

NBER WORKING PAPER SERIES

HOW BURDENSOME ARE
CAPITAL GAINS TAXES?

James M. Poterba

Working Paper No. 1871

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
March 1986

I am grateful to Dan Feenberg, Jerry Hausman, Mervyn King, James Wetzler, and especially Lawrence Summers for helpful discussions. William Gentry provided excellent research assistance. Robert Clarke of the Internal Revenue Service provided unpublished data. This research was supported by the National Science Foundation. The research reported here is part of the NBER's research program in Taxation and projects in Government Budgets and Taxation and Capital Formation. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

How Burdensome are Capital Gains Taxes?

ABSTRACT

Several recent and provocative studies have described portfolio trading strategies which permit investors to avoid all taxes on capital gains and to shelter a substantial part of their ordinary income as well. Other studies adopt the more traditional view that the capital gains tax raises the effective tax burden on capital income. This paper uses capital gain realization data from the 1982 IRS Individual Tax Model in an effort to distinguish between these views. It shows that for about one-fifth of the investors who realize gains or losses, the ordinary income loss-offset limitations are binding constraints. Since additional gain realizations do not affect these investors' current tax liability, they may be effectively untaxed on capital gains. Another significant group escapes taxation by not reporting realized gains. However, the largest group of investors trades in a less elaborate and more honest manner, realizing and reporting gains without offsetting losses. The capital gains tax may reduce the after-tax return earned by these investors.

James M. Poterba
Department of Economics
Massachusetts Institute
of Technology
Cambridge, MA 02139
(617) 253-6673

Traditional analyses of the capital gains tax focus on three types of investment distortions. First, the "lock-in effect," which arises because gains are taxed on realization rather than accrual, may lead investors to hold incompletely diversified portfolios. Second, risk-taking decisions may be distorted by the limited loss offset provisions, and other changes in the risk--return opportunity set, associated with the tax. Third, the tax may distort savings decisions by affecting the after-tax return which investors earn on appreciating assets.¹

Empirical studies of capital gains taxation typically center on estimating the effective tax rate under simple assumptions about the way investors manage their portfolios. They focus on the importance of deferral and non-taxation of gains at death in reducing the capital gains tax burden. These studies usually find that because average asset holding periods are quite long, the effective capital gains tax rate is only a fraction of the statutory rate.²

An alternative view of the capital gains tax with radically different implications both for analyzing distortions and for measuring effective tax rates has recently been advanced by Allen (1982), Constantinides (1983, 1984), and Stiglitz (1983). These authors recognize that by adopting appropriate portfolio strategies, investors can avoid paying capital gains tax. With perfect capital markets and no transactions costs, the current United States tax code permits an investor to shelter not just his capital income, but his ordinary income as well. By using one set of securities transactions, investors can transform ordinary income into capital gains; a second set of transactions will enable them to defer realization of taxable gains. In principle, the second step can be repeated until assets with accrued gains are bequeathed,

escaping capital gains taxation entirely. Although few investors may actually behave as this "tax minimizing" view suggests, the new analysis emphasizes that the impact of the capital gains tax depends upon the constraints or market imperfections which prevent investors from following tax-minimizing trading rules.

This paper investigates the empirical importance of investors whose trading strategies lead them to face zero marginal tax rates on realized gains. It suggests that a large part of the investing public does not engage in tax-minimizing portfolio transactions, but behaves in a fashion more accurately characterized by the traditional view. This finding informs the debate on the economic effects of capital gains taxation, and raises the more general question of why households do act to minimize their tax liabilities.

The paper is divided into five sections. The first describes the detailed provisions of the U.S. tax code affecting capital gains, and sketches the tax-minimizing trading rules examined in previous studies. The second section estimates the distribution of statutory marginal tax rates on realized gains, and examines the fraction of realized gains which are offset by capital losses. Evidence that a large fraction of investors face marginal tax rates of zero, or that a large share of realized gains are offset by losses, would support the "tax minimizing" view. The third section questions previous evidence on the significance of tax-induced distortions in asset holding periods. The fourth section discusses several omissions stemming from my focus on realized gains, and the conclusion suggests a number of directions for future research.

I. The Structure of Capital Gains Taxes

Each investor's marginal tax rate on realized gains is a complicated function of his realized short-term and long-term gains and losses. The applicable tax rate ranges between zero and the ordinary income tax rate, depending on the configuration of realized gains. The principal difficulty in analyzing capital gains taxation is the endogeneity of the very transactions which constitute the tax base. Different assumptions about investors' trading rules imply different effective capital gains tax rates. The first half of this section outlines the statutory provisions which determine an investor's marginal tax rate on realized gains. The second half sketches how different assumptions about investor behavior affect the marginal tax rate on realized gains, and identifies their empirical predictions.

I.A. The Legal Framework

There are four provisions in the U.S. tax code as of 1982 which must be considered in determining an investor's statutory tax rate on realized capital gains:³

(i) Short-term and long-term gains are treated differently. Gains and losses on assets which have been held for less than one year are considered short-term.⁴ Forty percent of net long-term gains and all net short-term gains are included in an investor's taxable income.

(ii) Short-term losses offset long-term gains dollar-for-dollar, and long-term losses offset a short-term gains dollar-for-dollar.

(iii) After gains have been used to offset losses, an investor with a net long-term loss may deduct one-half of the loss from ordinary income. If there

is a net short-term loss, the full amount is deducted. However, no more than \$3,000 of ordinary income may be offset by capital losses in any tax year. This limit is \$1,500 for married taxpayers filing separately. Capital losses in excess of the loss-offset limits may be carried forward indefinitely.

(iv) When an investor dies and bequeathes assets to his heirs, the tax basis of the transferred assets is raised to their current market value. Accrued gains on assets transferred this way avoid capital gains taxation entirely.⁵

Figure 1 shows how the first three provisions interact to determine the statutory tax rates on long-term and short-term realized gains. The investor's net short-term capital gain (N_S) is plotted on the vertical axis, while the horizontal axis shows the net long-term gain (N_L). The line $N_L + N_S = 0$ divides the plane into two regions, indicating the presence of a net gain or net loss. Realizations above this line generate net capital gains, while those below it correspond to net losses. The other line depicts the loss-offset constraint. It represents the points at which net short-term losses plus one-half of net long-term losses equal \$3,000. For an investor whose losses exceed this limit, i.e., one whose realizations lie below this line, marginal losses have no effect on current tax liability. They must be carried forward.

The net loss and loss-offset lines combine with the axes to divide the figure into seven different regions with different pairs of tax rates (τ_S, τ_L) on realized short-term and long-term gains. In Region I, the investor realizes both net long-term and net short-term gains. His capital gains tax liability is $\tau^*(N_S + .4N_L)$, where τ is his marginal tax rate on ordinary income. His marginal tax rate on realized long-term gains is therefore $\tau_L = .4\tau$, while that on short-term gains is $\tau_S = \tau$. Most studies of effective capital gains tax rates

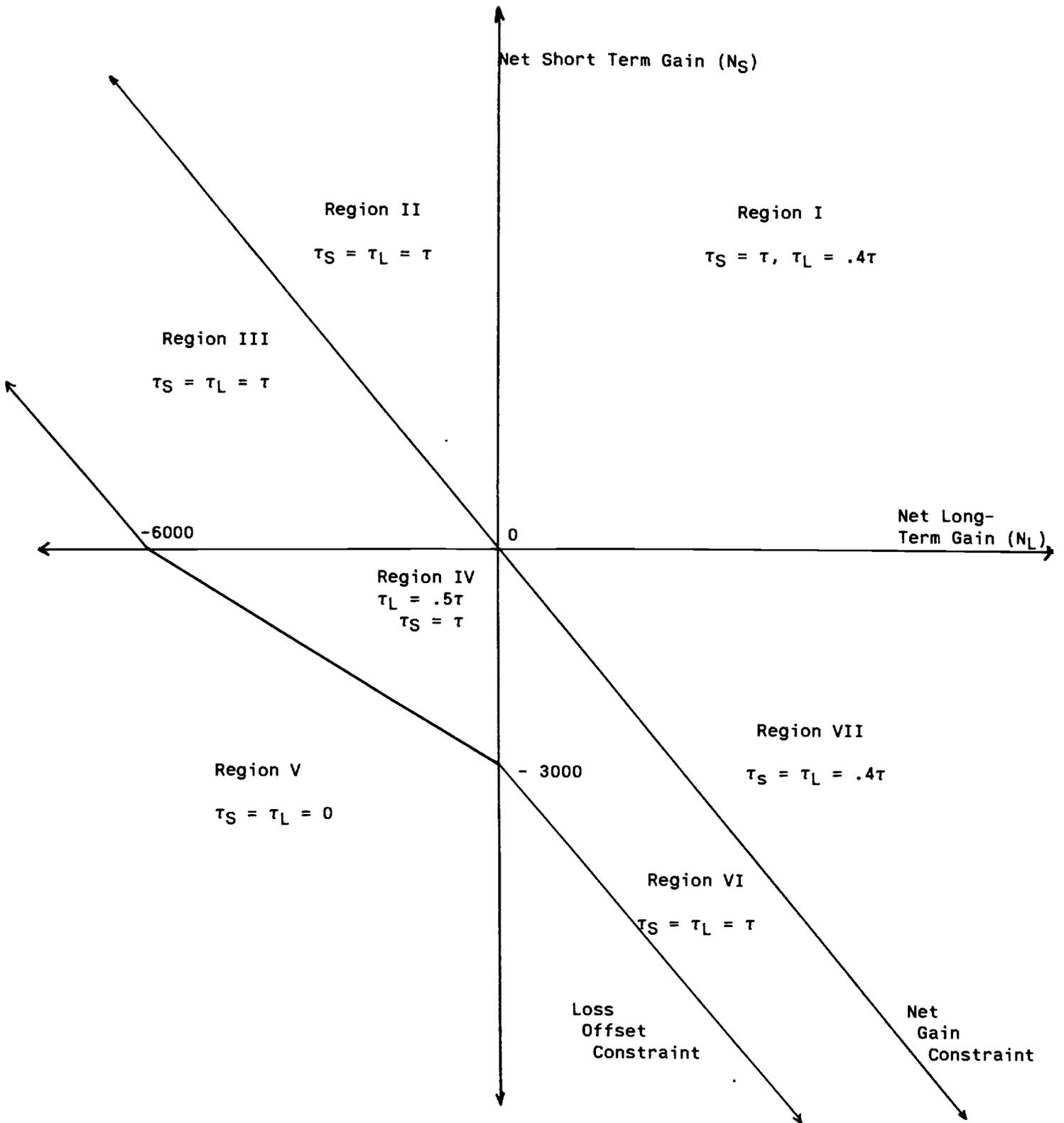


Figure 1: Statutory Tax Rates Applicable to Marginal Gains

assume that investors who realize gains face the tax rates in this region.

An investor in Region II realizes net long-term losses which are smaller in absolute value than his short-term gains. The losses offset the gains dollar-for-dollar yielding a net gain of $N_S + N_L$. The tax liability is $\tau^*(N_S + N_L)$, and his marginal tax rate on additional long-term or short-term gains is τ . Region III differs from Region II in that net short-term gains are smaller than net long-term losses, so the investor realizes a net loss. Since one-half of net long-term losses may be deducted from ordinary income, the investor's tax liability is $.5\tau^*(N_S + N_L)$, implying $\tau_S = \tau_L = .5\tau$. Region IV depicts an investor who realized small net losses both long-term and short-term. His losses enable him to reduce his taxable income by $.5N_L + N_S$, yielding a tax payment of $\tau^*(.5N_L + N_S)$. For this investor, $\tau_L = .5\tau$ and $\tau_S = \tau$. In both Regions III and IV, the net loss included in taxable income must be less than \$3,000.

Region V contains all the cases in which net losses exceed \$3,000. In this situation, the investor includes a \$3,000 loss in ordinary income, and carries forward the balance of the loss. Marginal changes in gain and loss realizations have no effect on current tax liability, although they affect the size of capital loss carryforwards. The marginal tax rate on marginal realizations depends upon the date at which the investor fully utilizes his capital loss carryforwards. If an investor expects to be in Region V forever, either because his loss-carryforwards are very large or because he continually realizes significant losses, then marginal tax rates on both short-term and long-term gains are zero.⁶

Investors in Region VI realize net long-term gains and net short-term losses but their short-term losses exceed long-term gains by less than \$3,000. All net

losses ($N_L + N_S$) can therefore be included in taxable income, so $\tau_S = \tau_L = \tau$. Finally, Region VII includes investors with realized net long-term gains and short-term losses, but for whom $N_L + N_S > 0$. Since net short-term losses offset long-term gains dollar-for-dollar, the net gain included in taxable income is $.4*(N_L + N_S)$. For investors in this region, $\tau_S = \tau_L = .4\tau$.

I.B. Portfolio Trading Rules

The difference between traditional analyses of the capital gains tax and the "tax minimizing view" derives from their differential assumptions about trading rules. The traditional analysis either fails to specify, or makes naive assumptions about, the trading rules used by investors. Studies suggesting important "lock-in" effects often provide no explanation of why investors trade their assets, but simply argue that trading will occur less frequently in tax regimes with high realization-based tax rates. Empirical studies of the effective tax rate such as Bailey (1969), King (1977), and Protopapadakis (1983) make the analytically tractable assumption that investors hold their assets for a fixed period, or assume that they face a constant probability each period of being forced to liquidate their assets. If investors do not trade unless forced to and asset returns are generated by a simple stochastic process, then it is possible to calculate the expected present value of the taxes which will be paid on a one dollar accrued capital gain. This tax rate is an increasing function of the probability of forced trades.

If investors actually followed this trading strategy, the distribution of investors across the various tax brackets in Figure 1 would depend principally on the distribution of returns. Provided expected (nominal) pre-tax returns

were positive, the government would expect positive revenue from its capital gains tax. An increase in marginal tax rates on ordinary income or a tightening of the loss-offset constraints would raise revenue, and assuming no change in pretax returns, lower the returns available to investors.

More sophisticated portfolio strategies from the tax standpoint are examined by Constantinides (1983). He assumes that investors face periodic forced asset sales, and takes the tax rates in Region I of Figure 1 as applying to forced realizations. He also assumes that losses are never large enough to cause the loss-offset constraint to bind, so that investors with losses face the tax rates of Region VI. If capital markets are perfect and there are no transaction costs or restrictions on wash sales, then the optimal trading rule is to (i) defer short-term gains until they become long-term unless otherwise forced to realize; (ii) realize losses when they occur⁷, (iii) sell and repurchase long-term assets whenever their price and tax basis are equal, and (iv) (possibly) sell assets with accrued long-term gains to re-establish their short-term status and potential to generate short-term losses.⁸

When the differential between the tax rates on short- and long-term gains is large enough, the government may actually lose revenue through its capital gains tax provisions. Most losses will be realized short-term for large deductions, while most gains will be realized long-term for smaller tax liability. Raising both long- and short-term capital gains tax rates proportionately will increase the rates at which losses may be deducted from ordinary income, and raise the effective tax burden on forced realizations. If forced realizations are infrequent, such a tax increase may actually reduce government revenues and raise the after-tax return to risky holding risky assets.

Constantinides' assumption that the loss-offset constraint does not bind implies that investors could lower their taxes by realizing additional capital losses. Both Allen (1982) and Stiglitz (1983) argue that investors can generate tax losses at low cost and without exposing themselves to much risk and therefore reduce their tax liability until either (i) the loss-offset provisions bind or (ii) tax payments equal zero. By assuming perfect capital markets, unrestricted short sales, and no transactions costs, they exhibit a variety of zero-net-worth investments which enable investors to realize capital losses while deferring capital gains. Stiglitz (1983) suggests four particular strategies: (i) the "locked in" strategy of postponing realization of long-term gains, (ii) the "immediate realization" strategy of realizing all losses immediately, (iii) the "indebtedness" strategy of borrowing to buy appreciating assets, and (iv) the "loss-roll-over" strategy of buying and selling highly correlated securities. If there were no loss-offset limits, these strategies would permit investors to avoid all taxes. With loss-offset constraints, investors must transform ordinary income into capital gains before they offset it with losses. This can be accomplished many ways: by shorting a dividend-paying stock around its ex-dividend day, by purchasing assets with tax depreciation in excess of their true economic depreciation, or by borrowing to purchase an appreciating asset, for example.

An investor who follows the Allen-Stiglitz tax minimizing strategies will either be in Region V of Figure I, or he will have generated enough ordinary losses to offset all ordinary income and pay no taxes. For these investors, changes in statutory capital gains tax rates have no incentive effects. They also have no effect on the government's tax receipts.

The Allen-Stiglitz trading strategies may be difficult to implement for several reasons. First, since they often require frequent trading, their value is very sensitive to transaction costs. Deferring accrued gains on corporate stock may require short sales which carry particularly high brokerage costs.⁹ Second, investors may be unable to realize gains or losses on particular assets without affecting their portfolio risk. For assets with many close substitutes, such common stocks, diversification issues may not arise. However, most capital gains arise from assets other than common stock. Only 17 percent of net capital gains in 1977, and 33 percent of those in 1981, were on corporate equities. More than a third of all gains realized are on depreciable property and real estate.¹⁰ It may be difficult and costly to discover close substitutes for these assets. Finally, the transactions which generate the Allen-Stiglitz results may attract IRS scrutiny of the investor's tax return and they are frequently the target of loophole-closing tax reforms. For example, the 1984 changes in the U.S. tax law have made it very difficult to generate losses from paper transactions in the securities market.¹¹

Since the Allen-Stiglitz "tax-minimizing" view makes the strong prediction that tax-paying investors should be found only in Region V, it can be tested easily. The modified tax-minimizing view of Constantinides, and the traditional constant sale probability model, make less precise predictions with respect to the distribution of marginal tax rates on realized gains. The long average holding periods for most assets, however, suggest that the pressure of forced realizations during the six month short-term holding period should be quite small.¹² Constantinides' model therefore would also imply a high concentration of investors with significant taxable losses in Region VI.

The next section tests these predictions by studying the actual distribution of tax rates on realized gains. There is undoubtedly a great deal of heterogeneity in the way investors manage their portfolios, and each of the portfolio strategies outlined above probably describes some part of the investing population. My empirical analysis is designed to provide evidence on the importance of tax-minimizing investors, by comparing the observed behavior of investors who realize capital gains with the predictions of the tax-minimizing view.

II. The Realization of Gains and Losses

The tax minimization view makes two predictions regarding the realization of gains and losses. First, a substantial fraction of investors should be observed at or near the capital gain loss-offset constraints. Second, investors should realize offsetting gains and losses. Investors should never realize and pay taxes on large capital gains, since they could have sheltered these gains with paper losses. This section uses data on reported capital gains and tax status, drawn from the U.S. Treasury's Tax Model Data file for 1982, to test these predictions. The data set contains a sample of 89,127 individual federal income tax returns. It oversamples high-income returns, and includes all returns with adjusted gross income in excess of \$400,000.

I first examine the distribution of investors across the seven tax regions in Figure 1. Table 1 reports three different tabulations of investor tax rates.¹³ The first column, which assigns each tax return in the sample a weight based on its sampling proportion, describes the fraction of tax returns in each category. The second column weights each return by the product of its sampling weight and its reported dividend income, as a proxy for the taxpayer's total wealth and importance as a stock market investor. This column shows the fraction of total dividends received by investors in each tax region. The third column weights observations by sampling weights, as in the first column, but is restricted to returns with adjusted gross income in excess of \$100,000.

The results demonstrate that many investors realize only gains and therefore face the tax rates of Region I. Over sixty percent of the investors with gains or losses realized only gains. Slightly more than fifty percent of the dividends received by the household sector accrued to investors in this region, who

Table 1: Marginal Statutory Tax Rates on Realized Capital Gains, 1982

<u>Tax Region</u>	<u>Fraction of Investors Reporting Net Gain or Loss</u>	<u>Fraction of Investors with Net Gains or Losses (Dividend Weighted)</u>	<u>Fraction of Investors with Net Gain or Loss and AGI > \$100,000</u>
Region I $\tau_S = \tau, \tau_L = .4\tau$	.637	.516	.571
Region II $\tau_S = \tau_L = \tau$	.011	.013	.009
Region III $\tau_S = \tau_L = .5\tau$	.116	.075	.071
Region IV $\tau_S = \tau, \tau_L = .5\tau$	.021	.017	.013
Region V $\tau_S = \tau_L = 0$	.112	.189	.146
Region VI $\tau_S = \tau_L = \tau$	.062	.044	.050
Region VII $\tau_S = \tau_L = .4\tau$	.040	.146	.139

Source: Author's tabulations based on 1982 U.S. Treasury Tax Model Data file. Further explanation of the regions and corresponding tax rates, τ_L and τ_S , may be found in the text and Figure I.

do not behave as the "tax minimization" model predicts.

A sizable group of investors do behave in ways consistent with the model, however. Eleven percent of the investors who received gains or losses faced a binding loss-offset constraint. Nearly nineteen percent of household dividends were received by investors in this group. This may understate the importance of these investors in the equity market if those persons who minimize their capital gains tax liability by following sophisticated trading strategies also hold low-yield common stocks to avoid dividend taxation.

Fifty three percent of the investors who were in Region V in 1982 had also been constrained by the loss-offset rules in 1981. For a sizable group of taxpayers, therefore, the binding loss-offset constraint is not a transient condition. The current data set cannot reveal the complete distribution of loss-constrained spells, since it only enables us to compare two consecutive years. An important issue which should be explored if longer panels of tax returns with capital gains information became available is the persistence of loss-constraint. This information is essential for assessing the effective tax burdens on investors in Region V.

Table 2 reports a more detailed calculation of the fraction of tax returns for which the loss-offset provisions are binding or nearly binding. It disaggregates taxpayers into groups based on adjusted gross income (AGI), and presents three sets of calculations corresponding to the weighting schemes in Table 1. The results show that although the probability that the loss-offset constraint will bind or nearly bind is low (.015) for the taxpaying population at large, it increases with AGI and reaches .12 for returns with AGI in excess of \$100,000. The most striking result is that nearly one quarter of the dividends reported on

Table 2: Constraints on Capital Loss Offsets to Ordinary Income, 1982

<u>Adjusted Gross Income Category</u>	<u>Fraction of Returns with Capital Losses Greater Than Limit</u>	<u>Fraction of Returns with Capital Losses Greater Than .50*Limit</u>
All Returns		
All Returns	.010	.015
< 0	.045	.063
0-10,000	.003	.005
10,000-50,000	.010	.015
50,000-100,000	.048	.075
> 100,000	.099	.126
All Returns with Gains or Losses		
All Returns	.112	.164
< 0	.131	.182
0-10,000	.098	.148
10,000-50,000	.108	.157
50,000-100,000	.121	.189
> 100,000	.146	.185
All Returns Weighted by Dividend Income		
All Returns	.189	.247
< 0	.291	.294
0-10,000	.099	.308
50,000-50,000	.232	.309
10,000-100,000	.171	.256
> 100,000	.169	.197

Source: Author's tabulations using a one-in three sample from the 1982 U.S. Treasury Individual Tax Model Data File.

returns with gains or losses, or sixteen percent of dividends reported on all individual tax returns, are on returns with net losses of more than half the loss-offset limit. Nearly seventeen percent of dividends accruing to households with more than \$100,000 in AGI are on returns for which the constraint binds.

My analysis of the fraction of investors for whom additional capital gains generate no additional current tax liability closely parallels Feenberg's (1981) study of dividend income.¹⁴ He found that almost no taxpayers were bound by the interest deductibility constraints which make additional dividend income effectively untaxed. His results are confirmed in my 1982 data, where 1.7 percent of all taxpayers have interest deductions within \$1000 of this constraint. Both the loss-offset constraint and the interest deductibility constraint, were binding for only .09 percent of the taxpayers in the sample, and 2.9 percent for those with AGI of \$100,000 or more. This finding suggests that few investors simultaneously face zero tax rates on both dividends and capital gains, and it does not suggest that there is a single group of "tax-minimizing" investors who successfully avoid taxation on all forms of capital income.

The calculations in Table 2 group all types of assets together, because the Treasury Tax Model does not provide information on individual asset transactions. For many purposes, however, such as analyzing the effect of capital gains taxation on the intersectoral allocation of capital, it is important to know effective tax burdens by asset type. Some disaggregated calculations can be made using the 1973 Survey of Capital Asset Sales. For 1973, eighty percent of all gain-producing long-term transactions, and 87.2 percent of all gross long-term gains, are reported on tax returns with net gains. Only 71 percent of common stock transactions with gross gains fall into this category, although

86.1 percent of all gross long-term gains on common stock are reported on returns with net gains. For non-business real estate and depreciable property, nearly ninety-five percent of all gains are reported on returns with net gains. These tabulations suggest that gains on corporate equity tend to face lower tax burdens, when realized, than gains on real assets.

The results from the 1982 Tax Model suggest that most capital gains are reported by investors who realize only gains. This contradicts the tax-minimizing view's prediction that investors should realize offsetting gains and losses. To explore the role of gain and loss offsetting in greater detail, Table 3 shows the fraction of long term gross gains which were reported on returns with gross losses which totally offset the gain. Only 2.7 percent of gross long-term gains, and 23.1 percent of gross short-term gains, are reported on returns with net capital losses. The table also shows the share of gross long-term gains reported on returns with no long-term losses or short-term transactions of any kind. They account for over half of all realized long-term gains, although only one third of gains realized on returns with AGI of at least \$100,000 fall into this category.

Although most gains are reported on returns without losses, many losses are reported on returns with net gains. For long-term losses, ninety three percent of the reported losses are on returns with net gains. For short-term losses this effect is less pronounced: only one third of the reported losses are on net gain returns. Short-term losses on high-income returns, however, shelter gains to a greater extent, since roughly two thirds of these losses are on returns with net gains.

One difficulty with the tests in this section is that the loss-offset

Table 3: Offsetting of Capital Gains and Losses, 1982

	<u>All Returns</u>	<u>Returns with AGI ≥ \$100,000</u>
Share of Gross Long-Term Gains Reported on Returns with:		
- No Gross Losses or Short-Term Gains	.518	.319
- Net Loss	.027	.011
Share of Gross Long-Term Losses Reported on Returns with:		
- No Gross Gains or Short-Term Losses	0	0
- Net Gain	.930	.978
Share of Gross Short-Term Gains Reported on Returns with:		
- No Gross Losses or Long-Term Gains	.097	.020
- Net Loss	.231	.112
Share of Gross Short-Term Losses Reported on Returns with:		
- No Gross Gains or Long-Term Losses	.155	.040
- Net Gain	.337	.669

Source: Author's calculations based on 1982 U.S. Treasury Tax Model Data File.

constraint might not be binding, even though an investor was following a tax-minimizing trading strategy, because he might have borrowed enough to generate interest payments larger than his other ordinary income. The borrowed funds could be invested in appreciating assets, while the investor might not realize any gains during a particular tax year. In this case, the tax return would show no capital gains activity. An intermediate case obtains if investors borrow to purchase capital assets and then sell them. The tax return would then show interest deductions as well as reported capital gains. This can be studied using the 1982 Tax Model data.

Thirty-six percent of all returns with gains or losses have interest payments in excess of the net gain, as might be expected under the tax minimization view. Excluding mortgage interest, the fraction falls to 27.5 percent. At the other extreme, forty one percent of all returns with gains (but only 14.6 percent with net gains and AGI \geq \$100,000) report no interest payments.

The results in this section reflect the substantial heterogeneity of the investing population. Although some investors behave as the Allen-Stiglitz "tax-minimizing" model suggests they should, the majority of investors who realize capital gains do not adopt sophisticated tax reduction strategies. Many realized gains, therefore, are taxed at substantial marginal rates.

III. The Timing of Realizations

The tax-minimizing model implies that capital losses should be realized as soon as they occur to maximize the present value of loss-offsets, while capital gains should be deferred at least until they become eligible for long-term gains treatment. Previous studies of gains and losses reported on tax returns, such as Fredlund, Gray and Sunley (1968) and Kaplan (1981), suggest some deferral takes place. Unpublished IRS data reported by the New York Stock Exchange (1982) show that in 1977, when transactions qualified for short-term treatment if they lasted less than nine months, loss realizations were 108, 120, 163, 29, 94, and 256 on transactions of duration seven through twelve months, respectively. These data suggest a sharp decline in loss realizations at nine months. Gains show no decline before nine months and rise slightly after transactions become eligible for long-term treatment. This section suggests that these data may be unreliable and may overstate the importance of deferral.

There is relatively little information on realization patterns from sources other than tax returns; one unique source of such evidence is Schlarbaum, Lewellen, and Lease's (1978) study of all security transactions between 1964 and 1970 in a sample of 2500 accounts at a large retail brokerage house. Their sample includes 75,123 round trip common stock transactions, and they tabulate the fraction of round-trip transactions which result in positive realized returns for different holding periods.¹⁵

Their findings are reproduced in the first column of Table 4. The probability of observing a negative gross return on a transaction with a duration of less than six months is no different from that for transactions lasting more than a year. The second and third columns in the table present calculations of

Table 4: Corporate Stock Transactions with Reported Capital Gains,
by Holding Period

Percent of Reported Transactions which Show Net Gains

<u>Holding Period</u>	<u>Brokerage Account Tabulations</u>	<u>Tax Return Tabulations</u>		<u>Tax Return Tabulations Weighted by Gain or Loss</u>	
		<u>1962</u>	<u>1973</u>	<u>1962</u>	<u>1973</u>
< 1 month	58	54	51	48	51
1-6 months	57	38	40	32	31
6-12 months	59	32	35	33	31
> 12 months	61	48	39	62	54

Source: Data in column one are from Schlarbaum, et al. (1978), p. 323. Tax return tabulations are based on author's calculations from U.S. Treasury (1966, Table 12) and (1980, Table 8). Statistics for transactions with holding periods of more than twelve months may not be comparable between column 1 and subsequent columns. The value in the first column is based on a sample of transactions which lasted at most seven years. The tax return tabulations in later columns include all transactions with holding period between one and ten years.

gain and loss realizations based on the 1973 Survey of Capital Asset Sales. For transactions with holding periods of one month or less, both the IRS tabulations and the brokerage firm data suggest that just over half of all transactions result in capital gains. Calculations weighting each transaction by the size of the resulting gain or loss, shown in the last two columns, yield conclusions similar to those based on simple transaction counts. The conformity between the data sources vanishes at longer holding periods. The brokerage firm data suggest that fifty-seven percent of transactions which last between one and six months yield capital gains, while the IRS tabulations imply approximately forty percent (thirty percent when value-weighted). The brokerage firm data suggest that nearly sixty percent of all transactions of between six and twelve month durations yield gains, while the IRS tabulations suggest about thirty percent.

A number of explanations might be proposed for the disagreement between these two data sets. The first is that the tax return data are biased by selective reporting of gains and losses. Investors may fail to report some capital gains, while faithfully reporting capital losses. During the time period covered by these data, there was no third party reporting system which provided the IRS with data on capital asset transactions. Alternatively, they may misclassify asset sales, erroneously (and perhaps deliberately) reporting long-term losses as short-term. This is most consistent with the observed pattern of gain and loss reports around the transition from short- to long-term holding periods. Studies of taxpayer compliance reveal substantial underreporting of capital gains tax liability, but do not disaggregate this into components due to complete nonreporting of transactions versus misreporting. In future work I hope to use unpublished IRS data to examine this issue.¹⁶

Since short-term gain realizations face higher tax rates than long-term gains, the incentive to avoid taxes through nonreporting is greater at short than at long holding periods. This suggests a potentially significant bias in previous attempts to show that asset trading distortions are caused by the holding period distinction. If all loss transactions but only a fraction of gain transactions are reported, or if the holding periods are misreported, and the misreporting probability is a function of the holding period, then analyses of tax return data may yield the spurious conclusion that gain-producing transactions are deferred. This finding could be purely an artifact of the selective sample provided by gains and losses reported to the tax authorities, and may have contaminated all of the previous studies which have used IRS data to show that investors are locked-in.

Tax avoidance is not the only possible explanation of the discrepancy between the brokerage firm and IRS data. Another is that the divergences are due to the different years covered by the two data sets. Both 1962 and 1973, the years of the IRS surveys, were years in which few short term gains were generated on common stock. One measure of the "realization potential" of a year is the average value of the current Standard and Poor's Composite Index, divided by its value six months earlier (similar results obtain for other holding intervals). For 1962 and 1973, the average values of this ratio were .932 and .965, respectively. For the period June 1964-December 1970, that covered by the brokerage firm data, the corresponding average ratio was 1.008.

Other possibilities could also be suggested. The particular brokerage firm which was surveyed might have provided its clients with particularly poor tax advice. The client pool might be unrepresentative of investors in general, and

there may be sample selection issues which arise because the investors are followed over a long period, but Schlarbaum et al. address these issues and find the characteristics of investors in their sample to closely resemble those for investors in general.

If the explanation is non-reporting, however, it implies two things. First, the distortions in asset trading patterns due to the capital gains tax may be smaller than previously believed. Studies based on tax return data, such as Feldstein, Slemrod, and Yitzhaki (1980), may yield a misleading picture of these distortions. Second, in analyzing the burden of the capital gains tax, it may be important to treat issues in tax evasion. Future theoretical and empirical work should be directed at assessing this burden.

IV. Realized Gains Versus Effective Tax Rates

The preceding sections ignore three important aspects of the taxation of capital gains, all of which play a central role in any attempt to estimate effective marginal tax rates. First, a sizable fraction of realized capital gains face a marginal tax rate of zero because they are never reported to the Internal Revenue Service. The most recent estimates (Internal Revenue Service, 1983) show that in 1981, when \$43.7 billion of taxable net capital gains should have been reported on individual income tax returns, only \$25.9 billion was actually reported. This implies a nonreporting rate of 40.6 percent for capital gains income, by comparison with 6.3 percent for wage and salary income, 16.3 percent for dividend income, and 13.7 percent for interest income. The only significant income categories with comparable noncompliance rates are those for partnerships and small businesses (53.0 percent nonreporting), nonfarm proprietor income (49.7 percent nonreporting), and informal supplier income (79.3 percent nonreporting).¹⁷ The nonreporting rate should be reduced by the recent introduction of third-party reporting for some gains, but a substantial share of realized gains may continue to escape taxation.

The second aspect of capital gains taxation which my analysis omits is the possibility of tax-reducing asset transfers. Many gains never face the taxes described above because the investor transfers his assets or dies before realizing the gain. If appreciated assets are bequeathed, their basis is "stepped-up" to their market value, and all prior appreciation escapes taxation. The Joint Tax Committee (1986) estimates that in 1986, the federal government suffered a revenue loss of 4.4 billion dollars from basis step-up, compared to 22.2 billion from partially excluding long-term capital gains from income.

Transferring appreciated assets to nontaxable institutions and minors also exposes the gains to taxation at relatively low rates. Unfortunately, no estimates of these flows are available.

Finally, by focussing on the tax rates which apply to realized gains, my analysis ignores the lengthy time periods which often elapse between accrual and realization of gains. To measure the effective tax burden on accruing gains, it is essential to know when they will be realized for tax purposes. Some indication of the impact of deferral is suggested by data on stock market transactions, drawn from the New York Stock Exchange (1984). In 1983, the share turnover rate for individual investors implied that shares were held an average of four years. For institutional investors, the average holding period was only one year. The average holding periods for securities which appreciate while the investor owns them may be even longer. Without a model of why investors trade, however, it is difficult to model effective capital gains tax rates.

V. Summary and Implications

This paper suggests that a significant fraction of realized capital gains are taxed at non-zero marginal tax rates. The investors who realize these gains are not following tax-minimizing portfolio strategies, and the capital gains tax has the effect of lowering their after-tax return. Other investors, however, follow trading strategies which make their effective tax rates on capital gains very low. Investor heterogeneity is an important aspect of capital gains taxation, and it is extremely difficult to aggregate across investors in different tax positions to obtain an overall measure of how the capital gains tax affects savings and investment incentives. The results suggest, however, that the "traditional" analysis of the capital gains tax which assumed that realized gains faced nontrivial marginal tax rates does apply to a sizable part of the investing population.

These results suggest several directions for future research. Perhaps the most important is explaining the evident divergence in investors' portfolio behavior. Some investors follow tax-minimizing portfolio strategies, while others do not. This heterogeneity may be due to differences in transaction costs, information, or other exogenous factors which induce investors to buy or trade securities.¹⁸ Investigating the sources of this heterogeneity will facilitate better modelling of the distortions induced by capital gains taxation. A second question raised by investor heterogeneity concerns the identity of the "marginal investors" who effectively determine asset prices and hence the market's relative valuation of dividends and capital gains. For both tax-minimizers and individual investors who behave in an unsophisticated way from the tax standpoint, capital gains are probably taxed more lightly than

dividend income. For other investors, however, principally corporations, the tax rate on capital gains may be significantly higher than that on dividend income. The resulting market equilibrium must depend on the relative wealths, risk aversions, and trading costs of these different investor groups.

A third issue, which applies in studying a wider range of taxes, concerns unreported income. For capital gains, nonreporting is a more serious problem than for most other income sources. However, it is not clear that the effective tax rate on the unreported component of capital gains is zero. Investors who decide to evade their tax liability may suffer a reduction in their expected utility as a consequence; at the margin, this should exactly equal their expected utility from the after-tax income they would receive if they report their income. The effective tax rate may therefore be equal on reported and unreported gains. Resolving the tax burden on tax evaders may be particularly important in measuring the distribution of effective capital gains tax rates across asset types. Some assets, notably collectibles and some types of tangible property, provide much greater opportunities for generating unreported income than do other assets. This could affect the relative tax rates on these assets, and have potentially important effects on the interasset allocation of capital.

Footnotes

1. Domar and Musgrave (1944), Stiglitz (1969), and more recently Balcer and Judd (1985), Judd (1985), and Kovenock and Rothschild (1983, 1984) examine the distortionary effects of the capital gains tax.
2. Bailey (1969), King and Fullerton (1984), and Protopapadakis (1983) estimate effective capital gains tax rates on households. Their results suggest that .05 is a rough approximation to the household tax rate. Lindsey (1986) presents recent evidence on the average marginal tax rate on realized gains over the 1965-1982 period; his data could be used to update the other calculations.
3. For a detailed discussion of several other provisions which affected the taxation of capital gains in years prior to 1978, see Lindsey (1986).
4. The definition of "short-term" has been changed numerous times. The required holding period needed to qualify for long-term gains treatment was six months prior to 1977 and nine months in 1978.
5. If assets are transferred as inter vivos gifts, the recipient inherits the donor's tax base and remains subject to capital gains taxation on the accrued gains, but the taxes are paid only when the recipient sells the asset. While such gifts are less attractive than transfer at death for capital gains tax purposes, they have the advantage of avoiding estate taxes.
6. If an investor is certain to exhaust his carryforwards in k years, then the marginal tax rates on realized gains is $\tau_t^g = \tau_{t+k}^g R_k$ where τ_{t+k}^g is the marginal capital gains tax rate in period $t+k$, and R_k is the current price of risk-free income in period $t+k$.
7. With perfect markets and no rules against wash sales, the investor does not forego any investment opportunities by following this strategy. He can either repurchase the security in which he realizes the loss, or buy a very close substitute for it, immediately after the sale.
8. The desirability of voluntarily realizing long-term gains depends upon the level of transactions costs, the differential between the short-term and long-term capital gains tax rates, and the asset's own variance.
9. It is not uncommon for personal investors who take short positions to be required to hold a balance half as large as their short position in a non-interest bearing brokerage account. The foregone interest cost may swamp the value of deferring capital gains taxation. Some other trading strategies may involve so many transactions that the brokerage costs, even at low marginal rates, become prohibitive; Constantinides and Scholes (1980) examine a case where this may be true.
10. In 1981 (1977), 33.2% (17.3%) of reported capital gains were on common stock, 38.3% (33.0%) were on nonbusiness real estate and other depreciable pro-

perty, 9.0% (10.8%) were on sales of partnerships and fiduciaries, and 19.5% (37.7%) were on other assets. These data are drawn from Brame and Gilmour (1982) and other unpublished IRS tabulations.

11. Wetzler (1984) presents a detailed discussion of the provisions in the 1984 Deficit Reduction Act which affected capital gains taxation.

12. The average holding period for noninstitutional investors trading on the New York Stock Exchange was four years in 1983 (NYSE (1984)).

13. The 1982 Tax Model Data File reports net capital gains and losses to four-significant-figure accuracy. For some returns with very large offsetting gain and loss transactions it is therefore impossible to measure proximity to the \$3,000 limit accurately. To explore the importance of this problem, Table 1 was recalculated omitting any returns for which the net gain or loss could not be determined to within one hundred dollars. (This excludes returns with both offsetting gains and losses, and a gain or loss of more than one million dollars). Only 0.11 percent of the returns with capital gains were excluded by this rule, and the results were changed only in the third decimal place.

14. For a discussion of how constraints on interest deductibility can make them marginal dividend tax rate zero, see Miller and Scholes (1978). Peterson, Peterson, and Ang (1985), as well as Feenberg, provide tax-return based evidence against this view.

15. I first learned of these tabulations from Shefrin and Statman (1985).

16. Hinrichs (1964) calculated that 36 percent of equity capital gains are never reported. His estimates are remarkably close to the total estimates of unreported capital gains found by recent IRS surveys.

17. These estimates are based on detailed IRS audits which are part of the Taxpayer Compliance Monitoring Program. Capital gains misreporting may take three different forms: transactions may be completely reported, their basis may be overstated, or their sale price may be understated. At present there are no data on the relative importance of these different factors.

18. Balcer and Judd (1985) provide one example of directions for future work. They explore the burden of the capital gains tax in a model where lifecycle investment considerations are the source of trading activity.

References

- Allen, Franklin, 1982, On the importance of interaction of tax code provisions, University of Pennsylvania, mimeo.
- Balcer, Yves and Kenneth L. Judd, 1985, The efficiency of capital taxation: Capital gains versus corporate, Kellogg School of Management, Northwestern University, mimeo.
- Bailey, Martin J., 1969, Capital gains and income taxation, in Arnold C. Harberger and Martin J. Bailey, eds., The Taxation of Income from Capital (The Brookings Institution: Washington, D.C.), 11-49.
- Brame, Bertie and Keith Gilmour, 1982, Sales of capital assets, 1973-1980, Statistics of Income Bulletin 2, 31-39.
- Constantinides, George M., 1983, Capital market equilibrium with personal tax, Econometrica 51, 611-636.
- Constantinides, George M., 1984, Optimal stock trading with personal taxes: Implications for prices and the abnormal January returns, Journal of Financial Economics 13, 65-89.
- Constantinides, George M. and Myron S. Scholes, 1980, Optimal liquidation of assets in the presence of personal tax: Implications for asset pricing, Journal of Finance 35, 439-452.
- Domar, Evsey and Richard Musgrave, 1944, Proportional income taxation and risk-taking, Quarterly Journal of Economics 58, 388-422.
- Feenberg, Daniel, 1981, Does the investment interest limitation explain the existence of dividends, Journal of Financial Economics 9, 265-269.
- Feldstein, Martin S., Joel Slemrod, and Shlomo Yitzhaki, 1980, The effects of taxation on the selling of common stock and the realization of capital gains, Quarterly Journal of Economics, 94, 777-791.
- Fredland, J. Eric, John Gray, and Emil Sunley, 1968, The six month holding period for capital gains: An empirical analysis of its effect on the timing of gains, National Tax Journal 21, 467-478.
- Hinrichs, Harley, 1964, Unreporting of capital gains on tax returns or how to succeed in gainsmanship without actually paying taxes, National Tax Journal 17, 158-163.
- Judd, Kenneth L., 1985, Capital gains taxation by realization, Kellogg School of Management, Northwestern University, mimeo.
- Kaplan, Steven, 1981, The holding period distinction of the capital gains tax, National Bureau of Economic Research Working Paper No. 762, Cambridge, Mass.
-

- King, Mervyn A., 1977, *Public Policy and the Corporation* (Chapman and Hall: London).
- King, Mervyn, and Don Fullerton, 1984, *The Taxation of Income From Capital* (University of Chicago Press: Chicago).
- Kovenock, Daniel J. and Michael Rothschild, 1983, Capital gains taxation in an economy with an 'Austrian sector,' *Journal of Public Economics* 21, 215-256.
- Kovenock, Daniel J. and Michael Rothschild, 1984, Notes on the effect of capital gains taxation on non-Austrian assets, University of California at San Diego, mimeo.
- Lindsey, Lawrence, 1986, Capital gains rates, revenues, and realizations, mimeo, Harvard University, Cambridge, MA.
- Miller, Merton H. and Myron Scholes, 1978, Dividends and taxes, *Journal of Financial Economics* 6, 333-364.
- New York Stock Exchange, 1982, Analysis of the capital gains holding period, Office of Economic Research, mimeo.
- New York Stock Exchange, 1984, *New York Stock Exchange Fact Book* (New York Stock Exchange, New York).
- Peterson, Pamela B., David R. Peterson, and James Ang, 1985, Direct evidence on the marginal rate of taxation and dividend income, *Journal of Financial Economics* 14, 267-282.
- Protopapadakis, Aris, 1983, Some indirect evidence on effective capital gains tax rates, *Journal of Business* 56, 127-138.
- Schlarbaum, Gary G., Wilbur G. Lewellen, and Ronald C. Lease, 1978, Realized returns on common stock investments: The experience of individual investors, *Journal of Business* 51, 299-325.
- Shleifer, Hersh and Meir Statman, 1985, The disposition to sell winners too early and ride losers too long: Theory and evidence, *Journal of Finance* 40, 777-791.
- Stiglitz, Joseph E., 1969, The effects of income, wealth, and capital gains taxation on risk-taking, *Quarterly Journal of Economics* 83, 262-283.
- Stiglitz, Joseph E., 1983, Some aspects of the taxation of capital gains, *Journal of Public Economics* 21, 257-294.
- U.S. Congress, Joint Committee on Taxation, *Estimates of Federal Tax Expenditures for Fiscal Years 1986-1990* (U.S. Government Printing Office, Washington, D.C.).
- U.S. Treasury Department, Internal Revenue Service, 1980, *Statistics of Income-1973, Sales of Capital Assets Reported on Individual Income Tax Returns* (U.S. Government Printing Office: Washington, D.C.).

U.S. Treasury Department, Internal Revenue Service, 1983, Income Tax Compliance Research: Estimates for 1973-1981 (Internal Revenue Service: Office of the Assistant Commissioner for Planning, Finance, and Research, Washington, D.C.).

Wetzler, James, 1984, The tax treatment of securities transactions under the Tax Reform Act of 1984, Tax Notes, 29 October 1984, 453-482.