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3 Capital Gains Rates, Realizations, and Revenues

Lawrence B. Lindsey

The effect of the capital gains tax on the sale of capital assets and the realization of gains on these assets have been a matter of substantial academic and political controversy. Capital gains are only taxed when an asset is sold, and so inclusion of gains in taxable income is largely discretionary from the point of view of the taxpayer. As a result, sensitivity to tax rates is probably greater for capital gains income than for other kinds of income.

This sensitivity may take a number of forms. Capital gains and losses on assets held for less than a specified time period, currently 6 months, are taxed as ordinary income while gains and losses on assets held for longer periods of time are taxed at lower rates. Within limits specified by the tax law, taxpayers have an incentive to realize losses in the short term and gains in the long term. Planning of sales around this capital gains holding period was studied by Kaplan (1981), who concluded that eliminating the distinction between long-term and short-term gains, and taxing all assets under current long-term rules, would enhance capital gains tax revenue. Fredland, Gray, and Sunley (1968) also found that the length of the holding period had a significant effect on the timing of asset sales.

The deferral of taxes on capital gains until realization enhances the incentive to postpone selling assets. A taxpayer might defer selling one asset and purchasing another with a higher pretax return because capital gains tax on the sale makes the transaction unprofitable. This is known as the "lock-in" effect. Feldstein, Slemrod, and Yitzhaki (1980) esti-

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mated that the effect of lock-in was substantial enough to suggest that a reduction in tax rates from their 1978 levels would increase tax revenue. Their study focused on sales of common stock using 1973 tax return data. The results mirrored those of an earlier work by Feldstein and Yitzhaki (1977) which relied on data from the 1963–64 Federal Reserve Board Survey of the Financial Characteristics of Consumers.

Brannon (1974) found evidence of reduced realizations of capital gains as a result of tax rate increases in 1970 and 1971. A lock-in effect was also identified by Auten (1979). Later Auten and Clotfelter (1979) found a substantially greater sensitivity of capital gains realizations to short-term fluctuations in the tax rate than to long-term, average tax rate levels. Minarik (1981) studied the lock-in effect and concluded that a 1% reduction in the capital gains tax rate would increase realizations, but by substantially less than 1%. The U.S. Department of the Treasury (1985) released a report to the Congress which presented substantially higher estimates of the elasticity of capital gains realizations to tax rates and concluded that the tax rate reductions of 1978 had the effect of increasing capital gains tax revenue.

Some work has also been done on incentives to lock in capital gains for very long periods of time. Assets held until death or contributed to charity escape capital gains taxation under the income tax. In the case of death, capital gains are taxed by the estate tax since estates are subject to estate taxes on the full fair market value of the assets they contain. Bailey (1969) and David (1968) have argued that eliminating these provisions would be an efficient means of reducing the lock-in effect by eliminating the possibility of escaping capital gains tax.

The objective of the present paper is to examine the relationship among capital gains tax rates, the level of realizations of long-term gains subject to tax, and revenues from capital gains taxation over an extended period of time. The Tax Reform Act of 1969 began an era of high variability in the capital gains tax rate which had been relatively constant for the preceding 15 years. Further changes in the tax reform bills of 1976, 1978, and 1981 continued this variability.

The changes in the effective capital gains tax rate which resulted from these laws were quite complex and often involved the interaction of several provisions. This paper makes careful estimates of the effective marginal tax rate on capital gains for various income groups over the period 1965–82. These detailed estimates suggest smaller variability in rates than suggested by the maximum effective rates cited in other studies. The first section describes the computation of the effective capital gains tax rates and describes the impact of the various provisions on the capital gains tax rate. The effect of these provisions is combined using detailed tabulation data from *Statistics of Income* to estimate average marginal effective tax rates for various income groups.

The second section analyzes data from the sector balance sheets and reconciliation statements of the Federal Reserve Board's *Flow of Funds* series. These data provide estimates of the level and composition of wealth of the household sector. They also estimate the change in value of these holdings due to movements in asset prices. This section also describes the method used to allocate these wealth values among the various income classes studied.

The final section combines the data on the level and distribution of wealth with the marginal tax rate series to estimate the effect of marginal tax rates on the rate of realization. These parameter estimates are then placed in the context of a revenue-maximizing objective function to calculate the capital gains tax rate that produces the maximum revenue for the government. The sensitivity of these estimates to econometric specification is also examined in the final section.

3.1 Capital Gains Tax Rates

The Internal Revenue Code of 1954 distinguished between gains on assets held at least 6 months and those held longer. The former were taxed as ordinary income while the latter, termed long-term gains, were given a 50% exclusion from taxable income. However, this exclusion was limited to net capital gains, long-term gains in excess of short-term losses. Therefore, to the extent that long-term gains simply cancelled short-term losses, the long-term marginal tax rate equalled the short-term rate, which was the same as the tax rate on ordinary income. (There were some exceptions to this tax treatment including S.1231 gains. These gains received capital gains treatment if positive but ordinary income treatment if negative.)

There remains some debate regarding the proper measure of capital gains for analysis. Minarik (1983) has argued that long-term gains in excess of any short-term loss is the only relevant measure of gains for considering the effect of tax rates and revenue implications. On the other hand, some analyses of capital gains, such as that by Feldstein and Slemrod (1982) have included net long-term capital losses in their calculation. These net losses are permitted only limited deductibility in the year taken, although they may be carried forward to offset future tax liability. In general, their inclusion would tend to decrease the apparent effectiveness of capital gains taxation in generating revenue and raise the apparent sensitivity of taxpayers to capital gains tax rates.

Poterba (1985) examined 1982 tax return data and found that taxpayers with net long-term gains comprised the majority of all returns reporting capital gains or losses. He noted, however, that a sizable fraction of taxpayers were subject to the capital loss limitation and therefore could realize additional long-term gains without incurring any additional current tax liability. These taxpayers are unaffected by the

marginal tax rate on capital gains, generate no capital gains tax liability, and are therefore neglected in the present study.

The present study examines only long-term gains in excess of short-term losses. The relevant marginal tax rate for most taxpayers is therefore half the tax rate on ordinary income as only half of such gains are included in taxable income. (After 31 October 1978 this inclusion rate was reduced to 40%.) The higher tax rate on inframarginal long-term gains used to offset short-term losses is neglected. We consider only the tax rate on marginal realizations of long-term gains for taxpayers with long-term gains in excess of short-term losses.

Although the general rule for tax rates on long-term gains is that they are half the ordinary rates (40% of ordinary rates after 31 October 1978), there are a number of other provisions of the tax code which affected the capital gains tax rate. These include the Alternative Tax Computation, the Additional Tax for Tax Preferences, the Maximum Tax on Personal Service Income, and the Alternative Minimum Tax. We consider each in turn, using detailed tabulation data from *Statistics of Income* to calculate its effect on capital gains tax rates.

3.1.1 The Alternative Tax Computation

Tax rates on ordinary income over most of the period of this study ranged up to 70%. Thus, taxation of long-term gains at half the ordinary rate would produce a maximum tax rate of 35%. However, a special provision, the Alternative Tax Computation, permitted the taxpayer to limit the marginal tax rate on at least some capital gains to 25%. Although generally described as having "effectively truncated the tax rate schedule,"[1] careful analysis of the data suggests that this was not the case. This section describes the operation and limitations of the alternative tax computation.

Prior to 1970, taxpayers were allowed to choose one of two tax computation methods. The first, called the regular method, involved using the ordinary tax rate schedule to compute tax on the taxpayer's total amount of taxable income including taxable capital gains. The second, the alternative tax computation method, involved using the ordinary tax rate schedule to compute the tax on non–capital gains income plus paying tax equal to 50% of the taxable portion of capital gains. As only half of long-term gains are taxable, the effective tax rate becomes 25%.

Figure 3.1 shows how the alternative tax computation should work. The figure plots taxable income along the horizontal axis and marginal tax rate along the vertical axis. The tax code exhibits the upward sloping form shown with the normal tax liability represented by the area of the triangle. In this case, the taxpayer's other income is sufficient to get him over the 50% bracket amount, and he pays tax liability

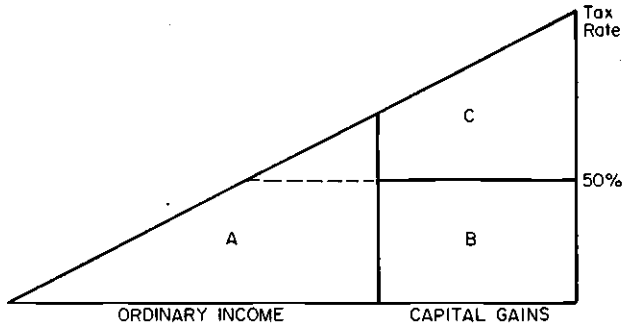

Fig. 3.1 Alternative tax computation limits capital gains tax rate to 50%.

indicated by area A on his ordinary income. In addition, the taxpayer pays 50% on the included portion of capital gains. This is indicated by area B. The total tax saving to this taxpayer from the alternative tax computation is area C, and his marginal tax rate on capital gains is limited to 25%.

Now consider the case shown in figure 3.2. Here, the taxpayer's total taxable income is enough to be taxed at a rate over 50%, but his non-capital gains income is not. The taxpayer has a choice. He can elect to be taxed under the regular tax rate schedule, in which case his tax liability is the large triangle, or he can elect the alternative tax computation. If he chooses the alternative tax computation, tax is levied by the ordinary schedule on his non-capital gains income, equal to area D. In addition, he pays tax at a 50% rate on the included portion of capital gains, indicated by areas E and F. As area E indicates, a portion of the taxpayer's long-term gains are taxed at a rate higher than they

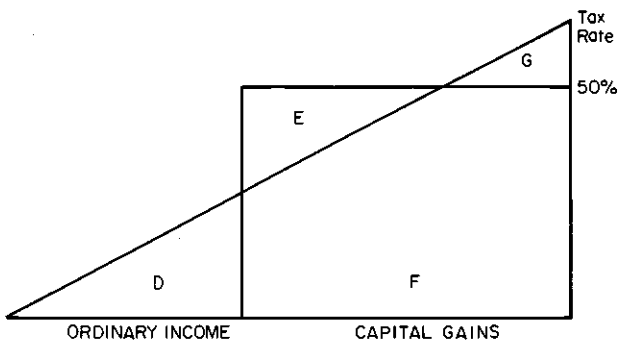

Fig. 3.2 Alternative tax computation fails to limit capital gains tax rate to 50%.

would be under the normal tax rate schedule. This taxpayer elects the alternative tax computation only if it results in a tax savings. In this case, such a situation results only if area E is less than area G.

Consider a taxpayer situation where this is the case. The taxpayer realizes long-term gains of $200,000 and has other income of $50,000. In addition, he has itemized deductions of $40,000. The taxpayer excludes half of the long-term gains from tax, leaving an adjusted gross income (AGI) of $150,000, and then subtracts itemized deductions to produce a taxable income of $110,000. Under the tax schedule of the era (1965–69), the ordinary tax computation would produce a tax liability of $51,380. Using the alternative tax computation, he would pay ordinary tax on the first $10,000, equal to $1,820, plus a 50% tax on the $100,000 of included gains, producing a total tax liability of $51,820.

This taxpayer would elect to be taxed under the ordinary schedule as it produces a lower tax liability. However, the marginal tax rate under this schedule is 62%, producing a marginal tax rate on capital gains of 31%. In this case, the alternative tax computation did not effectively limit the tax rate on long-term gains to 25%. An effective tax rate limit of 25% would require that the last $25,000 of included capital gains be taxed at 50%, rather than the first $25,000.

Although a majority of taxpayers in upper-income brackets who realized long-term gains did avail themselves of the alternative tax computation method, a significant fraction did not. For example, in 1966, of 27,766 taxpayers with adjusted gross incomes between $100,000 and $200,000, more than one quarter did not elect the alternative tax computation. The same was true for 16% of taxpayers with adjusted gross incomes between $200,000 and $500,000 with net long-term capital gains, and for 7.5% of taxpayers in the same situation with adjusted gross income over $500,000.[2]

The data are not sufficient to indicate the reason why these taxpayers elected the ordinary tax computation. It should be noted, however, that taxpayers are less likely to choose the alternative tax computation as long-term gains rise as a share of income. An extreme example would be a taxpayer with negative ordinary taxable income but large amounts of positive capital gains. This could be due to net operating losses in a business or partnership or to itemized deductions such as state taxes, interest, and charitable contributions, exceeding his ordinary income. The ordinary tax computation effectively permits this taxpayer to shelter that portion of his long-term gain which offsets the negative part of his ordinary taxable income. But, under the alternative tax computation, the tax on this negative portion of income would be zero, while the tax on the included portion of capital gains would be at the full 50% rate.

Thus, in certain situations, taxpayers with a substantial capital gain may still find themselves excluded from the alternative tax computation. The effect of this on the average marginal tax rate on taxpayers with net long-term gains was an increase of 1.5 percentage points above the 25% theoretical maximum for taxpayers in the $100,000 to $500,000 income range.

The Tax Reform Act of 1969 changed the alternative tax computation by limiting the 25% rate to a maximum of $50,000 in net long-term gains. Thus, only $25,000 of the included half of long-term gains qualified for the "special" 50% rate. In 1970, the excess over this amount was taxed at a maximum rate of 59%. This maximum tax rate was raised to 65% in 1971 and the limit was removed completely in 1972 and later years.

The actual alternative tax computation was constructed to minimize the potential benefits to the taxpayer. Figure 3.3 shows the method of computation for a taxpayer who would receive some benefit from the computation. The tax owed was comprised of three parts. The first part, denoted as area H, was the tax owed on the taxpayer's ordinary taxable income. This corresponds to area A in figure 3.1. The second part, denoted as area I, was a 50% tax on the first $25,000 of the included portion of capital gains. If the included portion of the taxpayer's gains was less than $25,000, then the effective marginal tax rate on these gains was 25%, and no further computation is necessary. If capital gains exceeded $25,000, then the tax computation included a third part, denoted as area J. This was the difference between (*a*) the tax calculated using the ordinary computation on the taxpayer's total taxable income and (*b*) the tax calculated using the ordinary computation on the sum of $25,000 plus the taxpayer's non–capital gains taxable income.

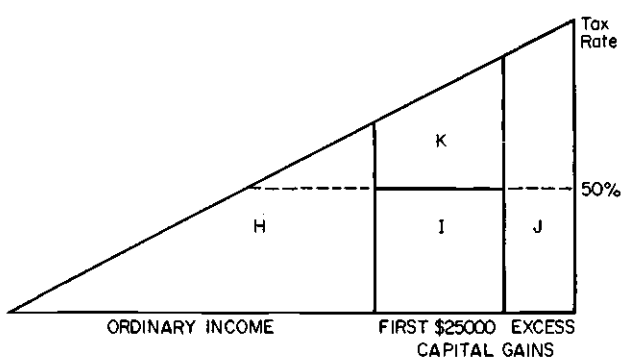

Fig. 3.3 Modified alternative minimum tax limits tax rate on some capital gains.

Table 3.1 **Revenue Loss on Inframarginal Taxpayers Using Alternative Tax Computation**

Year	Loss (in millions)
1970	$ 39.6
1971	39.4
1972	48.6
1973	53.5
1974	40.4
1975	48.1
1976	70.3
1977	88.7
1978	104.3

If the taxpayer did not elect the alternative tax computation, his tax would have been the total area under the ordinary tax schedule, denoted as areas H, I, J, and K. The net tax savings to the taxpayer was therefore area K. Note that for any taxpayer with more than $25,000 of included capital gains, the marginal tax rate on gains was the same as it would have been had there been no alternative tax computation. Thus, to the extent that capital gains realizations are based on marginal incentives, the alternative tax computation had no effect on a substantial number of taxpayers. Table 3.1 provides estimates of the revenue loss from this provision of an inframarginal tax reduction to recipients of capital gains.

The change in the alternative tax computation to limit special treatment to only $25,000 of included gains also had the effect of lowering the fraction of taxpayers electing the alternative computation, even among taxpayers with more than $25,000 of capital gains. Figure 3.4

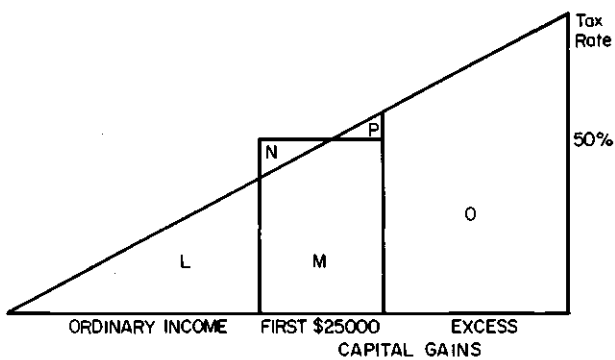

Fig. 3.4 Modified alternative minimum tax fails to lower taxes on capital gains.

shows a taxpayer situation in which it may not be in the interest of the taxpayer to elect the alternative tax computation. The taxpayer must pay tax above the statutory rate on a portion of his gains in the hope that this will offset a lower rate on some of the rest of his gains. This taxpayer would owe tax equal to areas L, M, N, and O. Under the ordinary tax computation he would owe taxes on L, M, O, and P. The taxpayer thus elects the alternative tax computation only if area N is smaller than area P.

The effect of this change in the alternative computation was to limit the marginal incentive to a minority of taxpayers in income groups with high marginal rates. Table 3.2 shows the fraction of taxpayers in high-income groups with net long-term capital gains who did not receive a marginal benefit from the alternative tax computation and the reason why. In only one income group in one year did a majority receive a marginal rate reduction.

There are two reasons for this ineffectiveness. First, it was impossible for any taxpayer with more than $25,000 in gains to benefit at the margin. Second, taxpayers with relatively small amounts of non–capital gains taxable income would also not benefit regardless of the size of their capital gains income. This limited alternative tax computation was therefore of marginal benefit only to taxpayers with relatively small amounts of capital gains income and relatively large amounts of other income. However, as noted above, much of the effect was inframarginal with regard to a taxpayer's decision making, while costing significant amounts of revenue.

3.1.2 The Additional Minimum Tax

The Tax Reform Act of 1969 began the Additional Tax for Tax Preferences, also known as the minimum tax. The excluded portion of

Table 3.2 **Percent of Capital Gains Taxpayers with AGI over $100,000**

Year	Using Alternative Tax Computation		Alternative Computation Not Used
	Reduced Capital Gains Tax Rate at Margin	No Effect on Marginal Rate	
1970	22.2%	41.2%	36.6%
1971	40.3	19.0	40.7
1972	45.0	13.7	41.3
1973	45.0	13.7	41.3
1974	41.3	11.3	47.3
1975	44.5	12.3	43.2
1976	47.2	12.8	40.0
1977	51.9	13.0	35.1
1978	47.9	12.4	39.7

capital gains was among a list of 9 types of income, termed preferences, which came under the minimum tax. The additional minimum tax was levied in two forms, one from 1970 through 1975 and one from 1976 through 1978. We consider each in turn.

The early form of the tax was levied at a 10% rate on the items of tax preference reduced by an exclusion of $30,000 plus the taxpayer's ordinary tax liability and some other deductions discussed later. The effect of this was to make the taxpayer's additional tax rate negatively related to his ordinary tax rate. In the case of the capital gains tax preference, the additional tax rate was negatively related to the effective capital gains tax rate. This was true whether the taxpayer elected the alternative or the regular method of tax computation.

Consider a taxpayer with substantial preference income who realizes an additional dollar of net long-term capital gains. The excluded portion of the gains, 50 cents, enters the minimum tax base as a tax preference. This 50 cents is offset by the amount the taxpayer's ordinary tax liability increased. This ordinary tax liability is increased by the remaining part of the capital gain, which is taxed either at the ordinary rate, or at 50% if the alternative tax computation is effective. Thus, the higher ordinary tax liability is either half the taxpayer's ordinary tax rate or 25 cents for the alternative tax. So, the 50 cent increase in capital gains preference could be offset by a 25% ordinary capital gains tax rate, raising the additional tax base by 25 cents on net. The 10% additional tax rate is applied to the net increase in the tax base, raising his marginal tax rate on the added dollar of capital gain by 2.5 cents.

If, on the other hand, the effective tax rate on capital gains is 35%, the minimum tax base would only rise by 15 cents for every dollar of long-term gains realized. The additional minimum tax in this situation would only be 1.5 percentage points. Figure 3.5 shows the relationship between the marginal tax rate on the included portion of capital gains and the additional tax rate.

The additional minimum tax had a feature which reduced its effectiveness over time. Taxpayers were allowed to carry forward from any year after 1970 the excess of ordinary tax over net preferences and apply the amount carried forward against the current year's net tax preferences. For example, suppose a taxpayer had ordinary tax liability of $50,000 in 1971 and tax preferences in the same year, after the $30,000 exclusion, of $40,000. He owed no minimum tax because his ordinary tax liability exceeded his preferences by $10,000. That $10,000 could be carried forward to 1972 to offset his tax preferences in that year. So, if he had a $30,000 ordinary tax liability in 1972 and $40,000 in preferences after the exclusion, he would owe no minimum tax in 1972 either. Taxes in excess of preferences could be carried forward for up to 7 years to reduce the future effect of the minimum tax.

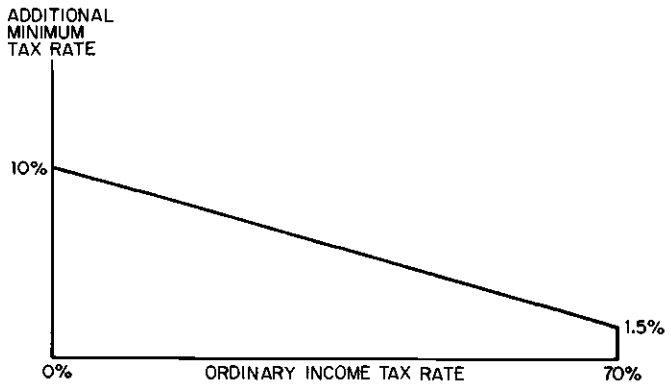

Fig. 3.5 Effect of pre-1976 additional minimum tax on capital gains tax rate.

Table 3.3 shows the effect of the additional minimum tax on the marginal tax rate on capital gains. The effect of carrying forward is clearly evident. In 1970, taxpayers in the $200,000–$500,000 income class faced an increased marginal tax rate on capital gains of 1.18 percentage points as a result of the additional minimum tax. By 1975, the effect of the additional minimum tax on the average marginal tax rate on capital gains was only 0.24 percentage points, or about 80% less. The reason for this was that substantial numbers of taxpayers had amassed amounts carried forward sufficient to exempt them from the minimum tax. In 1970, some 62% of all recipients of net capital gains with AGI between $200,000 and $500,000 paid some additional tax. By

Table 3.3 **Percentage Point Increase in Capital Gains Rate Due to the Additional Minimum Tax**

	Income Class				
Year	$50,000–$100,000	$100,000–$200,000	$200,000–$500,000	$500,000–$1,000,000	Over $1,000,000
1970	0.28	0.75	1.18	1.47	1.65
1971	0.08	0.26	0.58	0.98	1.27
1972	0.07	0.22	0.51	0.80	1.15
1973	0.06	0.20	0.42	0.72	1.02
1974	0.04	0.15	0.30	0.54	0.75
1975	0.04	0.11	0.24	0.45	1.08
1976	1.04	1.56	1.96	2.70	3.08
1977	1.37	1.72	2.21	3.75	4.62
1978	1.35	1.69	1.87	2.34	2.66

1975, only 13% of capital gains recipients in the same income category paid the additional tax.

The Tax Reform Act of 1976 made substantial changes in the minimum tax which greatly increased its scope. The sums carried forward from previous years was ended altogether. Two preferences were added, one for intangible drilling costs and one for itemized deductions in excess of 60% of adjusted gross income. The tax rate was raised to 15% and the exclusion lowered to the greater of $10,000 or one half of ordinary tax liability. The IRS estimates that this resulted in an elevenfold increase in the number of taxpayers paying the minimum tax and a sixfold increase in minimum tax revenues.[3]

The 1976 changes in the minimum tax raised the average effective tax rate on capital gains in two ways. First, it increased the number of taxpayers subject to the additional levy of the minimum tax, as the above figures indicate. Second, it increased the addition to the effective tax rate caused by the minimum tax for each minimum taxpayer. Figure 3.6 illustrates how this new minimum tax affected the marginal tax rate on capital gains.

If a taxpayer received an additional dollar of net long-term capital gains, the 50 cents excluded from the ordinary tax was treated as a tax preference. The remaining 50 cents raised the ordinary tax the taxpayer paid. Half of the increase in ordinary tax was used as an offset against preference income rather than the full amount of ordinary tax as in the 1969 law. So, if the taxpayer were in the 50% tax bracket, the additional dollar of capital gains would raise his ordinary taxes by 25 cents and his offset by 12.5 cents. In this case, the taxpayer's additional minimum tax base would rise by 37.5 cents. This base is taxed at a 15% rate,

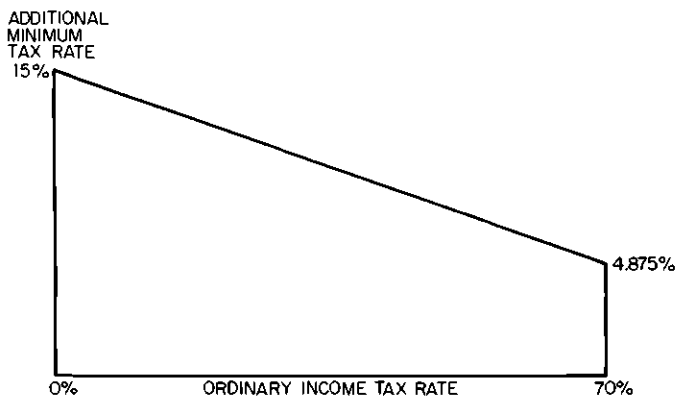

Fig. 3.6 Effect of post-1976 additional minimum tax on capital gains tax rate.

meaning that the taxes paid on the additional dollar of capital gains is increased by 5.625 cents.

As was the case before 1976, the additional taxes paid fall as the taxpayer's ordinary marginal tax rate rises. If a taxpayer's ordinary tax rate was 70% and the alternative tax computation was not effective at the margin, the ordinary tax would rise by 35 cents for every dollar of capital gains realized. This would mean a 17.5 cent offset against the additional 50 cents in tax preferences. The resulting 32.5 cent increase in the minimum tax base means that the minimum tax raised the effective tax rate on capital gains by 4.875 cents.

The additional tax had its greatest effect on the marginal tax rate on capital gains in 1977. In that year it raised the average capital gains rate in the top bracket by 4.6 percentage points. Some 92% of capital gains recipients with AGI over $1,000,000 were subject to the additional minimum tax in that year. The effect of the additional tax was much less in the top brackets in 1978. In that year only 52% of the recipients of capital gains in the over $1,000,000 income group paid additional tax. The reason for this is probably the tax legislation which moved through Congress that year. The additional minimum tax was eliminated beginning in January 1979. Tax-conscious investors may well have postponed their realizations to take account of this (and other) changes in the tax law which had the effect of lowering the capital gains tax rate.

The additional minimum tax interacted with other provisions of the tax code. As already noted, taxpayers electing the alternative tax computation would face higher additional minimum taxes on their capital gains than taxpayers who computed their tax according to the regular tax rate schedule. The additional minimum tax also interacted with the maximum tax on personal service income in a manner which increased the effective tax rate on capital gains income.

3.1.3 Maximum Tax on Personal Service Income

The Maximum Tax on Personal Service Income, otherwise known as the "maximum tax" was enacted as part of the Tax Reform Act of 1969. Its objective was to reduce the effective tax rate on wage, salary, and professional income below that on other types of income. Instead of the statutory 70% top rate, the top rate on personal service income was set at 60% in 1971 and 50% thereafter. As Lindsey (1981) showed, the maximum tax was ineffective at achieving these objectives for the vast majority of high-income taxpayers. However, a complex interaction between the maximum tax and other provisions of the tax law had the effect of raising the effective capital gains tax rate for many taxpayers.

Between 1971 and 1976, every dollar of preference income in excess of the additional tax exclusion (see above sec. 3.1.2) reduced the amount

of earned income eligible for the lower rate by one dollar. In effect, every dollar of capital gains received over a certain threshold converted 50 cents of earned income into unearned income for purposes of the maximum tax. As the tax rate on earned income could be as low as 50% and the tax rate on unearned income as high as 70%, this had the effect of adding as much as 10% to the effective capital gains tax rate. This interaction between capital gains and the maximum tax is known as "poisoning."

During this era there were two types of maximum tax poisoning caused by the receipt of capital gains. The first type, described above, involved the receipt of preference income above a threshold. The second involved an absolute limit on the amount of income eligible for treatment as earned income. This limit equalled taxable income minus the included portion of capital gains. Consider an example. A taxpayer has $200,000 in earned income and a total capital gain of $300,000 of which 50%, or $150,000, is included in income, making AGI a total of $350,000. The taxpayer has itemized deductions of $100,000. Therefore, the taxpayer's taxable income is $250,000. This second type of poisoning would limit the amount of income eligible for earned income treatment to $100,000, or taxable income less the included portion of capital gains.

The actual interaction of capital gains and the maximum tax is quite complex. This complexity would generally produce a rate of poisoning slightly lower than that described above. The amount of income eligible for treatment as earned income, known as earned taxable income (ETI), is given by the following formula:

$$\text{(1)} \qquad \text{ETI} = (\text{PSINC/AGI}) \times \text{TAXINC} - \text{PREFERENCES}.$$

In this equation PSINC, or personal service income, equals income from wages, salaries, and professional income. TAXINC, or taxable income, is apportioned between earned and unearned portions according to the share of AGI contributed by PSINC. Earned taxable income is then reduced by the amount of preference income, including the excluded portion of capital gains. This latter subtraction represents the "poisoning" effect described above.

However, the derivative of ETI with respect to a change in capital gains shows that there is an offset to this poisoning as well:

$$\text{(2)} \qquad \frac{d\text{ETI}}{d\text{CAPGN}} = \frac{0.5\ \text{PSINC}(\text{AGI} - \text{TAXINC})}{\text{AGI}^2} - 0.5.$$

Using the chain rule and the fact that an additional dollar of capital gains realizations increases AGI, TAXINC, and PREFERENCES by 50 cents each, we find that the change in ETI for a change in capital

gains depends on the ratios of ETI—TAXINC and PSINC to AGI. Most important is the fact that TAXINC is less than AGI. Therefore, the term in parentheses is positive. This in turn implies that ETI falls by less than the 50 cent change in preferences when capital gains increase. So, the interaction of the maximum tax and capital gains realizations means that the taxpayer was poisoned but also received a partial antidote.

The effect described by (2) was designed to allocate personal exemptions and itemized deductions between earned and other income. Moving a dollar of earned income into the unearned category will shift this allocation of personal exemptions and itemized deductions, providing the partially offsetting effect. However, this partial antidote was only effective if the taxpayer had preference income in excess of the preference exclusion. It was not effective in cases where the taxpayer's ETI was more than his TAXINC less included capital gains.

In 1977 the scope of poisoning was increased. Beginning in that year, all preference income regardless of source was used to offset ETI whether or not it exceeded the preference exclusion of the additional tax. Thus, although this change had no effect on the marginal capital gains tax rate of a poisoned taxpayer, the number of taxpayers who were poisoned was increased.

Table 3.4 presents calculations of the percentage point increase in the effective tax rate on capital gains due to the poisoning effect of the maximum tax. The effect of the 1977 changes is clear. In 1976, taxpayers in the $100,000–$200,000 income group had average marginal tax rates raised 0.34 percentage points by the maximum tax. In 1977, this jumped sixfold to 2.25 percentage points. Poisoning of the maximum tax was eliminated beginning in 1979 as a part of the Tax Reform Act of 1978.

Table 3.4 **Percentage Point Increase in Capital Gains Tax Rate Due to the Effect of the Maximum Tax**

	Income Class		
Year	$50,000–$100,000	$100,000–$200,000	Over $200,000
1971	0.01	0.07	0.18
1972	0.04	0.28	0.66
1973	0.07	0.34	0.75
1974	0.04	0.34	0.89
1975	0.04	0.32	1.02
1976	0.03	0.34	1.25
1977	0.27	2.25	3.70
1978	0.30	2.45	4.10

3.1.4 Alternative Minimum Tax

The Tax Reform Act of 1978 removed capital gains from the list of preferences subject to the additional minimum tax beginning in 1979. Instead, an alternative minimum tax was established which combined the excluded portion of capital gains, itemized deductions in excess of 60% of AGI, and the taxpayer's regular taxable income in its base. Taxes were levied at graduated rates of 10%, 20%, and 25% on this alternative tax base. The taxpayer paid the greater of his regular tax liability or his alternative tax liability.

Since the full amount of capital gains was in the alternative tax base, these three rates became the effective tax rate on capital gains for taxpayers who paid the alternative tax. These tax rates are generally lower than the ordinary capital gains rates, which could be as high as 28%, and so the alternative minimum tax had the effect of lowering the marginal tax rate on capital gains, even though the average tax rate paid by alternative minimum taxpayers was increased by the provision.

Nearly all alternative minimum taxpayers with AGI over $200,000 paid taxes at the 25% effective tax rate. In the $100,000–$200,000 income class this fell to about three-fourths of taxpayers paying the alternative minimum tax, with the average alternative minimum rate in this group at 23.6%. The average rate was only 17.6% in the $50,000–$100,000 income group.

The net result of the alternative minimum tax was to reduce the average marginal tax rate on capital gains in the top income groups by about 1.0 percentage point in 1979, and about 0.4 percentage points in 1980. But, because the top regular capital gains rate averaged 24% in 1981, the effect of the minimum tax was to increase the average marginal tax rate by about 0.2 percentage points that year. Other income groups had tax rate changes of about 0.2 percentage points as a result of the alternative minimum tax.

The Economic Recovery Tax Act of 1981 eliminated the 25% tax bracket on the alternative minimum tax. This meant that, beginning in 1982, alternative minimum taxpayers faced the same effective tax rate on capital gains as ordinary taxpayers—20%.

3.1.5 Combined Effects

Table 3.5 presents calculations of the average effective tax rate faced by taxpayers with net long-term gains in excess of short-term losses. The calculations were based on the tax computation status of taxpayers with such gains as reported in the *Statistics of Income*. The calculations weighted all taxpayers equally within a given income class in order to minimize the simultaneity between the tax rate and the level of realizations. The tax rate estimates include the effects of the interactions between the various types of taxation described in this section.

Table 3.5 Average Effective Marginal Tax Rate on Capital Gains

	Income Class					
Year	Under $50,000	$50,000–$100,000	$100,000–$200,000	$200,000–$500,000	$500,000–$1,000,000	Over $1,000,000
1965	11.1	25.5	26.5	26.6	26.0	25.3
1966	11.1	25.5	26.5	26.6	26.0	25.3
1967	12.5	25.5	26.5	26.6	26.0	25.3
1968	13.4	27.4	28.4	28.5	27.9	27.1
1969	13.8	28.0	29.0	29.1	28.5	27.7
1970	12.9	27.8	30.5	32.2	32.1	32.0
1971	12.5	26.3	29.1	32.0	33.3	33.9
1972	12.5	26.6	28.7	32.5	33.9	34.6
1973	12.5	26.6	28.9	32.8	34.3	35.0
1974	12.0	26.3	28.9	32.6	33.6	34.4
1975	11.6	26.3	28.8	32.5	33.5	34.7
1976	11.5	27.2	29.9	34.0	36.1	37.3
1977	10.8	27.8	31.7	36.3	39.2	41.2
1978	10.6	27.8	32.2	36.3	37.9	39.1
1979	10.6	19.4	25.3	27.3	27.0	26.9
1980	10.6	19.5	25.4	27.6	27.6	27.6
1981	10.8	19.1	22.9	24.1	24.2	24.2
1982	11.2	17.6	20.0	20.0	20.0	20.0

Also included in the tax rate estimates are the effects of the changes in the exclusion rate in the 1978 tax bill and the maximum capital gains rate in the 1981 tax bill. The 1978 act increased the rate of exclusion of net long-term gains from 50% to 60% for all assets sold after 31 October 1978. The figures for 1978 therefore take a weighted average of tax rates implied by the two exclusion rates in proportion to the fraction of the year each exclusion rate was in effect. In other words, a weight of .833 was attached to the rates applicable to a 50% exclusion and a weight of .167 was attached to the rates applicable to a 60% exclusion.

The Economic Recovery Tax Act of 1981 reduced the maximum tax rate on capital gains to 20% for all assets sold after 9 June 1981. The 1981 rates therefore reflect a weighted average of rates which ranged up to the old maximum of 28% for half the year and 20% for the other half of the year. In this case, equal weights were attached to the two tax rate scenarios.

The data show that the maximum capital gains tax rate increased rapidly between 1967 and 1977 and decreased rapidly thereafter. These data provide a significant amount of variance in the tax rate term. The next section describes how these data were combined with data on wealth to estimate the sensitivity of taxpayers to changes in the capital gains tax rate.

3.2 Capital Gains and the Value of Personal Assets

The level of capital gains realizations has been going up throughout the period of this study, 1965–82. Table 3.6 presents the nominal value of net long-term capital gains realizations in each of the 18 years encompassed by this study. Net long-term realizations in 1982 were more than 4 times their 1965 level. Of the 18 years listed, 12 were higher than the preceding year. This includes 1965, which was higher than (unlisted) 1964.

This general upward trend was marked by a number of discontinuities. Capital gains in 1969 and 1970 were well below the values of 1968. Net realizations were also lower in 1974 and 1975 than in 1973. The years 1969 and 1970 were associated with higher tax rates than preceding years due to the Vietnam War surtax. The year 1970 was associated with a decline in the stock market, as were 1974 and 1975.

On the other hand, very rapid growth in capital gains realizations occurred between 1978 and 1979. Net long-term gains in 1979 were 45% greater than in 1978. However, 1979 was associated with only a very modest advance in stock prices. The sharp decline in capital gains tax rates appears to be a primary factor in this advance in realizations. Capital gains realizations in 1978 may also have been depressed in anticipation of the cuts in 1979, increasing the apparent percentage rise in realizations.

Table 3.6 **Net Long-Term Capital Gains**

Year	Gains (in billions)
1965	$20.8
1966	20.8
1967	25.9
1968	33.5
1969	30.7
1970	20.4
1971	27.6
1972	34.9
1973	35.7
1974	30.9
1975	30.4
1976	38.6
1977	44.0
1978	48.6
1979	70.5
1980	69.9
1981	77.1
1982	86.1

The debate over the importance of capital gains rates in determining realizations is complicated by changes in the value of personal wealth including accrued but unrealized capital gains. The objective of this section is to estimate values for personal wealth holdings in order to control for this factor in determining the role that capital gains tax rates play in realizations.

The Federal Reserve Board issues a quarterly *Flow of Funds* report on the holdings of various sectors of the U.S. economy. These figures contain detailed balance sheets and reconciliation statements for the asset holdings of households, government, and corporations. The present study uses the values of wealth holdings by households.

The components of household wealth include many elements on which households either cannot or probably will not realize capital gains. For example, holdings of cash and checking and savings deposits do not include the possibility of capital gains. Capital gains accruing to households via financial intermediaries such as life insurance and pension funds are also not reported as capital gains when the taxpayer files his tax return. Capital gains in pension funds, including IRA and Keogh accounts, are reported as pension income when the funds are dispersed after retirement.

We therefore chose to divide household wealth into two components: those readily tradable and subject to potential capital gains realizations and those unlikely to be subject to such realizations. This section considers each in turn.

3.2.1 Tradable Wealth

Tradable wealth is comprised of those assets on which capital gains are regularly realized. The IRS has tabulated the distribution of capital gains by type of asset. Table 3.7 provides the percentage breakdown of sales of capital assets by the number of transactions and the value of net gains. The data show that sales of corporate stock, real estate, and capital gains income which passes through to the individual taxpayer from small business corporations, proprietorships, and partnerships comprise some 97% of the value of net capital gains.

In the context of the data in the *Flow of Funds*, these categories include land, residential structures, corporate equities, and equity in noncorporate businesses. This latter category includes the value of nonresidential real estate held by households. Tangible assets such as consumer durables, on which capital gains are rarely reported, were excluded from this study.

These traded assets have tended to comprise about two-thirds of all household wealth over the period studied. This share varied from a high of 69% in 1968 to a low of 65% in 1975. The most variable component of this traded wealth is household holdings of corporate equities,

Table 3.7 Realizations by Asset Type, 1977

Assets	Percent of Transaction	Percent of Gains
Included		
Corporate stock	42.1	14.7
Distributions from partnerships, etc.	10.7	14.1
Business real estate	2.6	9.2
Business non–real estate	8.8	10.4
Personal residence	6.5	14.9
Nonbusiness real estate	3.2	9.5
Installment sales	3.3	8.5
Excluded		
Commodities	1.3	0.1
Retirement distribution	0.4	0.7
Indeterminant	21.1	17.9

Note: This table was calculated from table 1.9 of the Department of Treasury's report to the Congress on the capital gains tax reductions of 1978, pp. 18–19.

which fell from nearly 23% of total wealth in 1968 to only 9.5% in 1979. The rapid decline in the holding of corporate equity was offset by increased holding of real estate. Nonresidential real estate peaked at 39.4% of household wealth in 1979, up from a low of 28% at the beginning of the period being studied.

Because of this variation in the components of personal wealth over time, we apportioned household wealth among the six income groups studied on a component-by-component basis. Each component was allocated according to the distribution of income reported on tax returns likely to flow from that component of household wealth. For example, the distribution of corporate equities in a given year was assumed to be the same as the distribution of dividends in that year. The sum of net rental income and net rental loss was used to apportion real estate wealth. Noncorporate business wealth was apportioned by combining net profits and net losses from proprietorships, partnerships, and small business corporations.

The key advantage of this apportioning technique was that the shares of wealth were determined from the same data base as the data on the level and distribution of capital gains realizations. Observations on individual income classes in each year were therefore independent of observations from other years. Capital gains income was excluded from the apportionment process to avoid simultaneity. At the same time, the aggregate level of wealth was determined independently of the data on capital gains realizations. Table 3.8 presents the level of tradable wealth for each income class in each year of the period studied.

Table 3.8 Tradable Wealth by Income Class

Year	Income Class					
	Under $50,000	$50,000–$100,000	$100,000–$200,000	$200,000–$500,000	$500,000–$1,000,000	Over $1,000,000
1965	1493	162	72	42	14	20
1966	1545	178	80	46	16	20
1967	1619	200	93	54	20	23
1968	1766	242	120	69	25	29
1969	1864	266	130	72	25	30
1970	1907	280	127	68	23	28
1971	2036	313	140	75	25	29
1972	2196	358	167	89	30	33
1973	2307	395	186	95	30	31
1974	2403	419	194	93	28	25
1975	2555	471	219	105	31	29
1976	2806	557	264	129	38	36
1977	3090	654	310	155	45	42
1978	3459	791	381	193	56	47
1979	3877	977	485	255	75	67
1980	4271	1204	617	338	106	108
1981	4659	1378	714	397	127	131
1982	4958	1455	771	455	155	161

One potential criticism of this approach is the allocation of corporate equity on the basis of dividends received. If there are clientele effects based on tax rates, this approach would tend to underestimate the value of corporate equities held by upper-income groups since these groups keep a smaller portion of their dividends after tax relative to capital gains than do other groups. However, an upward revaluation of wealth in upper-income groups to reflect this possibility would put downward pressure on the realizations-to-wealth ratio among taxpayer groups with high marginal tax rates. This would in turn suggest a greater impact of capital gains tax rates on realizations. We elected to ignore possible clientele effects in order to err on the side of conservatism in estimating the effects of capital gains tax rates.

The *Flow of Funds* data also includes reconciliation statements which explain the change in sectoral asset holdings from year to year. Holdings of a particular asset could vary for one of two reasons: net purchases or sales of the asset by the household sector or a change in the price of the existing stock of holdings. This latter effect is termed "revaluation" and for purposes of this study was used as a measure of unrealized capital gains on assets held by households.

We allocated the revaluation of each asset in the same manner as the stock of wealth held in that asset. Revaluation values were com-

puted for holding periods up to 7 years. These were converted into inflation-adjusted terms by increasing the nominal value of the asset held at the beginning of the revaluation period to reflect prices at the end of the revaluation period. A real value was obtained by subtracting this from what the value of the assets held at the end of the revaluation would have been if no net purchases had been made. In practice, revaluation periods over one year turned out not to be significant in estimating the level of capital gains. The data suggested that much of these multiyear revaluations was picked up in the value of wealth.

3.2.2 Nontraded Wealth

Nontraded wealth was comprised mainly of cash, interest-bearing financial assets, and life insurance and pension fund reserves. Over the period being studied, pension and life insurance reserves remained a roughly constant share of household wealth at about 11%. Cash and checking accounts declined from a bit over 3% of wealth to a bit under 3%. Interest-bearing financial assets tended to absorb any fluctuations in the share of nontraded wealth in total wealth.

As in the case of traded assets, we allocated these nontradable assets on a component-by-component basis as well. Cash and checking accounts were allocated in proportion to adjusted gross income. Interest-bearing financial assets were allocated in proportion to interest income. Pension and life insurance reserves were allocated in proportion to the sum of interest and dividend income.

Again, the key advantage of this apportioning technique was that the shares of wealth were determined from the same data base as the level and distribution of capital gains. Independence of observations for individual income classes in each year was maintained. And the aggregate level of wealth was determined independently of the data on capital gains realizations.

No revaluations of nontraded assets were necessary. Revaluation of cash, checking accounts, and saving deposits is impossible. The *Flow of Funds* accounts do not provide revaluations for any interest-bearing assets, maintaining each priced at par. Although some degree of revaluation may actually have occurred as a result of fluctuating interest rates, it is likely to have been quite small. All credit market instruments comprised only 9% of total financial assets in 1982. This included short-duration assets such as commercial paper on which no capital gain or loss was likely.

The next section uses this data on the level and distribution of household wealth in estimating the determinants of capital gains realizations. Wealth and revaluation values for given years were obtained by averaging the values at the beginning and at the end of the year. All of the values for wealth and revaluations were converted into real terms using the average value of the GNP deflator for the year in question.

3.3 Capital Gains Rates, Realizations, and Revenues

The preceding two sections described the derivation of data on capital gains tax rates, realizations, and the level and distribution of personal wealth. The objective of this section is to estimate the effect of tax rates on capital gains realizations and therefore on capital gains revenues.

The basic regression equation we estimate is:

$$(3) \qquad ln\ \mathrm{LTG}_{ij} = \beta_0 + \beta_1\ \mathrm{MTR}_{ij} + \beta_2\ ln\ \mathrm{TRD}_{ij} + \beta_3\ ln\ \mathrm{NTRD}_{ij} + \beta_4\ ln\ \mathrm{REV}_{ij} + \epsilon_{ij}.$$

In each case the subscript j represents one of the 6 income classes and the subscript i represents one of the 18 years being studied. LTG represents net long-term gains deflated by the GNP deflator where 1972 is valued at 100. MTR is the average marginal tax rate on net long-term gains. TRD represents the real value of tradable wealth. NTRD is the real value of wealth which is not readily traded. REV represents the revaluation of assets during the year i expressed in terms of 1972 prices. In the case of the wealth variables, midyear values were used. These were obtained by taking an average of end-of-year and beginning-of-year values.

The results of ordinary least squares regression of the data on the model described by (3) were:

Parameter	Estimate	Standard Error
β_0	−0.385	0.517
β_1	−6.199	0.787
β_2	1.100	0.107
β_3	−0.869	0.089
β_4	0.298	0.084

All four coefficients were significant except for the intercept term, which was not significantly different from zero. The adjusted R-square value for the regression was 0.8825.

The value for the tax rate parameter should be interpreted as saying that a 1.0 percentage point increase in the marginal tax rate produces a 6.2% decline in the level of long-term capital gains realizations. This represents a semielasticity format, not a pure elasticity one.

The parameter for tradable wealth should be interpreted as an elasticity. A 1% higher level of tradable wealth implies a 1.1% higher level of long-term gains realizations. The parameter estimate is within one standard error of a value of unity. In the absence of tax effects, and short-term market fluctuations, a value of unity would be expected.

The parameter for nontraded wealth should also be interpreted as an elasticity. In this case, a 1% increase in nontraded wealth decreases net long-term capital gains realizations by 0.87%. A negative value on

this parameter can be understood in the context of what comprises nontraded wealth. A substantial portion of this wealth represents highly liquid assets such as cash, savings and checking deposits, and government securities. If long-term capital gains realizations are designed to raise cash for consumption purposes, we would expect to see realizations negatively correlated with the existing level of these liquid assets.

The final parameter value also represents an elasticity. A 1% increase in the revaluation of traded assets in a given year increases net capital gains realizations by 0.3%. This parameter suggests that increases in stock, business, or real estate prices prompt increased realizations. Note that this is in addition to the increase in realizations due to a higher level of wealth. So, for example, in a year in which there is a 20% rise in the value of traded assets we could expect capital gains realizations to be higher by a total of about 28%, 22% due to the higher level of wealth and 6% due to the price increases in that year. If prices remained stable in later years, capital gains realizations would fall 6% in the following year to maintain a new, permanent level of gains 22% higher than the initial level.

Before exploring the robustness of these results, consider an additional interpretation for the tax rate parameter. In the case of a single tax rate, capital gains tax receipts are the product of the capital gains tax rate and capital gains realizations. Capital gains tax revenues are maximized when a given percent increase in the capital gains tax rate just offsets an equal percentage decline in realizations resulting from the highest rate.

In the context of the parameters estimated in (3), revenue maximization occurs when the capital gains tax rate times the tax rate parameter, β_1, equals negative unity. The revenue-maximizing capital gains tax rate implied by the results of the regression is 16.1%. The range of revenue-maximizing tax rates within one standard error of the estimate goes from 14.3% to 18.5%. This range is below the current top capital gains tax rate of 20%. Other specifications presented below support this general conclusion.

It should be noted that there is nothing "optimal" about a tax rate at a revenue-maximizing level. All tax rates above this level are simply counterproductive from the point of view of raising revenue. Stated differently, the shadow price of raising additional revenue at this top tax rate is infinite. Only tax rates below this revenue-maximizing point are within the possible range of optimality.

The robustness of this result can be examined by considering the effect of changing the specification of the regression equation. Tests of alternatives were therefore carried out. Equation (4) drops the variable representing revaluations of traded assets:

$$(4) \quad \ln \text{LTG} = \underset{(0.397)}{0.874} - \underset{(0.750)}{7.394}\ \text{MTR} + \underset{(0.104)}{1.246}\ \ln \text{TRD} - \underset{(0.088)}{0.971}\ \ln \text{NTRD}\ .$$

Standard errors are in parentheses below the parameter estimates. The adjusted R-square for this regression is 0.8693. The standard errors show that each coefficient is statistically significant.

In this case, the parameter value for the marginal tax rate term is increased to 7.39. This implies a revenue-maximizing marginal tax rate on capital gains of 13.5%. Much of the effect of dropping the gains parameter appears to have been picked up in the traded-wealth parameter, as we would expect.

The effect of dropping the non-traded-wealth term moves the tax rate parameter in the opposite direction, as (5) shows:

$$(5) \quad \ln \text{LTG} = \underset{(0.715)}{-0.282} - \underset{(1.077)}{5.076}\ \text{MTR} + \underset{(0.053)}{0.124}\ \text{TRD} + \underset{(0.110)}{0.564}\ \text{REV}\ .$$

All parameter estimates except for the intercept remain significant, but the R-square value for this regression drops to 0.775. This suggests that nontraded wealth contributes to the regression specification. The parameter on the tax rate variable implies a revenue-maximizing capital gains tax rate almost exactly equal to the current 20% level.

Dropping both the non-traded-assets variable and the revaluation variable produces a result indicated by (6):

$$(6) \quad \ln \text{LTG} = \underset{(0.543)}{2.468} - \underset{(1.097)}{7.326}\ \text{MTR} + \underset{(0.058)}{0.191}\ \text{TRD}\ .$$

Again, the parameter estimates are significant, but the R-square term falls to 0.720. The parameter estimate for the tax rate term resembles that for (4) when the revaluation term was also dropped. This reinforces the relationship between declines in capital gains tax rates and upward revaluations of the prices of stocks, real estate, and noncorporate businesses.

A further specification was run which did not differentiate the forms of wealth held. The results, shown in (7), reinforce the usefulness of separating wealth into traded and nontraded components.

$$(7) \quad \ln \text{LTG} = \underset{(0.724)}{-0.267} - \underset{(1.092)}{5.133}\ \text{MTR} + \underset{(0.054)}{0.115}\ \text{WEALTH} + \underset{(0.111)}{0.565}\ \text{REV.}$$

The R-square for this specification was 0.773. The parameters remain significant although the wealth term shows a lower t-statistic than in

the specifications where traded and nontraded wealth are run separately. Again, the MTR parameter implies a revenue-maximizing capital gains rate of about 20%.

When revaluations are dropped from the specification shown in (7), the parameter estimate on the tax rate term again rises to a value in excess of 7.

$$(8) \qquad \underset{\substack{\\ (0.566)}}{ln\ \text{LTG} = 2.369} \underset{\substack{\\ (1.120)}}{- 7.302\ \text{MTR}} + \underset{\substack{\\ (0.057)}}{0.186\ \text{WEALTH}}.$$

The R-square value for this regression is 0.719. Again, the parameter estimate for the tax rate coefficient resembles that in other cases where the revaluation term is dropped. The MTR parameter is little affected by the specification of the wealth term, as long as all of the values for wealth are included in the regression in some fashion.

A further check on the specification involves running dummy variables for each year in the period 1966–82 to see if any particular years are causing the results. The results of the basic specification (equation 1) run with annual dummy variables is:

$$(9) \qquad \underset{\substack{\\ (0.585)}}{ln\ \text{LTG} = 2.252} \underset{\substack{\\ (0.890)}}{- 6.849\ \text{MTR}} + \underset{\substack{\\ (0.116)}}{0.033\ \text{TRD}} + \underset{\substack{\\ (0.118)}}{0.228\ \text{NTRD}} \underset{\substack{\\ (0.093)}}{- 0.231\ \text{REV}} + \text{DUMMIES}.$$

The coefficients on the dummy variables were significant and illustrated an underlying time trend reflecting the rising levels of long-term gains over the period. Inclusion of these annual data reduced the significance of the wealth and revaluation coefficients as variations in these terms were captured on a year-by-year basis. However, the MTR coefficient remained highly significant and increased in value relative to the basic specification.

Another specification of the regression is obtained by changing the tax rate coefficient into an elasticity format. In this case, the natural log of the portion of the gain which the taxpayer is allowed to keep becomes the tax parameter. This specification presumes that a given percentage point reduction in the tax rate, or a given percent reduction in the same value, will have an effect which varies with the level of the tax rate.

For example, a reduction in the capital gains tax rate from 25% to 24% implies an increase in the share of the gain the taxpayer keeps from 75% to 76%. That represents a 1.33% increase in the share kept by the taxpayer. The same 1 percentage point reduction in tax rate from 50% to 49% would increase the taxpayer's share from 50% to 51% of the gain, or by 2%. Similarly, a 4% reduction in the tax rate, from 25% to 24%, and from 50% to 48%, would imply a percent change

in the after-tax share far greater at the higher tax rate (3 times as much) as at the lower tax rate.

The results of such a specification are:

$$\begin{array}{lll} (10) & \ln \text{LTG} = -20.510 + 4.253 \ln (1 - \text{MTR}) + 1.084 \ln \text{TRD} \\ & \qquad (2.301) \quad (0.587) \qquad\qquad (0.110) \\ & \qquad - 0.843 \ln \text{NTRD} + 0.346 \ln \text{REV}. \\ & \qquad\quad (0.091) \qquad\quad (0.085) \end{array}$$

Again, all of the parameter values are significant at a high level of confidence. The R-square value for this regression is 0.875, suggesting a nearly equal degree of explanation as the original specification in (3). The parameter values for the wealth and revaluation terms are also quite similar to those of (3). The addition of annual dummies raises the R-square term to 0.951.

The parameter estimate for the tax rate term requires reinterpretation. In this case, lower marginal tax rates increase the after-tax share. So, the positive coefficient again suggests a higher level of realizations when tax rates are reduced. The revenue-maximizing capital gains tax rate can be obtained by dividing unity by unity plus the tax rate coefficient. In this case, a revenue-maximizing capital gains tax rate of 19% is implied.

We would expect a higher revenue-maximizing rate to be implied by this specification, for a given percentage point reduction has a greater effect on the tax rate variable in high tax rate observations than in low tax rate observations. Still, the revenue-maximizing rate is slightly below the current 20% level.

A final specification of these equations was performed which included a variable for the change in the capital gains tax rate from the preceding year. If capital gains tax rates are suddenly reduced, we might expect a rush to realize gains which were not profitable to realize in earlier years with higher rates. This is known as the temporary unlocking phenomenon.

The term DMTR represents the difference between the current year's marginal tax rate and the preceding year's marginal tax rate. If the tax rate was lower in the current year, a negative value would result for DMTR. As we would expect a lower tax rate to increase realizations, a negative coefficient for DMTR is implied. Equation 11 indicates that this is the case:

$$\begin{array}{lll} (11) & \ln \text{LTG} -0.713 - 5.391 \text{ MTR} + 1.030 \text{ TRD} - 0.781 \text{ NTRD} \\ & \qquad (0.533) \quad (0.868) \qquad (0.110) \qquad (0.097) \\ & \qquad + 0.327 \text{ REV} - 3.027 \text{ DMTR}. \\ & \qquad\quad (0.084) \qquad (1.469) \end{array}$$

The results suggest that temporary unlocking contributes to the behavioral response to lower tax rates, thus enhancing revenue at lower rates. This implies that the permanent revenue-maximizing rate is higher than that implied by the earlier equations. The coefficient of 5.39 implies a revenue-maximizing marginal tax rate of 18.5%, higher than implied by the initial specification but lower than the current rate of 20%.

In conclusion, these data suggest a high degree of sensitivity of capital gains realizations to the tax rate imposed on such gains. The revenue-maximizing tax rate implied by these findings is at or below the current 20% level. This result is robust to the specification of the regression equation.

It is important to bear in mind the plausibility of this result in contrast to most findings about revenue-maximizing tax rates. Taxed commodities such as labor supply will show relatively little response to marginal tax rate reductions because a relatively high proportion of the maximum possible level of supply is in the market. By contrast, only a very small fraction of existing capital gains are realized in a given year.

For example, total capital gains realized in 1982 amounted to a record $86.1 billion. But, the revaluation in personally held traded assets during that year alone was $305.7 billion, implying that only 28.2% of that year's gains were realized. By contrast, in the high-tax year of 1978, total realized gains were $48.6 billion out of revaluations during that year of $693.9 billion. Only 7% of the increase in value in traded assets in that year was represented by realized gains. (Of course, in both years the stock of accumulated capital gains was enormous compared to realizations.)

Clearly the potential for increased capital gains realizations and revenues was substantial in 1978. The taxation of gains at the time of realization rather than at the time of receipt makes capital gains far more tax-rate-sensitive than other forms of income.

Notes

1. See, for example, the Department of Treasury's report to the Congress on the capital gains tax reductions of 1978, p. 35. A similar statement appears in the description of the alternative tax computation in the *Statistics of Income 1966*, p. 164: "The effect of this computation was a maximum tax of 25 percent on net long-term capital gain."
2. This data was derived from the *Statistics of Income 1966*, p. 94.
3. This data is presented in table 3B of the *Statistics of Income 1976*, p. 83.

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Comment

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Lindsey examines the effects of changes in the average marginal tax rate on capital gains on the sale of tradable capital assets and consequent realization of capital gains or losses. Lindsey finds that the revenue-maximizing tax rate on capital gains is quite low, in the vicinity of 16% to 20%.

Before evaluating Lindsey's final result, it is useful to discuss an important finding that follows directly from the first two major sections of his chapter. What emerges from Lindsey's conscientious effort to measure accurately the average marginal tax rate on capital gains is a clear idea that over the sample period considered by Lindsey, 1965–82, no forward-looking investor could possibly have calculated in advance the tax rate he would have to pay upon realizing a capital gain on his investment. The alternative tax computation, the additional minimum tax, and the maximum tax on personal service income together with numerous changes in the statutory tax rate levied on nominal capital gains all combined to make calculation of the actual tax rate on realization of nominal gains a very difficult task ex post, and an impossible one ex ante.

Unfortunately, despite painstaking efforts to measure accurately the tax rate on marginal realization of net long-term gains, Lindsey overlooks what is perhaps the major problem in the tax treatment of capital gains: a failure to index the cost basis for inflation. Therefore, it is important to realize that even though Lindsey's capital gains realizations are measured in 1972 dollars, they are not "real capital gains," for there is no way to tell whether those realizing gains are selling at prices that compensate sufficiently for the effects of inflation on real gains. Another way to make the same point is simply to observe that it is nominal gains that are taxed, and it makes little difference whether the nominal gains that are taxed are measured in current dollars or 1972 dollars. Lindsey's analysis still treats identically the investor who bought an asset at a price of 100 in 1970 and sold it at 200 in 1980 for zero real gain and the investor who bought the asset at 50 in 1970 and sold it at 200 in 1980 for a positive real gain.

One interesting question is whether it is possible to determine a bias in Lindsey's estimate of the revenue-maximizing tax rate on capital gains. I am inclined to think that it may be biased downward. To see why, suppose that during Lindsey's sample period the cost basis for capital gains tax purposes had been indexed. As a result, the rapid inflation of the 1970s would have produced less "lock-in" on capital

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assets. Thus, realizations would have proceeded steadily over time rather than accumulating in anticipation of a possible opening such as occurred in 1981, when the maximum tax rate on nominal capital gains was adjusted downward to 20%. In other words, investors in both real and financial assets have in the presence of a poorly indexed tax system come to anticipate ad hoc corrections for mismeasurement of income from capital or capital gains that result from accelerated rates of inflation.

The same phenomenon appears with respect to measures that affect the user cost of capital, such as investment tax credits or accelerated cost recovery schedules. Inflation results in an overstatement of profits for tax purposes and thereby discourages investment until some ex post correction is made in the form of front-loaded depreciation measures like those enacted in 1981. As a result, investment and capital gains realizations tend to display a choppy pattern in response to the ebb and flow of ex post corrections made necessary by an absence of adequate indexing provisions in the area of the tax code that deals with capital gains and income from capital.

Lindsey's analysis would probably benefit from raising the question of why capital gains ought to be treated differently from ordinary income. It is sometimes suggested that an adjustment is necessary to compensate for (*a*) the likelihood that not all of the nominal gains which are taxed are not real or (*b*) the income surge phenomenon that arises because capital gains are taxed on realization rather than on an accrual basis.

The corollary to this reasoning is that if only real capital gains were taxed on an accrual basis in a neutral tax system with a top marginal rate of 30% or below, there would be no need to treat capital gains any differently than ordinary income.

A little reflection provides some interesting extensions for Lindsey's analysis. The most useful question to analyze would be whether his estimates are sensitive to the level of the inflation rate. That rate is inversely related to the real gains underlying the nominal gains measured in 1972 dollars that constitute Lindsey's dependent variable. Were Lindsey to examine a period of lower inflation or deflation either in the United States or in some other country, since nominal gains would represent less of an overstatement of real gains or even an understatement in a period of deflation, the hypothesis would be that the measured response of capital gains realizations to a reduction in the tax rate on nominal gains would be reduced. As a result, Lindsey's estimate of the revenue-maximizing tax rate on capital gains would be reduced.

A stylized representation of the situation confronting investors with capital gains or losses during the 1970s makes clearer the possible downward bias just referred to in Lindsey's estimate of the revenue-

maximizing tax rate on capital gains. Investors with positive nominal capital gains, those whose sales of assets will yield tax revenue, may have positive, zero, or negative real gains depending upon the percentage appreciation in the asset relative to the percentage increase in the price level during the holding period. Reductions in the tax rate on capital gains tend to be anticipated by those following the discussion of changes in the tax code. Those with positive nominal gains that are also positive when measured in real terms will postpone realization in anticipation of a cut in the capital gains tax rate. Part of the lock-in effect results from the fact that nominal gains overstate real gains, and a cut in the tax rate on nominal gains can only mitigate the negative effect on realization of mismeasurement of real gains. At the margin, the incentive is to increase realizations promptly after the tax rate on nominal gains is reduced in cases where the lower tax makes it profitable to realize gains and purchase another asset with a higher pretax return.

The negative effect of inflation on capital gains realizations prior to ex post adjustments in the tax code is exacerbated not only by the overstatement of real gains that inflation produces but also by the bracket creep induced by high rates of inflation in the late 1970s. Here again there is a tendency to accumulate gains in anticipation of adjustment, as the congressional habit of periodically reversing the effects of bracket creep is well known. Bracket creep, like mismeasurement of real gains, tends to produce a surge of capital gains realizations immediately after an ex post adjustment in the tax code which lowers tax rates on nominal capital gains.

In sum, one should not conclude that in a comprehensive reform of the tax system, wherein real capital gains are taxed as accrued, Lindsey's work suggests that a top marginal rate would be too high. Rather, what Lindsey's estimates imply is that during inflationary periods when the mismeasurement of real gains and bracket creep combine seriously to distort the measurement of capital gains for tax purposes, a very low tax rate on nominal capital gains is required to carry forward realizations to a revenue-maximizing level.