squeeze out lots of economically advantageous activities. In the polar case at the revenue-maximum point, productive activity is reduced (this is why the tax base shrinks) even though the rate increase yields no additional revenue.

When examining the capital gains tax, capital transactions enhance the efficiency of the economy by allocating capital assets to their highest valued uses. In the absence of taxes, if another individual could make more productive use of a capital asset than its current owner, exchange between the two parties would be profitable. Exchanges of this type enhance the operation of the economy because they move the ownership of assets toward those individuals able to use capital assets most productively. The capital gains tax discourages these capital transactions because the current owner can keep the asset without any tax liability, but if the asset is sold, the capital gains tax must then be paid. Thus, it inhibits capital movements in the economy and reduces the productivity of the economy by discouraging the movement of capital toward its highest valued use. Lower capital gains taxes would reduce this inefficiency.

In the range near the revenue-maximizing tax rate, lower tax rates lead to substantial efficiency gains with little or no loss of revenue. At the optimal rate, the marginal benefits derived from the additional tax revenue will just equal the marginal cost imposed on the economy as a result of the higher rate. At the revenue-maximizing rate, however, the marginal benefit is zero (because a rate increase does not generate any additional revenue), but there is a substantial marginal cost (because the rate increase eliminates a large number of beneficial activities.)

Clearly, the optimal tax rate is always less than the revenue-maximizing rate, because at the revenue-maximizing tax rate, a small increase in the tax rate eliminates productive activities without raising any additional revenue. In contrast with the optimal rate, the revenue-maximum rate is highly inefficient. Thus, the optimal tax rate will be well below that rate. While this point reflects standard economic analysis widely accepted by almost all economists, it has been almost universally ignored in the policy debate. The implications for capital gains taxation are straightforward: If the revenue-maximum rate is no higher than 20 percent as we estimate, the optimal capital gains rate must be significantly lower, probably 15 percent or less.⁶

Income Taxes and Adjusted Gross Income

Not surprisingly, most capital gains taxes are paid by people in upper-income brackets. At least, they are in the upper-income brackets during the year a major capital gain is realized. Thus, it is worthwhile to break down taxpayers by income group to get a better idea of the effect of tax rates on the base income level. Table 3 presents some statistics on Adjusted Gross Income (AGI) and income taxes paid by the bottom 50 percent and the bottom 75 percent of taxpayers, while Table 4 presents the same data for taxpayers in the upper 1 percent and upper 5 percent.

Table 3: **Changes in the Real AGI and Real Taxes Paid by the Bottom 50 Percent and Bottom 75 Percent of Taxpayers Following Reductions in Marginal Tax Rates (1980-85 and 1985-90) and Increases in Marginal Tax Rates (1990-1994)**

	MTR in Initial Bracket	Real AGI (billions of 1992 dollars)		Real Income Taxes Paid (billions of 1992 dollars)	
		<u>Bottom 50%</u>	<u>Bottom 75%</u>	<u>Bottom 50%</u>	<u>Bottom 75%</u>
1980	14.00	\$491.6	\$1,203.8	\$30.2	\$115.0
1981	12.75	499.0	1,218.4	33.1	123.0
1985	11.00	533.8	1,299.6	30.5	110.3
1986	11.00	539.2	1,325.6	30.4	112.8
1990	15.00	558.3	1,407.0	28.0	110.6
1991	15.00	549.7	1,385.7	25.4	105.2
1994	15.00	561.1	1,408.3	24.3	104.1
Annual Rate of Change					
1980-1985		1.7%	1.5%	0.1%	-0.8%
1985-1990		0.9	1.6	-1.7	-0.8
1990-1994		0.1	0.0	-3.5	-1.5
1990-1991		-1.5	-1.5	-9.3	-4.9

Source: Internal Revenue Service, *Statistics of Income: SOI Bulletin* (various issues). The personal consumption expenditure component of the GDP deflator was used to convert the nominal data to real 1992 dollars.

The column labeled MTR in Initial Bracket shows the lowest marginal income tax rate. Note that the rate remains relatively constant throughout the period, especially when viewed in terms

of the income a taxpayer gets to keep after taxes. The highest initial rate during 1980-1994 was 15 percent, meaning a taxpayer gets to keep 85 cents out of every dollar, and the lowest was 11 percent, meaning that a taxpayer gets to keep 89 cents out of every dollar earned. Compared to the highest initial rate, the lowest initial rate provides only a 5 percent increase in after-tax income. Given the small differences, the rate changes in the lower brackets are likely to exert only a minor impact on the tax base. Of course, because the AGI data in Table 3 includes most taxpayers, a substantial share of the income listed in the table will be taxed at marginal rates higher than the minimum. Thus, the rate changes during the period will have provided many middle income taxpayers with a slightly greater change in after-tax earnings. Nonetheless, it is clear that the incentive effects accompanying the rate changes will be relatively small for most lower and middle income taxpayers.

In contrast, the incentive effects of the rate changes since 1980 will be much greater in the upper tax brackets. The highest marginal income tax rate varied from 70 percent, which left the taxpayer with only 30 cents out of every dollar, to 28 percent, which left the earner with 72 cents out of every dollar, or 240 percent more. Thus, those who remained in the lowest tax bracket throughout the period would have seen their marginal after-tax income change by less than 5 percent, while those in the highest tax bracket throughout the period would have seen their after-tax marginal income change by 240 percent. Because of this, one would expect to see the largest effects of tax rate changes in the upper tax brackets.

Table 3 shows a relatively slow growth of income for lower and middle income recipients during the 1980s, followed by virtually no growth in the 1990s. Note that there was a slight increase in the growth of AGI (from 1.5 percent to 1.6 percent) for the bottom 75 percent of income earners in the second half of the 1980s when compared to the first half. The average annual growth of AGI for the bottom 50 percent, however, declined from 1.7 percent in the first half of the 1980s to 0.9 percent during the latter half of the decade. Both groups showed virtually no growth in AGI between 1990 and 1994.

Real income taxes paid show a slight decline for the period for taxpayers in the bottom 50 percent and 75 percent of income earners. Table 3 shows that the rate of decline is larger in the 1990s than it was in the 1980s, and that the decline has been larger for the bottom 50 percent than the bottom 75 percent. Compare these figures with the parallel statistics on taxes paid by the upper 1 percent and upper 5 percent of taxpayers, shown in Table 4. The taxes paid by the upper-income groups show a consistent upward trend. For the top 5 percent of taxpayers, real income taxes paid grew at a rate of 1.2 percent per year from 1980 to 1985, 4.5 percent from 1985 to 1990, and 3.6 percent from 1990 to 1994. The bottom 75 percent of taxpayers showed negative growth rates in real tax payments for all of these periods. These figures show that the tax reforms since 1980 not only reduced the share of total income taxes paid by most taxpayers, and increased the share paid by upper-income taxpayers; the reforms actually reduced the total amount of taxes paid by most earners, while increasing the total amount paid by those with high incomes.

Table 4: Marginal Tax Rates and the Growth of AGI and Taxes Paid by High Income Taxpayers

	Top MTR	Real AGI (in billions)		Real Income Taxes Paid (in billions)	
		Top 1%	Top 5%	Top 1%	Top 5%
1980	70.0	\$235.3	\$584.3	\$82.5	\$158.6
1981	70.0	233.5	584.3	79.8	157.6
1985	50.0	310.2	701.0	95.7	168.7
1986	50.0	365.6	773.7	121.1	200.3
1990	28.0	520.2	1,026.2	120.9	210.0
1991	31.0	471.4	974.7	114.7	201.7
1994	39.6	520.2	1,049.3	146.7	242.0
Annual Rate of Change					
1980-1985		5.7%	3.7%	3.0%	1.2%
1985-1990		11.0	8.0	4.8	4.5
1980-1990		8.3	5.8	3.9	2.9
1990-1994		0.0	0.6	5.0	3.6
1990-1991		-9.4	-5.0	-5.5	-4.0

Source: Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns*, (various issues). The personal consumption expenditure component of the GDP deflator was used to convert the nominal data to real 1992 dollars.

As noted earlier, the incentive effects of the rate changes were substantially greater in the upper-income tax brackets. A comparison of taxes paid in Tables 3 and 4 shows that when considering overall tax payments, the effects of tax rate changes on upper-income taxpayers are very important. In 1980 the bottom 75 percent of earners paid \$115 billion in personal income taxes, nearly 40 percent more than the \$82.5 billion paid by the top 1 percent of earners. By 1986 the taxes paid by the top 1 percent of taxpayers exceeded those paid by the bottom 75 percent and by 1994 the top 1 percent paid 41 percent more than the bottom 75 percent of taxpayers (\$146.7 billion compared to \$104.1 billion). Although the marginal tax rates faced by the highest income taxpayers are now sharply lower than in 1980, their share of total tax payments has increased substantially.

The average tax rates of upper-income taxpayers have fallen along with their marginal tax rates. In 1980 the top 5 percent of income earners paid 27 percent of their incomes in income taxes, compared with 23 percent in 1994. The increases in income tax payments over this period have come because of increases in income. During the 1980s, the AGI of the top 5 percent of taxpayers grew at an average annual growth rate of 5.8 percent, and the growth rate was 8.3 percent for the upper 1 percent. In contrast, during the first half of the 1990s the growth of AGI in the upper brackets, like that for the bottom 75 percent of earners, fell to near zero.

As marginal tax rates change, people adjust their economic affairs in order to minimize their tax burdens. When the top marginal tax rates plummeted during the 1980s, people had less incentive to look for ways to avoid taxes. If, for example, a tax attorney were able to develop a tax shelter at the cost of 50 cents for every dollar sheltered, this would be a good option for a taxpayer in the 70 percent tax bracket. The taxpayer would then get to keep 50 cents rather than 30 cents after taxes. But when the top marginal tax rate fell to 28 percent, the taxpayer would be better off reporting taxable income than paying for the tax shelter. A reduction in tax avoidance activities during the 1980s enhanced the reported income—particularly in the upper-income groupings—and contributed to the apparent increase in the inequality of the observed income statistics.

Between 1980 and 1985, the real income taxes paid by the upper 1 percent of earners grew at an average annual rate of 3 percent; the growth in the taxes collected from the top 5 percent of earners was 1.2 percent. During this same time period, the top marginal tax rate fell from 70 percent to 50 percent. From 1985 to 1990 the top marginal tax rate fell from 50 percent to 28 percent, and both the top 1 percent and top 5 percent of income earners saw an increase in their rate of growth of tax payments to about 4.5 percent. Then, when the top tax bracket was increased to 31 percent in 1991 and 39.6 percent in 1993, the *growth rate* of tax collections from the upper 1 percent changed little, going from 4.8 percent to 5 percent, while the growth rate for the upper 5 percent declined from 4.5 percent to 3.6 percent. Income growth slowed also, but as noted above, this is at least partly attributable to taxpayers looking for more ways to shelter their income from taxes due to the higher rates.

The responsiveness in overall tax payments to changes in tax rates is not as apparent as it is when examining capital gains taxes. Still, one can see substantial effects in the growth of tax payments for upper-income taxpayers in Table 4. The growth rate in tax payments was 60 percent larger for the top 1 percent of earners during the 1985-1990 period, when the top marginal rate declined from 50 percent to 28 percent, than for the 1980-1985 period when the top marginal rate ranged from 50 percent to 70 percent. When tax rates went up again in the 1990-1994 period, the growth of tax revenues collected from the top 1 percent was virtually unchanged from that of the late 1980s, while growth of revenues derived from the top 5 percent of taxpayers slowed by 20 percent. These results are consistent with Feldstein (1995b), who argued that the rate changes in 1986 more than paid for themselves through rate-induced increases in the tax base.

Capital Gains and High-Income Taxpayers

The impact of changes in tax rates in the upper-income brackets is highly important because most of the revenue derived from the personal income tax is collected from these taxpayers. Thus, any effect on this small subset of taxpayers will have major effects on overall tax collections. It bears repeating that in 1994 the top 1 percent of income earners paid 41 percent more in income taxes than the bottom 75 percent of income earners. This section looks at those high-income taxpayers in more detail by separating out their capital gains income from the rest of their income.

The growth of AGI shown in Table 4 is potentially misleading because of changes in the treatment of capital gains during the period. Prior to 1987, only a fraction of capital gains income was included in AGI. For example, the maximum capital gains tax rate in 1980 was 28 percent, but this was calculated by subtracting 60 percent of capital gains from AGI, so the AGI statistics prior to 1987 exclude 60 percent of capital gains. After 1987, 100 percent of capital gains is included in AGI.

Table 5 reports both the nominal and real capital gains income of the top 1 percent and top 5 percent of taxpayers. The numbers in parentheses indicate the amount of capital gains income reported in AGI. Most capital gains taxes are paid by these upper-income taxpayers, which can be seen by comparing the capital gains realizations reported in Table 5 with total capital gains realizations presented in Table 1. Throughout most of this period, the top 1 percent of income recipients earned a little more than half of the total realized capital gains, while the top 5 percent have realized about two-thirds of the total capital gains income. These taxpayers are more likely to be sensitive to changes in tax policy. Many taxpayers may realize capital gains from the sale of a house or some other asset that is sold for reasons that are not primarily financial, whereas upper-income taxpayers are more likely to realize capital gains as a result of investment activity, where tax payments can be a crucial part of the decision.

Table 5: The Capital Gains Income of the Top 1 Percent and Top 5 Percent of Earners: 1980-1994

	Nominal Capital Gains (Number in parentheses is amount included in AGI)		Real Capital Gains in 1992 dollars (Number in parentheses is amount included in AGI)	
	Top 1%	Top 5%	Top 1%	Top 5%
1980	33.5 (14.5)	47.5 (22.2)	57.3 (24.8)	81.2 (37.9)
1981	39.1 (16.7)	48.7 (19.5)	61.4 (26.2)	76.5 (30.6)
1985	98.3 (41.1)	121.7 (51.1)	134.5 (56.2)	166.5 (70.5)
1986	219.1 (92.6)	263.1 (108.3)	280.9 (118.7)	337.3 (138.8)
1990	74.7	90.8	80.4	97.7
1991	61.9	76.9	63.9	79.4
1994	86.4	107.4	82.2	102.2
Annual Rate of Change in Real Capital Gains:				
1980-1985			19.0%	15.7%
1985-1994			-5.3	-5.3

Source: Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns*, (various issues). The personal consumption expenditure component of the GDP deflator was used to convert the nominal data to real 1992 dollars.

The numbers in Table 5 illustrate the strong correlation between capital gains realizations for upper-income taxpayers and the capital gains tax rate. From 1980 to 1985, when the top capital gains tax rate fell from 28 percent to 20 percent, the average annual rate of growth in real capital gains was 19 percent for the upper 1 percent of income earners, and 15.7 percent for the upper 5 percent. Then, from 1985 to 1994, when the highest capital gains tax rate rose to 28 percent (beginning in 1987), the average annual rate of change in realized capital gains dropped to *minus* 5.3 percent for both groups.⁷ **Measured in constant dollars, the capital gains realized by both the top 1 percent and top 5 percent of income recipients in 1994 were only three-fifths (61 percent) of their 1985 level. This reduction in capital gains realizations came during a decade when rising incomes, and especially rising equity values in the stock market, should have led to sharply higher capital gains. However, the higher tax rate provided a disincentive for the realization of the capital gains.**

Table 6 reports the real Adjusted Gross Income *minus* capital gains income for upper-income taxpayers. Over the entire period from 1980 to 1994 upper-income taxpayers showed exceptionally high rates of income growth, but it is interesting to note how that growth is concentrated in the years just after the Tax Reform Act of 1986 that slashed the marginal tax rates of high-income taxpayers. From 1980 to 1986 upper-income taxpayers had an average annual real income growth of about 2.6 percent, which is about 1 percent higher than the AGI growth of the bottom 50 percent and 75 percent of income earners (see Table 3). In the 1990-1994 period when these taxpayers saw higher marginal tax rates, the top 5 percent of taxpayers had an average annual income growth of only 0.5 percent, and the top 1 percent saw a slight decline, which was roughly in line with the growth rates of the bottom 75 percent of earners. The big difference came from 1986 to 1990, when the top 5 percent of income earners averaged a 10 percent growth in AGI less capital gains, and the top 1 percent had a whopping income growth (AGI less capital gains) of more than 15 percent.

Table 6: Changes in the Real AGI (Exclusive of Capital Gains) and the Real Taxes Paid by the Top 1 percent and Top 5 Percent of Taxpayers Following Reductions in Marginal Tax Rates (1981-86 and 1986-90) and Increases in Marginal Tax Rates (1991-1994)

	Real AGI (Exclusive of Capital Gains) (billions of 1992 dollars)		Real Income Taxes paid on Non-capital Gain Income (billions of 1992 dollars) ^a	
	Top 1%	Top 5%	Top 1%	Top 5%
1980	\$210.4	\$546.4	\$73.6	\$146.6
1981	207.3	553.7	66.0	141.3
1985	254.0	630.9	70.1	138.7
1986	246.9	634.9	67.7	139.6
1990	439.8	928.5	99.5	185.4
1991	407.5	895.3	97.7	181.7
1994	438.0	947.1	124.8	216.2
Annual Rate of Change				
1980-1986	2.7%	2.6%	-1.4%	-0.8%
1986-1990	15.5	10.0	9.6	6.8
1980-1990	7.7	5.5	3.1	2.4
1990-1994	-0.1	0.5	5.8	3.9

Source: Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns*, (various issues). The personal consumption expenditure component of the GDP deflator was used to convert the nominal data to real 1992 dollars.

^aIn calculating the real taxes paid as the result of capital gain income, we assumed that the top 1 percent paid 5 percent of the top marginal tax rate applicable to capital gains during the year and that the top 5 percent paid 9 percent of the maximum capital gains rate. The tax revenues generated by capital gains income were then subtracted from the total income taxes paid.

The figures in Table 6 exclude capital gains income, so this income jump must have come from other sources, such as wages and salaries, interest, dividends, and perhaps other types of business income. It is unlikely that income-earning opportunities increased this substantially during 1986-1990. More likely, with lower marginal tax rates, there was a smaller payoff to sheltering income from taxes, so more AGI was reported, leading to more of a growth in reported AGI than in actual income. This provides a good illustration of the way in which tax rate cuts can lead to tax revenue increases. Note that for the top 1 percent of income earners, their AGI less capital gains increased by 78 percent from 1986 to 1990. As a result, their total taxes paid on non-capital gains income rose by an estimated 47 percent during the period. For the top 5 percent, the estimated taxes on non-capital gains income rose by 33 percent between 1986 and 1990.

Critics might argue that this was due to a broadening of the tax base that offset the lowering of the marginal tax rate these taxpayers faced, but note that the income growth during the period

was sufficient to completely offset the lowering of rates independent of any base broadening due to reductions in allowable deductions. If the 50 percent marginal tax rate from 1986 were applied to all non-capital gains income of this group, they would have paid \$123 billion in taxes on this income. Applying the 28 percent tax rate to all non-capital gains income in 1990 would have yielded \$123 billion also. By 1994, when the top marginal tax rate was 39.6 percent, the top 1 percent of income earners had non-capital gains AGI slightly below the level they reported in 1990. These figures suggest that the current top marginal income tax rate of 39.6 percent is close to the revenue-maximizing rate, and that the 50 percent rate that existed prior to 1987 was well above the revenue-maximizing rate.

Tables 5 and 6 illustrate that upper-income taxpayers are very sensitive to changes in tax rates. Table 6 shows that when the top marginal income tax rate was cut from 50 percent to 28 percent, there was a *huge increase* in non-capital gains income between 1986 and 1990. Table 5 illustrates that, during this same period, there was a *huge decline* in capital gains realizations as the capital gains tax rate rose from 20 percent to 28 percent. **Thus, in the late 1980s when upper-income taxpayers had their marginal rates on ordinary income reduced substantially, but at the same time had their capital gains tax rate increased substantially, their non-capital gains income rose sharply while their capital gains realizations plummeted.**

The dramatic growth of the income base, exclusive of capital gains, during 1986-1990 illustrates the responsiveness of high-income taxpayers to changes in the rate structure. Unfortunately, this growth was largely concealed by the strong negative impact of the higher capital gains rates on the income base of this same group of taxpayers. The 1986 rate reductions on ordinary income had a much larger impact on the income base in the upper tax brackets than is generally realized. Had the capital gains rate not been increased by the same legislation, the growth of income in the upper brackets and increase in taxes collected from these taxpayers would have been truly phenomenal during the late 1980s and into the 1990s. Certainly, the revenues derived from this important group of taxpayers would have been greater than those that actually occurred.

The Effect of Inflation on Real Capital Gains Tax Rates

Analysis of the impact of inflation on the effective taxation of capital gains helps explain their sensitivity to rate changes. The disincentive effects of capital gains taxes are larger than they first appear. Since taxpayers are not permitted to adjust the purchase price of assets for the effects of inflation, the effective tax rate on real capital gains is higher--often substantially higher--than the statutory capital gains rate. In cases that are not particularly unusual, the effective rate can exceed 100 percent of the inflation-adjusted capital gain.

With inflation, the nominal value of capital assets increases relative to their real value. Suppose that Ann Smith purchased a plot of land for \$10,000 in 1980 and sold the land for \$20,000 in 1997. Since prices doubled during this period, her real capital gain is zero. Ann will not be able to buy any more goods and services with the \$20,000 received from the sale of the land in 1997 than she could have purchased with the \$10,000 she paid for the land in 1980.

Nonetheless, Ann will be subject to a capital gains tax on the nominal gain. If she is in the 28 percent tax bracket, she will owe a \$2,800 tax bill even though she reaped no real gain from the transaction!

Alternatively, suppose Ann was able to sell her land for \$25,000. In this case, measured in 1997 dollars, Ann's inflation-adjusted capital gain would be \$5,000 (\$25,000 minus a \$20,000 purchase price in terms of 1997 dollars) and her additional tax liability \$4,200 (28 percent of the \$15,000 nominal gain). She is liable for \$4,200 in additional taxes even though her real capital gain in current dollars is only \$5,000. The marginal tax rate on her real capital gain is 84 percent, not 28 percent!

As these typical examples illustrate, when assets are held a number of years, the current taxation of "phantom" capital gains leads to exceedingly high marginal tax rates even at modest rates of inflation. From the viewpoint of efficiency, these high rates are harmful because they reduce the funding available for new projects and encourage people to continue holding assets (until death or retirement) that they would otherwise like to sell.

Furthermore, the current system of capital gains taxation is extremely unfair to investors earning only modest capital gain returns. Table 7 illustrates why this is true. Here we consider how an investor's tax liability varies with the rate of return on an asset purchased for \$10,000 and held for five years when the rate of inflation is 3 percent, the approximate current rate. The calculated tax liability assumes that the taxpayer confronts a 28 percent rate, the current top statutory rate on nominal capital gains. The first row of the table assumes that the asset appreciates at a nominal rate of 4 percent per year, so at the end of five-year period it is worth \$12,167. The nominal capital gain on the asset is \$2,167, and at a 28 percent tax rate the capital gains tax liability is \$607. After adjusting for the 3 percent inflation, however, the real increase in the value of the asset is only \$574. Put another way, the \$12,167 derived from the sale of the asset will only purchase \$574 more goods and services today than \$10,000 would have purchased five years ago. The \$607 capital gains tax liability takes all of the real capital gain and more. In this case, the effective capital gains tax rate is 105.7 percent!

Table 7: The Rate of Return and the Variation in the Rate of Capital Gains Taxation on an Asset Purchased Five Years Ago for \$10,000 When Inflation Rate is 3 Percent

Annual Nominal Rate of Return	Nominal Value of Asset Held Five Years	Nominal Capital Gain	Tax Liability at 28% Rate	Real Capital Gain ^a	Tax Rate on Real Capital Gain ^b
(1)	(2)	(3)	(4)	(5)	(6)
4%	\$12,167	\$2,167	\$607	\$ 574	105.7%
5%	12,763	2,763	773	1,170	66.1%
8%	14,693	4,693	1,314	3,100	42.4%
15%	20,114	10,114	2,832	8,521	33.2%
25%	30,518	20,518	5,745	18,925	30.4%

^a This is equal to the nominal sales price of the \$10,000 asset after five years (column 2) minus \$10,000 $(1.03)^5$. The latter expression indicates the amount of current dollars that would have the same purchasing power as the original \$10,000 investment had five years ago.

^b This is equal to the tax liability (col. 4) divided by the real capital gain (col. 5). Both are measured in the purchasing power of the dollar at the end of the five-year period.

Look what happens as the nominal rate of return increases. When the taxpayer's asset appreciates at a nominal rate of 5 percent over the five-year period, the value of the asset increases to \$12,763, providing a real capital gain of \$1,170. The tax liability against this gain would be \$773, or 66.1 percent of the real gain. If the nominal return was 8 percent, the real capital gain would be taxed at a still lower rate (42.4 percent). The effective capital gains tax rate would be 33.2 percent if the investor was able to earn an annual nominal return of 15 percent. For those investors fortunate enough to enjoy a capital appreciation of 25 percent per year, the effective capital gains tax rate falls to 30.4 percent, only slightly higher than the statutory rate.⁸

As Table 7 illustrates, the current system taxes capital gains at substantially different rates. If an investor reaps a return slightly greater than the rate of inflation, the IRS claims more than 100 percent of the capital gain. In contrast, taxpayers holding assets appreciating at annual rates of 20 percent, 25 percent, or 30 percent pay much lower rates. Worse still, if you are unfortunate enough to hold an asset that appreciates less rapidly than the inflation rate, you will be hit with additional taxes even though you do not have a real capital gain.

Even with modest rates of inflation, the current system discriminates heavily against investors who reap only a small rate of return on their capital assets. The lower the taxpayer's capital gain rate of return, the higher the rate of taxation imposed on the gain. This pattern of taxing the least fortunate investors the most is highly unfair. We do not

know of any principle of taxation that would support higher tax rates for those earning lower rates of return. Yet, this is precisely what happens under the current system.

Even when the rate of inflation is low, the current tax structure often taxes capital gains at exceedingly high rates and it places the largest burden on those taxpayers receiving the lowest rates of return. The former is inefficient and the latter are highly unfair. Both of these problems would be alleviated if capital gains were indexed--that is, if taxpayers were allowed to adjust the initial purchase price of assets for the effects of inflation. As long as capital gains are taxed, the tax should be computed based on inflation-adjusted capital gains, not the nominal dollar value of the gains. Indexation would remove the bias inflation injects into the taxation of capital and it is especially desirable because it would both improve efficiency and promote fairness.

Conclusion and Implications

How high is the revenue-maximizing tax rate? In the actual economy there are many different tax rates and many different tax bases, so it may be true that some tax rates could be cut with no loss (or even a gain) in revenue, but not others. Our analysis suggests that for ordinary income the revenue-maximizing tax rate appears to be well below 50 percent, and it may be close to the current 39.6 percent top marginal rate. For capital gains the revenue-maximizing rate is much lower, and the evidence examined here indicates that a reduction in the rate from its current 28 percent to 20 percent would not reduce tax revenues in the long run, and would produce substantially more revenues in the short run as taxpayers sold capital assets they had been holding in order to delay or avoid the accompanying tax liability.

It makes sense that the revenue-maximizing tax rate would be lower for capital gains than for ordinary income. Whereas the option for most income is either to earn it or not, in the case of capital gains, taxpayers have another alternative: they can allow their gains to continue accumulating untaxed, rather than realize them and pay the tax. This possibility of deferring the payment of capital gains taxes makes capital gains income more sensitive to the rate at which it is taxed. In turn, the greater elasticity of the capital gains income base with respect to the rate makes the revenue-maximizing capital gains tax rate lower than that for ordinary income.

The point that the revenue-maximum rate is highly inefficient cannot be stressed too much. When higher tax rates shrink the tax base so much that they raise little or no additional revenue, this means that they are eliminating a large volume of mutually advantageous trades. Production is reduced and resources are used less efficiently than would otherwise be the case. Reflection on the potential gains that continue to be locked up by the current capital gains rate structure illustrates this point. Many asset owners are continuing to hold assets that they would like to sell to others who value them more. No doubt, the potential new owners believe they can employ the assets more effectively; this is why they are willing to pay more than the current owners value of the assets. But these mutually advantageous exchanges and the accompanying movements to more efficient uses do not occur because of the tax implications.

Clearly, the optimal tax rate is always lower than the revenue-maximizing tax rate because of the excess burden of taxation. When tax rates are close to their revenue-maximizing level, the tax rate can be reduced with relatively little reduction in revenue, but with a large reduction in the welfare cost of taxation. Estimates from several studies on the marginal excess burden of taxation suggest that it is around 25 percent of the revenue raised.⁹ **Cutting the capital gains tax rate from 28 percent to 20 percent would provide a substantial efficiency gain without any significant loss in revenue. From an efficiency standpoint, however, even the 20 percent rate is too high because the size of the excess burden of taxation is very high in the range near the maximum-revenue tax rate. These findings suggest that the optimal capital gain rate is probably 15 percent or less.**

In addition to reducing the capital gains tax rate, capital gains should also be indexed. The taxation of phantom capital gains, created through inflation, leads to both (1) exceedingly high effective tax rates (in some cases the effective rate exceeds 100 percent) and (2) the imposition of the highest capital gains tax rates on those earning the lowest rates of return. This allocation of the capital gains tax burden is unfair, discriminatory, and highly inconsistent with basic principles of taxation. Indexation of capital gains would both reduce the high effective rates stemming from inflation and eliminate the differential rates imposed on capital gains. The case for indexing of capital gains is particularly strong since this modification would both promote efficiency and remove one of the most unfair elements of the current tax structure.

Footnotes

1. See Feldstein (1995b) for support of the idea that tax rate decreases led to increases in revenues. Slemrod (1990) contains a number of chapters arguing both ways, showing that there is not a consensus on the issue. Even a tax rate of zero could increase tax revenues, when all effects are considered. Feldstein (1995a) argues that by exempting IRA contributions from income taxation, saving increases, which increases corporate income. Increased corporate income tax payments may more than offset the revenue losses from the zero rate in IRA contributions.
2. Depending upon the size and magnitude of other sources of income, various minimum tax provisions caused some taxpayers to confront marginal rates higher than the maximum ordinary capital gains rate during years prior to 1979.
3. In 1978 and 1981 the capital gains tax cuts were implemented in mid-year, and the rates shown in the table for those years are effective rates for the entire year.
4. The economy went into a recession in 1991, and as Table 1 shows, the realization of capital gains fell by approximately 14 percent during the downturn. In contrast, when the economy was in a much more severe recession in 1982, capital gains realizations increased by 5.3 percent over the previous year. This suggests that the lower rates of 1982 stimulated the realization of capital gains more than the recession deterred them.
5. This may understate the case because 1982 was a recession year, depressing capital gains realizations in that year and making the 1982-84 total lower. The low year of the less severe recession in the early 1990s was 1991, so 1992 was a recovery year.
6. While a rate reduction to 15 percent or less would lower the current rate substantially, Hall and Rabushka (1985) make a persuasive case for eliminating capital gains taxes entirely.
7. Here we compare capital gains income for 1985 with that of the 1990s in order to avoid distortions emanating from the moving of capital gains forward to 1986 prior to the rate increase of 1987.
8. If Table 7 were recalculated using the assumption of no inflation, the real capital gains rate for each row would be equal to the 28 percent statutory rate. The effective rates exceed the statutory rate because inflation results in the taxation of phantom capital gains. When an asset is held for five years, ten years, or longer, the tax burden accompanying these phantom gains becomes large even when the inflation rate is relatively low.
9. A pioneering study on the topic is Browning (1976). More recent estimates include Ballard, Shoven, and Whalley (1985), Stuart (1984), and Browning (1987).

References

- Auerbach, Alan J., "Capital Gains Taxation in the United States: Realizations, Revenue, and Rhetoric," *Brookings Papers on Economic Activity* 19 (1988), pp. 595-631.
- Auten, Gerald, and Charles Clotfelter, "Permanent Versus Transitory Effects and the Realization of Capital Gains," *Quarterly Journal of Economics* 97, No. 4 (November 1982), pp. 613-632.
- Ballard, Charles L., John B. Shoven, and John Whalley, "General Equilibrium Computations of the Marginal Welfare Costs of Taxes in the United States," *American Economic Review* 75, no. 3 (March 1985), pp. 128-138.
- Browning, Edgar K., "The Marginal Cost of Public Funds," *Journal of Political Economy* 84, no. 2 (April 1976), pp. 283-298.
- _____, "On the Marginal Welfare Cost of Taxation," *American Economic Review* 77, no. 1 (March 1987), pp. 11-23.
- Feldstein, Martin, "The Effects of Tax-Based Saving Incentives on Government Revenue and National Saving," *Quarterly Journal of Economics* 110, No. 2 (May 1995a), pp. 475-494.
- _____, "The Effect of Marginal Tax Rates on Taxable Income: A Panel Study of the 1986 Tax Reform Act," *Journal of Political Economy* 103, No. 3 (June 1995b), pp. 551-572.
- Feldstein, Martin, Joel Slemrod, and Shlomo Yitzhaki, "The Effects of Taxation on the Selling of Corporate Stock and the Realization of Capital Gains," *Quarterly Journal of Economics* 94, No. 2 (June 1980), pp. 777-791.
- Hall, Robert E. and Alvin Rabushka, *The Flat Tax*. Stanford: Hoover Press, 1985.
- Slemrod, Joel, ed., *Do Taxes Matter? The Impact of the Tax Reform Act of 1986*. Cambridge, Mass.: MIT Press, 1990.
- Slemrod, Joel, and William Skobe, "The Tax Elasticity of Capital Gains Realizations: Evidence from a Panel of Taxpayers," Cambridge, Mass.: National Bureau of Economic Research Working Paper #3237 (January 1990).
- Stuart, Charles, "Welfare Costs Per Dollar of Additional Tax Revenue in the United States," *American Economic Review* 74, no. 3 (June 1984), pp. 352-362.