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Empirical Tests Of Three Major Explanations For The Turn-of-the Year Effect: A Study Of Systematic Changes In Investor Trading Behavior

Mark David Griffiths

EMPIRICAL TESTS OF THREE MAJOR EXPLANATIONS FOR THE TURN-OF-THE-YEAR EFFECT: A STUDY OF SYSTEMATIC CHANGES IN INVESTOR TRADING BEHAVIOR

by

Mark David Griffiths

School of Business Administration

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ABSTRACT

This dissertation uses U.S. and Canadian trade-to-trade data to test the validity of the tax loss selling, portfolio rebalancing and disposition hypotheses. This data set permits more powerful tests than previously possible for two reasons. First, in the U.S. the taxation and the calendar year ends are co-incident; in Canada they differ by five trading days. Second, the availability of quote and transaction data permits classification of buyer- or seller-initiated trades.

I find evidence that the end of the taxation year is a determinant of year end trading. December has the most significant levels of seller-initiated trading, while January exhibits significant buyer-initiated trading. Based on analyses of individual, institutional and professional traders, I conclude that year end trading volume is tax related but is not necessarily related to capital loss realization. Year end returns are related significantly to the level of buyer-initiated trading. I find no evidence of potentially profitable investment opportunities.

Buying activity is concentrated in the first seven months and selling behavior dominates the last five months of the year. Analysis of intramonthly trading reveals that the mean number of trades is higher and the standard deviation is smaller over the first half as compared to the last half of the month. These differences may explain the observed monthly anomaly of larger first half returns.

Although most securities display a greater probability of seller-initiated trading in December, the portfolio comprising the largest capital gains exhibits significant buyer-initiated activity, supporting allegations of window dressing by professional fund managers. This portfolio also displays similar activity in January refuting the disposition hypothesis.

The results also highlight the caution to be exercised when employing rates of return in empirical analysis. The systematic tendency for security prices to shift from the bid to the ask price is widespread, especially for small valued transactions. Assuming these trades represent activity in small firms, the resulting mismeasurement of return may be a contributing factor in studies which find small firms outperform the market at the turn-of-the-year.

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CHAPTER 1

INTRODUCTION

1.1 Contributions of the Dissertation

The purpose of this dissertation is to examine the empirical validity of the three major explanations for the turn-of-the-year effect. The turn-of-the-year effect refers to the phenomenon that small market capitalization firms appear to have abnormally high stock returns in January, in particular over the five day trading period commencing the last trading day of December and ending the fourth trading day of January. The effect occurs with great regularity, having been detected in securities dating back to 1871 (Jones, Pearce and Wilson, 1987) and the size of the returns for small U.S. securities appears both statistically and economically significant (Lakonishok and Smidt, 1984).

The three theories I examine are: (1) the tax loss selling hypothesis which contends investors realize capital losses at the taxation year end to reduce current tax liabilities; (2) the disposition hypothesis, which argues that investors realize capital losses as late as possible in the old taxation year and capital gains as soon as possible in the new taxation year and; (3) the portfolio rebalancing hypothesis where institutional investors are believed to undertake new portfolio positions early in the new calendar year. The empirical

results of this dissertation support the tax loss selling and portfolio rebalancing hypotheses and reject the disposition hypothesis.

Using detailed trade to trade data from Canada (the Toronto Stock Exchange) and the United States (the New York and American Stock Exchanges), I examine the trading behavior of different groups of investors while avoiding the biases common in previous studies which rely on analyses of rates of return or total trading volume. My results indicate systematic changes in investor trading occur throughout the calendar and taxation year and that the level of buyer and/or seller-initiated trading is a significant determinant of turn-of-the-year security returns.

This dissertation uses the detailed data to determine the role taxation plays in the turn-of-the-year effect. Since the end of the calendar year is not co-incident with the effective end of the Canadian taxation year, comparative analysis of the Canadian and U.S. data sets provides additional power of the test. Results show that the end of the taxation year has a significant effect on the size and nature of trading. In addition, I show that income taxation in general, and not only capital gains regulations is the significant factor in trading behavior. Earlier tax loss selling studies focus solely on the role of capital gains. No evidence is found to support the argument that knowledge of these systematic tendencies represents profitable investment opportunities to the average investor.

Securities are combined on the basis of relative capital gains and market value to form portfolios. Unlike previous studies, I do not reform the portfolios at the end of the calendar year. Portfolios are formed in November so that portfolios comprising the same securities may be compared in December and January. I find that in general, the end of the calendar year is a period of significant seller-initiated trading while January is a period of significant buyer-initiated trading regardless of the basis on which the portfolios are formed. Some evidence is found to support "window dressing" -- the alleged practice by professional fund managers of purchasing bullish securities to improve the performance appearance of their portfolios. Previous studies were unable to detect this behavior due to the reliance on rates of return and the manner in which the portfolios were formed.

This dissertation also examines monthly trading behavior to determine whether the annual systematic patterns prevail over shorter time periods. In particular, Ariel's (1987) monthly anomaly is examined. I find that there are significant differences in the level and nature of trading between the first and last halves of each month which may account for the difference in reported returns over these two periods.

This study makes three other important contributions. First, both the Canadian turn-of-the-year effect and the monthly anomaly are fully documented. There are no published studies using detailed daily data of these anomalies.

Second, the level and extent of trading on the TSE is documented. This is of particular interest to those investors and researchers concerned with issues of liquidity and marketability of Canadian equity listings.

Third, the results highlight the caution which must be exercised when employing rates of return in empirical analysis. The tendency for securities to shift systematically from transactions at the bid price to transactions at the ask price is widespread, especially for small dollar value transactions. To the extent that these trades represent activity in small firms, the resulting mismeasurement of return may be a contributing factor in studies which find that small firms outperform the market at the turn-of-the-year.

In summary, the use of new methods and intraday data increases our understanding of the turn-of-the-year effect and provides important insights into anomalies which have puzzled financial researchers for almost half a century. The results are also important to the average investor since the anomalous returns do not represent profitable investment opportunities.

The remainder of this dissertation is organized as follows. In Chapter 2, I review the literature on the turn-of-the-year effect. This Chapter includes documentation of the size and extent of the Canadian turn-of-the-year effect, a description of the data and a discussion on

the methods used throughout this study. The empirical validity of the tax loss selling hypothesis is then tested.

In Chapter 3, I extend the analysis to show that capital gains regulations are not the only consideration in turn-of-the-year trading and that knowledge of the systematic changes does not represent an investment opportunity. In Chapter 4, I examine the role of portfolios in turn-of-the-year studies and review the literature on the disposition hypothesis, an alternate hypothesis forwarded to explain the annual anomaly. I repeat the analysis on portfolios of securities formed on the basis of capital gains and market value of equity. Evidence is found to suggest that investors do not act solely to minimize tax liabilities at the turn-of-the-year, although no support for the disposition hypothesis is found.

In Chapter 5, I limit the analysis to the last trade of the day for the months of December and January to show the relationship between reported returns and the level of buyer- and seller-initiated activity. Results from regression analyses strongly support the hypothesis that increased turn-of-the-year returns are driven by increased levels of buyer-initiated trading.

In Chapter 6, Ariel's monthly anomaly is analyzed. The purpose of this analysis is to determine if prima facie evidence exists to suggest other reported anomalies may also be related to changes in the nature and extent of investor trading behavior. This Chapter identifies

significant differences in trading between the first and second halves of the month.

Chapter 7 contains a summary of the conclusions and the implications for future research.

CHAPTER 2

THE TAX LOSS SELLING HYPOTHESIS

In this Chapter, I review the literature on the turn-of-the-year effect and the relevant portions of Canadian and U.S. income tax legislation relating to the taxation of capital gains and losses. The size and extent of the year end anomaly are examined, the data are described and I discuss the methods to be used throughout this study. I then test the empirical validity of the tax loss selling hypothesis.

2.1 Evidence of the Turn-of-the-Year Effect

Both Roll (1983) and Reinganum (1983) find the magnitude of the price increase in the first week of January is positively related to the magnitude of the short-term capital loss that could have been realized at the end of the previous year. They conjecture that the effect is largest for small firms because their stock returns are more volatile, because these issues trade less frequently and because tax exempt investors such as pension funds, have relatively small holdings in these stocks.

Berges, (BMS) McConnell and Schlarbaum (1984) examine monthly returns on 391 Canadian firms from January 1950 to December 1980. Although they find higher average returns in January, this phenomenon

exists both before and after the 1972 introduction of capital gains regulations[1].

2.2 U.S. and Canadian Capital Gains Legislation

Explanations of the turn-of-the-year anomaly usually center on tax loss selling by individual investors. Under Canadian income tax regulations, transactions are deemed consummated on the settlement date (the settlement day rule) which is five trading days after the transaction has been executed[2]. Thus, all trades an investor wants to include in the current tax year must take place at least five trading days prior to the calendar year end. In the United States, a sale of stock through an exchange is generally consummated on the date the contract to sell is entered into, and not when delivery of the stock is made[3]. During the last five trading days before the year end, U.S. investors have the option of choosing which tax year will be affected by the transaction. Financial researchers have generally believed that investors would delay taxable transactions and realize transactions which yield tax credits.

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1 Tinic, Barone-Adesi and West (1987) extend the BMS study by examining the role of American investors in Canada. The data employed were identical and the study serves primarily to confirm the BMS findings.

2 Interpretation Bulletin No. IT-133, paragraph 11(d).

3 See, for example, 1987 U.S. Federal Tax Reports paragraph 2831.03

2.3 The Size and Extent of The Turn-of-the-Year Effect

In Table 1, I document the size and extent of the turn-of-the-year effect in the U.S. and Canada over the period December 1977 through January 1989. Following Roll (1983), I calculate the mean difference in returns between an equally weighted index and a value weighted index[4] for the first 9 trading days and the last 9 trading days of each calendar year[5].

For U.S. securities, the turn-of-the-year pattern remains virtually unchanged from the description in the earlier study. Although the five day cumulative return of 4.15% from the last trading day in December through the fourth trading day in January appears considerably less than Roll's finding of 6.98% over the same days in the 1963-1979 period, there have been significant changes to the CRSP data tapes over the intervening period[6].

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[4] The equally weighted index proxies for a portfolio of small market capitalization firms while the value weighted index proxies for a portfolio of large market capitalization firms.

[5] The period December 1977 to January 1989 represents the maximum number of calendar year ends in this TSE intraday data set. Months are broken into first and last nine trading days to proxy for first and last halves since all months do not have equal numbers of trading days. This convention first used by Ariel (1987) is described in greater detail in Chapter 6. Unlike Ariel, at this point I do not include the last trading day of the calendar month as the first trading day of the next trading month.

[6] The CRSP data files have undergone several extensive revisions since the Roll study. Many changes such as the 1986 decision to delete American Depository Receipts (ADRs) have resulted in changes to the index return series.

For Canadian securities, the five day cumulative return is only 2.26%. However, due to the settlement day rule the end of the taxation year is day -6. If taxation has a significant role in the anomaly, it may be unreasonable to assume that the Canadian turn-of-the-year effect follows exactly the same timing as the U.S. anomaly[7]. Canadian mean daily returns are generally statistically significant at conventional levels throughout the turn-of-the-year period.

Keim (1989) argues that returns computed with closing bid or ask prices such as those used in Table 1 may not represent "true" prices[8]. Measurement error in portfolio returns results from bid or ask prices if investor buying and selling behaviors follow systematic patterns. Using closing bid, ask and transactions prices from the National Market System for trading in over-the-counter shares, he finds systematic tendencies for closing prices to be recorded at the bid in December and at the ask in early January. Further, he determines that after controlling for changing bid and ask prices, this pattern results in large portfolio returns on the two trading days surrounding the end of the year, especially for low-priced securities.

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[7] An additional complication is the level of trading between day -6 and the turn of the calendar year. This period which commences prior to the Christmas and Boxing Day holiday and continues to after the New Year's Day holiday contains the year's lowest volume trading days. Hence, reported returns may not be representative of "true" prices. This issue is discussed further in Chapter 5.

[8] See Blume and Stambaugh (1983) for a detailed discussion of the biases in computed returns.

Ritter (1988) contends that the turn-of-the-year effect arises from the "parking-the-proceeds" activities of investors. According to this theory, after investors sell securities at year end to realize tax losses, some of the sales proceeds are not immediately reinvested, but are "parked" until January. When these funds are reinvested, the buying pressure is concentrated in small firm securities which typically attract individual investors. Ritter's hypotheses are supported by analysis of the daily buy/sell ratios of the cash account customers of the largest U.S. retail brokerage house over a fifteen-year period. In contrast, Haugen and Lakonishok (1987) suggest the large January returns may result from professional fund managers purchasing perceived undervalued high risk securities early in the new year. There is no published evidence which directly supports this hypothesis.

This Chapter extends both Ritter's and Keim's work by examining the intraday buying and selling behavior of investors for securities listed on a major stock exchange. I find buying activity to be concentrated in the first seven months of the year and selling behavior to dominate in the last five months of the year. December has the highest and most statistically significant levels of seller-initiated activity, while January exhibits the highest levels of buyer-initiated trading. Seller-initiated trading generally dominates at significant levels throughout December up to and including the tax year end, after which statistically significant buyer-initiated activity occurs and continues throughout the first half of January. These results appear

driven by trades in which the total value of the transaction is less than $100,000[9]. I conclude that the turn-of-the-year effect is tax-related and associated primarily with small-sized transactions.

2.4 Data Description

Through the auspices of the Toronto Stock Exchange (TSE), all date and time stamped bid-ask quotes, transaction prices and volumes for every security listed on the Toronto Stock Exchange for the per . March, 1977 through June, 1989 have been made available. In addition, similar data for approximately 350 NYSE and AMEX securities from January, 1984 have been obtained[10]. The Canadian intraday transactions file also contains detailed information about the transacting brokers. Included in this information are data indicating whether the trade was made for a registered trader's account, a non-client account or a client

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[9] In the U.S., the NYSE and the AMEX classify any stock transaction of at least 10,000 shares as a block trade. In Canada, the Toronto Stock Exchange considers any stock transaction with a value of at least $100,000 as a block trade. This designation is, of course, purely arbitrary. Due to both the trading thinness on the TSE and the relatively low share prices, no other transaction value was deemed more appropriate.

[10] The Toronto Stock Exchange is the seventh largest of the world's major stock exchanges. In 1985, the market value of shares traded was $31,684 millions (U.S.) compared to $26,710 millions on the (eighth ranked) American Stock Exchange (1988 TSE Official Trading Statistics). See Hatch and White (1988) for a detailed comparison of Canadian and U.S. returns series. Recent Canadian data comprise approximately 400,000 quotes and 300,000 trades per month. No Canadian data are available for March 30, 1984. U.S. data are unavailable for November 24, 25, and 26, 1986. U.S. data for October 19, and October 23, 1987 are only available during the last half hour of trading.

account. A registered trader operates on the exchange floor and trades for the company account. A non-client is deemed to be any employee of a brokerage house and may be trading on a personal account or as an agent of the brokerage house. Clients are third party investors and may be either individuals or institutions.

Hence, it is possible to identify the parties on either side of any transaction as well as whether the trade was purchase or sale motivated. The discrimination between block and non-block transactions serves as a means of highlighting the trades of individual investors.

2.5 Testable Hypotheses

The tax loss selling hypothesis predicts that seller-initiated trading volume in stocks will increase at the tax year end as individual investors act to realize losses. The high January returns are hypothesized (Roll, 1983, p. 20) to result as a consequence of share prices rebounding to equilibrium levels as the selling pressure abates. Ritter (1988) generalizes tax loss selling to the "parking-the-proceeds" hypothesis, where individuals do not immediately reinvest all funds from December sales but "park" until January. When these funds are reinvested, the buying pressure pushes up the prices of the small firms' shares. I used the TSE's definition of a non-block transaction (< $ 100,000) to proxy for the trades of individual investors.

The analysis is based on the following testable tax loss selling hypotheses:

(1) The tax loss selling hypothesis predicts that the probability of a seller-initiated trade exceeds the probability of a buyer-initiated trade for small transactions towards the end of the taxation year.

(2) The generalized tax loss selling hypothesis also predicts that the probability of a buyer-initiated trade exceeds the probability of a seller-initiated trade for small transactions after the turn of the taxation year.

The null hypothesis is that on any given day the expected number of buyer-initiated trades equals the expected number of seller-initiated trades. This suggests a non-parametric approach to analyzing the number of trades in each category.

The most direct test is to estimate the binomial probability statistic:

$$P [\text{ sell (buy) }] = 0.5$$

The probability is estimated for days relative to the turn-of-the-year, based on the number of cases - pooled across years - in which the number of sells (buys) exceeds the number of buys (sells).

Tests of significance are based on the binomial Z-statistic:

$$Z = (p - \bar{p}) / \sqrt{(\bar{p})(1-\bar{p})/n}$$

where:

p = the observed probability of a seller-initiated transaction.

$\bar{p}$ = the mean probability of a seller-initiated transaction.

n = the total number of buyer- and seller-initiated transactions.

2.6 Methods

2.6.1 The Bid-Ask Mean Test

Prior to the availability of intraday quote and transaction data, the tick test was employed by academics and practitioners to determine the initiator of a trade. This test labels trades as seller-initiated if the transaction price is lower than the preceding trade price, and buyer-initiated if the transaction price is greater than the preceding trade price. Those trades with a price equal to the preceding trade ("zero" ticks) are usually discarded.

The tick test is unsatisfactory for two reasons in the current context; (1) the test can incorrectly identify the initiator of the

trade[11], and (2) trades consistently at the same value are not classified, leading to reduced power of the test[12].

Holthausen, Leftwich and Mayers (1987) demonstrate that the tick test causes serious misclassifications of (block) purchases. The authors have insufficient data to comment on misclassifications involving seller-initiated transactions. Robinson and White (1989) employ the bid-ask mean test where the mean of the preceding bid-ask quote is deemed the equilibrium price[13]. Transactions occurring above this value are designated buyer-initiated while trades occurring below this value are deemed seller-initiated. To assess the accuracy of the bid-ask mean test, Robinson and White analyze 99 known seller-initiated block trades and 97 known buyer-initiated block trades. Excluding zero ticks, the tick test correctly identifies 10 of 18 (56%) of the seller-initiated trades and 18 of 31 (58%) of the buyer-initiated trades. The

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[11] This problem is especially important in the case of thinly traded securities. Consider, for example, a buyer-initiated trade at the security's ask price; if the equilibrium price of the security then declines, even if the next trade is also at the ask price, the tick test registers a "down" tick (seller-initiated trade).

[12] Consider, for example, a buyer-initiated trade at the security's ask price; if the previous transaction had also been at the same ask price, the tick test would yield a zero tick and this observation would be discarded.

[13] Roll (1984) argues that in markets where transactions are costly to effect, a small region of price (the bid-ask spread) brackets the underlying value of the asset. The difference between the observed price and the underlying value serves as compensation to the market maker or dealer. The dealer sets the quotes symmetrically around the underlying value and the profits are a consequence of the random and equally probable arrival of buy and sell orders.

bid-ask mean test correctly identifies 61 of 72 (85%) of the selling trades and 51 of 74 (70%) of the buying trades. I believe the greater accuracy of the bid-ask mean test coupled with the higher retention of empirical observations justifies the use of this test.

Analysis of the classification method for the sample of U.S. securities (Table 2) reveals approximately 28% of all transactions are (unclassified) at the mean of the bid-ask quote. Only 12% of Canadian transactions are unclassified[14]. Under-representation of U.S. thinly traded securities and differing buyer-initiated characteristics, both of which are possible reasons for this difference are discussed in the following section.

2.6.2 Analytical Methods

Analysis of the aggregate data sets using the bid-ask mean test reveals that the probability of a seller-initiated transaction is significantly different from the 0.5 expectation. This may occur for several reasons. One simple explanation is that at the transaction level investors buy shares in greater quantity than they sell shares.

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[14] Hasbrouck (1988) using the same bid-ask mean test to analyze NYSE intraday data for the 42 trading days in March and April 1985, classifies 39.2% of the transactions as buyer-initiated and 44.2% as seller-initiated. Comparable statistics over the same time frame for the sample used in this dissertation are 35.5% and 37.0% as buyer-initiated and seller-initiated, respectively.

The general theory of optimal portfolio selection implies that even with unchanged expectations and tastes, individuals should continually rediversify their portfolios by selling some of the stocks which have appreciated in value and buying more of the stocks which have declined in value. Since the selling price will be greater than the buying price, this suggests more shares bought than sold. Transactions costs and minimum lot sizes may result in the more seller-initiated than buyer-initiated transactions. An alternate explanation contends that as institutions are becoming larger and thus net buyers of securities, individuals are becoming ne pliers (sellers) of securities.

Empirically, I find that the estimated probabilities of a seller-initiated transaction relative to the sum of the identified buyer- and seller-initiated transactions over the entire study period (Table 3) are:

P[Sell: U.S. data] = 0.495 Z-statistic = -35.84

P[Sell: Cdn. data] = 0.541 Z-statistic = 430.66

These binomial Z-statistics are calculated relative to the expected probability of 0.5. Both values are significant at the 0.01 level. In computing the Z-statistics, an important issue is the determination of the appropriate expected probability of a seller-initiated transaction for the population.

I use block (non-block) classification of trades as a proxy for identifying whether a trade involved institutional (individual)

investors. Robinson and White (1989) report that higher priced shares and non-block transactions, less than 10,000 shares, are more likely to trade at the mean of the bid-ask quote than blocks and lower priced shares. Their results for TSE and U.S. listings are similar. For U.S. listings, they report the percentage of non-block (block) trades occurring at the mean of the bid-ask quote ranged from 6.51% (3.87%) for securities valued $5.00 or less to 21.33% (16.75%) for securities valued over $20.00. Overall, the percentage of transactions at the mean of the bid-ask quote were 20.13% and 15.68% for non-block and block transactions respectively. The finding that a smaller percentage of trades occurs at the mean of the bid ask spread is consistent with larger numbers of lower priced security trades. Since TSE securities are generally lower priced than U.S. equity listings, this finding is not unexpected.

Given my results for the classification of trades (Table 2) that Canadian unclassified trades have both a greater value per trade and a higher dollar value per share than both identified buyer- and seller-initiated transactions, I believe that the majority of unclassified transactions are buyer-initiated. Thus, I use sub-group, for example block and non-block, mean probabilities of a seller-initiated trade in computing the adjusted Z-statistics. This technique recognizes that the amount of unclassified transactions may bias the probability of a seller-initiated transaction away from 0.5 and computes the adjusted Z-statistics relative to the observed mean.

2.7 Results

2.7.1 Monthly Results

Throughout this dissertation, U.S. results for the 1984-89 period are presented along with Canadian results for the period 1977-89 for comparison purposes. Shortening the Canadian sample to match the 1984-89 period was not deemed appropriate for several reasons. First, the power of the test is provided by the length and breadth of the Canadian data set. Second, the U.S. data set is not exhaustive and under-represents thinly traded securities. Therefore, it may not be totally representative of even the U.S. market. The major shortcomings arise in portfolio formation and are described in greater detail later (Chapters 4 and 5) in this dissertation. Finally, in the majority of cases, the U.S. data serve merely to confirm the Canadian results and to show that they should not be considered anomalous.

To test for seasonal buying, I determine the probability of a sell transaction (Table 3) for every calendar month. For U.S. securities, statistically significant buyer-initiated trading occurs through the first seven months of the year[15]. In August, neither buyer- nor

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[15] Since P[Sell] is generally not equal to the expectation of 0.5, it is often helpful in interpreting the Tables to examine the sign of the adjusted Z-statistic. A negative value indicates a greater degree of buyer-initiated activity while a positive value reflects higher levels of seller-initiated trading. An adjusted Z-statistic with an absolute value greater than or equal to 2.33 is significant at the 0.01 level.

seller-initiated trading dominates. For the remaining four months, statistically significant seller-initiated trading i served. The Canadian results also reported in Table 3, based on aggregate (both public and non-public[16]) transactions are similar. Although the aggregate February trading is seller-dominated and November trading is buyer-dominated, this reverses when only public-initiated transactions are considered[17].

For public only transactions, the probabilities of a sell transaction are:

	Transactions ≥ $100,000		Transactions < $100,000	
	P[Sell]	Adj. Z-stat.	P[Sell]	Adj. Z-stat.
February	0.549	- 3.75	0.521	-1.28
November	0.574	4.16	0.527	10.55

Thus, for public-initiated transactions the pattern of buyer- and seller-initiated trading in both U.S. and Canada is identical: on average, buyer-initiated trading dominates the first seven months and seller-initiated trading dominates the last five months. In both groups, December results are the most significant and January displays the highest average number of buyer-initiated transactions. Although

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16 Non-public transactions are deemed to be those trades initiated by floor traders and employees of brokerage houses. Public transactions are initiated by client accounts.

17 All other months remain significantly buyer or seller dominated as described in Table 3.

this annual pattern of buying and selling transactions has not been previously identified, the results are consistent with Ritter's (1988) hypothesis of parking the proceeds activities by individual investors who sell toward the end of one taxation year and do not reinvest until the new taxation year.

The method used assumes that trades in December are drawn from the same population as transactions in all other months. Calculating the binomial Z-statistics for the difference between the means of two populations yields more significant Z-statistics due to the resulting smaller estimated standard deviation. For example, limiting the analysis to individual public only transactions valued less than $100,000, the comparable turn-of-the-year statistics are:

	P[Sell]	Adj. Z-stat	Adj.* Z-stat
January	0.513	-23.14	-24.85
December	0.555	69.26	72.07

where:

Adj. Z-stat is calculated assuming December is drawn from the same population as transactions in all other months.

Adj.* Z-stat is calculated assuming December is drawn from a different population than transactions in all other months.

Therefore, in all cases, I test the most conservative null hypothesis[18].

2.7.2 Aggregate Daily Turn-of-the-Year Results

To identify specific turn-of-the-year tax related behavior, I pool transactions across years for the 20 trading days before and after the calendar year end[19]. Table 4 presents the results for the trading days leading up to the year end. For U.S. securities only day -9 is statistically insignificant. Excluding the buyer-dominated trading on day -17, all other days up to and including the day immediately prior to the turn-of-the-year are seller-dominated. This result is unexpected as Roll (1983)[20] reports that the day immediately prior to the year end experiences significant excess returns[21]. On each of the last four days

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18 I also calculated Z-statistics based on the difference between two means of normally distributed variables, each variable being characterized by the same unknown variance. While significance was obtained in December, levels were substantially reduced. These results are not reported since the distribution of P[Sell] is non-normal. Also, if the two hypothesized populations have different variances, then the Behrens-Fisher problem results (See Kmenta, 1986, p. 147) and is not easily resolved.

19 This period was arbitrarily chosen because it generally covers all trading days in both December and January.

20 See also, Reinganum (1983) and Keim (1983).

21 Roll's analysis was performed on daily CRSP data. If the closing trades on the day prior to the year end tend to be buyer-initiated, excess returns calculated on a daily basis and seller-dominated trading are not inconsistent. Wood, McInish and Ord (1985), Harris (1986), and Terry (1986) have found higher returns to occur at the end of the trading day. I test this possibility in Chapter 5.

the probability of a sell transaction is 59% or greater. These results are generally consistent with previous studies of tax loss selling.

Reinforcing these notions are the Canadian results. Up to and including day -6 (the last day of the year for tax purposes) all activity is significantly seller-initiated. Commencing on day -5 and continuing through the first half of January (Table 5) transactions are significantly buyer-initiated.

The heavy seller-initiated trading throughout December is consistent with "wash sale" tax provisions in both countries. Losses on securities purchased and sold within the same 30-day period are deemed artificial and are disallowed by both taxing authorities. Hence, individuals who wish to capture the loss in one taxation year but still believe in the long-run prospects of the securities may choose to sell early in December in order to repurchase the security in January. Also, investors seeking execution at favorable prices in thinly traded securities may enter the market with limit orders several days prior to the last day for tax purposes. The substantial increase in seller-initiated trading toward the end of the taxation year may then reflect increased use of market orders to guarantee immediate execution.

Table 5 shows that the shift to buyer-initiated activity discerned by Keim (1989) in closing data, prevails throughout the daily trading intervals. For U.S. securities in January, 13 of 20 days are buyer-dominated; the first four days and days 7 through 12 are days of

consecutive buyer-initiated activity. Canadian buyer-initiated trading occurs throughout the first 12 days of January. This activity is consistent with the larger observed returns over the first few trading days of January reported in Roll (1983) and Ariel (1987)[22].

2.7.3 Daily Turn-of-the-Year Results for Publicly Initiated Trades

The tax loss selling hypothesis asserts that the January effect is caused by the behavior of individual investors attempting to exploit capital gains provisions. Institutions should be either tax exempt or not subject to capital gains regulations. I test this assertion by restricting the analysis to transactions in which the initiator is coded as a client account[23]. I subdivide this group based on the TSE's $100,000 definition of a block transaction to discriminate between individual and institutional investors.

Table 6 presents the results of this analysis. For securities in which the transaction value is less than $100,000 the results reported in Table 4 are confirmed. Significant levels of seller-initiated trading occur up to day -6 after which buyer-initiated trading dominates, particularly on the day immediately preceding the turn of the calendar year. The same is not true for transactions valued over

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22 Analysis presented in Chapter 6 indicates that the first halves of months are not always significantly buyer-initiated. Generally, results follow the pattern shown in Table 3.

23 The U.S. data do not contain these broker codes. Hence, the analysis is restricted to the Canadian database.

$100,000. Levels of buyer- and seller-initiated trading are generally indistinguishable statistically, although day -1 displays significant buyer-initiated trading. These results are generally inconsistent with Haugen and Lakonishok (1987), only on days -1, -6 and -9 is there limited support for their position. It is also possible that the significant levels of seller-initiated activity on these days may represent the trading behavior of individuals trading in large blocks.

Examination of the test results for January (Table 7) support the conjecture that small sized transactions drive the turn-of-the-year effect. Transactions valued less than $100,000 are significantly buyer-dominated throughout the first twelve days of January. Large transactions are significantly buyer-initiated for two days at mid-month and for four of the last five days. The increased volume in the number of transactions at month end coupled with the increased probability of buyer-initiated trading are consistent with earlier studies[24] which found evidence of a January effect using monthly data.

2.8 Summary

I compare intraday transaction prices to the mean of the immediately preceding bid-ask quote to determine the initiator of the trade. The implications of the tax loss selling hypothesis are tested

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[24] See Berges, McConnell and Schlarbaum (1984) and Tinic, Barone-Adesi and West (1987).

by determining the probability of a seller-initiated transaction at appropriate points in the calendar and taxation year.

I conclude:

(1) There is a systematic component to the buying behavior of investors. In general, buyer-initiated trading dominates the first seven months and seller-initiated trading is dominant in the last five months of the year.

(2) Assuming that block transactions are attributable to institutional investors, there is no indication that institutional investors engage in any systematic buying or selling activity at the turn-of-the-calendar year.

(3) Seller-initiated trading activity in Canada switches dramatically to buyer-initiated on day -5, the first day of the new taxation year. In contrast, the U.S. seller-initiated trading continues through to day -1, in accordance with the U.S. taxation year end. This is strong support for the tax loss selling hypothesis.

(4) Assuming that small transactions are initiated by individual investors, then in combination with (2) and (3), the tax loss selling hypothesis is strongly supported.

(5) The existence of significant levels of seller-initiated trading prior to the effective taxation year end is consistent with the theoretical arguments of Constantinides (1984) that loss realization should not be confined to the last trading day of the year.

CHAPTER 3

THE BEHAVIOR OF PROFESSIONAL TRADERS

In this Chapter, I extend the analysis to show that capital gains regulations are not the only consideration in turn-of-the-year trading. The results demonstrate that professional investors generally not subject to capital gains regulations also engage in year end selling. No evidence is found of attempts to exploit the turn-of-the-year increase in stock returns.

3.1 Introduction

In this Chapter, I test the empirical validity of the implicit assumption in the tax loss selling hypothesis that turn-of-the-year trading is driven by individuals realizing capital losses. I examine the year-end transactions of individuals generally not subject to capital gains regulations. The incidence of buyer- and seller-initiated intraday trading of professional traders (registered traders and brokerage house employees) is analyzed throughout the calendar year and specifically at the turn-of-the-year. The methods employed are the same as those discussed in Chapter 2.

The results strongly support those found in Chapter 2 although I no longer find buying activity to be concentrated in first half of the year while selling activity dominates the latter half of the year. Nonetheless, seller-initiated trading continues to dominate throughout

December up to and including the tax year end, after which significant buyer-initiated activity commences and continues throughout the first half of January. I conclude that the turn-of-the-year effect is tax-related but not associated uniquely with capital loss transactions.

3.2 Testable Hypotheses

As described in Chapter 2, the tax loss selling hypothesis predicts that seller-initiated trading volume in stocks will increase at the tax year end as investors act to realize capital losses. The high January returns are hypothesized to result as a consequence of share prices rebounding to equilibrium levels as the selling pressure abates. This explanation has always been countered by the argument that knowledge of this annual selling/buying seasonal should be arbitrageable; professional traders should buy in December and sell in January. I specifically test this argument.

The analysis is limited to registered traders and employees of brokerage houses to proxy for professional traders. A significant exception to capital gains regulations applies to individuals or companies which are considered to be in the business of security trading. In such cases, all capital gains or losses are deemed business gains or losses and are subject to regular income tax rules and regulations. For professional traders in the business of security trading, capital losses are completely deductible and generate a

marginal tax benefit of t_t*(loss), where t_t is the professional trader's marginal tax rate. Individual investors only benefit by $(1-c_1)*t_p*$(loss), where c_1 is the disallowed portion of the loss and t_p is the investor's marginal tax rate. Hence, if professional traders file tax returns on a calendar year basis, they have a greater incentive to engage in tax loss selling but are also best situated to exploit any resulting mispricing.

I assume that the professional traders are in the business of security trading and would attempt to arbitrage the turn-of-the-year seasonal, if it were profitable to do so.

The analysis is based on the following testable hypotheses:

(1) For professional traders, the probability of a buyer-initiated trade exceeds the probability of a seller-initiated trade towards the end of the taxation year.

(2) For professional traders, the probability of a seller-initiated trade exceeds the probability of a buyer-initiated trade after the turn of the taxation year.

3.3 Results

3.3.1 Monthly Results

In the previous Chapter, I examine TSE data for public (individual and institutional) investors which account for approximately fifty-eight percent of all identified buyer- and seller-initiated transactions. In Table 8, I provide the monthly breakdown between public-initiated and professional trader initiated transactions over the twelve year period to show the relative size of the two sub-groups.

Above average levels of professional trader initiated activity occur over the five consecutive months from October through February. The relative level of professional trader activity is lowest in July and greatest in January although the total volume of trading is lowest in December. To test for seasonal buying/selling activity, I determine the probability of a sell transaction (Table 9) for every calendar month. In Chapter 2, based on both public and non-public transactions, I find that statistically significant buyer-initiated trading occurs through the first seven months while seller-initiated trading dominates the last five months of the year. I find no such pattern when examining trades initiated by professional traders. However, I do find statistically significant seller-initiated trading in December and significant buyer-initiated trading in January consistent with previous studies of tax loss selling.

3.3.2 Daily Turn-of-the-Year Results

To identify specific turn-of-the-year tax related behavior, I again pool transactions across years for the twenty trading days before and after the calendar year end. Table 10 presents the results for the trading days leading up to the year end. Without exception, all days up to and including day -6 (the last day of the year for tax purposes) display seller-initiated activity and are significant at the 0.01 level. Commencing on day -5 (the first day of the new taxation year) and continuing through the twelfth trading day of January buyer-initiated trading dominates; the results are statistically significant in excess of the 0.01 level.

The trading behavior of professional traders is virtually identical to that of public sector investors which suggests that there are no significant attempts by the professional traders to act contrary to the market. I conclude therefore that the year end anomaly does not represent a potentially profitable investment opportunity.

Table 11 shows that the shift to buyer-initiated activity in January discerned by Keim (1989) in closing data and detailed in Chapter 2 continues to prevail throughout the daily trading intervals even for this sub-group. Of the five days dominated by seller-initiated trading, only three days are significant at the 0.01 level. Four of the seller dominated trading days occur in the last five days of the month,

consistent with the larger observed returns over the first few trading days of January reported in Roll (1983) and Ariel (1987)[25].

3.4 Summary

The role of professional traders in the turn-of-the-year effect is tested by determining the probability of a seller-initiated transaction at appropriate points in the calendar and taxation year.

Based on the empirical results, I conclude:

(1) There does not appear to be a systematic component to the buying behavior of professional traders. Since professional trader transactions account for approximately 42% of all identified TSE trades, this confirms that public-initiated trades drive the buyer dominated trading over the first seven months and the seller dominated trading in the last five months of the year.

(2) Notwithstanding (1), January experiences significant buyer-initiated trading and December significant seller-initiated

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[25] In Chapter 6, I analyze Canadian public initiated transactions and find that, in general, the first half of trading months experience significantly greater volume than the later half. Buyer-initiated trading tends to dominate from just prior to the turn of the month to the fifth day of the new month. Significant consecutive days of seller-initiated trading are found in the second half of the month. Buyer behavior tends to be concentrated both throughout the first seven months and over the first half of each month.

trading. Further, the seller-initiated trading activity switches dramatically to buyer-initiated on day -5, the first day of the new taxation year. This is strong support for tax related trading by the professional traders.

(3) Assuming that the professional traders are not subject to capital gains regulations, (2) suggests that the end of the year is a time of tax related trading not necessarily associated with capital loss implications. This result is not totally unexpected since Berges, McConnell and Schlarbaum (1984) found evidence of a turn-of-the-year effect in Canada before the 1972 introduction of capital gains regulations[26].

(4) To the extent that registered traders and brokerage house employees represent potential arbitragers; I find no evidence of significant attempts to arbitrage the turn-of-the-year seasonal. This supports arguments that, in general, the turn-of-the-year effect does not represent a profitable arbitrage opportunity.

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[26] Jones, Pearce and Wilson (1987) document evidence of a turn-of-the-year effect in the U.S. dating back to 1871 -- forty-three years prior to the introduction of income tax legislation.

CHAPTER 4

THE USE OF PORTFOLIOS IN TURN-OF-THE-YEAR STUDIES

In this Chapter, I examine the role of portfolios in turn-of-the-year studies and review the literature on the disposition hypothesis; an alternate hypothesis which has been put forward to explain the turn-of-the-year effect. I repeat the analysis on portfolios of securities formed on the basis of capital gain/loss and market value of equity. Although, I present evidence to suggest that investors do not act solely to minimize tax liabilities at the turn-of-the-year, there is no evidence to support the disposition hypothesis.

4.1 Introduction

The use of portfolios is widespread in studies examining the turn-of-the-year effect. Portfolios are used primarily for two reasons: (1) the combination of securities serves to reduce measurement error in OLS beta calculations[27] and, (2) portfolios represent a convenient means of discriminating between types of securities over time without having to rely on individual security identification. Returns in the turn-of-the-year context generally refers to returns on portfolios of securities[28].

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[27] See, Black, Jensen and Scholes (1972), Fama and MacBeth (1973), Black and Scholes (1974) and Banz (1981).

[28] I specifically examine the relationship between portfolio returns and the level of buyer-initiated trading in Chapter 5.

Banz (1981) and Reinganum (1983) report a significant negative relation between abnormal returns (as measured by the capital asset pricing model) and market value of common equity for sample portfolios of NYSE and NYSE-AMEX firms, respectively[29].

Roll (1983) and Reinganum (1983) find the magnitude of the price increase in the first week of January is positively related to the size of the short term capital loss[30] that could have been realized at the end of the previous year.

In this Chapter, I examine the relation between relative market value of equity, capital value appreciation and the nature of turn-of-the-year trading behavior. This also allows me to test the major implication of the disposition hypothesis. Since this dissertation does not rely upon the specification of a returns generating process, portfolios are used to categorize securities.

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[29] Although it is not clear that the anomalous returns derive explicitly from a CAPM failure to account for firm size, several studies have shown that anomalous return behavior associated with a firm specific variable is largely subsumed under the "size" effect. For example, Reinganum (1983) finds the relation between abnormal returns and P/E ratios reported by Basu (1977) appears to vanish after controlling for size. Keim (1980) finds a significant negative relation between abnormal returns and the degree to which market value of equity exceeds both book value of equity and interprets this relation as a proxy for the size effect.

[30] In Canada, there is no distinction between short term and long term capital gains.

4.2 The Disposition Hypothesis

The disposition hypothesis has its roots in prospect theory as outlined by Kahneman and Tversky (1979)

> "...people tend to underweight outcomes that are merely probable in comparison with outcomes that are obtained with certainty. This tendency...contributes to risk aversion in choices involving sure gains and to risk seeking in choices involving sure losses." (p. 263)

Shefrin and Statman (1985) argue that financially this means investors will realize capital gains too soon and will hold securities with capital losses too long. The empirical evidence cited in their study does not reject the predictions of the neoclassical economic model in favor of the predictions of the behavioral model.

De Bondt and Thaler (1985, 1987) argue this alleged tendency for investors to violate Bayes' rule results in "overreaction" which affects stock prices. They find past losers consistently outperform past winners and conclude excess returns are related to both short term and long term performance, as well as to the previous year's market return[31]. They invoke the Kahneman and Tversky explanation to support the argument that investors push stock prices to unsustainable levels. However, De Bondt and Thaler's findings are open to efficient market arbitrage and CAPM methods criticisms. The failure to explain the

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[31] Chan (1986) and De Bondt and Thaler (1985) find the excess returns in January of securities sold in December may last for as long as five years.

anomaly using conventional (OLS) methods does not imply that an alternate behavioral explanation is correct. The study's major weakness is the authors' inability to explain why "contrary" investors are too few in number or market power that the overreaction to new information persists for so long.

In the only published test of competing turn-of-the-year theories Ferris, Haugen and Makhija (FHM) (1988) test the tax loss selling hypothesis and the disposition effect on the basis of their predictions for year-end trading volume. Tax-loss selling predicts volume will be relatively high at the end of the year as investors who traded earlier realize losses. The disposition hypothesis predicts relatively low year-end volume for these stocks, based on the notion that these investors will be reluctant to sell[32]. The authors conclude that their results are inconsistent with tax loss selling and supportive of the disposition effect not only as a determinant of year-end volume, but as a determinant of volume levels throughout the year.

However, the study suffers from several methodological difficulties. The sample is limited to the 30 smallest market capitalization firms listed on the CRSP tape from December 1981 to January 1985. The stocks were chosen because (FHM argue) small firm

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[32] Shefrin and Statman (1985) argue that even investors who are reluctant to realize losses may do so at the end of the taxation year if the pecuniary benefits from tax loss selling outweigh the psychic cost of recognizing a poor investment choice.

securities are likely to have high volatility in returns, making them candidates for tax strategies and because small firms are more likely to be held by tax paying individuals.

FHM pool abnormal volume from days within 365 calendar days into eight price ranges. These abnormal volumes are then regressed on the cumulative raw volume for the eight price ranges. This effectively focuses on the price volatility of these small securities.

Many theoretical and empirical studies show that the percentage bid-ask spread decreases with firm value and price level and increases with volatility. When prices and values fall (rise), volatilities generally rise (fall). This causes transactions costs to increase (decrease) so that less (more) volume will be observed. This prediction is identical to that of the disposition hypothesis, which is supported by the FHM results.

Hence, the sample highlights the securities for which rice volatility is greatest and for which the transaction cost explanation for volume may be especially important. Further, since only the smallest 30 firms are analyzed, many of the sample firms are likely losers for which prices have changed more than would be expected given a random sample.

Two further difficulties arise from the annual pooling of observations. First, pooling in the FHM fashion obscures the length of

the holding period; a matter of some importance in the U.S. for tax loss selling[33]. Second, FHM assume that all year end volume is seller-initiated. However, by construction, their results for the later days in December are based on regressions in which volumes for earlier days in the current and previous December are assumed to be buyer-initiated.

I perform a simple and direct test of the disposition hypothesis which overcomes these difficulties.

4.3 Testable Hypotheses

If capital appreciation plays a role in tax loss selling then at the turn-of-the-taxation-year the following hypotheses can be examined[34]:

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[33] In the U.S., the short term holding period was six months in 1942-76, nine months to 1978 and one year thereafter. Short term gains or losses are taxed as ordinary unearned income, while long term gains and losses are taxed at 40% of the investors marginal tax rate on ordinary income. Net short term losses and net long term gains incurred in the same year offset each other. Also, net short term losses and 50% of net long term losses are limited to a deduction of $3,000 in any year. Unused capital losses may be carried forward indefinitely.

[34] Note that this is a test of an assumption of the reason for a seller-initiated trade at the end of the taxation year and not a test of whether the sale was motivated by capital gains tax or income tax considerations.

(1) The tax loss selling hypothesis predicts that the probability of a seller-initiated trade in a portfolio of securities with capital losses exceeds the probability of a buyer-initiated trade.

Alternatively, if the disposition hypothesis is an accurate description of investor behavior then early in the new taxation year the following testable hypothesis should hold:

(2) The probability of a seller-initiated trade should exceed the probability of a buyer-initiated trade for portfolios with capital gains.

If the market value of equity is a determinant in the nature and level of trading at the turn-of-the-year then the following testable hypothesis can be examined:

(3) The generalized tax loss selling hypothesis predicts that the probability of a buyer-initiated trade in a portfolio of securities with a small total market value of equity should exceed the probability of a seller-initiated trade early in the new taxation year.

In each case, the null hypothesis is that the probability of a buyer-initiated transaction and the probability of a seller-initiated transaction are equal to the observed sample mean probabilities.

4.4 Data Description

Canadian securities are combined on the basis of relative capital gains and market value to form portfolios. U.S. securities are formed into portfolios on the basis of relative capital gains and price[35]. Analysis is restricted to the twenty days preceding and following the turn-of-the-year.

I also restrict the Canadian analysis to transactions valued less than $100,000 since they generally form more than 98% of all transactions. Unlike previous studies which preclude comparison of portfolios from December to January, portfolios are not reformed at the end of each calendar year.

For capital gains portfolios, I calculate the relative capital gain as the difference between the average November sell price and the average January buy price divided by the average January buy price. An important issue in the formation of capital gains portfolios is the length of the appropriate holding period. I have arbitrarily chosen a one year period and assume that investors base their decisions on the eleven month price difference between January and November of that same

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[35] The U.S. data files do not contain information on the number of outstanding shares. Consequently, portfolios based on market value of equity could not be formed. Blume and Stambaugh (1983) and Stoll and Whaley (1983) show stratifying by price or size produces very similar results. Hence, in this case, I use average price to proxy for market value of equity.

year. Although any period could possibly be chosen, the disposition hypothesis as currently defined in the literature does not assume any specific holding period. Hence, if the disposition hypothesis is an accurate description of investor behavior, it should hold over the per[illegible] used in this dissertation.

For market value portfolios, the total market value of equity is determined by multiplying the closing November price by the number of shares outstanding at that time. U.S. price portfolios are formed on the basis of average trading price in November. Portfolios are reformed each November thereby allowing comparison of December and January results.

In Tables 12 and 13, I present evidence which bears directly on the level of trading on the TSE and in the U.S. sample. Canadian portfolios contain approximately 200 securities while U.S. portfolios contain approximately 13 securities. Nonetheless, the total number of trades are surprisingly comparable. Over 50% of the total number of trades in Canada, may be accounted for by the largest four portfolios in both December and January. The smallest size Canadian portfolio in January averages approximately 200 trades per day -- 1 trade per security. The largest portfolio averages almost 2000 trades per day -- 10 trades per security. Comparable U.S. figures are: 18 trades and 166 trades per security per day for the smallest and largest portfolios, respectively. Trading in U.S. portfolios is more evenly distributed suggesting a much lower level of trading infrequency. To the extent

that abnormal returns have been used in previous studies to measure the size of the turn-of-the-year effect and since stock returns generally experience a positive drift, thin trading biases reported daily returns upwards.

4.5 Results

4.5.1 Results for Capital Gains Portfolios

For the eight smallest Canadian Capital Gains Portfolios (Tables 14A through 14E) over the twenty trading days prior to the calendar year end statistically significant seller-initiated trading generally takes place up to day -6, the effective end of the taxation year. For portfolios 2, 3 and 4, over the next five days buyer- and seller-initiated trading are generally indistinguishable statistically. In all other portfolios, trading switches on day -5 to significantly buyer-initiated. Results for portfolio 9 show a mixture of significant levels of buyer- and seller-initiated trading throughout the month. The largest portfolio however, experiences significant levels of buyer-initiated trading throughout December. Overall, these results are consistent with both tax loss selling and institutional "window dressing" where professional portfolio managers allegedly purchase securities which will improve the appearance of their balance sheets for

year end evaluation purposes[36]. The results for the largest two portfolios conflict with the predictions of the disposition hypothesis.

To the extent that capital gains are experienced in all portfolios, the seller dominated trading supports the finding in Chapter 3 that capital gains legislation is not the sole determinant of year end trading activity.

In January, all Canadian Capital Gains Portfolios (Tables 15A through 15E) generally display significant levels of buyer-initiated trading throughout the first half of the month. Only one day (day 15) is not buyer dominated for the largest portfolio.

The disposition hypothesis argues that investors wish to realize gains as soon as possible, hence all portfolios with capital gains and this portfolio in particular, should be seller dominated. This finding contradicts the major implication of the disposition hypothesis.

These results also provide additional support for both Ritter's park and ride hypothesis and the portfolio rebalancing hypothesis. Since the portfolios contain exactly the same securities in December and January of each year, it appears that with the exception of the two

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[36] See Haugen and Lakonishok (1987).

portfolios with the largest capital gains, investors purchase in January the same or equivalent securities they sold in December[37]

U.S. Capital Gains Portfolios in December (Tables 16A through 16E) exhibit significant levels of seller-initiated activity up to and including the last day of the calendar year. Significance levels generally increase as the year end approaches in keeping with the tax loss selling hypothesis. In January (Tables 17A through 17E), U.S. Capital Gains Portfolios are generally buyer dominated, especially for the two smallest and the two largest portfolios. Portfolios 6 and 7 are somewhat anomalous since they exhibit some degree of seller dominated activity. In general however, these results serve to support the tax loss selling and portfolio rebalancing hypotheses and to refute the disposition hypothesis.

4.5.2 Results for Canadian Market Size and U.S. Price Portfolios

Results for Canadian Market Value Portfolios (Tables 18A through 18E) are consistent with those reported in Chapter 2. Excluding the last five trading days, significant levels of seller-initiated transactions dominate December, generally increasing in significance

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[37] This finding challenges the wash sale provisions. In both the U.S. and Canada, no definition of an equivalent security appears in the income tax legislation. However, as a general rule, securities in the same firm but in different classes which confer identical rights on the investor would be deemed equivalent. Securities in different firms, with identical risk/return characteristics and conferring identical rights on investors would probably not be deemed equivalent.

with the approach of the taxation year end. This is strong evidence in support of a tax related selling hypothesis. Further, since the turn-of-the-year effect is usually associated with small capitalization firms which generally have small security prices (Stoll and Whaley, 1983), this suggests that mismeasurement of security returns may account for much of the observed anomaly.

In January, Canadian Market Value Portfolios (Tables 19A through 19E) display the characteristic levels of buyer-initiated trading throughout the month. The smallest two portfolios display the highest and most significant levels of buyer dominated trading from the first day of the new taxation year (day -5) through the fourteenth trading day in January. The largest portfolio is significantly buyer dominated from day -2 to day 12 with the exception of day 5. Unlike Lakonishok and Smidt's (1984) finding in the U.S. that the heaviest trading days for small securities are at the end of December, I find Canadian small securities are more likely to trade in January. These findings support the portfolio rebalancing and parking-the-proceeds arguments.

As seen in the Canadian results, U.S. Price Size Portfolios (Tables 20A through 20E) are seller dominated up to and including the last day for tax purposes. In January, all portfolios (Tables 21A through 21E) are generally buyer dominated especially over the first four trading days of the month. Again, strong support is found for a tax related selling hypothesis.

4.6 Summary

I examine the relation between relative market value of equity, capital value appreciation and the nature of turn-of-the-year trading behavior. This also allows a test of the major implication of the disposition hypothesis; that investors have an increased propensity to sell shares which have increased in value.

Based on my analysis, I conclude:

(1) In general, trading in December is seller dominated up to the effective end of the taxation year after which trading is buyer dominated (through January) for portfolios regardless of the basis on which they were formed. This result is consistent with those found in Chapters 2 and 3. This finding also provides reason to believe that the end of the year is a time of tax related trading. Both gains and losses may be realized without incurring a tax liability in the current year, if gains are offset by losses as allowed by income tax regulations. The evidence shows that trading is seller dominated for portfolios with either capital gains or losses. This finding supports such a gain and loss matching activity.

(2) Results for the portfolios comprising firms with the greatest market capitalization values strongly support a tax related selling hypothesis. Since previous studies reported the turn-of-

the-year anomaly predominated in small capitalization firms which generally have small security prices, this suggests that mismeasurement of security returns may account for much of the observed anomaly.

(3) The only exceptions to (1), are the two largest capital gains portfolios which are generally buyer-dominated through the 20 trading days prior to the calendar year end. This is supportive of two positions. First, investors who reconcile their portfolio positions at the year end may be attracted to "winner" securities. Second, the activity is consistent with popularly held beliefs of year end window dressing by professional portfolio managers.

(4) The existence of buyer dominated trading in December for the portfolio with the largest capital gains and the buyer-dominated trading in all capital gains portfolios in January are inconsistent with the primary implication of the disposition hypothesis. I reject this hypothesis as an accurate description of investor behavior.

(5) Results on the level and extent of trading in portfolios at the turn-of-the-year suggests that thin trading may play a significant role when a returns generating process is specified. Empirical analysis of security returns at the turn-of-the-year should account for the level of trading infrequency.

CHAPTER 5

THE RELATIONSHIP BETWEEN RETURNS AND CHANGES IN INVESTOR TRADING BEHAVIOR

Previous studies analyzed security (portfolio) returns based on closing prices to test explanations of the turn-of-the-year anomaly. In this Chapter, I show how these returns are related to investor trading behavior. The evidence strongly supports the use of buyer/seller-initiated trading levels as a determinant of turn-of-the-year returns.

5.1 Introduction

Prior to the availability of intraday data, researchers investigating the year end anomaly relied upon analyses of daily returns to portfolios of securities. Keim (1987) is among the latest of such studies and employs the common method of regressing total daily portfolio returns on dummy variables to highlight the day(s) on which anomalous behavior takes place.

In this Chapter, I limit the analysis used in the preceding Chapters to the last trade of the day for security transactions in December and January throughout the study period. Daily returns are computed from closing trade to closing trade. This limitation is specifically designed to show the relationship between the levels of seller (buyer) initiated activity and previous studies using returns data.

The methods employed in Keim (1987) are replicated for two reasons. First, this study is the most recent of the major published studies concentrating solely on anomalous returns and; second, the Keim study uses total reported returns and does not specify a returns generating process thereby eliminating any bias from that source.

Although he is primarily interested in determining whether the turn-of-the-year effect is related to abnormally high day of the week returns[38], Keim finds that returns are on average larger and exhibit a stronger relation to size in January than in the other eleven months for each day of the week. Further, the results of dummy regression analysis indicate that higher turn-of-the-year returns are not day-of-the-week specific.

My results indicate that the level of turn-of-the-year buying activity is a statistically significant determinant of the level of portfolio returns and provides a better explanation of year end returns

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[38] Previous day of the week studies (see, for example, French (1973), French (1980), and Gibbons and Hess (1981)) have found;
i) average portfolio returns tend to increase as the week progresses with average Monday returns being negative for every portfolio and average Friday returns being larger than on the other four weekdays.
ii) the difference between the average Friday return and the average returns of the other four days decreases as firm size increases.
iii) the negative relation between returns and firm size becomes more pronounced toward the end of the week.
Harris (1986) using intraday data shows that this size related Friday effect takes place primarily during trading hours.

than dummy variables used in previous studies. This is strong evidence that the turn-of-the-year anomaly is attributable to systematic changes in the level and extent of investor trading behavior.

5.2 Testable Hypothesis

If the higher average turn-of-the-year returns found in previous studies are attributable to systematic changes in investor trading behavior, then a testable hypothesis can be formed by limiting the analysis to returns based on closing prices and the level of buyer/seller-initiated activity in these transactions.

The purpose of this test is, i) to relate the probability of a buyer/seller-initiated transaction directly to prices and thus returns, and ii) to demonstrate that earlier analyses of returns were indirect tests of investor trading behavior.

Specifically, the following testable hypothesis can be examined:

(1) Turn-of-the-year returns are positively related to the level of buyer-initiated trading in closing transactions.

5.3 Preliminary Evidence of Investor Trading Behavior Based on the Last Trade of the Day

I proceed by initially limiting the sample to the last trade of the day for each security during the months of December and January. As noted above a major consideration in the analysis of returns data is the extent of thin trading among small size securities. The concern centers on two issues. First, securities which do not trade regularly impound information from longer intervals and although their returns are unbiased on average, they tend to be biased on a reported basis over shorter (non-trading) periods. Second, investors who hold securities which trade infrequently often have to concede larger premia in attempts to transact. To avoid bias from this source, I arbitrarily exclude all securities which do not trade on average five times (daily) and at least once a day[39].

On the TSE, a second concern is the absence of a requirement by market makers to update bid-ask quotations. Since limiting the sample to the last trade only would increase the weight such transactions would have, I eliminate any possible bias from this source by discarding all

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[39] Excluding extremely thinly traded securities is not an uncommon practice in empirical studies. Using price as the discriminating variable, the Laval Tapes used in both Berges, McConnell and Schlarbaum (1984) and Tinic, Barone-Adesi and West (1987) do not include securities which have an average price of less than five dollars on the basis that these securities are (arguably) thinly traded.

transactions which were evaluated against a quotation which was not posted on the current day.

In order to form portfolios, it was necessary to arbitrarily assign a day on which portfolios would be formed. To maximize the number of securities under analysis, I chose to form price size portfolios based on the security's closing price on the last trading day of the preceding November. As a result of these various restrictions, the Canadian sample subject to analysis comprised:

Year	# of Securities	Year	# of Securities
1977-78	253	1983-84	352
1978-79	286	1984-85	346
1979-80	384	1985-86	443
1980-81	384	1986-87	519
1981-82	303	1987-88	438
1982-83	381	1988-89	414

The year 1977-78 refers to the period December 1977 to January 1978. The U.S. sample with its relatively lower levels of infrequent trading ranged from 109 securities (January, 1985) to 150 securities (January, 1989).

In Table 22, I present comparative results for the U.S. and Canadian samples for the last 20 trading days of December. As in earlier analyses, data across years are pooled. The results are directly comparable to those presented in Table 4 although the current levels of significance are lower due to the fewer number of observations.

Interestingly, U.S. results are generally seller-dominated up to but excluding the last day of the calendar year which is statistically insignificant. This finding is consistent with Roll's (1983) finding that this day exhibits higher average returns. One day returns based on closing prices would be upward biased on this day[40], despite the statistically significant levels of seller-initiated trading throughout the day.

Canadian results remain significantly seller dominated up to and including day -6, the last day of the old taxation year. For the next five days results are mixed; day -1 is buyer dominated but day -2 is seller dominated, days -5 through -3 are statistically insignificant. These results are based only on closing trades. Since Canada has an open economy, the absence of heavy buyer-initiated trading as seen throughout the day may be attributable to foreign investors[41]. Nonetheless, the results are generally consistent with findings presented earlier.

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[40] Roll's (1983) analysis is based upon mean differences in returns between an equally-weighted and a value-weighted index. This method involves the use of proportional return calculations which have been shown to be upward biased in the presence of noise (eg. bid-ask spreads and discrete prices).

[41] Although Tinic, Barone-Adesi and West (1987) were unable to detect any significant activity by U.S. investors, their (Statistics Canada) data were not sufficiently refined to detect daily changes.

Table 23 presents the results for the first 20 trading days of the new calendar year. U.S. securities are generally buyer-dominated throughout the month as was the case in Table 5. Canadian securities display significant buyer-initiated trading on day 1 and statistically indeterminant trading on the following four trading days. This finding is consistent with the higher than average turn-of-the-year returns found by previous researchers.

In Tables 24 through 27, I limit the analysis to the Canadian sample only. The U.S. data tapes do not carry the requisite codes to perform the analysis on public versus non-public transactions. I also exclude analysis on large block transactions as the number occurring on the last trade of the day is generally too small to be statistically meaningful (average = 2.9 per day).

Tables 24 and 25 present the results for the last and first 20 trading days, respectively of the calendar year for public-initiated transactions smaller than $100,000. Seller-initiated trading dominates to day -6, after which results are generally statistically indeterminant through the middle of January. January does display significant levels of buyer-initiated trading especially in the later part of the month.

Tables 26 and 27 present the results for trades originating from floor traders and employees of brokerage houses. Again, trading is significantly seller-initiated up to and including day -6 after which trading is significantly buyer-initiated for four of the first six

trading days of the new taxation year. Trading is then generally indeterminant statistically through the sixth trading day of January.

5.4 Results of Regression Analyses

5.4.1 Descriptive Statistics of Price Portfolios

In Table 28, I present descriptive statistics of the Canadian price portfolios. The average price ranges from $ 0.95 in the smallest portfolio to $ 33.65 in the largest portfolio. Average (logarithmic) returns are generally monotonically decreasing from the smallest to the largest portfolio as are average standard deviations. All portfolio returns are significantly different from zero at least at the 0.05 level.

5.4.2 A Test of the Explanatory Power of P[Buy] over the First and Last 15 Trading Days of the Calendar Year

To examine whether there was any explanatory power in the level of buyer-initiated trading[42], the following regression was run over average portfolio returns. Due to the varying number of trading days in

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[42] The level of buyer- rather than seller-initiated trading was chosen as the explanatory variable so that results would be more easily interpretable. The probability of a buyer-initiated transaction is equal to 1 - P[Sell].

December, I arbitrarily decided to limit the sample to the first and last fifteen trading days of the calendar year.

$$\tilde{R}_{pt} = a_{p0} + a_{p1}*\tilde{B}_{pt} + \tilde{e}_{pt}$$

where:

$\tilde{R}_{pt}$ = the average logarithmic return on portfolio p on day t; p = 1...5, t = 1...30.

$\tilde{B}_{pt}$ = the probability of a buyer-initiated trade in portfolio p on day t; P[Buy] = 1 - P[Sell].

$\tilde{e}_{pt}$ = the random error term with an expected value = 0.

The null hypothesis is that the level of buyer-initiated trading on any given day is a determinant of the return for that day. This implies that a_{p1} should be positive and statistically significant. The alternate hypothesis is that the level of buyer-initiated trading does not influence the level of returns and that a_{p1} should be statistically insignificant.

The results of these regressions are presented in Table 29. In all cases, a_{p1} is positive and statistically significant, although its value decreases monotonically as average portfolio price increases. Each portfolio regression equation is significant at the 0.0001 level and the adjusted R^2 value is consistent with other studies employing daily data. The results are consistent with the hypothesis that the level of buyer-initiated trading is a determinant of security returns.

5.4.3 A Test of the Difference in Turn-of-the-Year Returns between the First 5 Days of the New Taxation Year and the Rest of the 30 Day Trading Period

To demonstrate the explanatory power of the level of buyer-initiated transactions as compared to previous studies, I commence by replicating Keim (1987) in which a dummy variable is used to capture the first five days of the new taxation year. I run the following regression over portfolio returns.

$$\tilde{R}_{pt} = a_{p0} + a_{p1}*D_t + \tilde{e}_{pt}$$

where:

$\tilde{R}_{pt}$ = the average logarithmic return on portfolio p on day t; p = 1...5, t = 1...30.

D_t = a dummy variable that equals one if day t is one of the first five trading days of the new taxation year and is zero otherwise.

$\tilde{e}_{pt}$ = the random error term with an expected value = 0.

In this case, the intercept a_{p0} measures the average return to portfolio p over the entire 30 day calendar year end period excluding the first five trading days of the new taxation year. The coefficient a_{p1} measures the difference in non-turn-of-the-year returns for portfolio p between the first five trading days of the new taxation year and the rest of the 30 period.

Estimates (t-statistics) for this equation are reported in Table 30. Each of the individual estimates of a_{p1} are generally statistically

significant as is the explanatory power of the individual regression equations. The results are consistent with and comparable to Keim's earlier findings.

I now redefine the regression equation to be:

$$\tilde{R}_{pt} = a_{p0} + a_{p1}*D_t + a_{p2}*D_t\tilde{B}_{pt} + a_{p3}*\tilde{B}_{pt} + \tilde{e}_{pt}$$

where:

$\tilde{R}_{pt}$ - the average logarithmic return on portfolio p on day t; p = 1...5, t = 1...30.

D_t - a dummy variable that equals one if day t is one of the first five trading days of the new taxation year and is zero otherwise.

$\tilde{B}_{pt}$ - the probability of a buyer-initiated trade in portfolio p on day t; P[Buy] = 1 - P[Sell].

$\tilde{e}_{pt}$ - the random error term with an expected value = 0.

The null hypothesis is that the level of buyer-initiated trading provides a better explanation of security returns than the dummy variable at the turn-of-the-taxation-year. Hence, one would expect a_{p3} to be positive and significant while a_{pi} provides no additional information. The coefficient a_{p2} is designed to measure the stability of buyer-initiated trading at the turn-of-the-year. If the coefficient is not significant, the level of buyer-initiated trading is stable at the turn-of-the-year. The alternate hypothesis is that the large average returns at the turn of the year are caused by the influence of factors other than the level of buyer-initiated activity. These factors would be reflected in positive and significant levels of a_{p1}.

Estimates (t-statistics) are presented in Table 31. In each case, the coefficient a_{p1} is positive but statistically insignificant and a_{p2} is negative and statistically insignificant. The coefficient a_{p3} is positive in every case and statistically significant at the 0.01 level for all portfolios.

These results are consistent with the hypothesis that the level of turn-of-the-year buyer-initiated activity is a determinant of security returns and are supportive of the Ritter's parking-the proceeds hypothesis. These results also suggest that neither the inclusion of a specific year end trading level variable nor the addition of a generic dummy variable improves prediction of turn-of-the-year returns. The larger and more significant coefficients for the smallest portfolios suggest that the level of buyer activity plays a more significant role for these securities than for higher priced securities.

5.4.4 A Test of the Difference in Turn-of-the-Year Returns between the First 10 Days of the New Taxation Year and the Rest of the 30 Day Trading Period

Since the first five trading days of the new taxation year are both thinly traded (especially for low priced securities) and do not coincide with the start of the new calendar year, I replicate the analysis performed in Section 5.4.3 over the first 10 days of the new taxation year.

Table 32 presents the results from the Keim dummy regression analysis. Again, the dummy coefficient is significant although less so than for the five day analysis. Nonetheless, the results are virtually identical to those present in Table 30.

I present the estimates (t-statistics) for the regression including the level of buyer-initiated trading in Table 33. In this case, the coefficient on $\tilde{B}_{pt}$ is generally smaller and less significant than in Table 31. The dummy coefficient is again positive but remains statistically insignificant as does the negative coefficient on the compound dummy and buyer level variable. These results reinforce those presented in the earlier section that the level of buyer-initiated activity is a better determinant of the level of turn-of-the-year returns than a dummy variable.

5.5 Summary

In this Chapter, I examine the relation between turn-of-the-year returns and the level of buyer-initiated trading activity. I conclude:

(1) Based upon last trade data, the turn-of-the-year is a period of tax related activity. In the U.S., evidence is found that the last trade on the last day of the old taxation year is buyer dominated. This supports Roll's finding (based on closing price data) that this day exhibits significant excess returns. In Canada, the end of the taxation year marks an end to the

continuous levels of seller dominated trading although trading does not shift immediately to buyer dominated. This may be due to the open nature of the economy. Nonetheless, increased levels of buyer-initiated trading are noted through the first four trading days of January. These findings are supportive of the tax loss selling hypothesis.

(2) Results from regression analysis show that the level of buyer-initiated trading activity is a stable and significant determinant of year end portfolio returns. Further, inclusion of a dummy variable to capture unspecified events at the turn-of-the-year does not add any additional explanatory power. This demonstrates that the level of buyer-initiated trading is related to prices and hence, to returns.

(3) Results from the regression analysis also demonstrate that previous studies were indirect tests of the level of buyer-initiated activity.

CHAPTER 6

THE MONTHLY EFFECT

In the previous Chapter, I establish the link between the nature and extent of investor trading behavior and security returns. In this Chapter, I examine the possibility of intramonthly trading patterns to suggest an empirical reason for Ariel's monthly anomaly. Significant differences in the level and nature of trading are found between the first and second halves of the month.

6.1 Introduction

Ariel (1987) finds the mean return for stocks is positive only for days immediately before and during the first half of calendar months, and indistinguishable from zero for days during the last half of the month. This monthly effect is independent of other known calendar anomalies such as the January effect and appears to be caused by a shift in the mean of the distribution of returns from days in the first half of the month relative to days in the last half. Although Ariel does not speculate further as to cause, the existence of significant buyer-initiated trading in the first half of the year followed by significant seller-initiated trading in the latter half (Chapters 2 and 3) provides sufficient grounds to investigate the possibility of intramonthly trading.

I commence by replicating Ariel's initial findings over an overlapping and a later time period and on the different database to verify the strength of the results. The results support Ariel's findings.

This Chapter extends Ariel's work by examining the intraday buying and selling behavior of investors over the first and last halves of each month. I find that, in general, there are more trades in the first half of the month and that buyer-initiated trading dominates over the turn of the calendar month. Significant levels of buyer-initiated trading are observed from three days prior to the month end until the fifth day after the turn of the month for Canadian transactions.

In the Canadian sample comprising only publicly-initiated trades, statistically significant buyer-initiated trading occurs from the day prior to the turn of the month through the fifth day of the month for transactions valued under $100,000. The remainder of the month is predominantly seller-initiated. For large sized transactions, buyer-initiated trading occurs on the same days but is significant only on days -1, 1 and 3. Higher and more significant levels of seller-initiated trading are found in the later half of the month. I conclude that Ariel's findings may be caused by systematic changes in buying behavior and volume over the course of the calendar month. In particular, the anomaly appears to be driven by small sized transactions.

6.2 Testable Hypotheses

If the monthly anomaly is the result of systematic trading behavior, then higher returns should be accompanied by increased buying activity while lower returns should result from increased selling activity.

I employ Ariel's definition of a trading month which is defined to extend from the last trading day of a calendar month (inclusive) to the last day of the following calendar month (exclusive). Since the average month has fewer than twenty-one trading days, nine first half trading days and nine last half trading days are used in decomposing a trading month. Use of nine rather than ten or more trading days avoids overlap of trading intervals in months with fewer trading days and permits an equal number of observations for each day. Throughout this Chapter, all references to months refer to trading months as defined here.

The analysis is based on the following hypotheses:

(1) The probability of a buyer-initiated trade exceeds the probability of a seller-initiated trade over the first nine trading days of the month.

(2) The probability of a seller-initiated trade exceeds the probability of a buyer-initiated trade over the last nine trading days of the month.

In Chapter 2, large block transactions were used to proxy for the activities of institutional investors. To test empirically whether institutional investors are driving Ariel's monthly anomaly, the following testable hypotheses are examined:

(3) The probability of a buyer-initiated trade for large transactions exceeds the probability of a seller-initiated trade over the first nine trading days of the month.

(4) The probability of a buyer-initiated trade for small transactions is equal to the probability of a seller-initiated trade throughout the month.

6.3 Results

6.3.1 Results for the First and Last Nine Days of the Month

Ariel (1987) examines the cumulative return on equal and value weighted CRSP indices over the period 1963-81. Due to Canadian data restrictions, I initially replicate Ariel's method over the period

March, 1977 through December, 1981[43]. The results are virtually identical to Ariel's for the CRSP data[44]. The Canadian indices show a much different result. While the mean cumulative return for the first nine trading days of each month exceeds the mean cumulative return from the last nine trading days, I am unable to reject the hypothesis that the means of the two groups are equal at all conventional levels of significance.

Replicating the study over the entire available data set, I find the monthly anomaly persists for the CRSP data while the Canadian data show mixed results. Mean cumulative equally weighted returns are significantly different from zero but the null hypothesis of the equality of means cannot be rejected. Mean cumulative value weighted returns of the half months are differentiable at the 5% level of significance. Chi-square tests comparing the probability that the cumulative return from the first half of the trading month will exceed the cumulative return from the second half of the same trading month are supportive of Ariel's results for U.S. data. For Canadian securities, the results are statistically significant at conventional levels only for the value weighted index returns. Table 34 summarizes these results.

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[43] This is the closest overlapping period to Ariel's study for which I have intraday data.

[44] Some results may vary due to changes and upgrades in the CRSP database. Ariel's results were based on the December, 1981 version. My data are from the December, 1988 version.

In general, the first four trading days of each month have the greatest average daily returns and the highest levels of significance. In Canada, as in the U.S., the equal weighted returns are systematically greater than the value weighted returns. I attribute this difference to the weighting given small capitalization securities. I suspect the increased levels of thin trading on the TSE also contribute to the inability to reject both equality of means and increased first half month cumulative returns for equally weighted index returns.

To test this conjecture, I examine total trading volume over the first and last nine trading days of each month for the two intraday data sets. To ensure January trading did not bias the results, the tests were performed both including and excluding January volumes. The findings are presented in Table 35.

The mean number of trades per day are higher and the standard deviation of the number of daily trades are smaller over the first half of the month than over the last half of the month. In all cases, except the U.S. sample (January volume included), equality of the mean daily trading volume in the two half months is rejected. I conclude that there is systemacic intramonthly trading behavior in terms of trading volume on both the major U.S. and Canadian stock exchanges. To the extent that securities are thinly traded in the latter half of the month, returns for the first half of the month will be biased upward.

To isolate systematic monthly trading, I determine the probability of a sell transaction (Table 36) for both the first and last nine trading days of each month. Although the U.S. equity listings do not appear to display any systematic buying behavior, the later half of the month contains four consecutive days of significant seller-initiated trading activity. To the extent that thin trading play a significant role in the determination of index returns, this would bias downward any reported return over the last half of the month.

Significant buyer-initiated trading in Canada persists from the third day prior to the month end through the fifth day of the month. In addition, in the latter half of the month six consecutive days of significant seller-initiated trading are observed. These findings support the existence of the monthly anomaly.

To eliminate any January effects in the monthly anomaly the above tests were repeated (Table 37) on the remaining pooled eleven months annual data. Although the U.S. results suggest significant buyer-initiated trading in the early half of the month, of more interest are the five consecutive days of seller dominated trading in the later half of the month. Canadian buyer-initiated trading dominates from three trading days prior to the month end through the fourth trading day of the new month. In addition, six consecutive days of seller-initiated trading dominate the second half of the month.

6.3.2 Results for Large and Small Block Investors

To investigate whether institutional or individual investors are driving the monthly anomaly, the analysis is confined to block and non-block categories. Since the U.S. data do not contain the requisite broker codes, the analysis is limited to the Canadian database.

For large size transactions (valued over $100,000), six consecutive days of buyer-initiated trading from two days prior to the month end and through the fourth day of the new month are found. These results are presented in Table 38. The two days prior and the first and third days after the turn of the month are statistically significant. The more numerous seller dominated days in the second half of the month are also generally more significant than those in the first half of the month. On average, the daily number of large size transactions is small.

The small size transactions (Table 38) display significant buyer-initiated volume from the day prior to and through the fifth day following the turn of the month. The latter part of the month also contains seven consecutive days of seller-initiated trading, six of which are significant. Due to both the strength of the statistical results and to the substantially more numerous small transactions, I conclude, that the systematic intramonthly trading behavior is principally due to changes in the probability of small size transactions occurring at the bid or ask prices. To the extent that small size

transactions proxy for individual investor transactions, I conclude that individual investors are the source of the monthly anomaly.

6.3.3 Results for First and Last Halves of Calendar Months

To test for seasonal buying within the calendar year, I continue the analysis by dividing each month into first and last halves. Table 39 presents the results. The U.S. equity listings generally display significant buyer dominated trading through the first half of August, after which seller-initiated trading dominates. Canadian results are not so definitive. In general, the findings are reflective of the results in Table 3.

Table 40 presents the results of limiting the analysis to block and non-block public initiated Canadian transactions. For large size transactions, buyer dominated trading generally commences the end of December and continues through the end of March. Significant seller-initiated trading occurs from September through November. This finding supports the Haugen and Lakonishok (1987) conjecture of portfolio rebalancing by professional fund managers.

For small size transactions, significant buyer-initiated trading occurs in the beginning of January, and generally from mid-February through mid-September. Significant seller-initiated trading dominates the remaining months (except for the last half of November). As stated in Chapter 2 these findings are consistent not only with Ritter's park

and ride hypothesis but also with other previous studies on tax loss selling[45]. The existence of significant levels of seller-initiated trading prior to the year end is consistent with the theoretical arguments of Constantinides (1984) that loss realization should not be confined to the last trading day of the year.

Although both the large and small size transactions display similar patterns in buying and selling activity, the small size transactions are again both more numerous and of greater statistical significance suggesting that these trades drive the monthly anomaly. The monthly anomaly is also generally consistent throughout the year. For eight of the twelve months, the level of buyer-initiated trading at the beginning of the month is greater than the buyer-initiated end of month trading for Canadian transactions.

The existence of buyer dominated trading in the later half of the month is not at odds with the results reported in Tables 24 through 26 where seller-initiated trading dominates (especially for Canadian equity listings) the last nine days of each month. When aggregated, the heavy last half month selling from September to December dominates the last half month buying activity from February to August.

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[45] See, for example, Keim (1983), Reinganum (1983), Lakonishok and Smidt (1984), Tinic, Barone-Adesi and West (1987) and Ritter and Chopra (1989).

6.4 Summary

I test trading frequency as a possible explanation for the monthly anomaly by determining the probability of a seller-initiated transaction over the first and last nine days of each month in the year. I conclude:

(1) There is a systematic component to trading volume between the first and last halves of each month. The first half month exhibits a higher mean daily number of trades and a smaller standard deviation. This finding is independent of January volumes.

(2) There is a systematic component to the buying behavior of investors at the turn of the month. Pooled aggregate data reveals seller-initiated trading volume dominates the second half of the month. Canadian results reveal significant buyer-initiated trading from three days prior to five days after the turn of the month. For Canadian data, buyer-initiated trading at the beginning of the month is greater than buyer-initiated trading at the end of the month for eight of the twelve months.

(3) To the extent that non-block transactions are attributable to individual investors, it appears individual investors engage in systematic buying behavior.

The great similarity between Canadian and U.S. results, particularly with respect to (1) the size and existence of the monthly anomaly, and (2) the systematic trading patterns both in terms of the timing of the transactions and buyer versus seller-initiated trading throughout the year suggest a high degree of integration between the two markets. Hatch and White (1988) indicate Canadian return series exhibit substantial correlation (eg. 0.77 to 0.88) with their corresponding U.S. return series. I suspect therefore that the absence of strong statistical support in the U.S. data base is sample specific. In particular, as noted in Chapters 2 and 4, while the U.S. sample is representative both in terms of total capitalization and price, thinly traded securities tend to be under-represented. To the extent that thin trading contributes to measurement error in the returns, I have been unable to document the full impact of its effect on U.S. equity listings.

CHAPTER 7

CONCLUSIONS

7.1 Conclusions

In this dissertation, intraday transaction prices are compared to the mean of the preceding bid-ask quote to determine the initiator of the trade. The implications of the tax loss selling, portfolio rebalancing and disposition hypotheses are then tested by determining the probability of a seller-initiated transaction at appropriate points in the calendar and taxation year. I then examine the relationship between security returns and the last trade of the day in the months of December and January. In addition, I investigate Ariel's monthly anomaly to determine whether it reflects changes in trading behavior between the first and last halves of the month.

I find:

(1) There is a systematic component to the buying behavior of investors. In general, buyer-initiated trading dominates the first seven months and seller-initiated trading is dominant in the last five months of the year.

(2) Assuming that block transactions are attributable to institutional investors; there is no indication that institutional

investors engage in any systematic buying or selling at the turn-of-the-calendar-year.

(3) Seller-initiated trading activity in Canada switches dramatically to buyer-initiated on day -5, the first day of the new taxation year. This is also true for investors generally not subject to capital gains regulations. In contrast, U.S. seller-initiated trading continues through to day -1, in accordance with the U.S. taxation year end. Buyer-initiated trading dominates throughout the first half of January.

(4) Analysis of the trading activity of floor traders and employees of brokerage houses reveals the pattern described in (3) above. The absence of buyer-initiated trading for this group prior to the turn-of-the-taxation-year indicates the absence of profitable arbitrage opportunities suggested by knowledge of a systematic pattern of returns.

(5) With the exception of the two portfolios with the largest capital gains, portfolios follow the same trading pattern as described in (3) above regardless of whether they were formed on the basis of market value of equity or on relative capital appreciation. The results for the large market value portfolios is strong support for a tax related selling hypothesis and challenges the reliability of returns analysis in earlier studies.

(6) The existence of buyer dominated trading in December for the two portfolios with the largest capital gains is supportive of both window dressing by professional fund managers. The extensive buyer dominated trading in January reinforces the hypothesis of portfolio rebalancing by professional fund managers.

(7) The absence of significant levels of seller dominated trading in both December and January in the two largest capital gains portfolios provides prima facie evidence against the disposition hypothesis being an accurate description of investor behavior.

(8) Ariel's monthly anomaly may be attributable to a systematic component to trading volume between the first and last halves of each month. The first half month exhibits a higher mean daily number of trades and a smaller standard deviation.

(9) My results also suggest that the level of thin trading may play a significant role in studies which rely upon a returns generating model. This seems particularly true in studies employing portfolios of securities.

(10) The level of buyer-initiated activity in closing trades is a significant determinant of the level of turn-of-the-year returns. This demonstrates the relationship between the nature and extent of investor trading behavior and security prices and returns.

7.2 Implications for Future Research

The results presented in this dissertation highlight the caution which must be exercised when employing rates of return in empirical analysis. I show that the tendency demonstrated by Keim (1989) for securities to shift systematically from transactions at the bid price to transactions at the ask price over the turn-of-the-taxation-year is also widespread on major stock exchanges throughout differing trading periods (months, half months and years) for small transactions. To the extent that these trades represent activity in small firms, the resulting mismeasurement of return may be a contributing factor in studies which find small firms outperform the market at various recurring points in time.

Thus, a major implication of the results of this dissertation is: conclusions based on empirical studies which do not correct for shifts between bid and ask prices may be erroneous. Blume and Stambaugh (1983) suggest the convention of using the mean of the bid and ask prices rather than transaction prices would help remove bid-ask biases. Lakonishok and Smidt (1983) suggest this method may not be appropriate due to requirements for price continuity imposed by Stock Exchanges. The results of this dissertation suggest transaction prices are not the most accurate proxy for calculating "true" returns. Additional research is required to demonstrate the full extent of the relationship between buyer/seller behavior and daily abnormal returns.

I have provided indirect evidence (Chapter 3) on the inability by professional traders to earn abnormal profits by purchasing securities in December and selling in January. Future research should investigate the behavior of brokerage houses employees separate from floor traders.

I have not shown whether abnormal returns could be earned by purchasing securities in the second half of the month and selling in the first half of the month. A complete analysis would require an in depth study of the size of the bid ask quote over the periods in question. If volume is a determinant of the bid ask spread as suggested by Demsetz (1968), Stoll (1978), and Ho and Stoll (1981) then market makers aware of the changes in volume may widen or narrow spreads to compensate for holding period risk over the differing periods thereby precluding arbitrage profits. This should also occur at the turn-of-the-year. Since the specialists set the bid and ask prices, a study of specialist activity during the day and across securities may lead to fruitful results.

TABLE 1

MEAN DAILY RETURN DIFFERENCES, EQUALLY WEIGHTED (EW) INDEX LESS VALUE WEIGHTED (VW) INDEX BY TRADING DAY AROUND THE TURN OF THE YEAR, COMPARISON OF U.S. AND CANADIAN DATA (1977-1988)

Trading Day Relative to First of Yr.	U.S. (EW-VW)[1] % per day	U.S. (t-stat)	Cdn. (EW-VW)[1] % per day	Cdn. (t-stat)
-9	- 0.0467	- 0.420	0.1300	1.327
-8	- 0.0035	- 0.030	0.2889	2.344*
-7	- 0.0242	- 0.339	0.2565	2.21*
-6	0.1859	3.046**	0.0941	0.968
-5	0.1122	1.064	0.3434	3.208**
-4	- 0.0111	- 0.114	0.2427	1.864*
-3	0.0172	0.366	0.2560	1.96*
-2	- 0.1943	- 0.284	0.2648	2.299*
-1 #	0.6514	7.127**	0.1798	1.409
1 ##	0.7311	10.466**	0.2836	2.828**
2	0.2058	1.281	0.3114	2.344*
3	0.3608	5.087**	0.3254	2.501*
4	0.0989	0.866	0.2396	2.330*
5	0.4424	1.918*	0.2992	2.538*
6	0.0490	0.288	0.3401	3.903**
7	0.1244	1.300	0.3362	2.619*
8	0.1802	3.436**	0.3852	3.524**
9	0.1796	2.221*	0.1868	2.393*

\# Last Trading Day of December
\## First Trading Day of January

[1] Mean Daily Difference Return (EW-VW)

** statistically significant at the 1% level
* statistically significant at the 5% level

The t-statistic is calculated from the standard deviation (across years) of the daily return differences on the trading day indicated. U.S. data cover the period December 1977 through December 1988 and are drawn from the December 31, 1989 version of the CRSP data tapes. Canadian data cover the period December 1977 through January 1989 and are drawn from the June 30, 1989 TSE/WESTERN data tapes.

TABLE 2

ANALYSIS OF CLASSIFICATION METHOD FOR U.S. AND CANADIAN EQUITY LISTINGS

U.S. Equity Listings[1]

Initiator	$ Value[4]	# Shares[5]	# Trades[6]	$/Trade[7]	$/Share[8]
Buyer	33.92%	33.73%	36.39%	9967.62	46.57
Seller	31.01%	32.29%	35.64%	9301.58	44.47
Unclassified[3]	35.07%	33.98%	27.97%	13411.81	47.80

Canadian Equity Listings[2]

Initiator	$ Value[4]	# Shares[5]	# Trades[6]	$/Trade[7]	$/Share[8]
Buyer	37.14%	37.68%	40.43%	12782.96	13.37
Seller	43.69%	46.52%	47.61%	12770.87	12.74
Unclassified[3]	19.17%	15.80%	11.96%	22302.70	16.46

1 U.S. results are based on 1387 daily observations for the period January 3, 1984 through June 30, 1989. Amounts expressed are in U.S. dollars.

2 Canadian results are based on 3112 daily observations for the period March 1, 1977 through June 30, 1989. Amounts expressed are in Canadian funds.

3 Unclassified since transaction price is at the mean of the immediately preceding bid-ask quote.

4 Average percentage of dollar value identified.

5 Average percentage of number of shares identified.

6 Average percentage of number of trades identified.

7 Average dollar value per trade identified.

8 Average dollar value per share identified.

TABLE 3

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION BY MONTH FOR U.S. AND CANADIAN EQUITY LISTINGS[1]

	U.S. Equity Listings (Sub-group mean of P[Sell]=0.495)					Canadian Equity Listings (Sub-group mean of P[Sell]=0.541)				
Mon	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
Jan	104128	98184	1213876	0.485	-21.35	96669	109536	2680673	0.531	-32.30
Feb	88279	84056	1034016	0.488	-14.75	87052	103994	2483607	0.544	10.57
Mar	100159	93347	1161040	0.482	-27.16	90148	102416	2665905	0.532	-30.13
Apr	96320	93949	1141622	0.494	- 2.63	79006	92144	2396115	0.538	- 8.13
May	94017	87649	1090005	0.482	-26.16	79316	90891	2382917	0.534	-21.68
Jun	95219	84872	1080553	0.471	-49.33	80029	92442	2414616	0.536	-15.64
Jul	86543	79939	832415	0.480	-27.07	7434	85528	2078295	0.535	-17.38
Aug	88109	86077	870934	0.494	- 1.55	75506	86499	2106076	0.534	-20.59
Sep	75746	81354	785504	0.518	40.50	75132	93185	2188137	0.554	37.48
Oct	91898	93786	928424	0.505	18.44	80385	100314	2349096	0.555	43.50
Nov	76306	79630	779683	0.511	27.66	75946	87674	2127072	0.536	-15.10
Dec	85099	101514	933070	0.544	94.63	66833	86924	1998850	0.565	69.04

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Canadian data comprise approximately 2600 securities from March 1977 through June 1989.

2 Average number of identified buyer-initiated transactions per month.

3 Average number of identified seller-initiated transactions per month.

4 Total number of identified buyer- and seller-initiated transactions per month over the entire study period.

5 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 4

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. AND CANADIAN EQUITY LISTINGS[1]

	U.S. Equity Listings[2]					Canadian Equity Listings[3]				
Day Rel to Yr End	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]
- 1	3381	5542	44616	0.621	53.26	2935	2767	68419	0.485	-29.24
- 2	3555	5125	43404	0.590	39.77	2815	2937	69026	0.511	-16.02
- 3	2790	4534	36625	0.619	47.47	2433	2645	60398	0.521	- 9.98
- 4	2114	3384	27495	0.615	39.94	1856	1856	44544	0.500	-17.34
- 5	2339	2880	26100	0.552	18.37	2743	2857	67191	0.510	-16.03
- 6	3915	5626	47709	0.590	41.34	3998	5326	111887	0.571	20.25
- 7	3901	5113	45071	0.567	30.67	3953	5916	118428	0.599	30.40
- 8	4347	5339	48432	0.551	24.74	3764	5432	110354	0.591	33.11
- 9	4988	4822	49051	0.492	- 1.54	3531	5022	102645	0.587	29.67
-10	3796	4977	43868	0.567	30.28	3700	5213	106949	0.585	28.81
-11	4758	4974	48666	0.511	7.09	3706	5051	105081	0.577	23.28
-12	4555	4943	47494	0.520	11.10	3867	5433	111593	0.584	28.97
-13	4205	495	45805	0.541	19.67	3736	5328	108769	0.588	30.96
-14	4198	5317	47583	0.559	27.83	3466	5120	103035	0.596	35.62
-15	4700	5011	48560	0.516	9.26	3880	5311	110292	0.578	24.55
-16	4358	4705	45321	0.519	10.27	3958	5088	108544	0 562	14.18
-17	4810	4440	46253	0.480	- 6.45	4145	5286	113171	0.560	13.14
-18	4627	4892	47595	0.514	8.26	4038	4958	107950	0.551	6.66
-19	4413	4567	44907	0.509	5.75	3718	4907	103499	0.569	18.03
-20	3973	5140	45567	0.564	29.48	3844	5078	107052	0.569	18.49

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Canadian data comprise approximately 2600 securities from March 1977 through June 1989.

2 The mean of P[Sell]=0.547 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495 (See Table 3).

3 The mean of P[Sell]=0.565 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541 (See Table 3).

4 Average number of identified buyer-initiated transactions per day.

5 Average number of identified seller-initiated transactions per day.

6 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

7 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

8 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 5

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. AND CANADIAN EQUITY LISTINGS[1]

	U.S. Equity Listings[2]					Canadian Equity Listings[3]				
Day Rel to Yr Beg	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]
1	3756	3525	43692	0.484	- 4.55	3390	3462	82220	0.505	-20.59
2	4878	3823	52211	0.439	-25.43	4549	4838	112647	0.515	-17.25
3	4615	4236	53114	0.479	- 7.56	4903	5097	119999	0.510	-21.76
4	4928	4002	53587	0.448	-21.68	5405	5706	133331	0.514	-20.14
5	4587	5188	58652	0.531	17.30	5276	5885	133931	0.527	-10.06
6	4744	5221	59797	0.524	14.16	5324	6006	135962	0.530	- 8.08
7	4996	4558	57325	0.477	- 8.59	5071	5552	127478	0.523	-13.17
8	4840	4463	55824	0.480	- 7.19	4947	5466	124952	0.525	-11.43
9	4662	4276	53631	0.478	- 7.69	5157	5132	123470	0.499	-29.77
10	5279	4677	59740	0.470	-12.35	5251	5361	127344	0.505	-25.68
11	4682	4361	54265	0.482	- 5.93	5084	5625	128509	0.525	-11.34
12	5358	4644	60018	0.464	-15.05	4885	5516	124814	0.530	- 7.56
13	4887	4910	58788	0.501	2.98	4892	5797	128265	0.542	0.98
14	4824	4902	58357	0.504	4.35	5016	5864	130553	0.539	- 1.46
15	4828	4818	57881	0.499	2.16	4815	6213	132331	0.563	16.36
16	6182	5278	68764	0.461	-18.07	4808	6175	131796	0.562	15.48
17	4771	4818	57539	0.502	3.60	4571	5586	121882	0.550	6.31
18	5337	4867	61233	0.477	- 8.93	4847	5418	123172	0.528	- 9.28
19	5303	5110	62481	0.491	- 2.14	5402	5990	136701	0.526	-11.28
20	4933	5024	59743	0.505	4.68	5133	6431	138768	0.556	11.29

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Canadian data comprise approximately 2600 securities from March 1977 through June 1989.

2 The mean of P[Sell]=0.485 for the first 20 days of January. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.485 (See Table 3).

3 The mean of P[Sell]=0.530 for the first 20 days of January. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541 (See Table 3).

4 Average number of identified buyer-initiated transactions per day.

5 Average number of identified seller-initiated transactions per day.

6 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

7 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

8 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 6

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR BY TRANSACTION SIZE FOR CANADIAN EQUITY LISTINGS[1]

	Transactions ≥ $100,000[2]					Transactions < $100,000[3]				
Day Rel to Yr End	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]
- 1	21	20	493	0.483	- 3.46	1611	1508	37429	0.483	-14.95
- 2	18	21	458	0.537	- 0.99	1548	1596	37733	0.508	- 5.56
- 3	12	15	323	0.573	0.46	1326	1441	33198	0.521	- 0.45
- 4	8	11	230	0.587	0.82	1023	1028	24618	0.501	- 6.52
- 5	19	21	487	0.528	- 1.44	1495	1602	37157	0.517	- 1.83
- 6	40	42	981	0.513	- 2.98	2339	3020	64314	0.564	21.09
- 7	46	60	1277	0.564	0.28	2317	3304	67457	0.588	34.20
- 8	44	53	1163	0.544	- 1.08	2217	3006	62675	0.576	26.83
- 9	47	50	1167	0.518	- 2.92	2104	2771	58498	0.568	22.49
-10	38	53	1091	0.577	1.16	2183	2906	61068	0.571	24.23
-11	37	57	1125	0.608	3.24	2174	2864	60458	0.568	22.88
-12	39	55	1124	0.585	1.66	2236	3060	63546	0.578	28.18
-13	42	55	1165	0.566	0.39	2206	2949	61865	0.572	24.95
-14	32	45	931	0.583	1.43	2046	2878	59086	0.585	30.44
-15	38	55	1113	0.588	1.86	2252	2915	62002	0.564	20.99
-16	37	48	1017	0.562	0.16	2314	2793	61278	0.547	12.33
-17	41	54	1135	0.572	0.80	2423	2962	64618	0.550	14.25
-18	37	53	1084	0.587	1.77	2395	2678	60874	0.528	2.93
-19	35	43	928	0.554	- 0.38	2214	2666	58555	0.546	11.75
-20	36	49	1017	0.581	1.37	2295	2846	61693	0.554	15.72

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Only client initiated trades are analyzed. Value of transaction calculated as transaction price times number of shares traded.

2 The mean of P[Sell]=0.563 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.560.

3 The mean of P[Sell]=0.555 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.522.

4 Average number of identified buyer-initiated transactions per day.

5 Average number of identified seller-initiated transactions per day.

6 Total number of identified buyer- and seller-initiated transactions per day over entire study period

7 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

8 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 7

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR BY TRANSACTION SIZE FOR CANADIAN EQUITY LISTINGS[1]

	Transactions ≥ $100,000[2]					Transactions < $100,000[3]				
Day Rel to Yr Beg	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]
1	22	26	579	0.541	- 0.94	1884	1804	44259	0.489	-13.82
2	36	47	986	0.567	0.44	2558	2536	61125	0.498	-11.95
3	46	59	1258	0.558	- 0.14	2746	2770	66197	0.502	-10.21
4	52	59	1335	0.533	- 1.96	3115	3140	75067	0.502	-10.98
5	51	65	1390	0.557	- 0.24	3022	3245	75202	0.518	- 2.34
6	50	63	1352	0.558	- 0.12	3068	3224	75505	0.512	- 5.32
7	45	64	1315	0.587	1.98	2955	3000	71448	0.504	- 9.75
8	55	70	1504	0.558	- 0.17	2889	2977	70398	0.507	- 7.72
9	44	55	1187	0.560	0.02	3140	2798	71264	0.471	-27.15
10	53	50	1236	0.485	- 5.28	3100	2940	72480	0.487	-19.02
11	59	57	1388	0.492	- 5.10	3012	3076	73058	0.505	- 5.07
12	45	56	1204	0.553	- 0.48	2785	2967	69028	0.516	- 3.24
13	51	69	1444	0.576	1.24	2808	2320	72210	0.533	6.10
14	56	77	1597	0.582	1.75	2875	3222	73157	0.528	3.51
15	50	74	1485	0.599	3.05	2618	3464	72984	0.570	25.75
16	66	73	1666	0.527	- 2.71	2812	3335	73764	0.543	11.19
17	50	63	1363	0.557	- 0.23	2652	3074	68714	0.537	7.77
18	57	61	1416	0.518	- 3.21	2867	2819	68233	0.496	-13.70
19	70	78	1786	0.527	- 2.82	3168	3144	75748	0.498	-13.16
20	62	70	1588	0.530	- 2.39	3068	3322	76686	0.520	- 1.19

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Only client initiated trades are analyzed. Value of transaction calculated as transaction price times number of shares traded.

2 The mean of P[Sell]=0.548 for the first 20 days of January. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.560.

3 The mean of P[Sell]=0.512 for the first 20 days of January. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.522.

4 Average number of identified buyer-initiated transactions per day.

5 Average number of identified seller-initiated transactions per day.

6 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

7 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

8 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 8

MONTHLY BREAKDOWN BETWEEN PUBLIC AND PROFESSIONAL TRADER INITIATED TRANSACTIONS (PERCENT)

Month	Total # Identified Transactions	Percent Public-Initiated	Percent Prof'l Trader
January	2,680,673	56.95	43.05
February	2,483,607	57.03	42.97
March	2,695,905	58.28	41.72
April	2,396,115	57.21	42.79
May	2,382,917	57.59	42.41
June	2,414,616	57.44	42.56
July	2,078,295	59.26	40.74
August	2,106,076	58.67	41.33
September	2,188,137	58.36	41.64
October	2,349,096	57.25	42.75
November	2,127,072	57.69	42.31
December	1,998,850	57.55	42.45
Total	**27,901,359**	**57.74**	**42.26**

TABLE 9

PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION BY A PROFESSIONAL TRADER[1]

Sub-group mean of P[Sell]=0.566

Mon	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
Jan	39504	266	1153991	0.555	-23.64
Feb	34968	47125	1067189	0.574	16.99
Mar	35258	45088	1124832	0.561	-10.10
Apr	31382	41863	1025415	0.572	11.56
May	31819	40369	1010630	0.559	-13.53
Jun	31673	41731	1027634	0.569	5.36
Jul	28304	36825	846664	0.565	- 0.88
Aug	29118	37844	870509	0.565	- 1.38
Sep	29186	40897	911072	0.584	33.96
Oct	33721	43535	1004309	0.564	- 4.80
Nov	31354	37868	899872	0.547	-36.06
Dec	27428	37840	848480	0.580	25.78

[1] Canadian data comprise approximately 2600 securities from March 1977 through June 1989.

[2] Average number of identified buyer-initiated transactions per month.

[3] Average number of identified seller-initiated transactions per month.

[4] Total number of identified buyer- and seller-initiated transactions per month over the entire study period.

[5] Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

[6] Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test P[z>=2.33]=0.01

TABLE 10

PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION BY PROFESSIONAL TRADERS FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR[1]

Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	1303	1239	30497	0.487	-27.69
- 2	1249	1320	30635	0.514	-18.49
- 3	1095	1189	26877	0.521	-15.02
- 4	825	817	19696	0.498	-19.38
- 5	1229	1234	29547	0.501	-22.54
- 6	1619	2264	46592	0.583	7.43
- 7	1590	2552	49694	0.616	22.55
- 8	1503	2373	46516	0.612	20.12
- 9	1380	2201	42980	0.615	20.34
-10	1479	2254	44790	0.604	16.14
-11	1495	2130	43498	0.588	9.08
-12	1592	2318	46923	0.593	11.73
-13	1488	2324	45739	0.610	18.84
-14	1388	2197	43018	0.613	19.60
-15	1590	2341	47177	0.596	12.94
-16	1607	2247	46249	0.583	7.39
-17	1681	2270	47418	0.575	3.75
-18	1606	2227	45992	0.581	6.49
-19	1469	2198	44016	0.599	14.14
-20	1513	2183	44342	0.591	10.47

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. The mean of P[Sell]=0.581 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.566.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test P[z>=2.33]=0.01

TABLE 11

PROBABILITY OF AN IDENTIFIES SELLER-INITIATED TRANSACTION BY PROFESSIONAL TRADERS FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR[1]

Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	1484	1632	44298	0.524	-17.94
2	1955	2255	74456	0.536	-16.72
3	2111	2268	86478	0.518	-28.52
4	2238	2507	108483	0.528	-25.02
5	2203	2575	96287	0.539	-16.95
6	2206	2719	70667	0.552	- 7.47
7	2071	2488	58744	0.546	- 9.91
8	2003	2419	61114	0.547	- 9.46
9	1973	2279	63805	0.536	-15.30
10	2098	2371	65185	0.531	-18.26
11	2013	2492	66926	0.553	- 6.70
12	2055	2493	60144	0.548	- 8.83
13	2033	3418	65235	0.627	31.46
14	2085	2565	70536	0.552	- 7.71
15	2147	2675	69216	0.555	- 5.97
16	1930	2767	69501	0.589	12.29
17	1869	2449	56129	0.567	0.55
18	1923	2538	61214	0.569	1.46
19	2164	2768	77218	0.561	- 2.67
20	2003	3039	76508	0.603	20.44

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. The mean of P[Sell]=0.556 for the first 20 days of January. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.566.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test P[z>=2.33]=0.01

TABLE 12

COMPARISON OF THE LEVEL OF TRADING IN CANADIAN AND U.S. CAPITAL GAINS PORTFOLIOS

Capital Gains Portfolios

December

	Canadian Portfolios			U.S. Portfolios		
Portfolio	Total # of Trades	Avg # Trades/Day	% of Total Trades	Total # of Trades	Avg # Trades/Day	% of Total Trades
1 #	93538	390	9.08	83854	839	9.90
2	73706	307	7.18	74347	743	8.77
3	79180	330	7.75	78510	785	9.26
4	84701	353	8.33	55191	552	6.51
5	99387	414	9.81	106972	1070	12.62
6	98717	411	9.79	107837	1078	12.73
7	99972	417	9.91	85641	856	10.11
8	121057	504	11.98	81998	820	9.77
9	110020	458	10.86	101087	1011	11.93
10 ##	156814	653	15.30	72023	720	8.50
Total	1017092			847460		

January

	Canadian Portfolios			U.S. Portfolios		
Portfolio	Total # of Trades	Avg # Trades/Day	% of Total Trades	Total # of Trades	Avg # Trades/Day	% of Total Trades
1 #	96527	402	7.32	76526	765	9.15
2	79809	333	6.10	67677	677	8.10
3	86626	361	6.66	67344	673	8.06
4	110197	459	8.51	60660	607	7.26
5	136572	569	10.58	94349	943	11.29
6	138898	579	10.81	111013	1110	13.28
7	139693	582	10.83	90473	905	10.82
8	168801	703	13.07	89486	895	10.71
9	144075	600	11.13	98167	982	11.74
10 ##	195489	815	14.98	80270	803	9.60
Total	1296687			835965		

\# Smallest Portfolio
Largest Portfolio

TABLE 13

COMPARISON OF THE LEVEL OF TRADING IN CANADIAN AND U.S. MARKET VALUE (PRICE) PORTFOLIOS

Market Value (Price) Portfolios

December

	Canadian Portfolios			U.S. Portfolios		
Portfolio	Total # of Trades	Avg # Trades/Day	% of Total Trades	Total # of Trades	Avg # Trades/Day	% of Total Trades
1 #	33983	142	3.31	34866	349	4.11
2	49595	207	4.84	27022	270	3.19
3	55475	231	5.41	42570	426	5.02
4	59075	246	5.76	36118	361	4.26
5	61761	257	6.02	44271	443	5.22
6	71457	298	6.97	94770	948	11.18
7	82281	343	8.02	110693	1107	13.06
8	105973	442	10.33	115244	1152	13.60
9	133511	556	13.02	148546	1485	17.52
10 ##	372729	1553	36.33	193586	1936	22.84
Total	1025840			847686		

January

	Canadian Portfolios			U.S. Portfolios		
Portfolio	Total # of Trades	Avg # Trades/Day	% of Total Trades	Total # of Trades	Avg # Trades/Day	% of Total Trades
1 #	49692	207	3.81	23462	235	2.79
2	59068	246	4.52	22357	224	2.66
3	64739	270	4.96	42526	425	5.06
4	72922	304	5.59	33926	339	4.04
5	72181	301	5.53	45556	456	5.42
6	86053	359	6.59	101053	1011	12.03
7	104669	436	8.02	108850	1089	12.96
8	136193	567	10.43	110605	1106	13.17
9	167675	699	12.84	135474	1355	16.13
10 ##	492435	2052	37.72	216353	2164	25.75
Total	1305627			835965		

\# Smallest Portfolio
\## Largest Portfolio

TABLE 14-A

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 1 (Smallest)					Portfolio 2				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	117	121	2851	0.509	- 3.43	87	104	2291	0.544	0.29
- 2	118	134	3023	0.531	- 1.10	86	103	2256	0.545	0.38
- 3	100	138	2847	0.580	4.18	72	91	1950	0.559	1.60
- 4	103	102	2455	0.497	- 4.38	60	72	1586	0.543	0.16
- 5	125	137	3142	0.521	- 2.25	89	100	2272	0.530	- 1.05
- 6	215	345	6710	0.616	12.33	163	266	5139	0.621	11.51
- 7	226	360	7027	0.614	12.28	164	299	5554	0.646	15.70
- 8	198	310	6095	0.610	10.81	141	254	4747	0.643	14.10
- 9	190	267	5488	0.584	6.39	140	227	4411	0.619	10.40
-10	184	265	5389	0.590	7.22	147	229	4511	0.609	9.17
-11	183	262	5342	0.588	6.89	130	229	4310	0.638	12.78
-12	177	254	5173	0.589	6.93	125	221	4156	0.638	12.55
-13	176	267	5310	0.603	9.07	124	228	4226	0.648	13.96
-14	146	260	4871	0.639	13.73	122	216	4051	0.639	12.52
-15	144	242	4628	0.627	11.74	122	214	4025	0.638	12.35
-16	142	238	4564	0.626	11.52	122	201	3874	0.621	9.99
-17	165	244	4904	0.596	7.73	126	184	3713	0.593	6.36
-18	167	220	4643	0.569	3.83	143	186	3941	0.566	3.15
-19	167	229	4751	0.579	5.26	126	169	3538	0.572	3.70
-20	176	217	4707	0.552	1 51	129	185	3772	0.589	5.92

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 1] = 0.589, the mean of P[Sell: Portfolio 2] = 0.610 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 14-B

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

Day Rel to Yr End	Portfolio 3 Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Portfolio 4 Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	91	110	2418	0.547	0.59	108	130	2857	0.546	0.54
- 2	92	115	2487	0.557	1.60	97	116	2556	0.546	0.51
- 3	83	109	2303	0.569	2.70	90	111	2411	0.551	0.99
- 4	58	81	1673	0.584	3.53	65	85	1804	0.568	2.30
- 5	96	117	2557	0.548	0.71	99	130	2744	0.566	2.63
- 6	165	270	5220	0.621	11.60	191	260	5409	0.577	5.31
- 7	171	261	5174	0.604	9.09	188	198	5825	0.614	11.18
- 8	153	272	5104	0.639	14.05	186	259	5335	0.582	6.01
- 9	166	243	4909	0.595	7.59	164	248	4941	0.603	8.75
-10	148	251	4788	0.630	12.36	149	247	4752	0.624	11.48
-11	163	234	4768	0.590	6.79	138	237	4494	0.632	12.24
-12	160	246	4876	0.606	9.11	159	253	4936	0.614	10.29
-13	153	231	4617	0.601	8.18	158	243	4815	0.606	9.05
-14	150	231	4578	0.606	8.83	151	241	4708	0.615	10.19
-15	151	213	4370	0.585	5.84	158	253	4940	0.615	10.44
-16	154	197	4209	0.562	2.73	178	235	4947	0.569	3.95
-17	136	206	4112	0.602	7.73	177	240	4999	0.576	4.97
-18	148	200	4169	0.574	4.28	176	211	4652	0.545	0.55
-19	126	182	3691	0.592	6.22	170	207	4523	0.548	0.95
-20	142	209	4207	0.596	7.16	159	223	4573	0.584	5.84

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 3] = 0.595, the mean of P[Sell: Portfolio 4] = 0.588 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 14-C

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 5					Portfolio 6				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	145	141	3432	0.494	- 5.53	134	120	3036	0.472	- 7.63
- 2	138	136	3287	0.495	- 5.29	122	140	3141	0.533	- 0.90
- 3	98	131	2743	0.572	3.26	111	123	2800	0.525	- 1.70
- 4	86	86	2060	0.502	- 3.55	71	82	1838	0.535	- 0.52
- 5	105	145	3004	0.581	4.40	137	157	3526	0.534	- 0.84
- 6	213	299	6143	0.584	6.76	190	284	5681	0.600	8.92
- 7	210	337	6557	0.616	12.19	216	324	6481	0.600	9.53
- 8	208	313	6242	0.601	9.51	210	293	6031	0.583	6.55
- 9	199	288	5842	0.591	7.67	184	276	5522	0.600	8.80
-10	190	287	5718	0.602	9.26	185	264	5396	0.588	6.93
-11	186	266	5423	0.588	6.95	197	283	5754	0.589	7.31
-12	204	308	6134	0.602	9.59	197	292	5862	0.597	8.60
-13	199	273	5671	0.578	5.59	194	292	5832	0.600	9.04
-14	197	275	5663	0.582	6.19	176	285	5538	0.618	11.50
-15	185	272	5477	0.595	8.02	198	301	5993	0.603	9.63
-16	202	265	5610	0.567	3.91	207	289	5951	0.583	6.50
-17	232	279	6126	0.546	0.79	220	307	6325	0.582	6.54
-18	228	241	5635	0.514	- 4.07	211	255	5591	0.547	0.90
-19	182	244	5109	0.573	4.59	200	248	5374	0.555	2.06
-20	193	276	5631	0.589	7.23	189	281	5638	0.598	8.59

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 5] = 0.575, the mean of P[Sell: Portfolio 6] = 0.580 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 14-D

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 7					Portfolio 8				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	142	132	3293	0.483	- 6.68	176	169	4139	0.892	- 6.71
- 2	143	155	3569	0.520	- 2.52	177	166	4111	0.484	- 7.33
- 3	126	129	3067	0.506	- 3.89	145	145	3477	0.500	- 4.85
- 4	87	98	2220	0.528	- 1.23	103	102	2463	0.499	- 4.18
- 5	138	150	3457	0.522	- 2.24	164	174	4052	0.514	- 3.45
- 6	221	238	5511	0.519	- 3.28	251	292	6509	0.537	- 0.65
- 7	213	293	6072	0.580	6.10	253	349	7230	0.580	6.66
- 8	222	284	6071	0.562	3.28	251	317	6809	0.558	2.82
- 9	193	269	5544	0.583	6.28	238	282	6230	0.542	0.16
-10	224	271	5938	0.547	0.93	251	339	7079	0.574	5.57
-11	228	286	6173	0.556	2.37	252	315	6806	0.556	2.48
-12	225	303	6337	0.574	5.27	285	386	8052	0.575	6.12
-13	220	274	5930	0.555	2.16	290	332	7464	0.534	- 1.21
-14	196	260	5463	0.570	4.30	221	321	6504	0.592	8.25
-15	218	270	5855	0.554	2.00	269	325	7121	0.547	1.02
-16	200	262	5543	0.568	4.03	272	292	6771	0.518	- 3.80
-17	209	272	5774	0 565	3.66	314	359	8076	0.533	- 1.44
-18	211	258	5636	0.550	1.36	294	319	7350	0.520	- 3.61
-19	189	261	5397	0.579	5.60	247	334	6972	0.575	5.70
-20	210	266	5711	0.559	2.73	246	316	6740	0.563	3.62

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 7] = 0.554, the mean of P[Sell: Portfolio 8] = 0.545 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 14-E

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 9					Portfolio 10 (Largest)				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	202	155	4282	0.433	-14.18	307	231	6451	0.430	-17.89
- 2	169	172	4098	0.505	- 4.63	300	262	6741	0.466	-12.36
- 3	130	148	3331	0.532	- 1.04	275	231	6070	0.456	-13.29
- 4	112	104	2594	0.481	- 6.13	201	160	4333	0.443	-12.95
- 5	148	149	3566	0.501	- 4.79	269	248	6446	0.461	-12.89
- 6	248	255	6039	0.507	- 5.30	359	331	8272	0.480	-11.13
- 7	226	277	6026	0.551	1.56	326	340	7897	0.511	- 5.38
- 8	212	239	5412	0.530	- 1.62	311	313	7485	0.502	- 6.77
- 9	210	243	5432	0.536	- 0.74	306	291	7163	0.488	- 9.00
-10	266	267	6393	0.501	- 6.42	314	325	7661	0.509	- 5.62
-11	239	262	5937	0.530	- 1.70	329	344	8077	0.511	- 5.41
-12	230	271	6008	0.541	0.00	341	364	8453	0.516	- 4.61
-13	220	280	5995	0.560	2.95	341	369	8526	0.520	- 3.89
-14	217	273	5878	0.557	2.46	344	366	8520	0.515	- 4.82
-15	262	312	6890	0.544	0.50	403	365	9217	0.475	-12.72
-16	292	280	6864	0.490	- 8.48	394	383	9331	0.493	- 9.31
-17	277	292	6829	0.514	- 4.48	419	417	10031	0.499	- 8.44
-18	264	291	6668	0.524	- 2.79	392	352	8925	0.473	-12.89
-19	270	281	6607	0.509	- 5.22	397	361	9097	0.477	-12.25
-20	297	327	7487	0.524	2.95	414	383	9560	0.480	-11.97

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 9] = 0.521, the mean of P[Sell: Portfolio 10] = 0.488 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 15-A

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 1 (Smallest)					Portfolio 2				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	129	129	3091	0.499	- 4.51	82	97	2149	0.541	0.00
2	199	177	4510	0.470	- 9.21	133	138	3245	0.509	- 3.52
3	219	194	4957	0.470	- 9.66	141	154	3543	0.521	- 2.30
4	266	252	6214	0.487	- 8.23	163	191	4257	0.539	- 0.25
5	300	266	6790	0.469	-11.47	173	189	4346	0.522	- 2.42
6	280	247	6333	0.469	-11.07	175	182	4281	0.510	- 3.92
7	226	221	5360	0.494	- 6.65	179	178	4279	0.498	- 5.44
8	203	213	4993	0.511	- 4.10	166	190	4271	0.534	- 0.88
9	206	185	4687	0.474	- 8.86	191	186	4524	0.493	- 6.24
10	209	200	4910	0.489	- 7.04	192	191	4589	0.499	- 5.50
11	218	213	5166	0.494	- 6.53	182	182	4372	0.500	- 5.24
12	183	212	4736	0.537	- 0.53	166	183	4177	0.525	- 2.00
13	201	210	4935	0.511	- 4.07	159	185	4123	0.538	- 0.37
14	185	197	4586	0.515	- 3.40	160	188	4167	0.540	- 0.13
15	165	215	4559	0.566	3.26	144	183	3922	0.560	2.30
16	152	196	4169	0.564	2.87	159	202	4333	0.559	2.29
17	151	184	4022	0.549	0.98	146	175	3858	0.545	0.48
18	155	163	3817	0.513	- 3.43	154	162	3790	0.512	- 3.45
19	181	185	4392	0.505	- 4.61	173	182	4254	0.511	- 3.78
20	193	186	4657	0.504	- 4.88	173	174	4170	0.501	- 4.99

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 1] = 0.502, the mean of P[Sell: Portfolio 2] = 0.522 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 15-B

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 3					Portfolio 4				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	108	117	2696	0.520	- 2.11	137	150	3442	0.523	- 2.04
2	148	168	3796	0.531	- 1.19	191	196	4644	0.506	- 4.61
3	170	187	4282	0.524	- 2.15	206	218	5080	0.515	- 3.58
4	181	214	4737	0.542	0.13	234	245	5747	0.511	- 4.40
5	171	205	4510	0.544	0.38	218	256	5696	0.540	- 0.15
6	152	221	4479	0.583	6.73	236	258	5935	0.522	- 2.83
7	163	205	4409	0.557	2.05	233	257	5883	0.525	- 2.37
8	144	197	4097	0.577	4.45	222	258	5756	0.538	- 0.44
9	171	184	4254	0.518	- 2.90	222	231	5430	0.510	- 4.41
10	188	189	4519	0.501	- 5.20	245	238	5786	0.493	- 7.06
11	180	189	4424	0.512	- 3.73	235	257	5894	0.522	- 2.82
12	158	203	4338	0.562	2.67	219	239	5493	0.522	- 2.72
13	149	199	4171	0.573	3.99	221	276	5966	0.555	2.09
14	176	193	4429	0.523	- 2.32	226	257	5795	0.533	- 1.18
15	172	228	4802	0.571	4.02	198	285	5799	0.590	7.21
16	188	240	5142	0.561	2.77	209	272	5767	0.565	3.52
17	177	213	4672	0.546	0.66	203	270	5678	0.570	4.22
18	188	193	4567	0.507	- 4.44	228	262	5872	0.535	- 0.89
19	207	204	4931	0.496	- 6.11	261	286	6561	0.524	- 2.66
20	178	222	4802	0.554	1.74	251	279	6351	0.527	- 2.16

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 3] = 0.541, the mean of P[Sell: Portfolio 4] = 0.532 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 15-C

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 5					Portfolio 6				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	160	153	3760	0.489	- 6.16	187	176	4349	0.485	- 7.14
2	238	251	5872	0.513	- 4.15	232	238	5635	0.507	- 4.93
3	281	312	7114	0.526	- 2.45	250	268	6210	0.518	- 3.50
4	307	316	7473	0.507	- 5.68	309	310	7423	0.500	- 6.83
5	275	330	7252	0.546	0.82	289	305	7132	0.513	- 4.57
6	291	329	7444	0.530	- 1.83	313	328	7638	0.512	- 4.91
7	282	312	7125	0.525	- 2.61	294	310	7258	0.513	- 4.61
8	299	298	7160	0.499	- 6.87	288	310	7177	0.518	- 3.77
9	282	280	6739	0.499	- 6.66	337	256	7112	0.432	-17.76
10	290	290	3958	0.499	- 6.77	317	291	7294	0.479	-10.23
11	269	326	7143	0.548	1.14	295	305	7201	0.508	- 5.41
12	282	300	6978	0.515	- 4.20	262	314	6913	0.546	0.80
13	279	338	7397	0.548	1.16	274	336	7319	0.552	1.82
14	276	313	7074	0.531	- 1.63	269	336	7267	0.555	2.31
15	272	346	7409	0.560	3.16	274	385	7899	0.584	7.39
16	303	338	7699	0.527	- 2.37	318	387	8456	0.548	1.24
17	248	295	6509	0.544	0.47	275	349	7490	0.559	3.01
18	299	319	7416	0.516	- 4.16	331	281	7340	0.459	-13.58
19	309	331	7674	0.517	- 4.06	350	336	8231	0.490	- 8.94
20	297	351	7786	0.542	0.17	296	342	7658	0.536	- 0.85

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 5] = 0.525, the mean of P[Sell: Portfolio 6] = 0.517 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 15-D

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 7					Portfolio 8				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	196	198	4732	0.503	- 5.05	227	208	5220	0.477	- 8.94
2	269	263	6386	0.494	- 7.26	289	299	7045	0.509	- 5.19
3	289	273	6741	0.486	- 8.73	311	329	7683	0.514	- 4.57
4	304	307	7341	0.503	- 6.29	364	3 1	8696	0.497	- 7.93
5	285	343	7525	0.546	0.84	354	377	8767	0.516	- 4.52
6	294	347	7687	0.542	0.17	371	401	9261	0.519	- 4.09
7	289	322	7331	0.527	- 2.32	369	358	8725	0.493	- 8.66
8	295	304	7196	0.508	- 5.41	368	367	8827	0.499	- 7.63
9	326	296	7465	0.475	-11.02	371	337	8490	0.476	-11.57
10	308	305	7352	0.498	- 7.13	372	359	8768	0.492	- 8.87
11	278	312	7076	0.529	- 1.95	340	364	8449	0.517	- 4.26
12	283	308	7094	0.521	- 3.26	312	348	7918	0.527	- 2.41
13	290	324	7375	0.527	- 2.32	326	395	8653	0.548	1.26
14	271	337	7292	0.554	2.15	353	403	9070	0.533	- 1.47
15	274	368	7695	0.573	5.42	337	435	9260	0.563	4.09
16	267	347	7376	0.565	3.98	351	411	9137	0.539	- 0.37
17	263	310	6878	0.541	0.00	340	389	8746	0.534	- 1.27
18	315	292	7281	0.481	- 9.89	363	351	8568	0.492	- 8.77
19	322	327	7793	0.504	- 6 31	448	430	10541	0.490	-10.12
20	315	325	7679	0.507	- 5.76	411	515	11101	0.556	3.05

1 Canadian data comprise approximately 2600 securities from March 197[illegible] through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 7] = 0.520, the mean of P[Sell: Portfolio 8] = 0.516 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 15-E

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 9					Portfolio 10 (Largest)				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	237	213	5394	0.473	- 9.65	317	277	7123	0.466	-12.23
2	287	304	7085	0.515	- 4.23	418	369	9434	0.469	-13.51
3	316	312	7537	0.497	- 7.38	418	378	9551	0.475	-12.46
4	340	313	7845	0.479	-10.61	479	458	11238	0.489	-10.65
5	312	333	7739	0.516	- 4.25	482	476	11500	0.497	- 9.12
6	323	313	7626	0.492	- 8.27	462	443	10852	0.489	-10.47
7	304	271	6893	0.472	-11.07	430	415	10144	0.491	- 9.73
8	314	277	7087	0.469	-11.71	419	406	99.	0.492	- 9.42
9	360	278	7654	0.436	-17.75	472	393	10371	0.454	-17.12
10	335	279	7376	0.455	-14.27	442	417	10298	0.485	-10.98
11	321	336	7876	0.511	- 5.15	482	417	10792	0.464	-15.46
12	309	304	7352	0.496	- 7.46	422	383	9652	0.476	-12.34
13	295	317	7335	0.518	- 3.81	408	402	9714	0.496	- 8.57
14	303	298	7212	0.496	- 7.39	450	405	10255	0.474	-13.11
15	256	317	6869	0.553	1.92	384	481	10378	0.556	2.95
16	302	325	7525	0.518	- 3.86	411	436	10154	0.515	- 5.06
17	304	311	7381	0.506	- 5.81	372	392	9159	0.513	- 5.18
18	294	286	6953	0.493	- 7.73	363	338	8412	0.482	-10.46
19	334	339	8071	0.504	- 6.42	407	367	9292	0.474	-12.48
20	340	365	8450	0.518	- 4.09	438	396	10005	0.474	-12.95

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Capital gains portfolios are created based upon the closing market price in November minus the closing price in January relative to the January closing price. The mean of P[Sell: Portfolio 9] = 0.496, the mean of P[Sell: Portfolio 10] = 0.487 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 16-A

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 1 (Smallest)					Portfolio 2				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	323	613	5624	0.655	23.95	195	410	3634	0.678	22.04
- 2	298	564	5177	0.655	22.97	234	447	4088	0.656	20.60
- 3	238	451	4139	0.655	20.56	210	381	3546	0.645	17.83
- 4	197	318	3095	0.617	13.63	222	333	3330	0.600	12.12
- 5	179	301	2883	0.627	14.23	157	265	2535	0.627	13.32
- 6	356	520	5261	0.594	14.36	253	339	3554	0.573	9.29
- 7	262	430	4156	0.621	16.22	237	343	3485	0.591	11.35
- 8	284	438	4339	0.606	14.64	273	379	3915	0.581	10.78
- 9	314	413	4368	0.568	9.68	238	368	3643	0.607	13.54
-10	272	446	4311	0.621	16.54	227	348	3460	0.605	12.93
-11	340	421	4573	0.553	7.82	309	349	3951	0.530	4.43
-12	323	394	4312	0.549	7.14	319	362	4092	0.532	4.74
-13	342	379	4335	0.526	4.05	269	333	3618	0.553	6.92
-14	267	408	4054	0.604	13.89	259	362	3731	0.583	10.81
-15	316	406	4337	0.562	8.87	314	362	4056	0.536	5.16
-16	316	369	4114	0.539	5.63	303	386	4142	0.560	8.35
-17	279	307	3521	0.523	3.37	299	336	3815	0.529	4.23
-18	268	321	3538	0.545	5.98	265	365	3788	0.579	10.40
-19	286	363	3900	0.559	7.96	323	370	4165	0.534	5.00
-20	262	373	3817	0.588	11.45	267	365	3799	0.577	10.14

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 1] = 0.470, the mean of P[Sell: Portfolio 2] = 0.500 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 16-B

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 3					Portfolio 4				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	254	442	4181	0.635	18.17	174	362	3220	0.675	20.38
- 2	237	443	4085	0.652	20.06	153	372	3153	0.709	23.98
- 3	211	357	3412	0.628	15.55	120	256	2263	0.680	17.57
- 4	206	283	2940	0.578	9.03	111	219	1998	0.663	15.03
- 5	209	273	2896	0.566	7.64	115	182	1783	0.613	9.97
- 6	308	431	4443	0.583	11.75	202	324	3160	0.615	13.51
- 7	271	391	3975	0.591	12.07	173	288	2767	0.625	13.66
- 8	267	423	4141	0.613	15.17	194	315	3061	0.618	13.62
- 9	311	376	4128	0.547	6.68	201	284	2917	0.585	9.74
-10	252	367	3717	0.593	11.98	189	274	2783	0.593	10.29
-11	312	374	4121	0.545	6.39	214	278	2956	0.565	7.57
-12	320	380	4200	0.543	6.20	209	272	2890	0.566	7.61
-13	319	359	4072	0.529	4.37	190	279	2823	0.594	10.56
-14	324	403	4371	0.554	7.82	166	284	2702	0.631	14.18
-15	343	362	4232	0.513	2.37	206	276	2902	0.572	8.34
-16	306	361	4003	0.541	5.87	203	265	2814	0.566	7.58
-17	353	353	4241	0.500	0.70	206	208	2491	0.502	0.68
-18	296	320	3700	0.519	2.91	201	26[illegible]	2789	0.568	7.67
-19	296	324	3728	0.522	3.33	227	247	2850	0.520	2.71
-20	294	359	3924	0.549	6.79	195	284	2879	0.593	10.55

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 3] = 0.566, the mean of P[Sell: Portfolio 4] = 0.603 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 16-C

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 5					Portfolio 6				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	234	473	4252	0.669	22.65	258	460	4314	0.641	19.14
- 2	356	600	5737	0.628	20.07	336	589	5550	0.637	21.12
- 3	320	456	4658	0.588	12.67	315	486	4809	0.607	15.50
- 4	299	430	4380	0.590	12.54	271	333	3630	0.551	6.71
- 5	300	427	4366	0.587	12.16	265	344	3656	0.565	8.41
- 6	491	589	6482	0.546	8.13	426	538	5787	0.558	9.01
- 7	409	537	5679	0.568	10.93	395	510	5436	0.563	10.04
- 8	393	565	5756	0.590	14.39	402	536	5631	0.571	11.45
- 9	457	545	6013	0.544	7.60	446	530	5865	0.543	7.33
-10	331	532	5178	0.616	17.48	448	555	6019	0.553	9.06
-11	441	544	5915	0.552	8.79	500	551	6312	0.524	4.62
-12	419	520	5635	0.554	8.81	424	564	5933	0.571	11.72
-13	385	498	5303	0.564	10.08	380	476	5137	0.556	8.74
-14	409	511	5525	0.556	9.05	395	523	5515	0.569	11.04
-15	444	477	5530	0.518	3.41	435	525	5763	0.547	7.86
-16	405	502	5445	0.553	8.59	445	529	5847	0.543	7.32
-17	404	512	5497	0.559	9.50	391	452	5063	0.536	5.81
-18	403	506	5457	0.556	9.06	413	529	5660	0.561	10.00
-19	379	477	5138	0.557	8.92	432	555	5923	0.562	10.35
-20	313	524	5026	0.626	18.60	355	642	5987	0.644	23.07

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 5] = 0.575, the mean of P[Sell: Portfolio 6] = 0.570 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 16-D

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 7					Portfolio 8				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	204	368	3438	0.643	17.40	233	312	3275	0.572	8.80
- 2	240	437	4064	0.645	19.18	233	363	3581	0.608	13.58
- 3	215	375	3549	0.635	16.69	191	298	2938	0.609	12.35
- 4	181	302	2902	0.624	13.94	156	248	2429	0.613	11.67
- 5	214	280	2966	0.566	7.78	203	262	2792	0.563	7.23
- 6	323	504	4966	0.609	16.09	328	444	4636	0.575	10.90
- 7	285	412	4251	0.583	11.44	324	405	4384	0.555	8.00
- 8	364	494	5153	0.575	11.52	339	436	4656	0.563	9.27
- 9	337	458	4773	0.576	11.21	393	381	4650	0.492	- 0.40
-10	299	446	4473	0.598	13.84	291	360	3911	0.553	7.29
-11	360	429	4735	0.544	6.69	385	392	4662	0.505	1.30
-12	331	438	4621	0.570	10.14	347	376	4343	0.519	3.22
-13	290	414	4227	0.588	12.14	315	386	4213	0.551	7.23
-14	313	486	4797	0.608	15.64	358	446	4829	0.555	8.28
-15	371	474	5080	0.561	9.38	392	425	4910	0.520	3.53
-16	339	427	4599	0.558	8.48	343	377	4326	0.523	3.73
-17	374	337	4275	0.474	- 2.76	367	339	4241	0.481	- 1.85
-18	311	358	4018	0.535	5.05	312	394	4240	0.558	8.21
-19	334	383	4307	0.534	5.09	329	386	4292	0.540	5.85
-20	294	447	4447	0.603	14.45	351	430	4690	0.551	7.67

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 7] = 0.581, the mean of P[Sell: Portfolio 8] = 0.546 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 16-E

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 9					Portfolio 10 (Largest)				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	232	455	4128	0.663	21.53	194	357	3311	0.648	17.63
- 2	263	516	4679	0.663	22.95	202	411	3682	0.671	21.31
- 3	232	441	4041	0.656	20.41	178	329	3048	0.649	17.04
- 4	189	363	3316	0.658	18.74	143	210	2123	0.594	9.12
- 5	214	378	3556	0.639	17.13	188	247	2612	0.568	7.44
- 6	334	582	5501	0.635	20.82	259	391	3910	0.601	13.29
- 7	357	531	5330	0.598	15.00	291	372	3984	0.561	8.33
- 8	355	531	5323	0.599	15.22	314	415	4379	0.569	9.74
- 9	391	533	5548	0.577	12.16	289	358	3888	0.553	7.26
-10	372	542	5490	0.593	14.54	244	336	3482	0.579	9.91
-11	466	539	6039	0.536	6.43	323	334	3950	0.508	1.65
-12	416	496	5477	0.544	7.24	323	315	3833	0.494	- 0.08
-13	372	512	5309	0.579	12.24	263	360	3748	0.578	10.12
-14	359	602	5773	0.626	19.91	254	371	3760	0.593	12.06
-15	417	529	5681	0.559	9.71	325	351	4058	0.519	3.12
-16	382	523	5437	0.578	12.25	278	330	3656	0.542	5.73
-17	361	494	5140	0.578	11.85	288	319	3643	0.525	3.67
-18	399	549	5696	0.579	12.65	245	313	3353	0.562	7.71
-19	343	429	4636	0.555	8.20	309	297	3645	0.490	- 0.61
-20	309	521	4987	0.628	18.76	286	373	3958	0.566	8.93

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 9] = 0.600, the mean of P[Sell: Portfolio 10] = 0.567 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 17-A

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 1 (Smallest)					Portfolio 2				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	398	252	3253	0.388	-12.21	297	225	2617	0.431	- 6.51
2	483	309	3966	0.390	-13.19	382	239	3111	0.385	-12.30
3	411	301	3566	0.423	- 8.58	319	254	2867	0.443	- 5.57
4	425	307	3667	0.419	- 9.16	356	247	3016	0.409	- 9.39
5	418	403	4112	0.491	- 0.54	345	357	3512	0.508	1.57
6	432	438	4351	0.504	1.13	335	355	3453	0.515	2.31
7	423	350	3872	0.453	- 5.23	398	334	3665	0.456	- 4.70
8	432	322	3775	0.427	- 8.32	362	293	3277	0.448	- 5.42
9	393	295	3445	0.428	- 7.81	364	292	3287	0.445	- 5.72
10	463	388	4261	0.456	- 5.12	435	315	3757	0.420	- 9.16
11	352	313	3332	0.471	- 2.82	390	281	3356	0.419	- 8.85
12	388	325	3568	0.456	- 4.63	388	292	3402	0.430	- 7.61
13	414	349	3820	0.458	- 4.59	341	340	3408	0.499	0.52
14	404	372	3886	0.480	- 1.91	317	308	3130	0.493	- 0.19
15	405	332	3689	0.450	- 5.47	324	290	3074	0.472	- 2.58
16	453	383	4183.	0.458	- 4.75	543	346	4445	0.389	-14.11
17	386	351	3687	0.476	- 2.28	385	300	3428	0.438	- 6.73
18	484	347	4158	0.417	-10.03	414	317	3656	0.434	- 7.43
19	452	327	3895	0.420	- 9.39	397	319	3584	0.445	- 5.98
20	430	377	4040	0.468	- 3.49	395	330	3632	0.455	- 4.77

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 1] = 0.448, the mean of P[Sell: Portfolio 2] = 0.445 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 17-B

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 3					Portfolio 4				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	284	184	2344	0.394	- 9.76	212	200	2065	0.486	- 0.80
2	335	208	2719	0.383	-11.70	302	207	2548	0.407	- 8.85
3	328	271	2999	0.453	- 4.62	212	230	2214	0.519	2.30
4	325	261	2934	0.445	- 5.37	287	239	2637	0.455	- 4.14
5	289	322	3060	0.526	3.48	261	329	2954	0.558	6.87
6	306	333	3202	0.521	2.97	255	330	2927	0.564	7.44
7	344	304	3241	0.469	- 2.96	324	282	3032	0.466	- 3.23
8	388	323	3560	0.455	- 4.80	323	331	3272	0.506	1.31
9	395	274	3349	0.410	- 9.84	290	329	3096	0.531	4.04
10	456	286	3715	0.385	-13.39	335	345	3406	0.508	1.48
11	341	271	3064	0.444	- 5.70	272	322	2976	0.542	5.13
12	407	315	3614	0.436	- 7.05	333	293	3133	0.468	- 3.03
13	430	367	3989	0.460	- 4.39	302	338	3206	0.528	3.78
14	401	317	3592	0.441	- 6.44	318	348	3339	0.523	3.26
15	420	308	3643	0.423	- 8.69	289	321	3056	0.526	3.41
16	439	339	3897	0.436	- 7.37	400	367	3843	0.479	- 2.04
17	357	312	3350	0.467	- 3.26	297	308	3028	0.509	1.50
18	405	312	3586	0.435	- 7.15	359	339	3496	0.486	- 1.07
19	404	341	3730	0.458	- 4.53	316	341	3287	0.519	2.72
20	365	385	3756	0.513	2.21	291	337	3145	0.536	4.64

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 3] = 0.450, the mean of P[Sell: Portfolio 4] = 0.508 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 17-C

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 5					Portfolio 6				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	393	375	3847	0.488	- 0.82	408	437	4230	0.517	2.90
2	434	407	4212	0.484	- 1.45	510	422	4666	0.453	- 5.79
3	384	377	3813	0.495	0.05	474	501	4877	0.514	2.63
4	470	332	4013	0.414	-10.31	495	446	4706	0.474	- 2.90
5	395	465	4307	0.541	6.01	467	814	5410	0.568	10.69
6	444	470	4575	0.514	2.58	577	681	6294	0.541	7.37
7	485	409	4473	0.457	- 5.03	608	622	6155	0.506	1.69
8	584	415	5000	0.416	-11.23	518	559	5388	0.519	3.57
9	452	408	4307	0.475	- 2.68	475	492	4839	0.509	1.95
10	536	411	4736	0.434	- 8.38	583	534	5590	0.478	- 2.54
11	460	368	4144	0.444	- 6.56	494	534	5148	0.519	3.51
12	562	402	4825	0.417	-10.81	638	635	6372	0.499	0.60
13	497	456	4768	0.478	- 2.29	639	619	6296	0.492	- 0.47
14	530	487	5086	0.479	- 2.32	555	583	5690	0.512	2.61
15	539	507	5235	0.484	- 1.53	583	574	5786	0.496	0.18
16	648	478	5634	0.424	-10.60	766	609	6875	0.443	- 8.64
17	507	495	5015	0.494	- 0.18	529	528	5292	0.500	0.67
18	583	514	5487	0.469	- 3.92	564	555	5596	0.496	0.13
19	621	559	5906	0.474	- 3.29	581	615	5982	0.514	2.95
20	491	502	4968	0.505	1.47	581	582	5821	0.500	0.83

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 5] = 0.467, the mean of P[Sell: Portfolio 6] = 0.503 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 17-D

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 7					Portfolio 8				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	317	369	3433	0.538	5.01	343	320	3319	0.482	- 1.49
2	388	376	3821	0.492	- 0.37	468	349	4089	0.427	- 8.67
3	357	427	3927	0.545	6.23	367	364	3655	0.498	0.36
4	353	356	3551	0.502	0.85	464	363	4138	0.439	- 7.19
5	365	498	4319	0.577	10.84	458	547	5025	0.544	6.99
6	383	488	4361	0.560	8.58	458	477	4680	0.510	2.06
7	481	476	4792	0.497	0.32	460	442	4514	0.490	- 0.64
8	407	469	4382	0.535	5.32	451	426	4385	0.486	- 1.23
9	392	426	4094	0.520	3.23	470	378	4244	0.446	- 6.41
10	512	540	5263	0.513	2.61	528	487	5069	0.481	- 1.97
11	477	481	4798	0.502	0.98	426	414	4203	0.493	- 0.29
12	435	496	4659	0.533	5.18	476	428	4525	0.474	- 2.88
13	422	543	4829	0.562	9.37	431	470	4506	0.522	3.59
14	478	555	5169	0.537	6.07	461	501	4816	0.521	3.58
15	441	581	5111	0.568	10.49	431	438	4352	0.504	1.21
16	553	563	5582	0.504	1.39	572	516	5442	0.474	- 3.09
17	346	500	4236	0.591	12.51	434	496	4654	0.533	5.17
18	422	488	4554	0.536	5.57	434	461	4480	0.515	2.70
19	436	519	4776	0.543	6.68	474	507	4906	0.517	3.07
20	459	504	4816	0.523	3.92	434	462	4484	0.515	2.73

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 7] = 0.536, the mean of P[Sell: Portfolio 8] = 0.494 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test $P[z \geq 2.33] = 0.01$

TABLE 17-E

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. CAPITAL GAINS PORTFOLIOS[1]

	Portfolio 9					Portfolio 10 (Largest)				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	409	412	4107	0.502	0.88	283	227	2604	0.437	- 5.92
2	452	432	4425	0.489	- 0.85	398	292	3457	0.423	- 8.41
3	454	428	4418	0.485	- 1.29	403	326	3645	0.447	- 5.77
4	515	435	4755	0.458	- 5.13	416	337	3772	0.448	- 5.80
5	459	604	5320	0.568	10.63	383	403	3932	0.513	2.25
6	456	579	5179	0.559	9.27	433	459	4462	0.515	2.61
7	485	458	4717	0.486	- 1.25	390	393	3916	0.502	0.88
8	452	507	4800	0.529	4.71	401	360	3811	0.473	- 2.67
9	458	464	4618	0.503	1.12	417	348	3830	0.455	- 5.01
10	512	478	4952	0.483	- 1.68	448	389	4188	0.464	- 3.96
11	427	484	4559	0.531	7.93	444	390	4171	0.468	- 3.52
12	498	486	4927	0.494	- 0.17	453	393	4233	0.465	- 3.95
13	481	505	4934	0.512	2.41	451	417	4342	0.480	- 1.92
14	495	540	5177	0.522	3.85	408	435	4218	0.516	2.77
15	463	575	5192	0.554	8.52	448	391	4201	0.466	- 3.72
16	619	636	6275	0.507	1.87	541	488	5147	0.474	- 3.00
17	444	539	4922	0.548	7.49	401	365	3830	0.477	- 2.29
18	442	535	4889	0.548	7.35	456	372	4145	0.449	- 5.90
19	465	573	5196	0.552	8.21	418	438	4290	0.512	2.24
20	456	504	4805	0.525	4.14	416	399	4076	0.489	- 0.71

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the relative difference between the average buyer-initiated price in the preceding January and the average seller-initiated price in November. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 9] = 0.520, the mean of P[Sell: Portfolio 10] = 0.475 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 18-A

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 1 (Smallest)					Portfolio 2				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	86	66	1826	0.435	- 9.09	84	79	1955	0.485	- 4.97
- 2	66	69	1614	0.511	- 2.42	82	90	2063	0.524	- 1.55
- 3	60	63	1477	0.510	- 2.39	88	81	2031	0.478	- 5.70
- 4	38	36	884	0.485	- 3.34	69	57	1509	0.452	- 6.94
- 5	48	49	1168	0.305	- 2.47	97	93	2278	0.489	- 4.98
- 6	64	97	1931	0.601	5.29	114	157	3252	0.581	4.58
- 7	62	95	1880	0.604	5.48	114	142	3072	0.555	1.56
- 8	56	84	1677	0.602	5.01	88	120	2496	0.575	3.41
- 9	53	74	1527	0.582	3.22	73	104	2132	0.587	4.26
-10	55	76	1582	0.580	3.11	80	112	2311	0.582	3.96
-11	73	77	1802	0.516	- 2.13	106	130	2835	0.551	1.07
-12	71	86	1878	0.546	0.44	92	124	2590	0.574	3.37
-13	72	96	2017	0.570	2.61	96	147	2906	0.605	6.92
-14	61	86	1761	0.585	3.71	92	142	2796	0.607	7.00
-15	58	78	1635	0.576	2.84	90	112	2415	0.555	1.38
-16	63	79	1700	0.555	1.16	96	116	2539	0.548	0.71
-17	62	85	1763	0.580	3.29	106	126	2789	0.544	0.32
-18	80	77	1889	0.490	- 4.45	106	110	2592	0.510	- 3.17
-19	78	93	2055	0.545	0.36	94	101	2335	0.519	- 2.13
-20	81	79	1917	0.493	- 4.22	106	119	2699	0.530	- 1.15

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 1] = 0.545, the mean of P[Sell: Portfolio 2] = 0.547 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 18-B

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 3					Portfolio 4				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	84	89	2072	0.515	- 2.38	91	85	2113	0.485	- 5.17
- 2	93	96	2267	0.506	- 3.34	85	99	2212	0.539	- 0.19
- 3	79	86	1978	0.519	- 1.96	88	83	2051	0.488	- 4.82
- 4	64	60	1479	0.485	- 4.32	63	63	1503	0.499	- 3.27
- 5	86	91	2119	0.513	- 2.58	86	89	2094	0.508	- 3.03
- 6	120	166	3425	0.580	4.58	131	161	3507	0.551	1.19
- 7	105	161	3198	0.604	7.15	115	175	2489	0.603	7.35
- 8	94	154	2978	0.621	8.76	104	152	3069	0.593	5.78
- 9	101	129	2753	0.562	2.21	98	135	2791	0.579	4.03
-10	108	147	3054	0.576	3.88	97	153	2981	0.613	7.90
-11	105	143	2973	0.575	3.72	109	167	3305	0.605	7.38
-12	105	146	3015	0.582	4.52	112	159	3246	0.587	5.26
-13	93	141	2813	0.603	6.60	103	158	3142	0.605	7.20
-14	98	132	2767	0.574	3.48	108	154	3142	0.587	5.17
-15	125	144	3219	0.535	- 0.68	113	141	3040	0.556	1.66
-16	112	132	2926	0.543	0.22	116	158	3277	0.577	0.77
-17	123	146	3232	0.544	0.34	125	161	3442	0.563	2.59
-18	115	126	2885	0.523	- 1.94	136	155	3490	0.533	- 0.95
-19	124	136	3118	0.525	- 1.79	138	166	3646	0.545	0.49
-20	136	131	3204	0.491	- 5.68	140	154	3525	0.525	- 1.91

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 3] = 0.553, the mean of P[Sell: Portfolio 4] = 0.562 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 18-C

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 5					Portfolio 6				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	93	87	2165	0.482	- 5.51	117	113	2753	0.493	- 5.06
- 2	98	100	2379	0.505	- 3.52	119	111	2758	0.482	- 6.11
- 3	78	85	1958	0.520	- 1.87	100	95	2332	0.488	- 5.14
- 4	58	61	1436	0.512	- 2.21	72	73	1739	0.500	- 3.43
- 5	89	105	2324	0.542	0.10	101	109	2512	0.519	- 2.21
- 6	135	181	3788	0.574	4.08	151	203	4252	0.573	4.19
- 7	133	201	4002	0.601	7.62	150	230	4553	0.605	8.67
- 8	115	170	3422	0.597	6.57	139	199	4052	0.589	6.13
- 9	111	162	3281	0.593	5.98	137	184	3847	0.574	4.11
-10	112	172	3401	0.605	7.49	142	201	4106	0.586	5.79
-11	112	156	3212	0.583	4.78	148	203	4222	0.578	4.83
-12	116	167	3393	0.591	5.85	142	200	4108	0.585	5.66
-13	111	168	3346	0.604	7.31	143	185	3938	0.565	3.02
-14	123	169	3503	0.580	4.63	133	185	3817	0.581	4.96
-15	118	151	3230	0.561	2.28	135	178	3755	0.568	3.32
-16	119	151	3235	0.560	2.17	141	165	3673	0.540	- 0.12
-17	134	160	3532	0.544	0.36	145	193	4069	0.569	3.58
-18	144	146	3471	0.504	- 4.37	151	170	3859	0.529	- 1.50
-19	127	143	3246	0.529	- 1.37	134	152	3439	0.531	- 1.18
-20	126	160	3437	0.559	2.12	145	160	3668	0.525	- 1.95

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 5] = 0.563, the mean of P[Sell: Portfolio 6] = 0.556 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 18-D

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 7					Portfolio 8				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	140	125	3181	0.470	- 8.04	151	141	3620	0.466	- 9.06
- 2	142	136	3335	0.488	- 6.14	140	138	3339	0.497	- 5.10
- 3	113	101	2561	0.472	- 7.01	122	148	3240	0.549	0.91
- 4	80	82	1942	0.504	- 3.27	98	90	2255	0.478	- 6.00
- 5	114	112	2710	0.496	- 4.70	145	149	3530	0.507	- 4.05
- 6	193	221	4969	0.534	- 0.99	225	274	5987	0.549	1.24
- 7	171	233	4846	0.577	5.03	239	318	6688	0.571	4.92
- 8	163	200	4357	0.552	1.46	220	287	6082	0.567	4.07
- 9	155	206	4324	0.571	3.96	197	278	5697	0.586	6.82
-10	155	202	4281	0.567	3.41	230	272	6016	0.542	0.16
-11	164	204	4406	0.554	1.73	208	273	5772	0.567	3.96
-12	176	204	4569	0.537	- 0.54	216	292	6091	0.574	5.17
-13	171	205	4521	0.545	0.54	212	295	6094	0.582	6.42
-14	154	207	4334	0.573	4.23	192	278	5636	0.591	7.53
-15	188	226	4964	0.547	0.85	215	277	5903	0.563	3.39
-16	178	201	4547	0.530	- 1.49	200	266	5599	0.570	4.36
-17	175	210	4613	0.545	0.55	232	260	5907	0.52b	- 2.01
-18	170	196	4385	0.535	- 0.80	228	251	5744	0.524	- 2.57
-19	199	188	4640	0.487	- 7.38	233	261	5923	0.528	- 2.01
-20	192	208	4796	0.519	- 3.06	276	295	6850	0.516	- 4.15

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 7] = 0.534, the mean of P[Sell: Portfolio 8] = 0.548 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 18-E

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 9					Portfolio 10 (Largest)				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	179	181	4322	0.503	- 5.01	450	435	10629	0.492	-10.14
- 2	160	178	4055	0.527	- 1.79	440	461	10821	0.512	- 6.05
- 3	134	161	3538	0.546	0.60	348	430	9335	0.552	2.73
- 4	110	132	2907	0.546	0.54	284	310	7123	0.522	- 3.22
- 5	165	184	4178	0.527	- 1.82	447	512	11514	0.534	- 1.51
- 6	272	373	7742	0.578	6.53	787	972	21112	0.553	3.50
- 7	271	402	8070	0.598	10.28	806	1154	23520	0.589	14.77
- 8	275	397	8064	0.591	9.01	817	1064	22569	0.566	7.54
- 9	256	358	7362	0.584	7.40	786	975	21129	0.554	3.79
-10	284	375	7916	0.569	1.05	778	1008	21440	0.564	6.76
-11	263	371	7616	0.585	7.71	737	969	20467	0.568	7.75
-12	271	391	7949	0.591	8.95	784	1106	22680	0.585	13.30
-13	265	351	7391	0.570	5.00	793	1016	21707	0.561	5.91
-14	235	370	7258	0.611	11.97	718	979	20364	0.577	10.31
-15	272	391	7954	0.590	8.77	785	1046	21980	0.571	8.93
-16	268	369	7644	0.579	6.67	857	974	21972	0.532	- 2.68
-17	271	361	7588	0.571	5.24	889	1076	23576	0.548	2.16
-18	290	337	7522	0.537	- 0.70	803	954	21089	0.543	0.58
-19	243	328	6852	0.574	5.48	697	942	19659	0.575	9.57
-20	264	368	7583	0.583	7.34	680	990	20043	0.593	14.77

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 9] = 0.573, the mean of P[Sell: Portfolio 10] = 0.559 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 19-A

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 1 (Smallest)					Portfolio 2				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	94	81	2091	0.463	- 7.16	98	74	2060	0.429	-10.20
2	120	99	2625	0.452	- 9.15	131	102	2797	0.438	-10.93
3	102	99	2412	0.494	- 4.63	116	104	2649	0.473	- 7.02
4	123	110	2789	0.471	- 7.42	146	132	3329	0.474	- 7.76
5	111	108	2634	0.494	- 4.84	144	146	3478	0.505	- 4.17
6	115	103	2612	0.473	- 6.97	138	130	3214	0.484	- 6.49
7	112	103	2584	0.479	- 6.33	126	127	3034	0.502	- 4.31
8	105	99	2450	0.484	- 5.66	113	118	2763	0.511	- 3.17
9	136	89	2698	0.398	-14.91	126	123	2988	0.494	- 5.16
10	123	108	2772	0.467	- 7.82	134	131	3180	0.494	- 5.32
11	122	114	2834	0.482	- 6.30	131	130	3124	0.498	- 4.82
12	106	101	2482	0.490	- 5.10	138	128	3192	0.480	- 6.92
13	119	93	2554	0.439	-10.34	139	141	3361	0.505	- 4.19
14	124	114	2860	0.480	- 6.55	137	138	3307	0.501	- 4.62
15	94	105	2389	0.528	- 1.28	114	147	3121	0.563	2.47
16	88	99	2240	0.531	- 0.95	116	128	2931	0.525	- 1.74
17	91	84	2102	0.479	- 5.70	105	122	2719	0.538	- 0.31
18	82	79	1925	0.490	- 4.49	102	100	2423	0.494	- 4.64
19	91	89	2161	0.496	- 4.20	99	105	2449	0.513	- 2.78
20	110	96	2477	0.466	- 7.49	129	117	2948	0.475	- 7.19

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 1] = 0.477, the mean of P[Sell: Portfolio 2] = 0.496 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 19-B

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 3					Portfolio 4				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	75	85	1911	0.532	- 0.79	97	97	2331	0.498	- 4.17
2	100	124	2682	0.553	1.25	146	146	3501	0.500	- 4.87
3	112	121	2789	0.519	- 2.33	160	156	3796	0.494	- 5.81
4	147	156	2634	0.513	- 3.39	178	176	4244	0.498	- 5.62
5	143	145	3451	0.504	- 4.36	181	175	4274	0.491	- 6.56
6	136	140	3313	0.506	- 4.04	185	170	4269	0.479	- 8.13
7	131	138	3232	0.512	- 3.31	167	154	3862	0.480	- 7.61
8	135	142	3323	0.512	- 3.36	163	143	3672	0.467	- 9.00
9	149	129	3335	0.465	- 8.81	183	145	3933	0.443	-12.33
10	149	150	3592	0.501	- 4.81	179	146	3897	0.450	-11.40
11	155	144	3584	0.482	- 7.09	176	168	4130	0.489	- 6.71
12	131	131	3147	0.500	- 4.62	139	157	3547	0.531	- 1.20
13	141	138	3338	0.495	- 5.33	135	149	3405	0.525	- 1.87
14	147	142	3468	0.490	- 6 03	149	154	3634	0.509	- 3.87
15	121	148	3247	0.552	1.26	129	164	3515	0.558	2.02
16	138	128	3190	0.482	- 6.69	130	167	3562	0.564	2.76
17	125	125	2996	0.501	- 4.39	123	149	3259	0.548	0.80
18	138	127	3183	0.478	- 7.13	124	121	2932	0.494	- 5.11
19	155	130	3426	0.456	- 9.98	141	132	3279	0.483	- 6.67
20	174	151	3898	0.464	- 9.65	161	163	3880	0.503	- 4.75

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 3] = 0.498, the mean of P[Sell: Portfolio 4] = 0.499 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 19-C

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 5					Portfolio 6				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	103	90	2320	0.467	- 7.15	131	125	3075	0.488	- 5.90
2	131	133	3172	0.503	- 4.30	165	157	3866	0.487	- 6.74
3	140	137	3329	0.494	- 5.44	161	164	3897	0.505	- 4.51
4	153	162	3777	0.514	- 3.33	181	188	4427	0.510	- 4.14
5	167	158	3897	0.485	- 7.02	184	185	4429	0.502	- 5.21
6	157	164	3848	0.510	- 3.86	191	191	4590	0.500	- 5.57
7	152	150	3621	0.497	- 5.31	174	180	4247	0.509	- 4.19
8	150	152	3626	0.503	- 4.59	181	189	4435	0.510	- 4.14
9	188	159	4158	0.457	-10.87	209	167	4505	0.444	-13.07
10	181	159	4083	0.468	- 9.36	220	202	5064	0.479	- 8.85
11	186	167	4226	0.473	- 8.87	200	218	5011	0.521	- 2.84
12	157	160	3808	0.504	- 4.58	189	185	4484	0.495	- 6.18
13	153	153	3673	0.499	- 5.11	167	193	4201	0.523	- 2.34
14	135	144	3350	0.515	- 3.02	172	175	4167	0.504	- 4.79
15	122	165	3444	0.573	3.77	156	202	4292	0.564	3.02
16	140	169	3701	0.547	0.73	167	192	4301	0.535	- 0.79
17	124	153	3322	0.554	1.50	163	170	3998	0.510	- 3.93
18	138	137	3297	0.498	- 4.96	177	158	4023	0.471	- 8.91
19	154	144	3569	0.484	- 6.83	187	178	4372	0.487	- 7.17
20	165	165	3960	0.501	- 5.05	200	189	4669	0.485	- 7.68

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 5] = 0.502, the mean of P[Sell: Portfolio 6] = 0.502 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 19-D

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 7					Portfolio 8				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	154	147	3609	0.487	- 6.51	165	158	3878	0.490	- 6.37
2	186	196	4586	0.514	- 3.67	239	247	5825	0.508	- 5.05
3	210	211	5051	0.501	- 5.71	280	267	6569	0.488	- 8.62
4	228	227	5456	0.499	- 6.23	333	305	7655	0.479	-10.89
5	223	241	5559	0.520	- 3.14	331	305	7629	0.479	-10.87
6	221	228	5397	0.509	- 4.72	336	332	8025	0.497	- 7.91
7	229	210	5270	0.478	- 9.18	304	306	7314	0.501	- 6.87
8	215	218	5194	0.503	- 5.50	267	297	6770	0.526	- 2.48
9	258	225	5793	0.465	-11.61	303	287	7082	0.486	- 9.29
10	245	220	5577	0.472	-10.34	308	285	7122	0.481	-10.16
11	258	260	6214	0.501	- 6.33	287	291	6927	0.504	- 6.18
12	217	238	5454	0.523	- 2.67	251	289	6482	0.536	- 0.81
13	199	257	5473	0.563	3.27	279	284	6753	0.505	- 5.94
14	205	231	5229	0.530	- 1.60	286	302	7059	0.514	- 4.55
15	191	264	5454	0.581	5.93	256	329	7026	0.562	3.53
16	188	233	5048	0.553	1.71	269	309	6937	0.535	- 1.00
17	201	209	4929	0.510	- 4.37	266	301	6808	0.531	- 1.66
18	194	208	4821	0.518	- 3.21	252	275	6322	0.523	- 2.87
19	224	225	5389	0.501	- 5.89	300	285	7023	0.487	- 9.08
20	223	208	5166	0.483	- 8.37	291	292	6987	0.501	- 6.71

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 7] = 0.511, the mean of P[Sell: Portfolio 8] = 0.506 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 19-E

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR CANADIAN MARKET VALUE PORTFOLIOS[1]

	Portfolio 9					Portfolio 10 (Largest)				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	207	223	5160	0.519	- 3.17	614	611	14704	0.499	-10.22
2	299	299	7175	0.500	- 6.97	849	867	20585	0.505	-10.37
3	330	334	7966	0.503	- 6.81	955	994	23384	0.510	- 9.51
4	386	381	9211	0.497	- 8.47	1043	1084	25522	0.510	- 9.94
5	352	376	8742	0.517	- 4.50	988	1208	26350	0.550	2.93
6	349	398	8956	0.533	- 1.52	1018	1167	26213	0.534	- 2.27
7	319	355	8081	0.527	- 2.53	1002	1085	25042	0.520	- 6.67
8	348	378	8701	0.521	- 3.74	999	1048	24564	0.512	- 9.12
9	348	322	8032	0.481	-10.79	987	956	23316	0.492	-15.02
10	322	350	8063	0.520	- 3.78	996	972	23612	0.494	-14.49
11	344	363	8484	0.514	- 4.99	903	1014	23005	0.529	- 3.65
12	321	367	8246	0.533	- 1.46	915	1011	23113	0.525	- 4.88
13	300	407	8481	0.575	6.28	929	1136	24781	0.550	2.84
14	332	371	8436	0.528	- 2.40	949	1122	24850	0.542	0.32
15	317	419	8837	0.569	5.28	942	1266	26489	0.573	10.45
16	341	406	8958	0.544	0.57	1055	1277	27994	0.548	2.35
17	342	383	8695	0.528	- 2.43	912	1153	24778	0.559	5.69
18	375	333	8495	0.470	-13.13	1082	1083	25980	0.500	-13.26
19	417	403	9842	0.491	- 9.95	1199	1261	29513	0.513	- 9.65
20	374	386	9114	0.508	- 6.32	1036	1351	28640	0.566	8.49

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Market value portfolios calculated as closing market price times outstanding equity shares on the last trading day in the previous November. The mean of P[Sell: Portfolio 9] = 0.519, the mean of P[Sell: Portfolio 10] = 0.528 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 20-A

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 1 (Smallest)					Portfolio 2				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	104	359	2783	0.774	28.44	88	215	1822	0.708	18.19
- 2	70	338	2449	0.828	32.97	94	196	1747	0.675	15.09
- 3	56	259	1897	0.820	28.33	93	156	1501	0.627	10.22
- 4	55	182	1422	0.768	20.59	64	111	1056	0.633	8.94
- 5	62	132	1165	0.680	12.62	51	99	906	0.660	9.94
- 6	94	266	2168	0.738	22.67	67	170	1428	0.716	16.68
- 7	94	222	1900	0.703	18.15	75	160	1414	0.681	13.99
- 8	105	244	2098	0.698	18.58	81	148	1378	0.646	11.20
- 9	85	210	1784	0.708	17.99	66	146	1279	0.688	13.81
-10	78	214	1755	0.732	19.83	63	147	1265	0.700	14.56
-11	86	180	1600	0.677	14.60	76	147	1342	0.658	12.05
-12	98	189	1722	0.659	13.57	97	155	1513	0.615	9.36
-13	87	206	1762	0.702	17.38	78	124	1212	0.614	8.28
-14	72	211	1707	0.744	20.58	66	137	1221	0.675	12.57
-15	84	201	1714	0.705	17.42	61	150	1271	0.709	15.25
-16	78	171	1497	0.685	14.73	72	142	1290	0.664	12.11
-17	70	144	1285	0.673	12.77	57	116	1042	0.668	11.17
-18	82	155	1424	0.653	11.93	71	170	1454	0.704	15.91
-19	85	136	1331	0.613	8.62	57	168	1355	0.747	18.54
-20	70	163	1403	0.699	15.30	49	204	1526	0.804	24.15

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 1] = 0.724, the mean of P[Sell: Portfolio 2] = 0.686 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 20-B

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 3					Portfolio 4				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	133	288	2526	0.684	18.01	105	243	2090	0.699	18.61
- 2	167	279	2681	0.625	13.44	79	246	1950	0.757	23.13
- 3	138	232	2226	0.627	12.47	79	187	1602	0.702	16.54
- 4	111	159	1622	0.589	7.60	58	139	1186	0.707	14.57
- 5	142	175	1903	0.552	4.95	60	127	1123	0.679	12.30
- 6	200	303	3025	0.602	11.81	119	224	2062	0.653	14.33
- 7	152	224	2261	0.596	9.58	107	208	1897	0.660	14.37
- 8	133	230	2180	0.633	12.89	123	208	1988	0.628	11.89
- 9	129	201	1985	0.610	10.26	123	175	1794	0.586	7.74
-10	103	211	1888	0.672	15.35	115	195	1863	0.630	11.62
-11	150	228	2275	0.604	10.35	136	194	1984	0.587	8.17
-12	121	217	2030	0.641	13.19	137	203	2050	0.597	9.20
-13	138	229	2210	0.624	12.09	117	203	1927	0.634	12.22
-14	113	190	1822	0.626	11.20	95	189	1706	0.665	14.07
-15	155	185	2045	0.545	4.50	124	184	1850	0.597	8.80
-16	135	194	1976	0.590	8.41	119	172	1751	0.591	7.99
-17	122	188	1864	0.607	9.65	113	164	1671	0.592	7.92
-18	126	188	1888	0.599	9.00	118	191	1855	0.618	10.62
-19	143	210	2119	0.595	9.22	142	172	1889	0.547	4.51
-20	122	217	2044	0.639	13.06	120	193	1880	0.617	10.58

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 3] = 0.613, the mean of P[Sell: Portfolio 4] = 0.637 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 20-C

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 5					Portfolio 6				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	122	262	2310	0.682	17.96	233	367	3609	0.612	14.00
- 2	118	312	2587	0.725	23.38	309	452	4569	0.594	13.39
- 3	92	223	1897	0.706	18.41	270	360	3783	0.571	9.35
- 4	92	164	1543	0.640	11.37	235	304	3241	0.564	7.90
- 5	94	159	1524	0.627	10.33	224	323	3285	0.590	10.89
- 6	173	221	2373	0.561	6.42	370	522	5355	0.585	13.21
- 7	163	214	2268	0.567	6.90	357	486	5064	0.577	11.65
- 8	156	244	2409	0.610	11.27	391	494	5318	0.558	9.18
- 9	183	250	2606	0.578	8.43	400	470	5227	0.540	6.49
-10	157	220	2267	0.583	8.40	331	473	4829	0.588	12.91
-11	193	225	2513	0.539	4.43	434	477	5468	0.523	4.20
-12	180	236	2503	0.567	7.16	430	456	5322	0.514	2.84
-13	163	205	2209	0.557	5.85	375	471	5080	0.557	8.85
-14	145	249	2371	0.652	13.36	361	505	5201	0.583	12.66
-15	181	229	2467	0.558	6.28	380	502	5297	0.569	10.80
-16	160	218	2277	0.577	7.79	359	458	4905	0.560	9.14
-17	150	175	1955	0.539	3.86	390	420	4863	0.519	3.29
-18	130	176	1846	0.575	6.85	367	441	4853	0.545	7.00
-19	168	205	2242	0.550	5.21	408	392	4808	0.490	- 0.72
-20	126	224	2105	0.638	13.17	331	451	4693	0.577	11.21

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 5] = 0.600, the mean of P[Sell: Portfolio 6] = 0.561 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.485.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 20-D

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

Day Rel to Yr End	Portfolio 7 Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Portfolio 8 Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	270	549	4818	0.670	24.54	307	565	5232	0.648	22.13
- 2	303	551	5128	0.645	21.44	351	655	6045	0.651	24.25
- 3	270	480	4503	0.640	19.49	282	524	4906	0.642	20.58
- 4	244	433	4065	0.639	18.41	261	442	4223	0.628	17.32
- 5	268	404	4036	0.601	13.51	294	393	4128	0.572	9.95
- 6	391	593	5905	0.603	16.53	478	633	6672	0.569	12.15
- 7	360	515	5259	0.589	13.56	385	534	5514	0.581	12.78
- 8	392	579	5827	0.596	15.48	411	593	6034	0.590	14.84
- 9	441	554	5978	0.557	9.52	464	574	6229	0.553	9.14
-10	380	551	5588	0.592	14.45	419	577	5981	0.579	12.97
-11	523	547	6421	0.511	2.61	522	552	6445	0.514	3.03
-12	477	520	5985	0.521	4.10	453	532	5916	0.540	6.93
-13	433	516	5697	0.544	7.34	409	551	5766	0.574	12.01
-14	417	566	5903	0.576	12.47	394	590	5908	0.599	16.04
-15	475	532	6050	0.528	5.15	508	530	6230	0.510	2.44
-16	462	565	6168	0.550	8.60	492	532	6147	0.519	3.83
-17	485	495	5883	0.505	1.59	490	508	5989	0.509	2.18
-18	481	626	6651	0.565	11.50	431	507	5637	0.541	6.84
-19	405	457	5178	0.530	5.08	454	574	6172	0.558	9.98
-20	368	556	5550	0.602	15.89	399	611	6070	0.605	17.11

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 7] = 0.575, the mean of P[Sell: Portfolio 8] = 0.572 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 20-E

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 9					Portfolio 10 (Largest)				
Day Rel to Yr End	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
- 1	400	677	6470	0.629	21.49	547	747	7771	0.577	14.46
- 2	415	784	7202	0.654	26.94	643	930	9443	0.591	18.64
- 3	377	624	6014	0.623	19.86	561	784	8077	0.583	15.82
- 4	347	466	4884	0.573	10.95	510	640	6908	0.556	10.22
- 5	352	480	5001	0.577	11.58	496	666	6980	0.573	13.05
- 6	601	775	8265	0.563	12.40	786	955	10450	0.549	10.98
- 7	590	721	7871	0.550	9.71	733	933	10000	0.560	13.04
- 8	608	796	8431	0.567	13.22	786	995	10692	0.559	13.20
- 9	679	691	8224	0.504	1.70	806	975	10690	0.548	10.86
-10	563	697	7565	0.553	10.08	714	923	9827	0.564	13.65
-11	656	693	8097	0.514	3.38	877	967	11070	0.524	6.19
-12	597	694	7752	0.538	7.54	840	916	10543	0.522	5.48
-13	598	659	7549	0.524	5.02	728	833	9373	0.534	7.47
-14	655	773	8574	0.541	8.53	787	987	10648	0.556	12.68
-15	683	768	8715	0.529	6.39	911	906	10910	0.499	0.76
-16	602	704	7843	0.539	7.79	841	915	10538	0.521	5.35
-17	620	609	7381	0.495	0.08	827	838	9997	0.503	1.69
-18	570	650	7325	0.533	6.48	736	815	9309	0.525	5.87
-19	611	631	7458	0.508	2.21	787	885	10039	0.529	6.88
-20	604	716	7925	0.543	8.50	736	984	10321	0.572	15.67

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 9] = 0.550, the mean of P[Sell: Portfolio 10] = 0.546 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 21-A

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 1 (Smallest)					Portfolio 2				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	108	85	970	0.439	- 3.48	100	64	825	0.389	- 6.08
2	116	78	978	0.403	- 5.76	134	75	1046	0.359	- 8.77
3	92	92	923	0.501	0.34	137	90	1140	0.396	- 6.71
4	117	108	1131	0.479	- 1.06	119	101	1106	0.460	- 2.31
5	111	114	1133	0.507	0.78	115	100	1079	0.465	- 1.96
6	111	121	1163	0.520	1.72	135	113	1245	0.456	- 2.74
7	120	110	1153	0.478	- 1.16	153	125	1394	0.451	- 3.27
8	138	106	1221	0.435	- 4.20	134	108	1214	0.446	- 3.44
9	132	110	1212	0.455	- 2.81	128	98	1134	0.435	- 4.06
10	139	113	1260	0.448	- 3.31	147	114	1307	0.437	- 4.20
11	136	105	1207	0.437	- 4.06	165	122	1439	0.426	- 5.24
12	121	108	1153	0.472	- 1.58	121	116	1186	0.490	- 0.35
13	134	120	1275	0.472	- 1.63	113	105	1095	0.482	- 0.85
14	145	112	1289	0.436	- 4.24	105	116	1105	0.525	1.99
15	124	126	1256	0.503	0.58	89	105	978	0.541	2.87
16	133	115	1246	0.465	- 2.14	79	112	959	0.588	5.77
17	121	118	1200	0.494	- 0.06	108	96	1024	0.469	- 1.68
18	108	115	1119	0.517	1.44	87	99	935	0.530	2.17
19	125	130	1282	0.510	1.08	82	109	959	0.468	4.54
20	126	131	1291	0.510	1.11	93	144	1187	0.607	7.75

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 1] = 0.477, the mean of P[Sell: Portfolio 2] = 0.473 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 21-B

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 3					Portfolio 4				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	145	135	1406	0.482	- 1.01	142	118	1303	0.454	- 2.99
2	217	172	1950	0.443	- 4.59	160	152	1562	0.487	- 0.62
3	177	208	1928	0.540	3.95	148	165	1572	0.527	2.52
4	239	208	2235	0.465	- 2.81	147	165	1564	0.528	2.62
5	208	227	2177	0.522	2.55	116	208	1622	0.641	11.78
6	210	220	2151	0.511	1.52	153	202	1779	0.568	6.14
7	242	238	2404	0.496	0.08	170	179	1746	0.513	1.47
8	271	212	2420	0.439	- 5.49	173	147	1607	0.459	- 2.87
9	209	191	2007	0.478	- 1.54	164	166	1654	0.504	0.70
10	228	191	2098	0.456	- 3.56	184	149	1669	0.448	- 3.88
11	202	196	1992	0.492	- 0.27	137	168	1527	0.551	4.36
12	233	176	2051	0.431	- 5.84	174	168	1715	0.490	- 0.38
13	236	249	2433	0.513	1.81	146	194	1703	0.570	6.20
14	233	262	2477	0.529	3.41	171	209	1906	0.549	4.74
15	204	213	2088	0.510	1.38	154	200	1776	0.564	5.83
16	245	233	2393	0.488	- 0.72	187	204	1962	0.521	2.34
17	148	180	1643	0.548	4.33	149	174	1619	0.539	3.51
18	217	201	2096	0.481	- 1.25	197	188	1930	0.488	- 0.65
19	224	244	2346	0.521	2.55	178	194	1863	0.522	2.36
20	213	233	2231	0.523	2.61	165	203	1847	0.551	4.83

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 3] = 0.492, the mean of P[Sell: Portfolio 4] = 0.524 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 21-C

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 5					Portfolio 6				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	175	172	1739	0.495	- 0.04	405	393	3996	0.493	- 0.29
2	214	186	2007	0.465	- 2.66	496	387	4415	0.438	- 7.54
3	179	187	1832	0.511	1.36	453	404	4288	0.472	- 3.07
4	274	178	2264	0.394	- 9.57	471	383	4271	0.448	- 6.10
5	234	265	2499	0.531	3.64	435	553	4944	0.559	9.07
6	254	264	2592	0.509	1.45	508	625	5665	0.552	8.53
7	278	234	2564	0.457	- 3.84	586	500	5433	0.461	- 5.06
8	224	252	2381	0.529	3.34	557	518	5379	0.482	- 1.93
9	208	236	2221	0.532	3.46	492	441	4667	0.473	- 3.02
10	280	211	2461	0.430	- 6.50	585	595	5905	0.504	1.43
11	260	237	2490	0.476	- 1.87	512	487	4997	0.487	- 1.06
12	288	222	2554	0.435	- 6.10	563	497	5301	0.469	- 3.82
13	237	269	2534	0.532	3.79	457	508	4833	0.526	4.36
14	238	215	2269	0.475	- 1.94	589	568	5789	0.491	- 0.67
15	228	193	2112	0.458	- 3.37	577	591	5845	0.506	1.69
16	285	235	2604	0.452	- 4.35	655	560	6080	0.461	- 5.33
17	182	204	1934	0.528	2.90	540	530	5351	0.495	0.03
18	209	216	2131	0.508	1.22	552	514	5335	0.482	- 1.83
19	226	229	2279	0.503	0.75	608	605	6070	0.499	0.60
20	214	203	2089	0.487	- 0.75	561	536	5489	0.488	- 0.97

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 5] = 0.488, the mean of P[Sell: Portfolio 6] = 0.491 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 21-D

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 7					Portfolio 8				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	375	386	3809	0.507	1.51	482	423	4530	0.468	- 3.67
2	499	408	4543	0.450	- 6.08	608	441	5252	0.421	-10.78
3	462	483	4728	0.511	2.17	488	443	4660	0.476	- 2.63
4	496	480	4887	0.492	- 0.43	582	440	5114	0.431	- 9.21
5	434	632	5331	0.593	14.30	507	627	5671	0.553	8.73
6	448	600	5243	0.572	11.21	506	616	5613	0.549	8.05
7	516	541	5287	0.512	2.47	493	488	4910	0.498	0.36
8	497	530	5142	0.516	3.03	538	507	5228	0.485	- 1.41
9	454	493	4740	0.521	3.54	508	543	5260	0.517	3.13
10	583	479	5313	0.451	- 6.36	623	656	6399	0.513	2.81
11	466	514	4900	0.524	4.13	514	554	5344	0.518	3.41
12	555	524	5398	0.486	- 1.39	564	568	5666	0.502	1.05
13	576	625	6010	0.520	3.90	595	587	5912	0.497	0.28
14	545	609	5776	0.528	4.94	550	593	5717	0.519	3.63
15	620	640	6306	0.508	2.08	542	563	5526	0.509	2.14
16	779	670	7251	0.462	- 5.55	710	664	6876	0.483	- 1.97
17	515	613	5645	0.543	7.26	521	586	5542	0.529	5.12
18	571	632	6019	0.526	4.76	569	571	5707	0.501	0.88
19	598	695	6456	0.538	6.98	602	572	5875	0.487	- 1.15
20	586	627	6066	0.517	3.40	573	587	5803	0.506	1.72

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 7] = 0.514, the mean of P[Sell: Portfolio 8] = 0.499 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 21-E

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. PRICE SIZE PORTFOLIOS[1]

	Portfolio 9					Portfolio 10 (Largest)				
Day Rel to Yr Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	553	457	5055	0.453	- 6.00	867	769	8186	0.470	- 4.53
2	676	500	5887	0.425	-10.69	1033	841	9374	0.449	- 8.97
3	637	554	5957	0.465	- 4.63	936	854	8953	0.477	- 3.36
4	692	524	6085	0.431	-10.03	969	736	8532	0.432	-11.70
5	666	749	7076	0.529	5.76	1015	1068	10419	0.513	3.60
6	671	749	7105	0.527	5.46	1083	1102	10928	0.504	1.98
7	720	634	6774	0.468	- 4.40	1121	1021	10712	0.477	- 3.78
8	700	645	6729	0.480	- 2.53	1084	981	10329	0.475	- 4.05
9	673	535	6043	0.443	- 8.11	1141	893	10171	0.439	-11.28
10	744	627	6860	0.457	- 6.27	1293	1039	11665	0.445	-10.71
11	640	571	6062	0.471	- 3.67	1052	906	9793	0.463	- 6.38
12	726	663	6951	0.477	- 2.97	1231	1024	11283	0.454	- 8.68
13	715	706	7108	0.497	0.27	1198	1040	11193	0.465	- 6.38
14	688	778	7332	0.531	6.09	1102	986	10443	0.472	- 4.63
15	748	748	7487	0.500	0.85	1056	936	9965	0.470	- 4.98
16	945	829	8877	0.467	- 5.23	1515	1100	13075	0.421	-17.00
17	689	684	6869	0.498	0.58	1113	1009	10615	0.475	- 4.05
18	739	672	7061	0.476	- 3.17	1312	1030	11714	0.440	-11.98
19	736	753	7449	0.506	1.87	1187	1006	10973	0.459	- 7.59
20	659	682	6707	0.508	2.20	1129	1036	10833	0.479	- 3.43

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Portfolios formed on the basis of the average buyer-initiated price in the preceding January. Securities must be listed a minimum of 13 consecutive months commencing each January. The mean of P[Sell: Portfolio 9] = 0.484, the mean of P[Sell: Portfolio 10] = 0.464 for the period indicated. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.485.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

TABLE 22

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION USING LAST TRADE DATA FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. AND CANADIAN EQUITY LISTINGS[1]

	U.S. Equity Listings[2]					Canadian Equity Listings[3]				
Day Rel to Yr End	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]
- 1	55	52	535	0.482	- 0.68	148	156	3656	0.513	- 3.38
- 2	50	63	565	0.556	3.23	130	172	3622	0.570	3.45
- 3	42	65	536	0.606	5.91	132	166	3576	0.556	1.79
- 4	49	58	535	0.546	2.66	130	144	3287	0.525	- 1.86
- 5	45	56	504	0.558	3.26	137	161	3577	0.542	0.06
- 6	52	59	552	0.531	1.90	128	197	3898	0.606	8.14
- 7	52	51	516	0.492	- 0.15	128	198	3904	0.607	8.32
- 8	53	57	550	0.515	1.04	126	198	3895	0.611	8.80
- 9	60	50	552	0.453	- 2.24	124	194	3814	0.610	8.57
-10	54	55	543	0.505	0.51	128	189	3801	0.596	6.82
-11	55	50	527	0.478	- 0.89	124	194	3811	0.611	8.65
-12	61	47	540	0.435	- 3.17	129	187	3801	0.591	6.24
-13	53	57	552	0.520	1.33	122	195	3804	0.616	9.27
-14	47	57	521	0.545	2.65	125	195	3844	0.610	8.56
-15	51	55	529	0.516	1.12	131	190	3845	0.593	6.40
-16	45	62	534	0.579	4.42	127	190	3812	0.599	7.21
-17	59	44	519	0.428	- 3.55	126	187	3756	0.597	6.84
-18	52	54	530	0.509	0.76	135	182	3809	0.574	4.11
-19	54	49	514	0.479	- 0.87	134	178	3737	0.570	3.55
-20	51	57	541	0.529	1.78	97	148	2940	0.604	6.83

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. U.S. securities analyzed range from 109 (January 1985) to 150 (January 1989). Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Canadian securities must trade on average five times and at least once per day during the turn-of-the-year period. The number of Canadian securities analyzed ranges from 253 (1977-78) to 519 (1986-87).

2 The mean of P[Sell]=0.547 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

3 The mean of P[Sell]=0.566 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

4 Average number of identified buyer-initiated transactions per day.

5 Average number of identified seller-initiated transactions per day.

6 Total number of identified buyer- and seller-initiated transactions per day over er .e study period.

7 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

8 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 23

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION USING LAST TRADE DATA FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR U.S. AND CANADIAN EQUITY LISTINGS[1]

Day Rel to Yr Beg	U.S. Equity Listings[2] Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]	Canadian Equity Listings[3] Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]
1	49	35	501	0.416	- 4.12	147	160	3685	0.522	- 2.33
2	52	33	507	0.391	- 5.40	139	173	3736	0.554	1.64
3	39	43	494	0.526	1.61	143	172	3788	0.546	0.61
4	46	40	519	0.464	- 1.58	150	168	3824	0.528	- 1.58
5	42	44	510	0.512	0.87	137	179	3794	0.568	3.27
6	47	40	518	0.459	- 1.83	137	179	3793	0.565	2.99
7	46	38	506	0.451	- 2.30	142	176	3804	0.554	1.56
8	41	44	506	0.518	1.18	135	180	3787	0.572	3.79
9	43	34	463	0.443	- 2.69	139	179	3815	0.563	2.73
10	49	34	494	0.411	- 4.33	146	174	3839	0.544	0.36
11	46	38	499	0.451	- 2.28	143	175	3809	0.551	1.18
12	42	43	496	0.490	- 0.26	133	182	3776	0.577	4.41
13	45	40	492	0.457	- 1.96	136	183	3829	0.573	3.97
14	39	43	491	0.519	1.26	137	184	3848	0.573	3.98
15	45	40	508	0.467	- 1.47	129	189	3815	0.594	6.60
16	43	40	495	0.485	- 0.53	134	186	3834	0.581	4.98
17	42	41	498	0.496	0.05	133	181	3773	0.577	4.44
18	42	43	510	0.506	0.56	139	175	3766	0.556	1.85
19	49	38	521	0.436	- 3.08	140	176	3791	0.556	1.89
20	44	41	511	0.479	- 0.80	141	178	3817	0.558	2.14

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. U.S. securities analyzed range from 109 (January 1985) to 150 (January 1989). Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Canadian securities must trade on average five times and at least once per day during the turn-of-the-year period. The number of Canadian securities analyzed ranges from 253 (1977-78) to 519 (1986-87).

2 The mean of P[Sell]=0.547 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.495.

3 The mean of P[Sell]=0.566 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.541.

4 Average number of identified buyer-initiated transactions per day.

5 Average number of identified seller-initiated transactions per day.

6 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

7 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

8 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 24

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION USING LAST TRADE DATA FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR SMALL TRANSACTIONS OF CANADIAN EQUITY LISTINGS[1]

Transactions < $100,000[2]

Day Rel to Yr End	Avg.# Buys[3]	Avg.# Sells[4]	Total[5]	P[Sell][6]	Z-stat[7]
- 1	76	79	1864	0.510	- 1.02
- 2	68	85	1834	0.555	2.79
- 3	71	85	1864	0.545	1.95
- 4	66	77	1719	0.538	1.29
- 5	72	85	1874	0.542	1.75
- 6	67	103	2047	0.605	7.50
- 7	70	104	2085	0.599	6.99
- 8	69	103	2056	0.598	6.92
- 9	73	103	2101	0.586	5.86
-10	73	97	2036	0.569	4.22
-11	70	102	2064	0.595	6.64
-12	73	97	2068	0.578	5.13
-13	71	101	2055	0.587	5.89
-14	71	104	2094	0.595	6.69
-15	77	97	2080	0.559	3.35
-16	74	100	2090	0.573	4.69
-17	69	101	2042	0.594	6.47
-18	77	95	2059	0.551	2.66
-19	75	91	1988	0.548	2.30
-20	54	76	1562	0.583	4.84

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. U.S. securities analyzed range from 109 (January 1985) to 150 (January 1989). Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Canadian securities must trade on average five times and at least once per day during the turn-of-the-year period. The number of Canadian securities analyzed ranges from 253 (1977-78) to 519 (1986-87) Only client initiated trades are analyzed. Value of transaction calculated as transaction price times number of shares traded.

2 The mean of P[Sell]=0.571 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.522.

3 Average number of identified buyer-initiated transactions per day.

4 Average number of identified seller-initiated transactions per day.

5 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

6 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

7 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 25

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION USING LAST TRADE DATA FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR SMALL TRANSACTIONS OF CANADIAN EQUITY LISTINGS[1]

Transactions < $100,000[2]

Day Rel to Yr Beg	Avg.# Buys[3]	Avg.# Sells[4]	Total[5]	P[Sell][6]	Z-stat[7]
1	74	78	934	0.541	- 0.94
2	76	81	975	0.567	0.44
3	78	84	1002	0.558	- 0.14
4	86	81	977	0.533	- 1.96
5	74	94	1128	0.557	- 0.24
6	79	96	1146	0.558	- 0.12
7	79	90	1080	0.587	1.98
8	78	92	1103	0.558	- 0.17
9	83	92	1109	0.560	0.02
10	82	93	1111	0.485	- 5.28
11	82	87	1042	0.492	- 5.10
12	74	91	1093	0.553	- 0.48
13	76	95	1134	0.576	1.24
14	80	94	1131	0.582	1.75
15	70	100	1199	0.599	3.05
16	78	98	1176	0.527	- 2.71
17	75	95	1140	0.557	- 0.23
18	79	88	1052	0.518	- 3.21
19	78	88	1058	0.527	- 2.82
20	82	89	1067	0.530	- 2.39

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. U.S. securities analyzed range from 109 (January 1985) to 150 (January 1989). Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Canadian securities must trade on average five times and at least once per day during the turn-of-the-year period. The number of Canadian securities analyzed ranges from 253 (1977-78) to 519 (1986-87). Only client initiated trades are analyzed. Value of transaction calculated as transaction price times number of shares traded.

2 The mean of P[Sell]=0.548 for the first 20 days of January. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.522.

3 Average number of identified buyer-initiated transactions per day.

4 Average number of identified seller-initiated transactions per day.

5 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

6 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

7 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 26

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION USING LAST TRADE DATA FOR THE LAST 20 TRADING DAYS OF THE CALENDAR YEAR FOR NON-PUBLIC TRANSACTIONS OF CANADIAN EQUITY LISTINGS[1]

Day Rel to Yr End	Avg.# Buys[3]	Avg.# Sells[4]	Total[5]	P[Sell][6]	Z-stat[7]
- 1	76	76	1769	0.518	- 4.04
- 2	61	86	1755	0.585	1.57
- 3	61	80	1691	0.569	0.24
- 4	63	66	1553	0.512	- 4.30
- 5	64	75	1674	0.539	- 2.24
- 6	59	92	1815	0.608	3.59
- 7	57	91	1776	0.616	4.25
- 8	56	94	1796	0.628	5.31
- 9	49	90	1667	0.647	6.65
-10	53	91	1727	0.630	5.37
-11	53	89	1707	0.626	4.97
-12	55	86	1691	0.609	3.53
-13	50	93	1710	0.651	7.08
-14	52	91	1715	0.634	5.67
-15	53	91	1723	0.632	5.48
-16	52	89	1693	0.632	5.48
-17	56	84	1681	0.603	3.03
-18	57	86	1723	0.602	3.00
-19	57	85	1708	0.600	2.80
-20	41	70	1337	0.631	4.76

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. U.S. securities analyzed range from 109 (January 1985) to 150 (January 1989). Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Canadian securities must trade on average five times and at least once per day during the turn-of-the-year period. The number of Canadian securities analyzed ranges from 253 (1977-78) to 519 (1986-87). Only client initiated trades are analyzed. Value of transaction calculated as transaction price times number of shares traded.

2 The mean of P[Sell]=0.604 for the last 20 days of December. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.566.

3 Average number of identified buyer-initiated transactions per day.

4 Average number of identified seller-initiated transactions per day.

5 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

6 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

7 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 27

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION USING LAST TRADE DATA FOR THE FIRST 20 TRADING DAYS OF THE CALENDAR YEAR FOR NON-PUBLIC TRANSACTIONS OF CANADIAN EQUITY LISTINGS[1]

Day Rel to Yr Beg	Avg.# Buys[4]	Avg.# Sells[5]	Total[6]	P[Sell][7]	Z-stat[8]
1	72	81	1839	0.531	- 3.05
2	62	90	1817	0.591	2.16
3	64	87	1818	0.575	0.81
4	63	85	1784	0.574	0.68
5	62	84	1750	0.575	0.80
6	58	82	1677	0.583	1.42
7	61	84	1730	0.579	1.11
8	56	86	1708	0.606	3.33
9	55	85	1679	0.607	3.38
10	62	80	1702	0.561	- 0.41
11	60	87	1752	0.593	2.28
12	59	89	1766	0.602	3.05
13	58	86	1729	0.595	2.44
14	56	87	1718	0.610	3.68
15	58	87	1741	0.600	2.88
16	54	86	1687	0.614	3.99
17	56	85	1693	0.602	2.98
18	59	85	1725	0.593	2.22
19	61	86	1755	0.586	1.72
20	58	87	1741	0.601	2.93

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. U.S. securities analyzed range from 109 (January 1985) to 150 (January 1989). Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Canadian securities must trade on average five times and at least once per day during the turn-of-the-year period. The number of Canadian securities analyzed ranges from 253 (1977-78) to 519 (1986-87). Only client initiated trades are analyzed. Value of transaction calculated as transaction price times number of shares traded.

2 The mean of P[Sell]=0.589 for the first 20 days of January. Adjusted Z-statistics are calculated relative to the sub-group mean of 0.566.

3 Average number of identified buyer-initiated transactions per day.

4 Average number of identified seller-initiated transactions per day.

5 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

6 Probability of a seller-initiated transaction; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

7 Binomial Z-statistic adjusted for the mean of the sub-group. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 28

AVERAGE PERCENTAGE RETURNS, STANDARD DEVIATIONS AND TEST STATISTICS FOR PRICE PORTFOLIOS ON THE TSE FOR THE FIRST AND LAST 15 TRADING DAYS OF THE CALENDAR YEAR DECEMBER 1977 - JANUARY 1989[1]

Price Quintile	Average Price	Average Return	Standard Deviation	T-Stat (Mean=0)	P-Value
Smallest	$ 0.95	0.00455	0.02070	4.17	0.0001
2	$ 3.68	0.00146	0.01344	2.06	0.0399
3	$ 8.58	0.00154	0.01048	2.79	0.0055
4	$ 15.52	0.00116	0.00851	2.59	0.0099
Largest	$ 33.65	0.00077	0.00717	2.03	0.0434
F-Statistic[2]		5.84			
P-Value		0.0001			

[1] Quintiles comprise a minimum of 50 securities (1977-78) and a maximum of 104 securities (1986-87); quintiles are formed based on closing prices as at the last trading day in the preceding November. Securities must trade on average five times and at least once per day throughout the 30 day period. Returns are calculated as follows:

$$\tilde{R}_t = \ln[\, 1 + ((\tilde{P}_t - \tilde{P}_{t-1})/\tilde{P}_{t-1})\,].$$

[2] The F-statistic tests the equality of mean returns across portfolios. Degrees of freedom: 3, 356.

TABLE 29

TEST OF THE EXPLANATORY POWER OF P[BUY] OVER THE FIRST AND LAST 15 TRADING DAYS OF THE CALENDAR YEAR FROM DECEMBER 1977 - JANUARY 1989[1]

$$\tilde{R}_{pt} = a_{p0} + a_{p1}\tilde{B}_{pt} + \tilde{e}_{pt}$$

Price Portfolio	a_{p0}	a_{p1}	Adj. R^2	F-Stat.	P-Value
Smallest	-0.028	0.0803	0.1371	58.04	0.0001
	(-6.376)	(7.619)			
2	-0.023	0.0556	0.1134	46.92	0.0001
	(-6.329)	(6.850)			
3	-0.020	0.0486	0.1478	63.28	0.0001
	(-7.239)	(7.955)			
4	-0.009	0.0236	0.0509	20.26	0.0001
	(-3.919)	(4.501)			
Largest	-0.009	0.0229	0.0664	26.55	0.0001
	(-4.671)	(5.152)			

[1] Quintiles comprise a minimum of 50 securities (1977-78) and a maximum of 104 securities (1986-87); quintiles are formed based on closing prices as at the last trading day in the preceding November. Securities must trade on average five times and at least once per day throughout the 30 day period. Returns are calculated as follows:
$\tilde{R}_t = \ln[\ 1 + ((\tilde{P}_t - \tilde{P}_{t-1})/\tilde{P}_{t-1})]$.

[2] D_t is a dummy variable that equals one if day t is one of the first five trading days of the new taxation year and is zero otherwise.

[3] $\tilde{B}_{pt}$ equals 1-P[Sell] for portfolio p on day t.

[4] T-statistics are presented in parentheses.

TABLE 30

TEST OF THE DIFFERENCE IN TURN-OF-THE-YEAR RETURNS USING A DUMMY VARIABLE REGRESSION BETWEN THE FIRST FIVE DAYS OF THE NEW TAXATION YEAR AND THE REST OF THE 30 DAY TRADING PERIOD DECEMBER 1977 - JANUARY 1989[1]

$$\tilde{R}_{pt} = a_{p0} + a_{p1}D_t + \tilde{e}_{pt}$$

Price Portfolio	a_{p0}	a_{p1}	Adj. R^2	F-Stat.	P-Value
Smallest	0.002 (1.948)	0.014 (4.851)	0.0591	23.53	0.0001
2	0.000 (0.075)	0.008 (4.552)	0.0521	21.72	0.0001
3	0.001 (0.981)	0.006 (3.975)	0.0395	15.76	0.0001
4	0.001 (1.323)	0.003 (2.608)	0.0159	6.80	0.0095
Largest	0.000 (1.116)	0.002 (1.814)	0.0063	3.29	0.0706

[1] Quintiles comprise a minimum of 50 securities (1977-78) and a maximum of 104 securities (1986-87); quintiles are formed based on closing prices as at the last trading day in the preceding November. Securities must trade on average five times and at least once per day throughout the 30 day period. Returns are calculated as follows:

$$\tilde{R}_t = \ln[\ 1 + ((\tilde{P}_t - \tilde{P}_{t-1})/\tilde{P}_{t-1})\ ].$$

[2] D_t is a dummy variable that equals one if day t is one of the first five trading days of the new taxation year and is zero otherwise.

[3] T-statistics are presented in parentheses.

TABLE 31

TEST OF THE DIFFERENCE IN TURN OF THE YEAR RETURNS USING A P[BUY] AND DUMMY VARIABLE REGRESSION BETWEEN THE FIRST FIVE DAYS OF THE NEW TAXATION YEAR AND THE REST OF THE 30 DAY TRADING PERIOD DECEMBER 1977 - JANUARY 1989[1]

$$\tilde{R}_{pt} = a_{p0} + a_{p1}D_t + a_{p2}D_t*\tilde{B}_{pt} + a_{p3}*\tilde{B}_{pt} + \tilde{e}_{pt}$$

Price Portfolio	a_{p0}	a_{p1}	a_{p2}	a_{p3}	Adj. R^2	F-Stat.	P-Value
Smallest	-0.029	0.017	-0.012	0.078	0.1787	27.034	0.0001
	(-6.25)	(1.374)	(-0.423)	(6.924)			
2	-0.022	0.008	-0.003	0.051	0.1400	20.488	0.0001
	(-5.55)	(0.793)	(-0.133)	(5.653)			
3	-0.021	0.018	-0.031	0.050	0.1692	25.378	0.0001
	(-7.17)	(2.336)	(-1.880)	(7.510)			
4	-0.009	0.003	-0.001	0.022	0.0561	8.114	0.0001
	(-3.49)	(0.418)	(-0.063)	(3.818)			
Largest	-0.009	0.004	-0.007	0.023	0.0639	9.166	0.0001
	(-4.41)	(0.747)	(-0.619)	(4.705)			

[1] Quintiles comprise a minimum of 50 securities (1977-78) and a maximum of 104 securities (1986-87); quintiles are formed based on closing prices as at the last trading day in the preceding November. Securities must trade on average five times and at least once per day throughout the 30 day period. Returns are calculated as follows:

$$\tilde{R}_t = \ln[\ 1 + ((\tilde{P}_t - \tilde{P}_{t-1})/\tilde{P}_{t-1})\ ].$$

[2] D_t is a dummy variable that equals one if day t is one of the first five trading days of the new taxation year and is zero otherwise.

[3] $\tilde{B}_{pt}$ equals 1-P[Sell] for portfolio p on day t.

[4] T-statistics are presented in parentheses.

TABLE 32

TEST OF THE DIFFERENCE IN TURN-OF-THE-YEAR RETURNS USING A DUMMY VARIABLE REGRESSION BETWEN THE FIRST TEN DAYS OF THE NEW TAXATION YEAR AND THE REST OF THE 30 DAY TRADING PERIOD DECEMBER 1977 - JANUARY 1989[1]

$$\tilde{R}_{pt} = a_{p0} + a_{p1}D_t + \tilde{e}_{pt}$$

Price Portfolio	a_{p0}	a_{p1}	Adj. R^2	F-Stat.	P-Value
Smallest	0.001	0.011	0.0582	23.21	0.0001
	(0.731)	(4.817)			
2	-0.001	0.006	0.0406	16.21	0.0001
	(-0.606)	(4.026)			
3	0.000	0.004	0.0274	11.12	0.0009
	(0.388)	(3.334)			
4	0.000	0.002	0.0120	5.37	0.0210
	(0.794)	(2.317)			
Largest	0.000	0.001	0.0033	2.18	0.1411
	(0.806)	(1.475)			

[1] Quintiles comprise a minimum of 50 securities (1977-78) and a maximum of 104 securities (1986-87); quintiles are formed based on closing prices as at the last trading day in the preceding November. Securities must trade on average five times and at least once per day throughout the 30 day period. Returns are calculated as follows:

$$\tilde{R}_t = \ln[\ 1 + ((\tilde{P}_t - \tilde{P}_{t-1})/\tilde{P}_{t-1})\ ].$$

[2] D_t is a dummy variable that equals one if day t is one of the first ten trading days of the new taxation year and is zero otherwise.

[3] T-statistics are presented in parentheses.

TABLE 33

TEST OF THE DIFFERENCE IN TURN OF THE YEAR RETURNS USING A P[BUY] AND DUMMY VARIABLE REGRESSION BETWEEN THE FIRST TEN DAYS OF THE NEW TAXATION YEAR AND THE REST OF THE 30 DAY TRADING PERIOD DECEMBER 1977 - JANUARY 1989[1]

$$\tilde{R}_{pt} = a_{p0} + a_{p1}D_t + a_{p2}D_t*\tilde{B}_t + a_{p3}*\tilde{B}_t + \tilde{e}_{pt}$$

Price Portfolio	a_{p0}	a_{p1}	a_{p2}	a_{p3}	Adj. R^2	F-Stat.	I-Value
Smallest	-0.025	0.000	0.0175	0.0664	0.1611	23.983	0.0001
	(-4.83)	(0.008)	(0.758)	(5.156)			
2	-0.019	-0.003	0.0163	0.0442	0.1245	18.010	0.0001
	(-4.25)	(-0.481)	(0.928)	(4.207)			
3	-0.016	-0.006	0.0175	0.0401	0.1538	22.750	0.0001
	(-4.99)	(-0.992)	(1.323)	(5.160)			
4	-0.011	0.008	-0.0140	0.0280	0.0555	8.032	0.0001
	(-3.75)	(1.547)	(-1.294)	(3.953)			
Largest	-0.010	0.002	-0.0040	0.0239	0.0621	8.922	0.0001
	(-4.00)	(0.482)	(-0.413)	(4.232)			

[1] Quintiles comprise a minimum of 50 securities (1977-78) and a maximum of 104 securities (1986-87); quintiles are formed based on closing prices as at the last trading day in the preceding November. Securities must trade on average five times and at least once per day throughout the 30 day period. Returns are calculated as follows:

$$\tilde{R}_t = \ln[\ 1 + ((\tilde{P}_t - \tilde{P}_{t-1})/\tilde{P}_{t-1})\ ].$$

[2] D_t is a dummy variable that equals one if day t is one of the first ten trading days of the new taxation year and is zero otherwise.

[3] $\tilde{B}_{pt}$ equals 1-P[Sell] for portfolio p on day t.

[4] T-statistics are presented in parentheses.

TABLE 34

THE MEAN CUMULATIVE RETURN FROM THE FIRST NINE TRADING DAYS OF EACH MONTH[1], THE MEAN CUMULATIVE RETURN FROM THE LAST NINE TRADING DAYS OF EACH MONTH, T-STATISTIC FOR THE DIFFERENCE OF THESE TWO MEANS FOR EACH PERIOD[2], AND χ^2 STATISTIC OF THE FREQUENCY OF HIGHER FIRST HALF RETURNS

EQUALLY WEIGHTED INDEX	Ariel 1977-81 (60 mths)	CRSP[3] 1977-81 (58 mths)	CDN[3] 1977-81 (58 mths)	CRSP[4] 1977-88 (142 mths)	CDN[4] 1977-89 (148 mths)
Mean of first 9-day returns	1.62%	1.63%	2.10%	1.33%	1.60%
(std dev)	(3.07%)	(3.13%)	(3.19%)	(3.17%)	(3.07%)
Mean of last 9-day returns	0.07%	0.08%	1.84%	0.16%	1.52%
(std dev)	(3.23%)	(3.31%)	(4.04%)	(3.31%)	(4.50%)
T-Statistic	2.70***	2.59***	0.43	3.06***	0.17
Frequency of Higher 1st Half Returns	43	38	35	89	76
$\chi^2_{(2-1)}$	11.27***	5.59**	2.48	9.13**	0.70
VALUE WEIGHTED INDEX					
Mean of first 9-day returns	0.95%	1.04%	1.09%	0.86%	0.94%
(std dev)	(2.95%)	(2.99%)	(3.01%)	(3.04%)	(3.07%)
Mean of last 9-day returns	-0.18%	-0.16%	0.46%	0.10%	0.28%
(std dev)	(2.39%)	(2.46%)	(3.19%)	(2.65%)	(3.07%)
T-Statistic	2.30**	2.38***	1.09	2.25**	1.86##
Frequency of Higher 1st Half Returns	37	36	37	80	83
$\chi^2_{(2-1)}$	3.27#	3.38#	4.41##	2.28	4.06##

\# significant at 0.1 level
\## significant at 0.05 level
** significant at 0.025 level
*** significant at 0.001 level

1 A trading month is defined to extend from the last trading day of a calendar month (inclusive) to the last trading day of the following calendar month (exclusive).

2 CRSP data are drawn from the December 31, 1988 version of CRSP tapes. Canadian data are drawn from June 30, 1989 version of TSE/WESTERN database.

3 The 48 months covers the period March 1, 1977 through December 31, 1981. Canadian intraday data are unavailable prior to March, 1977.

4 The 142 months of CRSP data cover the period March 1, 1977 through December 31, 1988. The 148 months of Canadian data cover the period March 1, 1977 through June 30, 1989.

TABLE 35

SUMMARY STATISTICS COMPARING TOTAL NUMBER OF TRADES[1], MEAN NUMBER OF TRADES PER DAY (STANDARD DEVIATION) AND Z-STATISTICS OF DIFFERENCE OF MEANS BETWEEN THE FIRST NINE DAYS AND THE LAST NINE DAYS OF EACH MONTH

(I) January Data Included

	U.S. Data	Cdn. Data
First 9 Trading Days		
Total Number of Trades	5,097,627	12,882,937
Mean Number of Trades/Day	556,363	1,431,437
(Standard Deviation)	(11,340)	(44,428)
Last 9 Trading Days		
Total Number of Trades	5,008,627	11,847,716
Mean Number of Trades/Day	556,514	1,316,412
(Standard Deviation)	(24,240)	(58,893)
Z-Statistic of Equality of Means	1.10	4.68

(II) January Data Excluded

	U.S. Data	Cdn. Data
First 9 Trading Days		
Total Number of Trades	4,684,161	11,788,947
Mean Number of Trades/Day	520,462	1,309,883
(Standard Deviation)	(10,999)	(29,649)
Last 9 Trading Days		
Total Number of Trades	4,459,138	10,66[illegible]356
Mean Number of Trades/Day	495,460	1,184,4[illegible]0
(Standard Deviation)	(23,447)	(57,890)
Z-Statistic of Equality of Means	2.90	5.78

[1] U.S. data comprise approximately 350 securities from January, 1984 through June, 1989. Canadian data comprise approximately 2600 securities from March, 1977 through June, 1989. A trading month is defined to extend from the last trading day of a calendar month (inclusive) to the last trading day of the following calendar month (exclusive).

TABLE 36

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION (Z-STATISTIC) FOR THE FIRST (B) 9 DAYS AND THE LAST (E) 9 DAYS OF EVERY MONTH FOR U.S. AND CANADIAN SECURITIES[1]

	U.S. Equity Listings (Sub-group mean of P[Sell]=0.495)					Canadian Equity Listings (Sub-group mean of P[Sell]=0.541)				
Day Rel to Mth Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1 (B)	4132	4119	544633	0.499	5.90	4178	4767	1324130	0.533	-18.47
2 (B)	4413	4176	564312	0.484	-16.53	4456	5041	1405701	0.531	-23.79
3 (B)	4388	4268	571405	0.493	- 3.02	4552	5142	1434848	0.530	-26.44
4 (B)	4417	4476	587010	0.503	12.26	4597	5316	1467170	0.536	-12.15
5 (B)	4335	4320	571274	0.499	6.05	4566	5370	1470754	0.540	- 2.43
6 (B)	4255	4153	555004	0.494	- 1.49	4509	5382	1464005	0.544	7.28
7 (B)	4333	4250	566552	0.477	-27.10	4504	5416	1468303	0.546	12.16
8 (B)	4370	4331	574312	0.498	4.55	4392	5300	1434580	0.547	14.42
9 (B)	4215	4310	562765	0.506	16.50	4368	5181	1413446	0.543	4.77
-9 (E)	4550	4369	588733	0.490	- 7.67	4121	5028	1354195	0.550	21.02
-8 (E)	4546	4306	584289	0.486	-13.76	4249	5071	1379427	0.544	7.07
-7 (E)	4498	4301	580778	0.489	- 9.15	4238	5103	1382480	0.546	11.80
-6 (E)	4377	4279	571396	0.494	- 1.51	4225	5128	1384398	0.548	16.53
-5 (E)	3937	3942	520056	0.500	7.21	3712	4506	1216418	0.548	15.49
-4 (E)	4001	3951	524854	0.497	2.90	3838	4564	1243745	0.543	4.48
-3 (E)	4142	4105	544412	0.498	4.43	4083	4752	1307635	0.538	- 6.88
-2 (E)	4129	4121	544624	0.500	7.38	4022	4658	1284853	0.537	- 9.10
-1 (E)	4236	4089	549485	0.491	- 5.93	4114	4632	1294564	0.530	-25.12

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Canadian data comprise approximately 2600 securities from March 1977 through June 1989. The last trading day of the preceding month and the first 8 trading days of each calendar month constitute the first 9 days reported. The 9 trading days ending the second last trading day of each calendar month comprise the last 9 days reported

2 Average number of identified buyer-initiated transactions per day

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the study sample. For a one-tail test P[z>=2.33]=0.01

TABLE 37

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION (Z-STATISTIC) FOR THE FIRST (B) 9 DAYS AND THE LAST (E) 9 DAYS OF EVERY MONTH EXCLUDING JANUARY FOR U.S. AND CANADIAN SECURITIES[1]

	U.S. Equity Listings					Canadian Equity Listings				
Day Rel to Mth Beg	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	tat[6]
1 (B)	4144	4162	506727	0.501	7.12	3904	4487	1241910	0.535	-14.54
2 (B)	4368	4156	520051	0.488	-11.54	4088	4648	1293054	0.532	-21.68
3 (B)	4386	4283	528868	0.494	- 2.81	4154	4729	1314849	0.532	-21.86
4 (B)	4380	4519	542387	0.508	17.68	4158	4853	1333839	0.539	- 5.79
5 (B)	4319	424.	522159	0.495	- 1.45	4138	4893	1336823	0.542	1.16
6 (B)	4206	4054	503927	0.491	- 7.10	4077	4895	1328043	0.546	10.41
7 (B)	4263	4213	517085	0.497	1.44	4092	4966	1340825	0.548	15.11
8 (B)	4308	4307	525560	0.500	5.80	3991	4857	1309628	0.549	17.23
9 (B)	4164	4309	516897	0.509	18.69	3950	4765	1289976	0.547	12.54
-9 (E)	4395	4221	525670	0.490	- 8.70	3717	4556	1224563	0.551	21.10
-8 (E)	4451	4137	523924	0.482	-20.27	3864	4567	1247957	0.542	1.12
-7 (E)	4375	4184	522178	0.489	-10.11	3854	4628	1255485	0.546	10.12
-6 (E)	4165	4115	505103	0.497	1.42	3808	4641	1250695	0.549	16.83
-5 (E)	3769	3810	462415	0.503	9.52	3348	4054	1095542	0.548	13.65
-4 (E)	3818	3804	464993	0.495	4.09	3442	4103	1116720	0.544	5.30
-3 (E)	3943	3901	478551	0.497	1.38	3647	4245	1168271	0.538	- 7.59
-2 (E)	3995	3980	486536	0.499	4.19	3598	4149	1146689	0.536	-11.82
-1 (E)	4064	3964	489768	0.494	- 2.80	3707	4092	1154363	0.525	-35.58

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. P[Sell:January excluded]=0.496. Canadian data comprise approximately 2600 securities from March 1977 through June 1989. P[Sell: January excluded]=0.5415. Adjusted Z-statistics are calculated realtive to stated sub-group means. The last trading day of the preceding month and the first 8 trading days of each calendar month constitute the first 9 days reported. The 9 trading days ending the second last trading day of each calendar month comprise the last 9 days reported.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the study sample. For a one-tail test P[z>=2.33]=0.01

TABLE 38

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION (Z-STATISTIC) BY TRANSACTION SIZE FOR THE FIRST (B) 9 DAYS AND THE LAST (E) 9 DAYS OF EVERY MONTH FOR CANADIAN SECURITIES[1]

		Transactions ≥ $100,000					Transactions < $100,000				
Day Rel to Mth Beg		Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
1	(B)	36	42	11680	0.538	- 4.79	2297	2412	697089	0.512	-15.04
2	(B)	38	48	12903	0.558	- 0.46	2456	2513	735490	0.506	-25.75
3	(B)	40	51	13676	0.560	- 3.68	2496	2569	749648	0.507	-24.26
4	(B)	45	54	14856	0.545	- 0.24	2514	2646	763879	0.513	-14.00
5	(B)	41	52	13909	0.559	0.69	2493	2676	765165	0.518	- 5.25
6	(B)	38	49	13055	0.563	0.47	2431	2669	754930	0.523	3.48
7	(B)	39	50	13330	0.562	0.47	2447	2724	765373	0.527	10.51
8	(B)	39	50	13330	0.562	2.28	2415	2665	752129	0.525	6.94
9	(B)	37	49	12797	0.570	2.29	2371	2605	736528	0.524	5.15
-9	(E)	37	49	12902	0.570	1.14	2183	2488	691452	0.533	19.97
-8	(E)	37	48	12749	0.565	0.69	2260	2524	708132	0.528	11.79
-7	(E)	38	49	13001	0.563	- 1.59	2279	2559	716226	0.529	13.55
-6	(E)	38	47	12668	0.553	4.10	2277	2587	720047	0.532	18.68
-5	(E)	29	40	10374	0.580	0.62	1987	2228	623923	0.529	12.65
-4	(E)	31	40	10689	0.563	1.70	2034	2253	634603	0.526	7.97
-3	(E)	32	42	11154	0.568	2.39	2143	2345	664423	0.522	1.63
-2	(E)	33	44	11606	0.571	- 1.96	2113	2296	652621	0.521	0.00
-1	(E)	35	43	11671	0.551	- 5.93	2179	2259	656960	0.509	-19.47

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. P[Sell: ≥ $100,000] = 0.560, P[Sell: < $100,000] =0.521. Adjusted Z-statististics are calculated relative to these sub-group means. The last trading day of the preceding month and the first 8 trading days of each calendar month constitute the first 9 days reported. The 9 trading days ending the second last trading day of each calendar month comprise the last 9 days reported.

2 Average number of identified buyer-initiated transactions per day.

3 Average number of identified seller-initiated transactions per day.

4 Total number of identified buyer- and seller-initiated transactions per day over entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the study sample For a one-tail test P[z>=2.33]=0.01

TABLE 39

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION BY MONTH FOR U.S. AND CANADIAN EQUITY LISTINGS FOR THE FIRST (9) AND LAST (E) 9 DAYS OF EACH CALENDAR MONTH[1]

	U.S. Equity Listings (Sub-group mean of P[Sell]=0.495)					Canadian Equity Listings (Sub-group mean of P[Sell]=0.541)				
Mon	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
Jan (B)	42003	39294	487833	0.483	-16.76	(B) 40635	43515	1093990	0.517	-50.38
(E)	46649	44928	549489	0.491	- 3.93	(E) 41157	50175	1187431	0.549	17.49
Feb (B)	42696	41400	504643	0.492	- 4.26	(B) 39726	48717	1149832	0.551	21.52
(E)	39888	37312	464455	0.485	-13.63	(E) 38736	44847	1086699	0.537	- 8.37
Mar (B)	40698	38925	477791	0.489	- 8.30	(B) 64854	95969	1971680	0.539	- 5.64
(E)	42066	38340	482480	0.477	-25.01	(E) 38169	44955	1080717	0.541	0.00
Apr (B)	41220	41409	495815	0.501	8.45	(B) 35199	39690	1048565	0.530	-22.60
(E)	41787	40185	491866	0.490	- 7.01	(E) 35964	43020	1026737	0.545	8.13
May (B)	38871	37170	456303	0.489	- 8.11	(B) 33183	38691	1006311	0.538	- 6.04
(E)	40644	38813	463026	0.473	-29.94	(E) 36711	41877	1021748	0.533	-16.23
Jun (B)	41067	38640	465707	0.471	-32.76	(B) 34056	38763	1019506	0.532	-18.24
(E)	38565	34695	439616	0.474	-27.85	(E) 35379	40950	992391	0.536	-10.00
Jul (B)	33651	32697	331789	0.493	- 2.30	(B) 31581	36315	882828	0.535	-11.31
(E)	37863	34119	359982	0.474	-25.20	(E) 28872	33750	876883	0.539	- 3.76
Aug (B)	40932	38979	399593	0.483	- 8.85	(B) 32328	36657	896868	0.531	-19.01
(E)	32058	32130	320988	0.501	6.80	(E) 29889	34794	905684	0.538	- 5.73
Sep (B)	33444	38286	358673	0.534	46.72	(B) 35352	42123	1007423	0.544	6.04
(E)	33210	33282	332474	0.501	6.92	(E) 29142	36918	924854	0.559	34.74
Oct (B)	34542	34974	347652	0.503	9.43	(B) 32499	39204	932322	0.547	11.63
(E)	41175	40149	406658	0.494	- 1.28	(E) 34479	42570	1078799	0.553	25.01
Nov (B)	35418	36801	361435	0.509	16.83	(B) 32409	37256	902782	0.533	-15.25
(E)	31941	33867	329090	0.515	22.95	(E) 30582	34578	912341	0.531	-19.17
Dec (B)	39033	42966	410033	0.524	37.14	(B) 32094	42579	970830	0.570	57.34
(E)	31329	42363	368503	0.575	97.13	(E) 24021	29790	753432	0.554	22.64

1 U.S. data comprise approximately 350 securities from January 1984 through June 1989. Canadian data comprise approximately 2600 securities from March 1977 through June 1989. The last trading day of the preceding month and the first 8 trading days of each calendar month constitute the first 9 days of each month reported. The 9 trading days ending the second last trading day of each calendar month comprise the last 9 days of each month reported.

2 Average number of identified buyer-initiated transactions over the 9 day period per month.

3 Average number of identified seller-initiated transactions over the 9 day period per month.

4 Total number of identified buyer- and seller-initiated transactions per month over the entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test $P[z \geq 2.33]=0.01$

TABLE 40

COMPARISON OF THE PROBABILITY OF AN IDENTIFIED SELLER-INITIATED TRANSACTION BY MONTH FOR U.S. AND CANADIAN EQUITY LISTINGS BY TRANSACTION SIZE FOR THE FIRST (B) AND LAST (E) 9 DAYS OF EACH CALENDAR MONTH[1]

	Transactions ≥ $100,000					Transactions < $100,000				
Mon	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]	Avg.# Buys[2]	Avg.# Sells[3]	Total[4]	P[Sell][5]	Z-stat[6]
Jan (B)	369	468	10906	0.558	- 0.42	(B) 23418	23526	610465	0.501	-31.28
(E)	477	594	14090	0.552	- 1.91	(E) 23958	26892	661178	0.529	13.02
Feb (B)	423	522	12416	0.553	- 1.57	(B) 23184	25722	635841	0.526	7.98
(E)	387	468	11310	0.548	- 2.57	(E) 22950	24408	615757	0.515	- 9.42
Mar (B)	522	576	15508	0.522	- 9.53	(B) 41157	41706	1160254	0.503	-38.81
(E)	387	486	11454	0.553	- 1.51	(E) 22896	24633	618033	0.518	- 4.72
Apr (B)	369	468	11861	0.556	- 0.88	(B) 20889	21033	586982	0.502	-29.14
(E)	369	486	11195	0.568	1.71	(E) 21276	23220	578567	0.522	1.52
May (B)	351	441	11175	0.558	- 0.43	(B) 19629	20925	567945	0.516	- 7.54
(E)	351	441	10502	0.557	- 0.62	(E) 21510	22950	578051	0.516	- 7.61
Jun (B)	342	432	11014	0.560	0.00	(B) 20061	20664	570188	0.507	-21.16
(E)	342	450	10347	0.567	1.43	(E) 21240	22293	565965	0.512	-13.55
Jul (B)	324	405	9676	0.554	- 1.19	(B) 19368	20358	516618	0.512	-12.95
(E)	279	351	8885	0.558	- 0.38	(E) 17541	18855	509686	0.518	- 4.29
Aug (B)	315	396	9363	0.554	- 1.17	(B) 19449	20133	514595	0.509	-17.23
(E)	270	351	8779	0.564	0.76	(E) 18099	19215	522581	0.515	- 8.68
Sep (B)	333	432	10065	0.565	1.01	(B) 21519	22986	578654	0.516	- 7.61
(E)	252	342	8407	0.571	2.03	(E) 17334	20520	530132	0.542	30.61
Oct (B)	315	432	9773	0.577	3.39	(B) 19386	21483	531480	0.526	7.30
(E)	297	441	10394	0.598	7.80	(E) 18747	24129	600361	0.563	65.14
Nov (B)	297	405	9303	0.575	2.91	(B) 18162	20637	504523	0.532	15.64
(E)	270	360	8962	0.568	1.53	(E) 18225	19350	526175	0.515	- 8.71
Dec (B)	306	414	9382	0.574	2.73	(B) 18918	23616	553151	0.555	50.62
(E)	216	243	6579	0.535	- 4.09	(E) 13689	16515	423079	0.547	33.85

1 Canadian data comprise approximately 2600 securities from March 1977 through June 1989. Only client initiated trades are analyzed. P[Sell: ≥ $100,000] = 0.560, P[Sell: < $100,000] = 0.521, adjusted Z-statistics are calculated relative to these sub-group means. The last day of the preceding month and the first 8 trading days of each calendar month constitute the first 9 days of each month reported. The 9 trading days ending the second last trading day of each calendar month comprise the last 9 days of each month reported.

2 Average number of identified buyer-initiated transactions over the 9 day period per month.

3 Average number of identified seller-initiated transactions over the 9 day period per month.

4 Total number of identified buyer- and seller-initiated transactions per month over the entire study period.

5 Probability of a seller-initiated transactions; where P[Sell]=Total number of identified seller-initiated transactions/Total of identified buyer- and seller-initiated transactions.

6 Binomial Z-statistic adjusted for the mean of the sub-sample. For a one-tail test P[z>=2.33]=0.01

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