THE EFFECTS OF TAXATION ON THE SELLING OF CORPORATE STOCK AND THE REALIZATION OF CAPITAL GAINS*

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This study provides the first econometric analysis of the effect of taxation on the realization of capital gains. The analysis thus extends and complements the earlier study by Feldstein and Yitzhaki [1978] of the effect of taxation on the selling of corporate stock. The present analysis, using a large, new body of data obtained from individual tax returns, supports the earlier finding that corporate stock sales are quite sensitive to tax rates and then shows that the effect on the realization of capital gains is even stronger.

The effective rates at which capital gains are taxed have increased substantially in recent years. Debate continues on proposals to change the tax law in ways that would further increase these tax rates as well as on proposals to reduce the effective tax on capital gains. The present paper uses a new, rich body of microeconomic data to estimate how taxation affects the selling of corporate stock and the realizing of capital gains. The results indicate that the current high rates of tax on capital gains substantially reduce the selling of corporate stock, particularly sales that would involve recognizing net capital gains.

Until 1969, the tax rate on long-term capital gains[1] was limited by a ceiling of 25 percent. Individuals whose marginal tax rates were below 50 percent could exclude half of their gains, thereby paying a tax rate of less than 25 percent. Higher income individuals could use the "alternative tax" method that subjected the entire gain to a 25 percent tax. Since then, several statutory changes have combined to raise the tax on capital gains. The alternative tax method is now limited to the first $50,000 of capital gains per taxpayer; since 50 percent of the gains in excess of this amount are excluded from taxable income, the personal tax rate on marginal capital gains can now be as high as 35 percent. A "minimum tax," originally introduced in the

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1. At this time, the long-term capital gain rate applied to assets held for at least six months.

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Tax Reform Act of 1969, now subjects the excluded half of capital gains for some taxpayers to an additional tax of 15 percent. In 1969, the tax on capital gains was effectively raised further for some high-income individuals by a provision that made the tax rate which such individuals must pay on wage and salary income depend on the amount of capital gains that they realize.[2] The combination of these tax changes makes the current marginal capital gains tax rate exceed 40 percent for many individuals, substantially more than the previous 25 percent maximum.[3]

In addition to these statutory tax changes, the effective tax on real capital gains has been raised substantially by inflation. Under current law, the capital gains tax is levied on nominal capital gains with no adjustment for changes in the price level since the stock was acquired. This not only overstates the value of real capital gains, but by converting real losses to nominal gains, also reduces investors' opportunities to offset capital losses against capital gains. Feldstein and Slemrod [1978] analyzed the corporate stock sold by individuals in 1973. They found that adjusting the costs of these stocks for the increase in comsumer prices since they were acquired would change the $4.6 billion gain on which taxes were paid to a loss of nearly $1 billion and would cut the corresponding tax liability in half.

A wide range of proposals to change the taxation of capital gains is being actively discussed.[4] The Treasury has proposed eliminating the alternative tax completely. Other proposals to increase the tax on capital gains include raising the minimum tax or even eliminating the 50 percent exclusion. The effective tax rate would be lowered by proposals to tax only real gains or to decrease the tax rate with the length of the holding period, or to repeal the minimum and maximum tax rules related to capital gains. More radical proposals include extending the "rollover" provision (in which capital gains are not taxed if the proceeds are reinvested) to corporate stock or a more general substitution of an expenditure tax for the current income tax.

2. Under the "maximum tax" provisions, the marginal tax rate on wages, salaries and other personal services income is limited to 50 percent. The 1969 change provides that, for each two dollars of capital gain, the individual must reduce the income that he subjects to the 50 percent "maximum tax" by one dollar and subject that dollar to his ordinary tax. This reclassified dollar may then be taxed at a personal rate of up to 70 percent. For an individual with a 70 percent marginal tax rate, this reclassification adds 20 cents per two dollars of capital gain.

3. Several other statutory changes have also raised the tax on capital gains: the holding period required to qualify as long-term capital gains has increased; the basis of capital assets transferred at death is no longer increased to market value; the ability to donate capital gain property to charities has been limited, etc. In addition, state income tax on capital gains has become increasingly important.

4. See, among others, Break and Pechman [1975], Brinner [1973], and David [1968].

A prerequisite for sound policy decisions is an understanding of how alternative tax rules would affect investor behavior. It is particularly important to know whether high tax rates "lock investors in" existing stocks, thereby reducing the efficiency of the capital market. Similarly, it is important to know whether increasing the tax rate on capital gains would actually increase revenue, or by substantially reducing the realization of gains, would decrease revenue.

This study provides the first econometric analysis of the effect of taxation on the realization of capital gains. The analysis thus extends and complements the earlier study by Feldstein and Yitzhaki [1978] of the effect of taxation on the selling of corporate stock. The present analysis, using a large, new body of data obtained from individual tax returns, supports the earlier finding that corporate stock sales are quite sensitive to tax rates and then shows that the effect on the realization of capital gains is even stronger.

The first section of the paper discusses the data used in this analysis. Section II presents estimates of the effect of the tax on common stock sales and compares these results with those of the earlier Feldstein-Yitzhaki study. The third section discusses the corresponding estimates of the response of realized capital gains. Simulations of the effects of several alternative policies are presented in Section IV. There is a brief concluding section.

I. Data and Definitions

Each year, the Internal Revenue Service and the Treasury select a stratified random sample of approximately 100,000 individual tax returns with which to study income sources, deductions, and tax liabilities. The information for each taxpayer consists of the major items on the individual's tax return (form 1040). The sample is drawn so that the sampling fraction increases to 100 percent for taxpayers with adjusted gross incomes over $200,000. As a result, the sample can be used to make accurate estimates even for the high-income groups that consist of relatively small numbers of people. Moreover, because the sampling probabilities are known, unbiased estimates for all taxpayers or for any subgroup can be constructed.

In 1973, the Treasury collected more detailed information on the capital gains and losses reported on these tax returns. In addition to the usual information on each tax return, this special study recorded the nature of the asset (stock, real estate, etc.), the purchase price, date acquired, sale price, and date sold for each sale of a capital asset (as

reported on schedule D of form 1040). Our analysis focuses exclusively on the sale of corporate stock.

In order to study the effect of tax rates on the selling of corporate stock, we require a probability sample of all the taxpayers who own stock and not just of those who sold stock in 1973. Although the tax returns provide no direct information about the ownership of corporate stock, we can use the receipt of dividends to identify stockholders. Our sample consists of 53,523 taxpayers who received dividends in 1973; the sample weights imply that this groups represents a population of 11.5 million taxpaying units that owned stock in 1973. All taxpayers without dividend income are eliminated from the sample.

The analysis that we present in the following sections of this paper relates the value of the stock sold and of the net capital gain realized by each stockowner in the sample to his "capital gains tax rate" and to other determinants of sales and gains. To calculate each individual's "capital gains tax rate," we use a sophisticated computer program (TAXSIM) that embodies the basic features of the tax law as of 1973. This program calculates the effect on the individual's total tax liability of another dollar of capital gains, including such calculations as the use of the alternative tax, the extra "minimum tax," and the change in the standard deduction for those who do not itemize their deductions. The "capital gains tax rate" is a marginal tax rate defined as the extra tax liability due on an additional dollar of capital gain.

Since the capital gains tax rate of an individual can vary with the amount of capital gain that he realizes, there are several possible ways of calculating our capital gains tax rate variable.[5] The simplest procedure is to use the capital gains tax rate that would apply to the first dollar of corporate stock capital gain that the individual realizes, i.e., the extra tax liability that would be due on a dollar of capital gain if the individual had no other sales of corporate stock. This "first dollar capital gains tax rate" has the statistical advantage of being exogenous in the sense that it is independent of the individual's decision about how much gain to realize.[6]

5. In effect, the individual faces a schedule of capital gain tax rates rather than a single rate.

6. There is, of course, the possibility that the individual adjusts his other taxable income (by, for example, taking other losses) during the year to the amount of gain that he realizes, thus making even this "first dollar" tax rate endogenous. To reflect this would require a much more elaborate behavioral model than we have. This is an issue we hope to investigate in future research.

However, for very wealthy individuals who typically realize large gains, these "first dollar" rates could differ substantially from the tax rates at which marginal decisions were actually made in 1973. The most appropriate rate to use for each individual is the "last dollar capital gains rate," i.e., the additional tax liability that would be incurred if the individual increased his capital gain in 1973 by one dollar. Because this tax rate is endogenous to the individual's decision, an equation using this rate cannot be estimated by ordinary least squares. We therefore use a consistent instrumental variable estimation procedure.[7] Fortunately, both definitions of the tax rate yield quite similar results.

The specification of the equations that we have estimated and the precise definitions of the other variables will be discussed in the following section, where the estimates of selling behavior are presented. Before turning to this, it is useful to comment briefly on the difference between the data used in the current study and the data used in the earlier Feldstein-Yitzhaki analysis. That study was based on the 1963–1964 Federal Reserve Board survey of 646 households that owned common stock at the end of 1962. The information collected for each household included the value of common stock owned at the end of 1962 and the amounts sold and purchased during 1963. This permitted studying "stock switching" and "net selling" separately. There was no reliable information on the amount of gain realized, and tax rates had to be estimated on the basis of income data reported in the survey. Despite these problems and the relatively small sample, the Feldstein-Yitzhaki analysis found clear evidence that the sale of corporate stock is very sensitive to individual differences in capital gain tax rates.

II. THE SELLING OF CORPORATE STOCK

Our analysis of the selling of corporate stock focuses on the value of corporate stock sales per dollar of dividends received during 1973. We use dividends in this way to represent the value of the stock in each individual's portfolio, since the tax returns contain no direct measure of the portfolio value. There is some evidence that the ratio of dividends to portfolio value varies inversely with the adjusted gross income [Blume, Crockett, and Friend, 1974]. This suggests that the

7. The instrumental variables are the exogenous "first dollar capital gains tax rate" and a "predicted last dollar capital gains tax rate" based on the average capital gains of individuals with that income and dividends.

tax rate appears to have a smaller effect on the sales-dividend ratio than it actually does on the sales-value ratio, and that our parameter estimates understate the effect of the tax on the selling of corporate stock.

In 1973 the average dividend yield on corporate stock was approximately 3 percent.[8] By restricting our sample to taxpayers with at least $3,000 of dividends, we limit our attention to individuals with portfolios of approximately $100,000 or more. Such taxpayers accounted for 79 percent of all dividends reported by individuals for 1973. Restricting the sample in this way eliminates the implausibly high ratios of sales to dividends that occur in smaller portfolios because of chance fluctuations and measurement errors. Taxpayers with larger portfolios are also less likely to distort the estimates by altering the timing of capital gains and losses to take advantage of the very small opportunities to offset long-term losses against short-term gains, etc.

The age of the taxpayer affects the selling decisions in a number of ways. The tax rules that prevailed in 1973 provided that the basis (or "cost") of assets transferred at death would be revalued to the current market value. This implies that the tax deterrent to selling should increase with the taxpayer's age and should be particularly strong for older taxpayers. Older taxpayers are also likely to have held their stock for a longer time, thus increasing the ratio of gain to total share value and increasing the incentive not to sell. These considerations apply to selling in order to reinvest the proceeds in other assets. Feldstein and Yitzhaki [1978] contrasted this "switch selling" with the "net selling" used to finance consumption. Older individuals are more likely to be net sellers in order to finance consumption. Although the tax return data do not include an exact age, we can distinguish taxpayers who are age sixty-five or older; we include a dummy variable wherever at least one individual is at least age sixty-five. Since our data do not allow us to distinguish switch selling from net selling, the overall effect of age is ambiguous.

Two other variables are likely to affect the individual's decision to sell common stock: the value of the stock in his portfolio and the level of the individual's income. Although the probability of selling at least some stock is likely to increase with portfolio size, the ratio of sales to dividends is likely to vary inversely with the size of the portfolio for two reasons. First, any net sale of stock to finance a major

8. The yield on the Standards and Poor's 500 stocks was 0.0306.

consumption expenditure or nonportfolio investment could more easily represent a large fraction of a small portfolio. In addition, switching two or three securities in a small portfolio could involve selling a very large fraction of the total value of the portfolio. Although we do not have a direct measure of the value of stock to include in the equation, we can again use the value of dividends to represent the value of the stock. We include the logarithm of dividends so that the variable will not be dominated by the largest portfolios.

Individuals with lower money incomes are more likely to be retired (or below their permanent income for other reasons) and are therefore more likely to want the proceeds of the net sales of common stock. Again, switch sales are not likely to follow the same pattern as net sales. Higher income individuals are more likely to switch stocks because they can better afford the risks of speculation and are more likely to have access to relevant investment information. We include the logarithm of adjusted gross income in our equation without any prior theory about its sign.[9]

Equation (1) of Table I presents the estimated coefficients for this equation. The coefficient of the tax variable (−62.4 with a standard error of 5.98) indicates that the taxation of capital gains has a very powerful effect on the selling of corporate tax. For example, a 10 percentage point increase in the tax rate on capital gains reduces the ratio of long-term sales to dividends by 6.2.

The negative coefficient on the age variable indicates that older taxpayers are less likely to sell than younger taxpayers. The tax incentives to postpone switch selling thus dominate the need to finance retirement consumption. The sales-to-dividend ratio also varies inversely with portfolio size and income.

Several variants of equation (1) that have been estimated (but are not presented) deserve comment. Using the "first dollar" marginal tax rate, i.e., the marginal tax rate on long-term capital gains that the individual would face before he realized any capital gains, reduces the coefficient of the tax variable only slightly (from −62.4 to −45.4), and leaves the other coefficients essentially unchanged.[10] Extending the sample to all shareholders (and not just to those with more than $3,000 of dividends) eliminates the estimated effect of the tax; the coefficient

9. To eliminate the simultaneity of adjusted gross income and sales, we exclude the actual capital gains included in AGI from AGI but add back in a predicted value of "included" capital gains based on a tabulation by income and dividends.

10. Using a marginal tax rate based on "predicted capital gains" introduces substantial random error and results in a substantially reduced tax coefficient.

TABLE I

THE EFFECTS OF TAXATION ON THE SELLING OF CORPORATE STOCK AND THE REALIZATION OF CAPITAL GAINS*

Equation	Dependent variable	Population	Tax	Estimated coefficients: Age 65	Logarithm of dividends	Logarithm of adjusted net AGI	Constant	Sample size
(1)	Long-term sales	All	−62.4	−1.13	−2.80	−0.483	38.8	27,832
	Dividends		(5.98)	(0.557)	(0.188)	(0.184)	(2.11)	
(2)	Probability	All	−0.650	−0.0295	0.022	0.00420	0.519	27,832
	of selling		(0.069)	(0.00639)	(0.00216)	(0.00212)	(0.0242)	
(3)	Long-term sales	Aged	−59.6		−2.48	0.450	42.5	9,348
	Dividends	only	(7.00)		(0.203)	(0.265)	(2.46)	
(4)	Probability	All	−0.729		0.0198	0.00605	0.516	9,348
	of selling		(0.131)		(0.00379)	(0.00494)	(0.0458)	
(5)	Long-term gains	Aged	−49.7	0.176	−1.23	−0.504	35.0	27,832
	Dividends	only	(3.79)	(0.353)	(0.119)	(0.117)	(1.33)	
(6)	Long-term gains	Aged	−51.8		−1.19	0.204	26.9	9,348
	Dividends	only	(5.74)		(0.167)	(0.217)	(2.01)	

	Sample statistics: Sales dividends	Gains dividends	Probability of selling	Tax (actual last dollar)	Age 65	Logarithm of dividends	Logarithm of adjusted net AGI
Mean	7.75	3.50	0.614	0.264	0.336	10.22	11.61
Standard deviation	42.61	26.63	0.487	0.090	0.472	1.45	2.08

* In all cases the sample is limited to returns with at least $3,000 in dividends. Figures in parentheses are the adjusted standard error of estimate.

of the tax variable is very small and less than its standard error. As we noted above, we believe that this reflects the problems of measuring behavior of investors with small portfolios, but it may also indicate that such investors are less sensitive to tax considerations.

In 1973, 50 percent of shareholders with more than $3,000 in dividends sold some corporate stock. Equation (2) of Table I shows that the decision to sell anything, as well as the amount of selling, is sensitive to the individual's tax rate. The tax coefficient of −0.650 (with a standard error of 0.069) implies that a 10 percentage point increase in the marginal tax rate reduces the probability of selling something by 6.5 percentage points. The other estimated coefficients show that older people are less likely to sell, that investors with larger portfolios are more likely to sell something, and that higher income individuals are also more likely to sell.

Equations (3) and (4) describe the selling behavior of taxpayers age 65 and over.[11] The tax coefficient in equation (3) is lower than in equation (1) but is still substantial. The probability of selling (equation (4)) shows an even greater sensitivity for older taxpayers than for the population as a whole.

The evidence in this section confirms the earlier findings of Feldstein and Yitzhaki [1978] that current tax laws have a very substantial effect on the selling of corporate stock. Indeed, the basic tax coefficient estimate of −62.4 in our *sales-to-dividend* equation is roughly similar to the earlier estimate that the *sales-to-market value* responds to the marginal tax rate with a coefficient of −3.20 (standard error = 1.04). Since the dividend-to-market value ratio is approximately 0.03, the current estimate of −62.4 is equivalent to −1.87 in the units of the earlier study.

Two problems should be borne in mind in interpreting the current estimates and the results presented in the next section. First, we have information on the individual's tax rate only for 1973. An individual whose tax rate varies substantially from year to year will tend to sell more when his rate is low. To the extent that low rates in 1973 are only temporarily low, our estimates will overstate the sensitivity of selling to the tax rate. We have no way of knowing how important this is. Second, our analysis is based on the 1973 experience and therefore on the bequest rules that applied then. In 1973, the tax rules provided for a full revaluation of assets transferred at death. Current

11. More precisely, at least one "age exemption" was claimed by these taxpaying units.

law provides only for a carry-forward of the basis of assets that are bequeathed. Since this change reduces the advantage of not selling, investor behavior may be somewhat less sensitive to tax rates now than in 1973.

III. THE REALIZING OF CAPITAL GAINS

A unique advantage of our current set of data is that it contains accurate information on capital gains and losses. We are therefore able to make the first estimates of the effects of the tax law on the realizing of net capital gains. This section follows the structure of the previous one and focuses on the net capital gains (positive or negative) realized in 1973 per dollar of dividends. Again, we examine the effect of the marginal tax rate and the taxpayer's age, portfolio size, and income.

Equation (5) of Table I shows that the realizing of capital gains is very sensitive to the marginal tax rate. The coefficient of −49.7 (with a standard error of 3.79) implies that a 10 percentage point change in the marginal tax rate changes the gain-to-dividend ratio by 4.97. An important implication of this high coefficient is that a reduction in the tax rate on capital gains would actually increase the total revenue collected.[12]

The realization of capital gains varies with portfolio size and income in the same way that selling does. The effect of age is more difficult to interpret. Equation (5) indicates that age does not have a statistically significant effect when the tax rate, income, and portfolio size are taken into account. Comparing equations (1) and (5) thus suggests that the ratio of capital gains to sales rises with age, a quite plausible implication, since older taxpayers are likely to have held their assets longer. Limiting the sample to older taxpayers (equation (6)) indicates that as a group they are equally responsive to the tax rate.

IV. SIMULATING ALTERNATIVE TAX RULES

The estimated coefficients imply that corporate stock sales and the recognition of capital gains are both very sensitive to marginal tax

12. When this equation is re-estimated for the "first dollar" marginal tax rate, the coefficient estimates are very similar: the tax coefficient is −37.1 (standard error 1.96). When the sample is extended to all dividend recipients, the standard errors are large, and the parameter estimates are unstable.

rates. In this section we use the estimated parameter values to calculate the impact of alternative tax rules on the aggregate volume of selling and the aggregate value of capital gains. For this purpose, we contrast the observed behavior under the 1973 law with two alternatives: Option 1 limits the rate of tax on long-term capital gains to 0.25 (and eliminates the minimum tax), while option 2 taxes all capital gains as short-term gains, thus eliminating both the alternative tax and the exclusion.[13]

It is important to emphasize that these simulations are not "forecasts" but measures of what, ceteris paribus, sales and realized gains would have been in steady state in 1973 under different tax rules. Any *change* in tax rules would involve transitional adjustments that are difficult to predict and that could last for several years.

Our simulation of the effect of tax changes on selling uses the tax coefficient in equation (1) of Table I, −62.4. For each individual, we calculate the tax rate change implied by going from the 1973 law to the option being studied.[14] We then multiply this difference between marginal tax rates by −62.4. This yields the predicted change in the individual's ratio of long-term sales to dividends. This is added to his actual 1973 long-term-sales-to-dividend ratio to get a new predicted value. This new predicted value is multiplied by the individual's actual 1973 dividends to get a predicted long-term sales for the individual. This predicted value (or zero if the predicted value is negative) is aggregated over all individuals using the appropriate sampling weights. This gives the total predicted sales for the particular option. A similar calculation is done for capital gains using the coefficient of −49.7 from equation (4). In both cases, the calculation is limited to individuals with dividends of at least $3,000; this causes our calculations to understate the effect of tax changes, but the understatement is small, since these individuals represent 79 percent of the dividends and, having generally higher incomes, are more sensitive to changes in the tax rules.[15]

13. For both options, net capital losses are constrained to be less than $3,000, the value anticipated in the current 1978 tax rules. For the sake of comparison, this constraint has been imposed on the 1973 "current law" simulations as well.

Note that option 1 does not coincide with any actual proposal for cutting capital gains tax rates, since it simply reduces the tax rate on all individuals currently facing a rate higher than 0.25, and leaves all other rates unchanged.

14. More specifically, we use the marginal tax rate on the last dollar of actual capital gain under the two alternatives.

15. Note that we do not use all of the estimated coefficients of equations (1) and (5) to predict selling and gains under alternative tax rules. The very low explanatory power of the equations would make such predictions very inaccurate. Instead we use the precisely estimated tax coefficient to calculate *changes* in selling and gains. An alternative way of describing our procedure is to say that we add the calculated residual for each individual to the predicted value based on all the coefficients.

The results of our simulation are presented in Table II for seven adjusted gross income classes as well as for all taxpayers together.

Consider first the impact of the tax options on the value of corporate stock sales. Limiting the long-term capital gains tax rate to 0.25 (option 1) increases corporate stock sales to $44.6 billion from the $29.2 billion under the 1973 law. In contrast, treating all capital gains like short-term gains (option 2) reduces selling to $18.5 billion, nearly one-half its 1973 level. Not surprisingly, the relative changes are greatest for the higher income taxpayers.

The changes in realized gains are even more dramatic than the changes in sales. Limiting the tax rate to 25 percent causes a more than three-fold increase in realized gains, from $5.3 billion to $17.2 billion. The higher tax rates under option 2 would substantially contract the value of realized gains.

It is interesting to note the revenue effects of the tax changes. A decrease in the tax rate causes a substantial increase in tax revenue, while a rise in the tax rate causes tax revenue to fall sharply.[16] Since the analysis pertains specifically to 1973, these estimates are directly applicable to current tax law changes only with the qualifications that changing conditions may suggest.[17] For example, since 1973 there have

16. Note that this calculation, like all the analysis in this paper, refers only to corporate stock. The total revenue effect for all capital gains cannot be determined without further analysis of other asset types.

The revenue estimates that are presented in Table II are approximations to the actual tax revenue from capital gains. For the "1973 law" calculations, the actual last-dollar marginal rate of tax applicable to short-term gains is applied to the total short-term gains, and the actual last-dollar marginal rate of tax on long-term gains is applied to long-term gains. For option 1, the long-term tax rate is limited to 0.25 and is applied to the estimated long-term gains. Short-term realized gains are assumed to be unchanged. For option 2, the short-term tax rate is applied to both actual short-term gains and estimated long-term gains.

17. It has been suggested to us (by our referees, and others) that one important qualification concerns the limitation that the stock of accrued gain has on the realizations which can be made from that stock. This raises two points. The first is whether, in our regression analysis, a measure of the amount of accrued gain available for realization by the individual should be included as an explanatory variable. We think so, but unfortunately no such measure was available. Second, it suggests that our aggregate estimate of realizations should be bounded in some way by the total accrued gain that exists. This seems a reasonable concern. We can, however, easily show that on a *continuing* basis the gains that accrue on average each year significantly exceed the realization rate predicted in the simulation of option 1.

In 1973, total dividends of nonfinancial corporations were $23.9 billion. The average ratio of dividends to share prices was 3.06 percent in that year for the 500 companies in the Standard and Poor's index. These figures imply a total market value of corporate stock of $780 billion. Realized capital gains of $17 billion would thus represent approximately 2.1 percent of the market value of the stock. While accrued gains in any year will depend on the chance fluctuations of the stock market, over the long run, gains can be expected to accrue on the basis of retained earnings and the general rise in the price level. According to Standard and Poor's, retained earnings averaged 4.06 percent of market value. Even if inflation could be ignored, our calculated value of realized capital gains would be only half of accrued gain. Even a 4 percent rate of inflation would make the accrued gain equal to 8 percent of market value and would make our calculated realized gain equal to only one-fourth of the accrued gain.

TABLE II

SIMULATIONS OF ALTERNATIVE TAX POLICIES*

	Adjusted gross income class							
	Less than $10,000	$10,000 to $20,000	$20,000 to $50,000	$50,000 to $100,000	$100,000 to $200,000	$200,000 to $500,000	More than $500,000	Total
	—Millions of dollars—							
				1973 Law				
Sales	1,652	2,149	7,337	6,667	4,654	3,730	3,050	29,249
Net gains	145	271	1,046	776	883	1,000	1,139	5,262
Tax liability	6	29	142	170	239	321	401	1,308
				Option 1				
Sales	1,652	2,226	7,683	8,472	8,187	8,923	7,482	44,624
Net gains	145	334	1,320	2,152	3,625	5,072	4,630	17,279
Tax liability	6	44	210	509	889	1,258	1,149	4,066
				Option 2				
Sales	1,481	1,297	3,832	4,141	2,841	2,583	2,346	18,521
Net gains	184	124	117	306	442	616	791	2,580
Tax liability	−5	7	4	69	132	234	346	786

* Option 1 limits the rate of tax on long-term corporate stock capital gains to 0.25. Option 2 taxes all corporate stock capital gains as short-term gains. All figures refer to population with dividends greater than $3,000. For both options, net gains are constrained to be greater than $3,000 for each return. For the sake of comparison, this constraint has been imposed on the 1973 law estimates as well.

been alterations in a number of important aspects of the taxation of capital gains, which doubtlessly interact with the effects of simple changes in the rate of tax.[18]

V. CONCLUSION

The estimates presented in this paper confirm the earlier finding of Feldstein and Yitzhaki [1978] that the selling of corporate stock is sensitive to the tax rates, and show that the realizing of capital gains is even more responsive. More generally, this study provides further evidence of the powerful effects that our tax system has on the process of capital formation.

The results indicate that reducing the tax on capital gains would not only encourage a more active market in corporate stock but would also increase tax revenue. There are a number of other proposals to alter the taxation of capital gains that would also increase selling: adjusting the cost of assets for the general rise in the consumer price level; constructive realization of gains at death; taxing accrued gains directly or retroactively with interest; or allowing tax-free rollovers. Analyzing the effects of such proposals requires a more complete model of the decision to sell corporate stock. The development of such a model would be an important extension of the current analysis.

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18. Some of these statutory changes are listed in note 2.

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SPECIAL REPORT
TWR ANALYSTS and ADVOCATES

THE LOCK-IN EFFECT OF THE CAPITAL GAINS TAX: SOME TIME-SERIES EVIDENCE

by Joel Slemrod and
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Martin S. Feldstein is President of the National Bureau of Economic Research, Inc. In this paper, he examines the effects of the capital gains tax on the amount of capital gains that are realized. He concludes that a disaggregated analysis provides striking evidence that the changes in the taxation of capital gains since 1969 have significantly depressed the realization of such gains.

One issue in the current debate about lowering capital gains tax rates is the revenue cost of such a reduction. Much of the controversy has centered around the increased tax revenue that would result if the tax reduction stimulated the economy to a higher level of national income. Another, more direct, possibility is that the tax revenue loss would be mitigated by an increased volume of capital gains realizations coming at any given level of national income. Investors holding appreciated assets will be less "locked in" to their current portfolio, when faced with a lower tax penalty on selling assets.

Some work we have done recently at the National Bureau of Economic Research[1] suggests that the positive response of corporate stock capital gains realizations to reduction in the capital gains tax rate is quite substantial. In fact, it may be so large that a cut in the capital gains tax would actually increase revenue from this type of capital gain. These studies used two different cross-sectional data sets to investigate the response of individual transactions behavior to the taxation of gains.

New Evidence on Lock-In Effects

Our purpose in this note is to present some new evidence that a lock-in of capital gains can also be detected by looking at the aggregate data on all capital gains before and after the changes in the taxation of capital gains. *The lock-in effect is evident once we divide individuals into categories on the basis of how much the tax changes have affected them.*

We divide individuals into three categories — (i) those with adjusted gross income (AGI) less than $100,000, (ii) those with AGI between $100,000 and $500,000, and (iii) those with more than $500,000 in AGI. Our reasoning is that the limitation on the alternative tax, the introduction of the tax on preference income, and the "poisoning" of earned income would primarily affect only those in the latter two categories, and affect the highest-income group more intensively than the middle group. This is illustrated by the following evidence.

In 1974, (the latest year for which such information is available), 57% of the income in the highest class came from returns subject to the minimum tax. The cutoff of the alternative tax similarly impacted largely the upper two groups, where the greatest concentration of returns with long-term capital gains exceeding $50,000 occurs.

In 1974, 98% of all the net capital gains of the highest group were made by returns with at least $25,000 net gain (Note that $50,000 of long-term capital gain is equal to $25,000 of net gain as defined by the IRS). Eighty percent of the net capital gain of the middle group was so concentrated, while only 22% of net capital gain of the lowest income group had at least $25,000 net gain per return. Clearly the limitation of the alternative tax affects the highest income asset sellers much more often than the lowest.

Table I presents the recent history of the net gain from the sale of capital assets by income class.

The first thing we notice is that the total net gain bounces around substantially from year to year, even when the tax law is unchaged. Obviously there are factors other than taxes that influence realization of gains.

The most important law changes increasing the capital gains tax were contained in the Tax Reform Act of 1969, the relevant provisions of which took effect in the succeeding three years. In order to discern a lock-in effect, we ought to compare 1969 and before with 1970 and after. In addition, we might expect increased gains realized in 1969 in anticipation of higher taxes starting in 1970.

The Simplest Comparison

The simplest comparison, between 1969 and 1970, provides the most striking evidence of a lock-in effect. While net gains of the presumably unaffected under $100,000 class were 34% higher in 1969 than in 1970,

In sum, we can detect evidence of a lock-in effect in the aggregate data on net gains from capital assets.

[1] M. Feldstein and S. Yitzhaki, "The Effects of the Capital Gains Tax on the Selling and Switching of Common Stock," *Journal of Public Economics*, 1978; M. Feldstein, J. Slemrod, and S. Yitzhaki, "The Effects of Taxation on the Selling of Corporate Stock and the Realization of Capital Gains," National Bureau of Economic Research, 1978.

Table I

Net Gain from Sales of Capital Assets, 1967-1976

($ billions)

Adjusted gross income	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Less than $100,000	10.3	12.7	10.3	7.7	10.4	12.9	13.5	11.8	11.9	15.2
$100,000 to $500,000	2.6	3.6	3.1	1.9	2.6	3.4	3.2	2.4	2.4	3.2
More than $500,000	1.7	2.6	2.7	1.1	1.6	2.1	1.5	1.2	1.2	1.5
Total	14.6	18.9	16.1	10.7	14.6	18.4	18.2	15.4	15.5	19.9

Source: Statistics of Income: Individual Tax Returns, 1972 to 1976 (1975 and 1976 data is preliminary). Figures for 1971 and before are taken from the historical summary presented in the 1972 volume.

they were 63% higher for the $100,000 to $500,000 class, while the over $500,000 class had 145% more gains in 1969. If we adjust the trend in gains by the change in the lowest-income class, the gains of the highest-income class were 111% higher in 1969 than in 1970.

Comparing these two years may be unfair if 1969 included anticipatory selling by the higher income classes, and there is some evidence that it did: while net gains of the lowest income class fell 19% from 1968 to 1969, net gain of the highest income class actually increased 4%.

A More Relevant Comparison

A fairer and more relevant comparison would be an average of 1967 and 1968 net gains on the one hand and an average of 1975 and 1976 on the other, the two most recent years for which data is available. Table 2 makes this comparison. Note first that in 1975-76 the net gains of the lowest income class were somewhat higher than in 1967-68, so if anything the trend since then has been upward. Nevertheless, we see that the net gains of the middle group were about 12 percent lower in 1975-76 than they were in 1967-68, and that the net gainsof the highest income class were 35 percent lower in 1975-76 than in 1967-68. This is an indication that the highest income individuals were much less likely to realize gains after the Tax Reform Act of 1969 than before.

Table 2

Comparison of Net Capital Gains for 1967-68 and 1975-76

($ billions)

Adjusted Gross Income	1967-68	1975-76	% Change
Less than $100,000	11.47	13.52	+17.9
$100,000 - $500,000	3.14	2.76	-12.1
More than $500,000	2.12	1.38	-34.9

The evidence does not depend on the assumption that the relative respective income classes have remained constant over the past decade. If we normalize the net gains in each class by some measure of total income in the group, a similar (and more powerful) relationship holds. Table 3 specifically shows net capital gains as a percentage of adjusted gross income (not including the net capital gains) for our three groups.

Table 3

Net Capital Gains as a Percentage of Adjusted Gross Income Net of Gains 1967-68 and 1975-76

Adjusted Gross Income	1967-68	1975-76	% Change
Less than $100,000	2.36	1.42	-39.8
$100,000 - $500,000	37.4	9.72	-74.0
More than $500,000	154.7	36.3	-76.5

While there has been a large decrease in the gain percentage for all groups, the upper two groups' decline was far more extreme than the lowest income group.

Estimates of the revenue effect of a change in capital gains taxation — if they are based on the assumption of unchanged net realized gains — may be misleading.

Summary

In sum, we can detect evidence of a lock-in effect in the aggregate data on net gains from capital assets. This, in addition to evidence from cross-sectional research, indicates that estimates of the revenue effect of a change in capital gains taxation — if they are based on the assumption of unchanged net realized gains — may be misleading.