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James M. Poterba
Scott J. Weisbenner

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ABSTRACT

This paper investigates the effect of specific features of the U.S. capital gains tax on turn-of-the-year stock returns. It focuses on two tax changes. The first, enacted in 1969, reduced the fraction of long-term losses that were deductible from Adjusted Gross Income from 100 percent to 50 percent. The second, part of the Tax Reform Act of 1976, raised the required holding period for long-term gains and losses from six months to one year. This paper describes how each of these tax changes should have affected incentives for year-end capital loss realization and the potential magnitude of the turn of the year effect in stock returns. We present evidence that is consistent with the hypothesis that detailed provisions of the capital gains tax, such as the short-term holding period, affect the link between past capital losses and turn-of-the-year stock returns. These findings provide support for the role of tax-loss trading in contributing to turn-of-the-year return patterns.

James M. Poterba
Department of Economics, E52-350
Massachusetts Institute of Technology
50 Memorial Drive
Cambridge, MA 02142-1347
and NBER
poterba@mit.edu

Scott J. Weisbenner
Department of Economics
Massachusetts Institute of Technology
50 Memorial Drive
Cambridge, MA 02142-1347
weis@mit.edu

The unusual behavior of stock returns at the turn of the calendar year is one of the most-studied empirical regularities in financial economics. A variety of explanations have been offered for the abnormally high returns that have been observed historically on the last days of December and first days of January. Some focus on the annual cash flow patterns to institutional investors or on the incentives that year-end reporting requirements place on these investors. Others suggest that the income tax system facing individual investors, especially the realization-based taxation of capital gains, may induce tax-loss selling and therefore affect turn-of-the-year returns. Because realized capital losses can be used to reduce taxes on realized gains or other income in the calendar year in which they are realized, taxpayers have an incentive to realize capital losses before year-end. Such tax-loss selling could produce year-end selling pressure in shares that have experienced losses before year-end; if this selling pressure abates after the turn of the year, the prices of these shares might rise, thereby contributing to higher returns after the turn of the year.

In one of the classic studies of the turn of the year effect, Roll (1983) describes this tax-loss selling explanation. He then notes that "If investors realized that such a pattern were persistent, they would bid up prices before the end of the year and there would be no significant positive returns after January first... [however], we are obliged to test every theory, even one so patently absurd as this, by the empirical strength of its predictions... (p. 20)" His empirical evidence suggests that the turn-of-the-year return is related to the return over the previous year, as the tax loss selling explanation would suggest. Firms that experience more negative returns in one year display larger January returns in the next. Complementing this finding, there is now a substantial body of research, including Dyl (1977), Branch (1977), Slemrod (1982), Lakonishok and Smidt (1986), Ritter (1988), Dyl and Maberly (1992), Eakins and Sewell (1993), and Reece (1997), that suggests that individual investors are sensitive to tax considerations in their year-end stock trading.

These empirical findings suggest that the "absurd" tax-based explanation must be given serious consideration, even though a definitive link between tax-motivated trading behavior and turn-of-the-year stock returns has yet to be established.

One difficulty in evaluating the tax-loss-selling hypothesis is that many of its predictions coincide with an alternative model, the "window dressing hypothesis" for institutional investors. "Window dressing" is the apparent tendency for institutional money managers to sell losing issues before year-end or quarter-end, when they must disclose their portfolio holdings. The present study is designed to uncover testable predictions that flow from the tax loss-selling hypothesis but do not follow from the "window dressing" model, and to evaluate them.

This paper presents new evidence on the link between tax-loss selling and turn of the year returns. It exploits changes over time in the structure of capital gains taxes to generate predictions about the correlation between previous losses and year-end tax loss selling. A substantial previous literature, including Constantinides (1984), Chan (1986), and Sims (1995), discusses optimal stock trading strategies when short and long-term capital gains are taxed differently. Constantinides (1984) demonstrates when there are no distinctions between long-term and short-term gains, and when there are no transaction costs, there should be no increase in tax loss selling at year-end. Losses should be realized as they occur. In the presence of transactions costs, however, and under tax regimes that make short-term losses more valuable to investors than long-term losses, it may be optimal for investors to realize their losses just before they become long-term, or just before the turn-of-the-year, whichever comes first.

There have been changes over time in the length of time that assets must be held to qualify for long-term capital gains treatment and in the incentive to realize short-term losses in excess of realized gains. In a setting with transaction costs, such tax changes

would affect optimal tax-loss selling behavior. If such trading is an important determinant of turn-of-the-year stock returns, then the tax changes may provide an opportunity to uncover a link between tax-motivated trading the these returns.

We focus on two specific changes in capital gains tax rules. First, in 1969, the fraction of long-term losses that could be deducted from Adjusted Gross Income was reduced from 100 percent to 50 percent. The full amount of short-term losses could still be deducted, subject to some limits. This tax change strengthened investors' incentive to realize short-term losses. The second tax change, enacted in 1976, was the lengthening of the holding period for long-term gains and losses from six to twelve months. This change altered the set of previous returns that would be most important for determining the amount of year-end tax-loss selling.

An example illustrates the importance of the definition of the holding period. Consider an investor who purchases a security for $100 on January 1. On June 15, the security's value falls to $50. If assets held more than six months are designated as long-term assets, and if only half of long-term losses can be deducted from AGI, then the investor has an incentive to sell the asset before June 30. After June 30, only $25 of the loss can be offset against other income; before that date, the entire $50 loss can be deducted. The full value of the loss after June 30 could still be used to offset other capital gains, but not all investors may have such gains. A similar argument for realizing capital losses before year-end would apply for any investor who bought a security before July 1 and experienced a price decline before the six-month anniversary of this purchase. The securities that should experience the greatest amount of year-end tax loss selling should be those that lost value after July 1. Investors who purchased those securities in the second half of the year could claim a short-term loss by selling their positions before year-end, and they could accelerate their tax saving into the current year by trading before December 31.

Our empirical strategy is to use changes in the capital gains tax rules to generate testable predictions in the relationship between lagged returns and turn-of-the-year returns. If tax loss selling by individual investors does not contribute to year-end selling pressure, then changes in the capital gains tax rules should be inconsequential for turn-of-the-year returns. A relationship between these tax rules and turn-of-the-year returns, however, provides some evidence that tax loss selling contributes to January returns.

The paper is divided into seven sections. Section one describes the capital gains tax provisions in the federal income tax code that bear on realization decisions. The second section provides a brief summary of previous research that has investigated the link between tax loss selling potential and turn-of-the-year returns. Section three describes the data that we analyze and presents summary information on turn-of-the-year returns over the time period, 1963-1984, which we consider. The fourth section presents our primary results on the effect of holding period changes and changes in the share of long-term losses that can be deducted from AGI on the relationship between lagged returns and turn-of-the-year returns. Section five explores the robustness of our basic findings by showing that the relationship between past returns and turn-of-the-month returns in months other than January does not resemble that in January. The sixth section reports supportive evidence on links between capital gains tax rules, past returns, and the volume of year-end trading in individual stocks. A brief conclusion suggests several directions for future work.

1. Capital Gains Taxation and Tax Loss Selling

The capital gains tax in the United States has changed many times in the postwar period. Tax rates, the length of the holding period that qualifies assets for long-term gains treatment, the fraction of long- and short-term losses that can be deducted against non-gain Adjusted Gross Income (AGI), and the dollar limit on the losses that can be deducted

from AGI have all been modified. Many of the changes in these provisions have occurred in periods of substantial change in the structure of equity markets, or have generated relatively short-lived intervals during which the tax law did not change. We are particularly cautious in analyzing the tax changes of the 1980s and early 1990s, because other changes, such as the rise of derivatives markets that affected the cost of equity trading, may be more important than tax changes in determining optimal tax loss selling over this period. This section begins with a brief discussion of tax incentives for realizing short-term losses at year-end, then describes the 1969 and 1976 changes in the capital gains tax law. It concludes with a brief discussion of the number of taxpayers who were most affected by the 1969 and 1976 reforms.

1.1 Incentives for Tax Loss Selling

Previous studies, notably Chan (1986) and Reiss (1997), have derived conditions under which an investor will find it optimal to realize a short-term capital loss before year-end, rather than wait until after the turn of the year and realize the loss, possibly as a long-term loss. We set the stage for the empirical work that follows with a simple stylized model based on their work. Consider an investor holding a stock with an accrued loss of 100*L percent of the purchase price. Assume further that the stock would still quality for short-term capital gain or loss treatment, and that the short- and long-term capital gains tax rates are respectively τ_{SL} and τ_{LT}. In the absence of any turn-of-the-year considerations, there is a clear incentive to realize the loss short-term whenever the short-term capital gains tax rate exceeds the long-term rate. The tax saving from realizing a short-term loss is $L*\tau_{SL}$, while that from deferring realization and subsequently realizing a long-term loss is

$L*\delta*\tau_{LT}$, where δ is a discount factor reflecting the delay associated with deferred realization.

At year-end, when an investor could realize a short-term capital loss in the current tax year, or defer the loss and realize it, possibly as a long-term loss, in the next tax year. Given the historical patterns of turn-of-the-year stock returns, investors may expect some capital appreciation of stocks with previous losses around the turn of the year. In this case the short-vs.-long-term realization decision is modified. If R_J denotes the expected turn-of-the-year return, the condition for realizing the short-term loss to be optimal is

$$L*\tau_{SL} > R_J + (L - R_J)*\delta*\tau_{LT}.$$

This condition assumes that holding the loss until after the turn of the year will result in long-term gains treatment. For values of δ near unity, this condition reduces to

$$L*(\tau_{SL} - \tau_{LT}) > R_J*(1-\tau_{LT}).$$

The larger the difference between the short-term and long-term capital gains tax rates, the greater the incentive for short-term realization before the turn of the year. Within the period that defines a short-term gain or loss, i.e. for assets that are not close to becoming long-term holdings, the same capital gains tax rate applies before and after the turn of the year. In this case the incentive for current realization would come only from accelerating the date at which the tax loss can be claimed. In light of the discrete, annual payment of taxes, it is possible that deferring realization by one day can delay payment of taxes by one year. In this case δ would likely be significantly less than unity.

1.2 Capital Gains Tax History

Table 1 provides a summary of the gains-related tax provisions for the last four decades. Our analysis focuses on two specific changes in the capital gains tax law that

were enacted in the Tax Reform Acts of 1969 and 1976, respectively. We focus on this period to avoid confounding tax changes with other changes in the equity market, such as the rise of derivatives or the growth of trading by foreign investors. The 1969 Tax Reform Act reduced the fraction of long-term capital losses that could be deducted from Adjusted Gross Income (AGI) from 100 percent to 50 percent effective January 1, 1970. Prior to 1969, 100 percent of losses could be deducted, subject to a $1000 limit, regardless of whether these losses were long or short term. The 1969 rule was in force until 1986, when another tax reform returned to the pre-1969 rule on loss deductibility. The limit on the amount of losses that could be offset against AGI would make this provision of greater importance to small investors than to large ones. The importance of such investors in affecting asset returns is an open question.

The 1969 restriction on losses offsetting other income was weakened in 1976, when the definition of short-term gains became more lenient. When the 1969 reform took effect, long-term losses were defined as those on assets held for more than six months. This definition was modified by the 1976 Tax Reform Act, which raised this holding period to nine months for 1977 and twelve months for years after 1978. This holding period change was reversed in the Deficit Reduction Act of 1984, which reduced the long-term gain holding period to six months for assets purchased between mid-1984 and the end of 1987. Since 1988, the long-term holding period has again been twelve months.

There have been substantial changes in derivatives markets, the costs of trading, and the role of tax-exempt institutional ownership of corporate stock since the mid-1980s. We are therefore reluctant to combine the post-1986 period, with a holding period of twelve months and long- and short-term losses equally deductible against AGI, with the pre-1969 period, when there was no distinction between long- and short-term gains from the standpoint of AGI offset. We therefore confine our analysis to a study of turn-of-the-

year returns over the period 1962, when the CRSP tapes first permit daily return calculations, through 1984, when the long-term holding period was reduced from twelve months to six months.

Restrictions on the use of long-term losses to offset other types of income, such as those in effect from 1970 to 1986, give investors incentives to recognize losses while they were short-term. In the presence of transactions costs, changes in the definition of the holding period, and in the nature of the loss-offset rules should affect investor behavior.

In later sections, we will present empirical results based on daily stock returns for the 1963-1984 period. This twenty-two-year span can be divided into three regimes with regard to capital gains taxation. The first regime is January 1963 through January 1969, when the long-term holding period was six months and long-term losses were just as valuable as short-term losses for reducing AGI. Table 1 shows that there was one post-1984 year – 1987 – with similar tax rules to this period. We tried including turn-of-the-year returns for January 1988 in our analysis below, and the results were similar to those we report for the contiguous samples below. We report results for the contiguous sample.

The second tax regime is 1970-1976, when the holding period was still six months, but long-term losses were only half as valuable for AGI reduction as short-term losses. Because of the limits on deducting long-term losses against AGI, and the six month holding period, the tax loss selling hypothesis predicts that losses over the most recent six months should have a larger effect on turn of the year returns than losses incurred earlier. As with the first tax regime, there is a more recent period, 1985 and 1986, that exhibits the same tax rules. We tried adding turn-of-the-year returns for January 1985 and January 1986 to those for the 1970-1976 period. Once again the results were similar to those for the contiguous 1970-1976 period that we present below.

The third tax regime we consider, 1979-1984, combines a twelve-month holding period with a reduced value of long-term losses. We leave January 1977 and January 1978 out of our analysis because they have transitions from six to nine to twelve month holding periods. These transitions reduce the selling pressure in December 1976 and December 1977 that would otherwise have been associated with six and then nine-month holding periods. In this regime, six-month and six-to-twelve month lagged returns should both be important predictors of December selling and subsequent turn-of–the-year returns.

The tax loss-selling hypothesis makes two predictions about the impact of the tax changes that we consider. The first is that between the 1963-1969 period and the 1970-1976 period, the effect of losses in the first half of the year on turn-of-the-year returns should have weakened relative to the effect of the return over the period July to December. This is the result of the change in deductibility rules on long-term losses. The second prediction is that for the 1979-1984 period, when the holding period is twelve months, this disparity should have weakened further or disappeared. We evaluate these predictions below.

1.3 The Role of Loss Offset Limits

The foregoing discussion of capital losses offsetting other taxable income sidestepped the potentially important role of loss-offset limits. Prior to 1976, taxpayers could not deduct more than $1000 of capital losses from their taxable income ($1000 in 1969 translates to $4390 in 1997). This limit was raised to $2000 for 1977 and $3000 thereafter. Investors with taxable losses in excess of these limits could carry forward losses, indefinitely but without adjustment for inflation, for use in future years. Nevertheless those with loss carryforwards would face smaller differences between the

effective tax rates on long-term and short-term losses than would those taxpayers who could deduct the losses against AGI in the year the losses were realized.

The practical importance of loss offset limits has varied over time. Tabulations from the Treasury Individual Tax Model, using the TAXSIM data files at the National Bureau of Economic Research, show substantial variation over time in the fraction of dividend income (a proxy for holdings of corporate stock) that is reported on tax returns with capital losses in excess of the loss limit. This fraction is never greater than one third, which suggests a modest role for loss-constrained taxpayers. Such taxpayers received 10.9 percent of dividends in 1964, 19.8 percent in 1969, 32.2 percent in 1974 (after a sharp fall in share prices), 12.0 percent in 1979, 6.7 percent in 1984, 14.6 percent in 1989, and 22 percent in 1994. Poterba (1987) and Auerbach, Burman, and Siegel (1998) discuss the cross-sectional and time series determinants of the share of taxpayers facing binding loss limits.

Investors who do not face the binding constraint on the use of capital losses to offset other components of AGI receive at least two thirds of the dividend income reported on individual tax returns in each year (and approximately ninety percent in many years). These individual investors could reduce their tax liability by realizing capital losses. Not all of these unconstrained investors may have had losses to realize, but the limited role of the loss constraint suggests that a substantial fraction of individual investors could avail themselves of tax-reducing trading strategies.

The differential tax rules that applied to long-term and short-term losses in various time periods only apply to a subset of investors who might realize capital losses. Capital gains and losses are "netted" against each other before they are added to, or subtracted from, adjusted gross income. A taxpayer with long-term gains in excess of short-term losses, for example, would effectively face the long-term capital gains tax rate on incremental short-term loss realizations, since these losses would be used to reduce net

taxable long-term gains. The only taxpayers who face different tax rates on short-term losses and long-term losses are those who already have both net short-term and net long-term losses, and those who already have both net short-term and net long-term gains.

The Treasury Tax Model data provide some information on the fraction of dividends received by taxpayers that might face such differential tax rates. In 1970, for example, 73.4 percent of all dividends were reported by taxpayers that had some capital gain or loss realizations. Fourteen percent of these dividends were reported by taxpayers that had net long- and short-term gains or net long- and short-term losses. Another 1.8 percent of these dividends were on tax returns with short-term gains or losses, but no long-term gains or losses. These dividend-weighted fractions are stable across years in the early 1970s. These tabulations suggest that a nontrivial share of individual investors had gain and loss realizations that led them to face different marginal tax rates on short-term and long-term losses. The impact of such investors on the determination of asset returns is an open question, and our empirical work is an indirect test of this impact.

2. Previous Evidence on Tax Loss Selling Potential and Turn-of-the-Year Returns

Previous research has yielded mix results regarding the link between tax loss selling and abnormal patterns in turn-of-the-year returns. Roll (1983) finds that stocks with losses in the previous year are more likely to experience positive turn-of-the-year returns. Reinganum (1983) constructed a measure of the potential for tax-loss-selling in different securities, and found a positive relationship between this variable and abnormal January returns. Sias and Starks (1997) find that abnormal January returns are greater for stocks with substantial individual rather than institutional ownership, and view this evidence as consistent with the presence of tax-loss selling in December. Because data on the importance of institutional shareownership in the years prior to 1980 are very limited, it is

difficult to use their approach to study the impact of capital gains tax changes such as those considered in this project.

A number of studies have asked whether there are turn-of-the-year return anomalies in countries where there is no capital gains tax. These include pre-1973 Canada (Berges, McConnell, and Schlarbaum (1984)), pre-1965 Great Britain (Reinganum and Shapiro (1987)), and the pre-1917 United States (Schultz (1985), Jones, Pearce, and Wilson (1987), and Jones, Lee, and Apenbrink (1991)). These studies provide mixed evidence on the importance of tax loss selling in contributing to turn-of-the-year return behavior. It is important to recognize that finding a turn of the year return effect in a country without a capital gains tax does not imply that tax loss selling does not contribute to observed turn-of-the-year returns in countries with a capital gains tax. Such a finding simply implies that other factors, perhaps year-end behavior by untaxed institutional investors, also contribute to such return patterns.

There are three previous studies that are particularly related to our investigation of holding periods, loss offset rules, and turn-of-the-year return effects. The first is Chan's (1986) analysis of whether accrued long-term losses have the same effect on January returns as accrued short-term losses. Chan (1986) defines short-term losses as those occurring during the short-term holding period, as we do. He analyzes CRSP data for the 1963-1982 period, and finds little evidence of differences between the effects of long-term and short-term losses. His analysis is based on portfolio groupings of securities, while ours focuses on regression analysis of firm-level returns with controls for time-invariant firm effects as well as year effects. This may explain part of the disparity in our results.

A second pair of studies that also concludes that the short- versus long-term loss distinction is not relevant is DeBondt and Thaler (1985, 1987). These studies find that January returns are related to both recent and historical losses, and they conclude that this

is presumptive evidence against tax loss selling as an explanation for January returns. The focus in these studies was on returns over periods of several years, however, and the research did not attempt to distinguish the short-term losses as defined by the tax system. Moreover, investors may face incentives to realize even long-term losses before the end of December, to accelerate their use of the deductions such losses would generate.

Finally, Sims (1995) study is particularly related to this research. Sims (1995) presents important evidence linking both long-term and short-term loss realization potential to returns in December as well as early January. He finds that the coefficient on long-term loss potential is smaller than that on short-term loss potential, but estimates statistically significant effects for both measures of loss potential. He interprets this as evidence against the role of short-term loss-realization behavior in contributing to turn-of-the-year returns. Sims (1995) also finds important evidence that loss realization potential is correlated with poor returns in December, as the tax-loss-selling hypothesis would suggest. Our study builds on Sims (1995) by focusing on differences in the coefficients on the long- and short-term loss realization potential under different tax regimes. We do not explore December returns, but we do consider how long- and short-term losses affect volume as well as returns. We also investigate how the definition of the holding period for short-term gains and losses affects the link between past returns and turn-of-the-year returns.

One difficulty with virtually all previous studies of turn-of-the-year returns and previous returns concerns the identification of tax loss selling as opposed to other types of investor behavior. The tax-loss selling hypothesis and the hypothesis of "window dressing" on the part of institutional money managers, is suggested by Haugen and Lakonishok (1987) and Lakonishok, et al. (1991), yield similar predictions for stock returns and volume around the turn-of-the-year. According to the window dressing hypothesis, institutional investors dump shares with sharp price declines from their portfolio just prior

to the end of the calendar year so the annual report does not show holdings of poorly performing stocks.

Our tests have power to distinguish between window dressing and tax loss selling. Because changes in capital gains taxation apply to individuals, not untaxed institutions such as pension funds and universities, our tests implicitly provide some evidence on the significance of individual trading in contributing to turn-of-the-year returns. Although institutional money managers at mutual funds do manage money for taxable investors, there is little evidence (see Dickson and Shoven (1993)) that fund managers considered tax factors in their trading behavior, particularly during the time period that we study.

3. Data Description

We analyze returns on common stocks that are classified as "ordinary common shares" on the daily and monthly CRSP return files. Computing the loss potential of a security requires at least twelve months of previous returns. We typically define the "loss potential" of a security (LOSS) as the percentage difference between its price at the beginning of a time period (say on July 1) and its price at the end (say on December 30):

$$LOSS = (P_{Dec}/P_{July\ 1} - 1).$$

LOSS is set equal to zero if the firm experienced a capital gain over this interval. GAIN is defined analogously for firms that experienced capital appreciation.

We also consider a second measure of loss potential that incorporates some information on the price trajectory that a security has followed within July-December interval. This is the percentage difference the price at the end of an interval and the "volume weighted price" within the interval (LOSS2).

$$LOSS2 = (P_{Dec}/\Sigma V_k P_k - 1).$$

V_k denotes volume, and P_k closing price, on each of the k trading days during the relevant time interval. Sims (1995) used this volume-weighted measure of capital losses.

It is not clear which of these measures of loss potential is preferable on theoretical grounds. The simple return over an interval measures the gain or loss potential for investors who bought the security at the beginning of the interval, while the variable using volume-weighted prices captures the average gain or loss for all those who bought shares within the interval. Because those investors who bought shares late in the interval may not be considering selling, however, the second measure may be an imperfect proxy for loss realization potential.

For daily returns, the CRSP NYSE and AMEX files begin in July 1962. We can obtain beginning-of-1962 prices for NYSE stocks from the monthly CRSP file, so we can begin our study of turn-of-the-year returns for NYSE stocks in January 1963. When we use volume-weighted prices, we must begin in January 1964, because daily and monthly volume data are not available prior to July 1962. For AMEX stocks, we must begin in 1964 even when we use beginning-of-interval to end-of-interval loss potential measures. We separate the NYSE and AMEX shares on the grounds that individuals hold a greater fraction of the shares in AMEX firms. If behavior related to the individual income tax is important in explaining turn-of-the-year returns, we would expect the resulting patterns to be stronger for AMEX than for NYSE stocks. The CRSP file provides returns on shares traded on NASDAQ only after 1973, so we do not consider these shares in our analysis. We define returns as the sum of dividends paid, divided by beginning-of-period price, plus the change in the share price divided by the initial price.

We focus on differences in return patterns across the three capital gains tax regimes that we identified above. Table 2 shows the median and mean return for NYSE and AMEX stocks on the last trading day of December and the first five days of January

under each tax regime. We follow Roll (1983), Sims (1995), and others in defining turn of the year returns as including returns on the last trading day of December, since past empirical work has suggested that whatever factors affect early January returns also affect returns on the last December trading day. Turn-of-the-year returns are substantial for all of the sample periods we consider. They are largest for the 1970-76 period, when the median return on these six days for the NYSE would correspond to an annual return ((250/6)*.046) of 192 percent. The effect is even more pronounced for the typically smaller stocks that are traded on the American Stock Exchange.

The last panel of Table 2 shows the returns on a portfolio that includes a short position in any share with a July-December return in the first decile (highest returns) and a long position in any stock in the lowest return decile over this period. The returns on this portfolio are positive, statistically significantly different from zero, and largest in the 1970-1976 period relative to the other years.

The data show that turn of the year returns are largest for the 1970-1976 period. There is no basis for predicting such a finding solely from considerations related to taxation. While investors with accrued losses from the second half of the year had strong incentives to sell their shares at year-end, those with losses from earlier in the year should have sold their shares earlier. The large average turn-of-the-year effect in the early 1970s may be the result of differences in the distribution of past returns in this period and other time periods. During the 1970-76 period, the median stock experienced a July-December capital appreciation of −6.9 percent, compared with +4.5 percent in 1963-69 and +0.9 percent in 1979-84. The greater prevalence of losses may have contributed to a greater overall turn-of-the-year effect. The difficulty of interpreting evidence on the average turn-of-the-year return is a key factor in our focus on individual firm return patterns.

4. Lagged Returns, Tax Regimes, and Turn-of-the-Year Effects

To investigate how tax law changes affect turn of the year returns, we focus on the link between these returns for individual firms and the past return experience for these firms. The basic specification that we estimate is

$$(1) \quad R_{Jan,i,t} = \beta_1 * GAIN_{July\text{-}Dec,i,t-1} + \beta_2 * GAIN_{Jan\text{-}June,i,t-1} + \beta_3 * LOSS_{July\text{-}Dec,i,t-1} + \beta_4 * LOSS_{Jan\text{-}June,i,t-1} + \phi_i + \lambda_t + \varepsilon_{it.}$$

The dependent variable is the return for the last trading day of December and the first five trading days of January. The terms ϕ_i and λ_t correspond to firm-specific and year-specific intercepts. The firm-specific fixed effects are particularly important in this specification, because they capture return differentials that may be related to volatility, systematic risk, or other slowly changing firm characteristics. Gains and losses over the second half of the year exclude returns for the last five trading days of the year.

Distinguishing lagged gains from lagged losses permits us to investigate the impact of changes in the definition of the long-term holding period and in the percentage of long-term losses deductible against non-gain AGI on the link between lagged losses and turn-of-the-year returns. If tax-loss selling is an important factor in explaining turn-of-the-year returns, then we should observe a pattern in the coefficients on lagged losses over the three tax regimes. Note that GAIN is positive and LOSS is negative, so negative values of β_3 and β_4 imply larger turn of the year returns on shares with larger losses in the previous year. The predicted pattern is: (1) $\beta_3 \leq \beta_4 < 0$ during 1963-69, when there was a six month holding period and long term gains were losses 100% deductible; (2) $\beta_3 < \beta_4 < 0$ during 1970-1976, when there was a six month holding period and long-term losses were only 50% deductible; and (3) $\beta_3 = \beta_4 < 0$ during 1979-1984, when there was a twelve month holding period and long term losses were 50% deductible. We expect little

difference between the coefficients on six- and twelve-month lagged returns in periods when the holding period is twelve months. We test for differences between short-term and long-term losses by including the return over the most recent six months and that over the previous six months. Not surprisingly, similar findings emerge from specifications (not reported here) that include returns over the previous six and previous twelve months. (Because of return compounding, this specification is not numerically identical to (1)).

Table 3 shows the results of estimating equation (1) for NYSE and AMEX stocks. The table shows that losses in the previous year predict higher January returns for the entire post-1963 sample period. Gains during the previous year predict much smaller absolute differences in January returns, and in many cases the coefficient estimates are statistically insignificantly different from zero. There are also differences in the coefficient estimates on lagged losses in the three different tax regimes. In particular, the coefficients on the January-June and July-December lagged losses are substantially different in the 1970-1976 period, one of the two periods when there was a six-month holding period.

The results in Table 3 suggest that the coefficients on the January-June and July-December losses for NYSE stocks are indistinguishable for the 1963-1969 period as well as for the post-1976 period, but that they <u>are</u> distinct for the 1970-1976 period. This accords with our foregoing analysis about the incentives for investors to realize losses at different points in the calendar year. For AMEX stocks, returns over the second half of the year have a greater impact on turn-of-the-year returns than returns over the first half of the year. The <u>differential</u> between the coefficients on the losses over the most recent six months, and the previous six months, are greater in the 1970-1976 period than in the 1963-1969 period, as the tax loss selling hypothesis suggests.

The results for NYSE stocks for the January 1970-1976 period suggest that a 20% capital loss from July-December is associated with a turn-of-the-year return that is higher

by 358 basis points. However, a 20% capital loss over the first half of the previous year is associated with only a 66 basis point increase in returns around the turn-of-the-year for the same time period. It is particularly significant that in the tax regime with a twelve-month holding period, we do not find any evidence of differences in lagged gains or losses over different horizons.

We report specifications that relate turn-of-the-year returns to losses and gains over the previous twelve months. We have also estimated equations with additional lagged returns; these equations are in the spirit of models estimated by DeBondt and Thaler (1985). Including further lagged returns does not affect the coefficients on the returns over the most recent twelve months. Losses over the period from 24 to 12 months prior to the turn-of-the-year do have some predictive power for turn-of-the-year returns. The estimated coefficients are -0.047 (0.008) for the 1963-1969 period, -0.083 (0.007) for 1970-1976, and -0.049 (0.008) for the 1979-1984 period. Gains over the period 24 to 12 months prior exhibit regression coefficients that are smaller in absolute value than those on losses, although they are still statistically significant: -0.010 (0.003) for 1963-1969, -0.013 (0.004) for 1970-1976, and -0.021 (0.002) for 1979-1984. Because including returns lagged by more than twelve months does not appear to affect the coefficients on returns over the six and twelve month lags, the remainder of our analysis focuses on specifications that exclude further lagged returns.

Table 4 presents results using LOSS2, rather than LOSS, and an analogous measure of gains, as the independent variables in (1). This is the case in which prices are volume-weighted within the six-month intervals. The results are qualitatively similar to those using simple lagged returns in Table 3. The impact of July-to-December losses on turn-of-the-year returns is greatest in the 1970-1976 period, and the difference between the loss potential from the first half of the year, and that from the second half of the year, is

greatest for this period. In light of the similarity of our results using different return measures, we focus the remainder of our analysis on the specifications that use simple lagged returns as measures of loss potential. We also limit most of our subsequent analysis to NYSE stocks. We found similar results for AMEX-traded shares, but in the interest of brevity, we do not report those findings.

The single greatest difficulty with our interpretation of results like those in Table 3 is that the capital gains tax law was not the only factor that varied between the late 1960s and the early 1970s. Perhaps most importantly, the early 1970s included a period of poor stock market returns, so the set of stocks with losses to realize at year-end was larger in this regime than in the other time periods. To provide some evidence on whether the different pattern of turn-of-the-year returns is due to the changing distribution of previous returns, or to the link between past returns and turn-of-the-year returns for stocks with a given return experience, we further disaggregated the regressors in equation (2).

Table 5 presents results of an equation in which we include separate variables for capital losses of less than 20 percent, 20-40 percent, and more than 40 percent. We replace the LOSS variable with three variables, LOSS<20, LOSS20-40, and LOSS>40. These three variables add up to the LOSS variable in equation (1), but they provide some evidence on the pattern of turn-of-the-year effects across different size losses. We do not stratify the GAIN variable, given our focus on losses.

The results show that for any given loss magnitude, the coefficient linking a July-December loss to the turn of the year return is larger in 1970-76 than in either of the other time periods. While the fraction of firms in these various loss categories changed significantly between the late 1960s and the early 1970s, the coefficients on losses in each category move in tandem with the aggregate coefficient for all firms with losses. Moreover, there are pronounced differences for all sets of losses between the January-

June and July-December loss effects. This evidence suggests that the changing distribution of LOSS is not the driving force in the results in Table 3.

We also re-estimated our equations for the 1970-1976 period excluding returns for the 1973 and 1974 calendar years (thus excluding the turn-of-the-year for 1974 and 1975). The changes in the coefficients on the most recent six month return, and the previous six month return, between 1963-1969 and 1970-1976 (excluding 1973 and 1974) were similar to those reported in Table 3. The difference between the July-to-December and January-to-June loss coefficients for the 1970-1976 period, excluding 1973 and 1974, is −0.096 (0.014) for NYSE stocks, and −0.147 (0.024) for AMEX stocks.

To provide further insight on our results, we also disaggregated our analysis by firm size. Rozeff and Kinney (1976) and Keim (1983) were among the first to observe that large turn of the year returns were concentrated among stocks with small market capitalization. If small stocks are more apt to suffer large losses or have a higher percentage of individual ownership, then the small firm premium in January is consistent with a tax-loss selling explanation. To address the relationship between firm size, lagged losses, and turn-of-the-year returns, we estimate (1) allowing the LOSS coefficients to vary by size deciles.

Table 6 presents the results of this analysis. To simplify interpretation, the table presents only the difference between the coefficients on the July-December and January-June loss variables (β_3 - β_4 above). The correlation between lagged losses and turn-of-the-year returns is strongest for small and medium size firms. For firms in the two largest size deciles, there is no evidence of a difference in these coefficients in the 1970-1976 period, and there is even some evidence that the coefficient on January-June losses is larger for large firms in the 1963-69 and 1979-84 periods. When the incentive to realize losses before six months is mitigated, for 1963-69 and especially for 1979-84, we observe the

July-December losses as a strong predictor of January returns for only three deciles in 1963-69 and only for the smallest size decile in 1979-84. These results suggest that the link between capital gains tax provisions and turn of the year returns is not solely a small firm phenomenon.

5. Further Evidence on Robustness

The results for turn-of-the-year returns presented above are suggestive, but there are many questions about sample selection, return definition, and related issues that might be raised with respect to interpretation. This section presents three types of evidence on the robustness of our findings.

First, an immediate concern with results like those presented above is that they may be due to serial correlation patterns in stock returns that are not associated with year-end tax-loss selling. We addressed this issue by estimating the same regression specification on returns for the six trading days beginning on the last trading day of each non-January "turn of the quarter" month (March, June, September). These months might be particularly significant for institutional investors, since they correspond to the months in which quarterly reports are issued. The window dressing hypothesis might therefore lead us to expect that whatever affects January returns also affects returns in these months.

Table 7 presents the findings from our "turn of the quarter" analysis. The results show no consistent relationship between lagged returns and turn of the month returns in April, July, and October. These findings suggest that <u>something</u> is special about January, although the open question is whether the something is tax-loss selling.

Second, we consider the effect of dropping the return on the last day of December on the general pattern of results. Table 8 reports these findings, which are analogous to those above for the last day of December and the first five days of January for the sample

of NYSE firms. The results are very similar to those in the earlier table. In particular, there is a sharp change in the relative magnitudes of the coefficients on the loss in the most recent six months, and the previous six months, as we move from the 1963-1969 to the 1970-1976 period and then to 1979-1984. The general finding that lagged losses are significantly and negatively related to early January returns, while lagged gains have small effects if any, also emerges in this table.

Finally, in Table 9, we consider an issue of return definition involving the bid-ask spread. Keim (1989) and Bhardwaj and Brooks (1992) have suggested that turn-of-the-year return anomalies may simply be the result of changes in the location of transactions prices within the bid-asked price range. These studies argue that trades at the end of the year are more likely to take place at the bid price, because they are "sell" orders, while trades in the early part of January are more likely to occur at the "ask" price, because they are buy orders. If this is correct, then part of the return at the turn of the year could simply be the result of movement within the bid-ask spread. We investigate this possibility by defining an alternative measure of the return for the six days we focus on. CRSP reports low and high prices for the day if the stock was traded, and the closing bid and ask quotes if no trades occurred. Information about bid-ask spreads should be found in trading spreads. Our alternative return measure is the difference between the bid (or low) price at the end of the fifth trading day in January, and the ask (or high) price at the beginning of the last trading day in December. Movements in where transactions occur within the bid ask spread will not affect this return measure.

Table 9 presents results of re-estimating equation (1) using this return measure as the dependent variable. Once again we limit the analysis to the sample of NYSE stocks. The estimated coefficients are smaller than those in Table 3, but the general conclusions about the importance of lagged losses and the difference between recent and further

lagged loss effects during the 1970-1976 period are unaffected by this redefinition of returns. This suggests that the findings presented above are not driven by spurious return measurement effects due to bid-ask spreads.

6. Evidence on Trading Volume

The tax-loss-selling hypothesis has implications for the volume of trade as well as for turn-of-the-year returns. Dyl (1977), Lakonishok and Smidt (1986), Bolster, et al. (1989), and Weisbenner (1997) all investigate the link between trading volume and past stock performance. The general conclusion drawn from their work is that tax-motivated trading may affect stock market activity at the end of the year. Table 10 shows how market activity varies over the year. Following Dyl (1977), Bolster, et al. (1989), and Michaely and Vila (1996), trading activity during a month is measured by excess turnover. (Lo and Wiang (1997) provide a broad survey of alternative measures of firm-specific turnover.) Turnover is defined as a stock's volume per share outstanding. Excess turnover is then defined as a stock's turnover normalized by the average turnover for that stock over the previous 12 months. Note that only in the month of December is a stock with a recent capital loss traded more heavily than a stock that has appreciated over the previous five months. While consistent with the tax loss selling hypothesis, this pattern of trading is also consistent with "window dressing" by institutional money managers.

Table 11 shows how the relationship between December volume and lagged returns varies over the three tax regimes. The change in volume patterns around the 1969 tax change is particularly striking. Stock performance over the first half of the year has no effect on trading volume in December in the 1969-1975 period, but is a statistically significant predictor of December volume in the 1963-1968 period. This is an important piece of confirmatory evidence for the returns-based findings in the previous sections.

Evidence that the increased holding period in 1978 changed the link between December turnover and lagged returns is weaker. Lakonishok and Smidt (1986) note that they are unable to find evidence of a change in volume patterns when the holding period was increased from 6 to 12 months in the late 1970s, but they do not report any results. Comparing the coefficients from the 1969-1975 and 1978-1983 periods in Table 11, one finds that capital losses over the first half of the year, relative to losses from July-November, are slightly more correlated with December volume after the holding period is increased to 12 months. Understanding the link between the volume of tax-loss selling, and the effect of such selling on returns, is clearly an issue for further study.

7. Conclusion

Our results support the view that tax-related factors affect turn of the year returns. Some explanations of why lagged returns are related to these turn of the year returns, such as the institutional "window dressing" hypothesis, would not predict any relationship between the long-term capital gains holding period for individual investors and the correlation between past returns and the turn of the year effect. Yet our empirical findings suggest that there is a substantial relationship in the U.S. equity markets of the 1960s and 1970s. Our findings are consistent with the predictions of the tax loss selling hypothesis, and they suggest that this hypothesis may have some part in explaining the turn of the year effect. The most significant limitation of this project is that it does not provide an estimate of the fraction of the observed turn-of-the-year return pattern is the result of tax-motivated trading behavior.

Our analysis has not attempted to integrate the role of changing transactions costs for equity trading in the discussion of tax-loss selling incentives. The change in the structure of NYSE commissions in 1975 (summarized in Stoll (1979)) could have important

effects in this regard. Unfortunately, it is difficult to determine the precise change in effective trading costs facing individual traders at this time, because the costs of different sized trades responded differently to deregulation. In addition, some of the most important changes, such as the growth of discount brokers, developed gradually after 1975. The development of derivatives markets could also have potentially important effects, as could variation over time in average bid-ask spreads, but we leave these issues for further work.

A related issue that bears further study is the effect of the supply of realizable losses on the nature of turn-of-the-year effects. There are some years, such as 1974, when the aggregate market experiences substantial losses and investors are likely to have many unrealized capital losses in their portfolios. In such years investors may have little need to engage in year-end tax loss trading, and this may affect the turn-of-year returns. Dhaliwal and Trezevant (1993) find that the positive January return to shares that declined during the previous year is larger in down-market years than in up-market years. Further work on the link between taxation and turn-of-the-year returns could usefully focus on the nature of individual investor behavior, particularly the relationship between involuntary gain and loss realizations during the year and voluntary year-end realizations. Complementary research, such as that by Huddart and Narayanan (1997), should focus on the trading behavior of mutual funds and other institutional investors at different points in the calendar year. This work should consider the degree to which individual investor trading preferences are reflected in the behavior of financial intermediaries.

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Table 1: Key Provisions of the Federal Capital Gains Tax, 1942-1996

Years	Long Term Holding Period (months)	Percentage of Long-Term Losses Deductible Against AGI	Loss Limit
1943-1969	6	100	$1000
1970-1976	6	50	$1000
1977	9	50	$2000
1978-1984	12	50	$3000
1984-1986	6	50	$3000
1987	6	100	$3000
1988-1995	12	100	$3000

Source: U.S. Treasury Department (1985) and Pechman (1987).

Table 2: Turn of the Year Returns: Mean, Median, and Return Differential Between Stocks with Losses and Gains In July-December Period, Various Tax Regimes

	1963-1969	1970-1976	1979-1984
Median Return			
NYSE	0.018	0.046	0.019
AMEX	0.022	0.085	0.025
Mean Return			
NYSE	0.024 (0.011)	0.065 (0.017)	0.026 (0.010)
AMEX	0.041 (0.017)	0.120 (0.019)	0.044 (0.014)
Mean Return to Long Position in Stocks In Lowest Decile (Ranked by July-December Return) And Short Position in Stocks in Highest Decile			
NYSE	0.033 (0.003)	0.100 (0.031)	0.053 (0.007)
AMEX	0.088 (0.013)	0.181 (0.029)	0.077 (0.010)

Source: Authors' tabulations from daily CRSP files. Standard errors are shown in parentheses. AMEX sample for results in first columh begins in 1964. Standard errors are corrected to account for contemporaneous correlation of returns.

Table 3: Regression Results Relating Returns on Last Day of December and First Five Trading Days of January to GAINS and LOSSES in Past Year, NYSE and AMEX

Explanatory Variable	1964-69		1970-1976		1979-1984	
	NYSE	AMEX	NYSE	AMEX	NYSE	AMEX
$LOSS_{Jan\text{-}June,t\text{-}1}$	-0.069 (0.010)	-0.106 (0.024)	-0.033 (0.010)	-0.069 (0.015)	-0.084 (0.010)	-0.099 (0.018)
$LOSS_{July\text{-}Dec,t\text{-}1}$	-0.074 (0.012)	-0.182 (0.026)	-0.179 (0.012)	-0.242 (0.015)	-0.081 (0.010)	-0.112 (0.016)
$GAIN_{Jan\text{-}June,t\text{-}1}$	-0.026 (0.005)	-0.017 (0.006)	-0.007 (0.005)	-0.013 (0.006)	0.009 (0.004)	0.005 (0.007)
$GAIN_{July\text{-}Dec,t\text{-}1}$	-0.030 (0.005)	-0.016 (0.005)	0.014 (0.007)	0.001 (0.010)	-0.039 (0.004)	-0.025 (0.005)
Diff. in LOSS coefficients	-0.005 (0.015)	-0.076 (0.036)	-0.145 (0.014)	-0.173 (0.021)	0.003 (0.014)	-0.012 (0.025)
Adjusted R2	.327	.245	.377	.296	.213	.234
Sample Size	4688		6778		4521	

Notes: Difference in LOSS coefficients is coefficient on $LOSS_{July\text{-}Dec,t\text{-}1}$ minus coefficient on $LOSS_{Jan\text{-}June,t\text{-}1}$. All equations include firm-effects and year-effects. Values in parentheses are White (heteroscedasticity-consistent) standard errors.

Table 4: Regression Results Relating Returns on Last Day of December and First Five Trading Days of January to Daily-Volume-Weighted GAINS and LOSSES in Past Year, NYSE

Explanatory Variable	1964-1969		1970-1976		1979-1984	
	NYSE	AMEX	NYSE	AMEX	NYSE	AMEX
$LOSS_{Jan\text{-}June,t\text{-}1}$	-0.097 (0.020)	-0.135 (0.028)	-0.061 (0.015)	-0.111 (0.020)	-0.062 (0.018)	-0.058 (0.030)
$LOSS_{July\text{-}Dec,t\text{-}1}$	-0.093 (0.021)	-0.247 (0.036)	-0.277 (0.022)	-0.352 (0.024)	-0.137 (0.015)	-0.179 (0.024)
$GAIN_{Jan\text{-}June,t\text{-}1}$	-0.072 (0.013)	-0.058 (0.019)	-0.043 (0.018)	-0.031 (0.027)	0.023 (0.011)	-0.024 (0.021)
$GAIN_{July\text{-}Dec,t\text{-}1}$	-0.080 (0.013)	-0.079 (0.018)	0.031 (0.019)	0.017 (0.030)	-0.090 (0.012)	-0.073 (0.020)
Diff. in LOSS coefficients	-0.004 (0.028)	-0.112 (0.044)	-0.216 (0.024)	-0.241 (0.032)	-0.075 (0.024)	-0.121 (0.037)
Adjusted R2	.297	.241	.376	.293	.206	.230
Sample Size	7042	4657	9474	6783	8616	4193

Notes: Difference in LOSS coefficients is coefficient on $LOSS_{July\text{-}Dec,t\text{-}1}$ minus coefficient on $LOSS_{Jan\text{-}June,t\text{-}1}$. All equations include firm-effects and year-effects. Values in parentheses are White (heteroscedasticity-consistent) standard errors.

Table 5: Regressions of Turn-of-Year Returns on Lagged Returns, NYSE Stocks, Stratified by Lagged Gain or Loss and by Size of Loss

Explanatory Variable	1963-69	1970-76	1979-84
LOSS <20%	-0.040	-0.039	-0.021
Jan-June	(0.014)	(0.021)	(0.017)
LOSS <20%	-0.085	-0.093	-0.069
July-Dec	(0.015)	(0.017)	(0.014)
LOSS 20-40%	-0.070	-0.053	-0.076
Jan-June	(0.011)	(0.011)	(0.013)
LOSS 20-40%	-0.069	-0.132	-0.072
July-Dec	(0.015)	(0.011)	(0.011)
LOSS >40%	-0.076	-0.026	-0.116
Jan-June	(0.013)	(0.011)	(0.016)
LOSS >40%	-0.068	-0.215	-0.104
July-Dec	(0.039)	(0.017)	(0.019)
GAIN	-0.028	-0.006	0.005
Jan-June	(0.005)	(0.005)	(0.004)
GAIN	-0.029	0.001	-0.039
July-Dec	(0.005)	(0.007)	(0.004)
Adjusted R2	.328	.383	.216

Estimates are similar to those in Table 3 but stratify securities by previous returns. All estimating equations include firm and year effects. Sample sizes are the same as those for NYSE entries in Table 3.

Table 6: Regression Results for Turn-of-Year Returns, NYSE & AMEX Stocks Pooled, Difference in LOSS coefficients over Market Capitalization Deciles

Size Decile	1963-69	1970-76	1979-84
1st (smallest)	-0.013 (.058)	-0.113 (0.037)	-0.114 (0.052)
2nd	-0.040 (0.044)	-0.165 (0.033)	0.002 (0.037)
3rd	-0.106 (0.043)	-0.135 (0.031)	0.000 (0.036)
4th	-0.117 (0.041)	-0.085 (0.028)	-0.045 (0.036)
5th	-0.066 (0.032)	-0.134 (0.024)	-0.017 (0.031)
6th	0.000 (0.037)	-0.111 (0.027)	0.020 (0.028)
7th	0.069 (0.031)	-0.084 (0.023)	0.009 (0.030)
8th	0.085 (0.029)	-0.057 (0.021)	0.068 (0.028)
9th	0.047 (0.029)	-0.035 (0.022)	0.108 (0.024)
10th	0.082 (0.030)	0.023 (0.023)	0.073 (0.028)
Adjusted R2	.313	.412	.263

Note: Difference in LOSS coefficients is coefficient on $LOSS_{July\text{-}Dec,t\text{-}1}$ minus coefficient on $LOSS_{Jan\text{-}June,t\text{-}1}$. Market capitalization decile cutoffs for January of year t are formed at end of year t-2. Sample sizes are the same as for NYSE samples in Table 3.

Table 7: Regression Results, NYSE Stocks, Relating Returns on Six Days (starting with last day of previous month) to GAINS and LOSSES in Past Year for all Change-of-Quarter Months, 1963-1984

Explanatory Variable	January	April	July	October
$LOSS_{t-12 \text{ to } t-7}$	-0.063 (0.006)	0.010 (0.004)	-0.019 (0.004)	0.004 (0.005)
$LOSS_{t-6 \text{ to } t-1}$	-0.144 (0.007)	0.018 (0.004)	0.016 (0.004)	-0.011 (0.004)
$GAIN_{t-12 \text{ to } t-7}$	-0.003 (0.002)	0.005 (0.003)	0.003 (0.002)	-0.007 (0.002)
$GAIN_{t-6 \text{ to } t-1}$	-0.026 (0.003)	-0.004 (0.002)	0.004 (0.002)	0.023 (0.003)
Difference in LOSS coefficients	-0.081 (0.008)	0.008 (0.006)	0.035 (0.006)	-0.014 (0.007)
Adjusted R2	.375	.163	.200	.200
Sample Size	29,355	29,380	29,496	30,654

Regressions are similar to those in Table 3 but consider different "turn of quarter" months. All equations include firm and year effects.

Table 8: Regression Results, NYSE Stocks, Relating Returns on First Five Trading Days of January to GAINS and LOSSES in Past Year

Explanatory Variable	1963-1969	1970-1976	1979-1984
$LOSS_{Jan\text{-}June,t-1}$	-0.076 (0.009)	-0.036 (0.009)	-0.070 (0.010)
$LOSS_{July\text{-}Dec,t-1}$	-0.067 (0.012)	-0.139 (0.011)	-0.069 (0.009)
$GAIN_{Jan\text{-}June,t-1}$	-0.029 (0.004)	-0.008 (0.005)	0.010 (0.004)
$GAIN_{July\text{-}Dec,t-1}$	-0.030 (0.004)	0.009 (0.007)	-0.040 (0.004)
Difference in LOSS coefficients	0.008 (0.015)	-0.103 (0.013)	0.001 (0.014)
Adjusted R2	.352	.307	.217
N	8,096	9,540	8,781

Notes: Equations are identical to those in Table 3 for NYSE stocks, including firm and year effects, but differ only in the exclusion of the last trading day of December from the definition of the dependent variable (the turn-of-the-year return).

Table 9: Robustness Evidence on Regression Results, Excluding Effect of "Bid-Ask Spread" on Returns, NYSE Stocks

Explanatory Variable	1963-1969	1970-1976	1979-1984
$LOSS_{Jan\text{-}June,t\text{-}1}$	-0.059 (0.008)	-0.017 (0.008)	-0.065 (0.010)
$LOSS_{July\text{-}Dec,t\text{-}1}$	-0.051 (0.010)	-0.140 (0.010)	-0.061 (0.009)
$GAIN_{Jan\text{-}June,t\text{-}1}$	-0.024 (0.004)	-0.002 (0.004)	0.007 (0.004)
$GAIN_{July\text{-}Dec,t\text{-}1}$	-0.038 (0.004)	0.009 (0.007)	-0.036 (0.004)
Diff. In LOSS coefficients	0.008 (0.013)	-0.123 (0.012)	0.005 (0.013)
Adjusted R2	.340	.282	.200
Sample Size	8096	9540	8781

Note: Equations are similar to those in Table 3, including firm and year effects. See text for further discussion of the definition of returns to correct for possible movements within the bid-ask spread in determining returns..

Table 10: Regressions of Monthly Excess Turnover on Gains and Losses Over the Preceding Eleven Months, NYSE stocks 1963-1983 (December), 1964-1984 (January-June), 1963-1984 (July-November)

Month	Cumulative Loss, t-5 to t-1	Cumulative Loss, t-11 to t-6	Cumulative Gain, t-5 to t-1	Cumulative Gain, t-11 to t-6	Adjusted R2
January	0.722 (0.070)	0.187 (0.055)	0.577 (0.060)	-0.286 (0.030)	.120
February	0.261 (0.062)	0.362 (0.064)	0.693 (0.044)	-0.296 (0.028)	.115
March	0.254 (0.066)	0.437 (0.068)	0.720 (0.051)	-0.320 (0.033)	.081
April	0.285 (0.063)	0.660 (0.053)	0.593 (0.039)	-0.263 (0.043)	.122
May	0.034 (0.062)	0.628 (0.054)	0.595 (0.045)	-0.187 (0.031)	.112
June	0.002 (0.077)	0.395 (0.110)	0.616 (0.071)	0.136 (0.229)	.175
July	0.265 (0.178)	0.565 (0.089)	0.580 (0.050)	-0.110 (0.053)	.027
August	0.156 (0.050)	0.422 (0.053)	0.595 (0.041)	-0.132 (0.023)	.155
September	-0.012 (0.055)	0.211 (0.055)	0.736 (0.049)	-0.118 (0.024)	.090
October	0.179 (0.067)	0.408 (0.066)	0.810 (0.054)	-0.152 (0.022)	.107
November	-0.181 (0.053)	0.250 (0.052)	0.724 (0.051)	-0.224 (0.022)	.102
December	-0.749 (0.052)	-0.160 (0.051)	0.238 (0.041)	-0.381 (0.022)	.084

Source: Tabulations using monthly CRSP return file. Turnover is defined as a stock's volume per share outstanding, excess turnover as a stock's turnover normalized by the average turnover for that stock over the previous 12 months.

Table 11: Regression of December Excess Turnover on Lagged Returns, NYSE Stocks Over Different Tax Regimes

Explanatory Variable	1963-1968	1969-1975	1978-1983
$LOSS_{Jan\text{-}June,t\text{-}1}$	-0.917 (0.300)	-0.001 (0.062)	-0.129 (0.093)
$LOSS_{July\text{-}Nov,t\text{-}1}$	-0.812 (0.217)	-1.019 (0.076)	-0.539 (0.092)
$GAIN_{Jan\text{-}June,t\text{-}1}$	-0.510 (0.085)	-0.206 (0.028)	-0.374 (0.037)
$GAIN_{July\text{-}Nov,t\text{-}1}$	0.213 (0.096)	0.560 (0.117)	0.144 (0.043)
Diff. In LOSS coefficients	0.104 (0.352)	-1.018 (0.092)	-0.410 (0.120)
Adjusted R2	.031	.102	.128
N	7,039	9,476	8,683

See text for further details.