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Trading Volume for Winners and Losers on the Tokyo Stock Exchange

Marc Bremer and Kiyoshi Kato*

Abstract

This paper examines trading volume on the Tokyo Stock Exchange. Traditional theory suggests that taxes create strong incentives to delay realization of capital gains and accelerate realization of losses. Contrary to the theory, we find strong evidence that turnover is higher for stocks with gains (winners) than for stocks with losses (losers). In particular, the winner stocks of *keiretsu* firms tend to have high end-of-fiscal-year turnover. This is true even when realizing gains could result in higher tax liabilities. We conclude that capital gains taxes have only a small impact on turnover in Japan. Other non-tax-related motives, especially window dressing, appear to dominate investor behavior. We find strong evidence that this window dressing is concentrated in the stock of *keiretsu* firms.

I. Introduction

This study examines trading volume on the Tokyo Stock Exchange at the end of the fiscal year. The traditional tax advice is to accelerate realization of losses and postpone gains. This reflects the desire by investors to reduce their current taxable income while postponing receipt of additional taxable income. Numerous studies document a measurable alteration in trading volume or in the way securities are priced that is attributable to the tax code or changes in the tax code.¹ One study of particular interest is Lakonishok and Smidt ((1986), hereafter, LS), which examined turnover on the New York and American Stock Exchanges for winners and losers over the period 1971–1982. They conclude that, although there was evidence of tax-motivated trading, other motives for trading were more

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¹Constantinides (1984), Miller and Scholes (1978), and Stiglitz (1983) provide models that show this behavior depends upon specifics of the tax code. Dyl (1977) and Branch (1977) empirically verify investors' propensity to trade stocks with capital losses more heavily and to reduce trading in stocks with capital gains in the last month of the tax year; other empirical examinations of year-end tax-induced behavior are Reinganum (1983), Tinic, Barone-Adesi, and West (1987), and Lakonishok and Smidt (1984), (1989). In addition, a small group of studies examines the specific impact on trading that can be associated with an alteration of the tax code. This group includes Bolster, Lindsey, and Mitrusi (1989), Bremer (1995), Lakonishok and Vermaelen (1986), and Slemrod (1982a) and (1982b).

important. Investors seemed reluctant to trade losers. We find a similar result for investors in the Tokyo Stock Exchange. Like LS, this study considers both tax-related and non-tax-related motives, including reasons that are often associated with Japanese investors. In general, we find that Japanese investors do not trade losers. We conclude that capital gains taxes have only a modest impact on trading volume. Other non-tax-related motives for trading appear to dominate investor behavior in Japan.

The next section briefly examines the logic of investment behavior that links past prices and volume. Section III describes the data and introduces the methodology. Section IV shows empirical results. Section V investigates several plausible explanations for the results. The final section contains a summary and brief discussion.

II. The Trading Response to Past Prices

A. Tax-Related Reasons

Individual investors in Japan did not pay taxes on stock trading profits during most of the period of this study. Capital gains taxes on individual stock transactions were introduced in April 1989. Individuals now have the option of paying tax using one of two methods: i) the net proceeds method, which is effectively a 26-percent tax on capital gains; or ii) the gross proceeds method, which is actually a 1-percent tax on the proceeds of the stock sale. The tax is usually collected when the stock is sold. As a matter of practice, most individual investors pay this tax using the gross proceeds method.² Thus, there should be no particular tax-related incentive for individuals to trade winners or losers.

The stock capital gains of Japanese businesses are taxed as ordinary corporate income under most circumstances.³ There is neither a distinction between long- and short-term gains, nor were there wash-sale restrictions during the period examined here. Brokerage commissions are fixed by law and high, with round-trip commissions starting at 2.4 percent of trading value for small transactions, but falling to 0.3 percent for the largest transactions.⁴

Value-maximizing corporate investors will generally attempt to defer paying tax on unrealized stock gains by postponing stock sales into future tax periods. The incentive to defer realizing stock gains becomes larger with both the size of the tax and the amount of the gain. Most firms in Japan end their fiscal year in

²The gross proceeds method will result in a lower tax liability when stock gains are large. Qualifying to use the net proceeds method requires detailed records of stock purchases and sales. Many individual investors who purchased shares before the 1989 tax reform do not have these records. In this case, tax is determined by the gross proceeds method. Because the gross proceeds tax is relatively small, many individual investors elect to use this method as a matter of convenience, having their broker collect the tax when they sell their stock.

³During most of the period of this study, the corporate tax rate was 42 percent on retained corporate profits and 32 percent on profits paid as dividends. See Ishi (1993) and Tax Bureau (1989) for more on corporate taxes in Japan.

⁴Informal commission discounts and subsidized investment services are sometimes provided by brokers to large investors. Businesses are major investors on the Tokyo Stock Exchange (TSE). In 1988, for example, financial institutions held 47.1 percent of shares while nonfinancial businesses held 24.9 percent. These statistics are from the Tokyo Stock Exchange Fact Book (1989) and publications by the Ministry of Finance and Japan Securities Research Institute (1990).

March (79 percent of firms in this study), hence, tax-avoiding firms will defer selling winners until after March. Tax-minimizing profitable firms holding stocks with unrealized capital losses have an incentive to book the loss in the current tax year because the loss will shield other taxable income. Thus, trading volume of losers should be high in March. To summarize, if Japanese corporate investors follow tax-minimizing strategies we expect the following:

1. Winner stocks should have lower volume than loser stocks at any given point in time.
2. Winner volume should be especially low at the end of the fiscal year while loser volume should be higher.

Empirical evidence contrary to these conjectures might indicate either i) that there is no relationship between past prices and trading volume; or ii) that non-tax-related links between past prices and volume dominate tax-related links. We would reject (i) in favor of (ii) if winner volume is significantly greater than loser volume.

B. Non-Tax-Related Reasons

According to the popular financial press, Japanese firms have a long-term orientation and are less obsessed with current corporate earnings than their non-Japanese counterparts. Nevertheless, there is considerable anecdotal evidence suggesting that Japanese companies are genuinely concerned with current earnings. Stories in which firms offset disappointing operating results with profits on the sales of securities and assets are common. For example, the *Nikkei Weekly* (1992) reported:

When figures for the fiscal year through March are finalized at Kyokuyo Co., Japan's fourth largest fishery, the bottom line will show profits. However, only a decision to unload ¥4.3 billion in stock kept the company from being flooded with red ink.

Because gains and losses are formally recognized only when stocks are sold, firms can manipulate reported profits by selectively selling winners from their portfolio of stocks or booking profits from their investment trusts. This window dressing behavior suggests that volume for losers should be low at the end of the fiscal year and high for winners.⁵

Similar links between past prices and volume may be caused by the Ministry of Finance (MoF). It is rumored that large firms in Japan are given guidance by the MoF regarding the amount of profits they should book. Specific examples of this sort of administrative guidance to companies are difficult to document in detail, in part because the legality of this practice is ambiguous. General descriptions

⁵Note that window dressing is very different from another accounting manipulation technique that has recently received attention: *tobashi*. *Tobashi* is a financial term coined from the Japanese verb *tobasu*, which, loosely translated, means to make fly or skip. *Tobashi* removes securities with losses from a company's books through repurchase agreements based on nonmarket prices. That is, the loss-making security skips from one firm to another in such a way that firms never report losses. It permits companies to close their books at the end of the fiscal year without having to formally book losses. *Tobashi* repurchase agreements are almost always arranged privately through brokers. They do not change TSE trading volume and, hence, are not considered in this research. See Machida (1992) and Tomomatsu and Idei (1992) for descriptions of recent *tobashi*.

of administrative guidance are common. See, for example, Johnson (1982) and The Economist (1995). If profits from regular operations are insufficient, the MoF supposedly instructs firms to sell stocks with gains to guarantee a certain level of taxable income and pay the resultant tax. This form of response to stock prices has similar implications to window dressing. Shefrin and Statman (1985) and LS describe other links between past prices and volume. In general, non-tax-related explanations suggest that winner volume should be high (and especially high at the end of the tax accounting period) and loser volume should be low.

III. Data and Methodology

The proprietary data were provided by Daiwa Securities. The data consist of all First Section TSE stocks for which monthly price and volume data are available over the period 1975 to 1990. We identify the relation of the abnormal component of stock trading volume to fiscal timing (dummy variables corresponding to the beginning and ending months of the fiscal year and other months), winner/loser categorization (a zero-one binary variable where one corresponds to whether the stock was a winner over the past n months), and the actual gain or loss on each security.

Abnormal volume is estimated using a residuals to out-of-sample market model regression coefficients procedure. This is the approach used by Morse (1982) and LS. We also examined abnormal volume using the same approach as Dyl (1977) and Bolster, Lindsey, and Mitrusi (1989). The results were essentially the same. The procedure is applied as follows. Individual stock volume time-series are first transformed into monthly turnover form by dividing the number of shares traded in a given month by the number of shares outstanding. Market (turnover) volume is calculated as the simple average of all the individual stock turnovers. Abnormal volume is estimated in four-year blocks.⁶ Data covering the first three years of each block are used to estimate coefficients of a turnover “market” model with the regression,

$$(1) \quad \text{VOL}_{it} = a_i + b_i \text{VOLTSE}_t + e_{it},$$

where VOL_{it} is stock i 's turnover in month t ; VOLTSE_t is market turnover for month t , and e_{it} is the disturbance term for stock i in month t .⁷ Abnormal volume is estimated in the fourth year with the following equation,

$$(2) \quad \text{AVOL}_{it} = \text{VOL}_{it} - (\hat{a}_i + \hat{b}_i \text{VOLTSE}_t).$$

This approach produces abnormal turnovers for 156 months over the period 1978 to 1990. The number of stocks in the four-year blocks ranges from 711 to 905 out of a potential 1194 in our data set.

⁶We required that stocks have all observations for each four-year block to be included. However, different four-year blocks could have different numbers of stocks. So, for example, the first four-year block, covering the period 1975 to 1978, had 711 stocks. The last four-year block, covering the period 1987 to 1990, had 901 stocks. Corresponding adjustments were made in each block's market turnover measure so that the average abnormal turnover for all stocks in each period is always zero. This procedure reduces survivorship bias.

⁷We also carried out tests based on abnormal turnover calculated from the process: $\text{VOL}_{it} = \text{VOLTSE}_t + e_{it}$. The results were very similar.

We classify stocks as winners or losers depending on whether price per share has increased or decreased over the previous n months. Dividends are ignored. For example, for $n = 3$, stocks were classified as winners when $P_{t-1}/P_{t-4} > 1$. We present here results for n -month winners based on 1-, 3-, 6-, and 12-month periods. As mentioned above, there is no distinction between long- and short-term gains in Japan.

Table 1 shows simple averages of turnover per company for years and months from 1978 to 1990. Panel A shows average turnover by year. Average turnover is roughly coincident with the business cycle in Japan. The Economic Planning Agency reported business cycle troughs in 1983 and 1986; cyclical highs were recorded in 1977, 1980, and 1985. The TSE experienced a prolonged bull market from the mid-1980s to 1989. Both volume and prices fell dramatically in 1990. These data are very similar to turnover reported by the Tokyo Stock Exchange (1989).

TABLE 1
Average Monthly Turnover per Company for the TSE by Years and Months, 1978–1990
(Percent per Month)

Panel A. Average Monthly Turnover per Company by Years

Year	78	79	80	81	82	83	84	85	86	87	88	89	90	AVG
Percent	7.3	4.9	5.6	3.8	3.4	4.8	5.2	5.4	6.4	7.2	6.9	7.4	4.1	5.6

Panel B. Average Monthly Turnover per Company by Months

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
Percent	5.5	5.9	6.2	5.9	5.9	6.3	6.1	5.1	4.8	5.4	4.8	5.0	5.6

Turnover is calculated by dividing the number of shares traded in a given month by the number of shares outstanding.

Panel B of Table 1 shows average monthly turnover by months. Turnover in March, the end of the fiscal year, is high at 6.2 percent. This value is significantly larger than average turnover. Yet, March turnover is not the highest monthly turnover; June turnover is slightly higher at 6.3.

IV. Empirical Results

Following the same approach as LS, we first determine whether there is a significant difference between winner and loser turnover. We estimate the following cross-sectional regressions for n -month winners and losers,

$$(3) \quad \text{AVOL}_{it} = \alpha + \beta DN_i + e_i,$$

where AVOL_{it} is each stock's abnormal turnover, DN_i is a dummy variable set equal to one for n -month winner stocks, and to zero otherwise. Negative estimates of β suggest that winners have lower abnormal volume than losers. A total of 156 regressions were estimated [13 years (1978–1990) \times 3 winner/loser category groups (March, April, and other months) \times 4 cross-sectional winner/loser definitions ($n = 1, 3, 6,$ and 12 months)]. In every regression, β is positive and has a t -statistic larger than 2. This strikingly robust result indicates that abnormal volume for winners is higher than for losers.

Table 2 reports summary data for the cross-sectional regressions. The table shows average abnormal volume and *simple averages* of *t*-values for winners and losers. Abnormal loser turnover is the estimated α from equation (3); winner abnormal turnover is $\alpha + \beta$. The table averages these values over the 13 yearly regressions from 1978 to 1990. Winners clearly have significantly higher volume than losers; in every case, the average turnover of winners is significantly greater than that of losers.

TABLE 2
Average Abnormal Turnover of Winners, Losers, and *t*-Values of Difference^a by Month and Winner/Loser Definition, 1978–1990 (Percent per Month)

Winner/ Loser Def. ^d	March ^b				April ^b				May–February ^c			
	Loser	<i>t</i>	Winner	Diff	Loser	<i>t</i>	Winner	Diff.	Loser	<i>t</i>	Winner	Diff.
1	-2.20	7.3	2.99	5.19	-1.87	6.0	2.29	4.16	-1.77	6.4	2.16	3.93
3	-2.70	6.2	1.67	4.37	-2.72	6.5	2.19	4.91	-2.31	7.3	2.33	4.64
6	-2.56	6.5	1.90	4.46	-2.42	6.0	1.91	4.33	-2.53	7.2	2.04	4.54
12	-2.49	5.3	1.39	3.88	-2.34	5.4	1.56	3.90	-2.66	6.4	1.57	4.23

^aA positive *t*-value shows that the abnormal volume for winners is higher than for losers.

^bMarch and April are tax-impacted months.

^cMay through February are not tax-impacted months.

^dWinners are stocks whose prices have increased over the previous (one, three, six, and 12) months.

We expect to observe a seasonal component to the price-turnover relationship. Table 2 also shows differences in winner and loser turnover. Seasonal differences in volume are not large. Winner turnover is consistently greater than loser volume by about 4 to 5 percent for all loser/winner definitions and months. This contradicts conjecture one because winners tend to be sold and losers held in every month. We do observe higher March turnover for the one-month winner definition category. However, other *n*-month winner categories do not have higher March turnover. This suggests that tax-related motivations are not a predominant influence on turnover in Japan.

The previous approach categorized stocks as winners or losers on the basis of price changes over the preceding one, three, six, and 12 months. These categories are not independent since one-month winner stocks are likely to also be three-month winner stocks. This lack of independence merits further investigation. To address this issue, we use LS's analysis of variance approach. This amounts to regressing abnormal turnover on dummy variables, which correspond to the four winner definitions,

$$(4) \quad AVOL_i = \alpha + \beta_1 D1_i + \beta_2 D3_i + \beta_3 D6_i + \beta_4 D12_i + u_i,$$

where $AVOL_i$ is abnormal turnover for stock *i* in a given month, and $D1$, $D3$, $D6$, and $D12$ are dummy variables set equal to one if the stock price increased over the previous one, three, six, and 12 months, and to zero otherwise.

Table 3 shows results for these regressions for the entire 13-year period. The intercept shows abnormal turnover when the stock price fell. The intercepts

are negative in every observation period, indicating that stocks with losses have lower abnormal turnover. The β coefficients show the impact of an increase in stock price on abnormal volume. The β coefficients are all positive, indicating that stock price increases lead to higher turnover. Table 3 confirms the previous results: winners are traded, losers are held. That is, investors trade winner stocks significantly more than loser stocks. This is true for all months, even tax-impacted months. For example, in May through February, if price decreased over the past four periods (one, three, six, and 12 months), abnormal turnover is -0.0377 . If price increased in each of these four periods, abnormal turnover is 0.031 ($= -0.0377 + 0.0215 + 0.0168 + 0.0138 + 0.0166$).

TABLE 3

Analysis of Variance: Regression Coefficients and *t*-Values Showing the Effect on Abnormal Turnover of Winner/Loser Status in the Previous One, Three, Six, and 12 Months by Month, 1978–1990

Observation Period	Intercept	Direction of Price Trend in the Previous:			
		1 Month	3 Months	6 Months	12 Months
March ^a	-0.0433 (-23.78) ^{b**}	0.0316 (15.29)**	0.0126 (5.70)**	0.0242 (11.08)**	0.0117 (5.41)**
April ^a	-0.0369 (-21.52)**	0.0220 (10.61)**	0.0146 (6.38)**	0.0136 (5.92)**	0.0165 (7.62)**
May–February ^c	-0.0377 (-65.73)**	0.0215 (33.30)**	0.0168 (23.45)**	0.0138 (18.33)**	0.0166 (23.07)**

^aMarch and April are tax-impacted months.

^b*t*-values are in parentheses.

^cMay through February are not tax-impacted months.

**Significant at the 0.01 level.

We also examine the link between the magnitude of the price change and trading volume by estimating the following regression model,

$$(5) \quad AVOL_i = \alpha + \beta_1 D1_i + \beta_2 D3_i + \beta_3 D6_i + \beta_4 D12_i \\ + \gamma_1 R1_i + \gamma_2 R3_i + \gamma_3 R6_i + \gamma_4 R12_i \\ + \delta_1 D1_i R1_i + \delta_2 D3_i R3_i + \delta_3 D6_i R6_i + \delta_4 D12_i R12_i + e_i,$$

where $D1$, $D3$, $D6$, and $D12$ are the same dummy variables described in equation (4), and $R1$, $R3$, $R6$, and $R12$ are $(P_{t-1}/P_{t-2}) - 1$, $(P_{t-1}/P_{t-4}) - 1$, $(P_{t-1}/P_{t-7}) - 1$, and $(P_{t-1}/P_{t-13}) - 1$, respectively. Loser slopes are represented by γ (γ_1 to γ_4) and winner slopes are $\gamma + \delta$ [$(\gamma_1 + \delta_1)$ to $(\gamma_4 + \delta_4)$]. This regression equation uses pooled cross-sectional and time-series observations.

Panel A of Table 4 shows the results of this regression. Slope coefficients for losers are multiplied by -1 . Thus, positive slope coefficients show an increase in trading volume; negative coefficients show a decrease. The middle block of coefficient estimates shows winner slopes ($\gamma + \delta$). The table shows that trading volume increases for all periods for one-, three-, and six- month winner definitions. Volume declines for 12-month winners. This supports conjecture one for stocks held less than a year. Short-term winner stocks are sold, which contradicts our

tax-related conjectures. Loser volume is more difficult to interpret. March loser volume is lower, but not significantly so for one- and three-month losers. April and other month volumes are ambiguous. Other month loser volume is 0.0301 higher for one-month losers and -0.0443 for 12-month losers.

Panel B of Table 4 shows differences in the estimated slope coefficients of equation (5) for winners and losers. Positive slope differences show that an increase in stock prices causes a proportionate rise in trading volume more than a fall in stock prices reduces trading volume. Panel B shows that most slope differences are positive for every month and winner/loser definitions. The only exception is the coefficient for the April period with the three-month definition, which is -0.0031 . However, this value is not statistically significant. In most cases, the March slope coefficient differences are larger than April and other month differences. The exception is the April, 12-month holding period slope difference.

The mostly positive differences for April are consistent with at least one aspect of the traditional approach to the relationship between volume and past returns. Investors wishing to realize gains, while deferring taxes, might delay selling winners until the start of the new fiscal year. Yet, this evidence is weak because the April slope difference for the three-month holding period is not significantly different from zero. Further, as shown in Panel A, the April winner slope for the 12-month period is negative.

In summary, our results indicate that winners are sold in almost every period while losers are held. This pattern is more clearly observed in March, when most Japanese firms end their fiscal years. This suggests a fiscal-year-end effect consistent with non-tax-related explanations.

V. Extensions

This section extends the analysis of the previous section to explore several explanations of why volume and price changes might be related. It is divided into two parts corresponding to tax-related and non-tax related explanations.

A. Tax-Related Extensions

The previous section found that tax considerations have little impact on trading. However, changes in the tax rate could provoke measurable changes in trading behavior. The 1988 Tax Reform Act changed corporate taxes in two stages. The rate was effectively lowered from 42 percent to 40 percent on April 1, 1989, and lowered again to 37.5 percent on April 1, 1990. Rational tax-avoiding profitable businesses will reduce their tax liability by deferring selling winner stocks in March of 1989 and 1990. Firms could realize these gains in April of 1989 or 1990 when the new lower tax took effect. Thus, we expect to observe low March winner volume and high April winner volume in 1989 and 1990. That is, March winner turnover should be low in an absolute sense and also low relative to turnover in previous non-tax-change months. Similarly, tax-avoiding firms could reduce their tax liability by selling loser stocks in March of 1989 and 1990. These losses would shield more profit from tax when the corporate tax rate was high. Hence,

TABLE 4

Analysis of Covariance: Regression Coefficients Showing the Effect on Abnormal Turnover of Winner/Loser Status in the Previous One, Three, Six, and 12 Months by Month, 1978–1990

Panel A. Coefficients

	March ^a	April ^a	May– February ^b	
α	-0.0192 (-5.69) ^{c**}	-0.0190 (-6.24) ^{**}	-0.0260 (-27.24) ^{**}	
β_1	0.0119 (4.48) ^{**}	0.0040 (1.55)	0.0045 (5.48) ^{**}	
β_2	0.0133 (0.47)	0.0076 (2.72) ^{**}	0.0050 (5.68) ^{**}	
β_3	0.0059 (2.09) [*]	-0.0003 (-0.10)	0.0047 (5.02) ^{**}	
β_4	0.0058 (1.97) [*]	0.0054 (1.89)	0.0080 (8.47) ^{**}	
$\gamma_1 + \delta_1$	0.1836 (12.02) ^{**}	0.2160 (13.04) ^{**}	0.1989 (41.16) ^{**}	} Winner Slopes
$\gamma_2 + \delta_2$	0.0391 (3.92) ^{**}	0.0361 (3.99) ^{**}	0.0660 (20.37) ^{**}	
$\gamma_3 + \delta_3$	0.0598 (8.40) ^{**}	0.0488 (7.13) ^{**}	0.0195 (9.06) ^{**}	
$\gamma_4 + \delta_4$	-0.0213 (-6.82) ^{**}	-0.0229 (-7.30) ^{**}	-0.0069 (-6.10) ^{**}	
$-\gamma_1$	-0.0352 (-1.13)	0.0113 (0.45)	0.0301 (3.57) ^{**}	} Loser Slopes
$-\gamma_2$	-0.0335 (-1.35)	0.0391 (1.75)	0.0090 (1.47)	
$-\gamma_3$	-0.0673 (-3.50) ^{**}	-0.0359 (-1.81)	-0.0137 (-2.46) ^{**}	
$-\gamma_4$	-0.0432 (-2.93) ^{**}	-0.0815 (-5.69) ^{**}	-0.0443 (-9.91) ^{**}	

Panel B. Difference in Slope Coefficients

	March	April	May– February
$\gamma_1 + \delta_1 -$ $(-\gamma_1)$	0.2189 (6.40) ^{**}	0.2047 (6.89) ^{**}	0.1688 (17.75) ^{**}
$\gamma_2 + \delta_2 -$ $(-\gamma_2)$	0.0726 (2.74) ^{**}	-0.0031 (-0.13)	0.0570 (8.34) ^{**}
$\gamma_3 + \delta_3 -$ $(-\gamma_3)$	0.1271 (6.24) ^{**}	0.0847 (4.06) ^{**}	0.0332 (5.60) ^{**}
$\gamma_4 + \delta_4 -$ $(-\gamma_4)$	0.0219 (1.46)	0.0586 (4.00) ^{**}	0.0373 (8.13) ^{**}

^aMarch and April are tax-impacted months.

^bMay through February are not tax-impacted months.

^ct-values are in parentheses.

**Significant at the 0.01 level.

*Significant at the 0.05 level.

Winners are stocks whose prices have increased over the previous n (one, three, six, and 12) months. Loser slopes are represented by γ_1 to γ_4 , whereas slopes for winners are $(\gamma_1 + \delta_1)$ to $(\gamma_4 + \delta_4)$. To facilitate the interpretation of the results, the slope coefficients for losers are multiplied by -1 (because the rates of return for losers are negative).

we predict that in March of 1989 and 1990 loser volume will be high and April loser volume will be low.

These tax-rate-change conjectures can be tested using an analysis of variance with interaction approach. Using the turnover measure described in Section III, we estimate the following regressions,

$$(6) \quad AVOL_i = \alpha + \beta D12_i + \gamma Z_i + \delta D12_i Z_i + e_i,$$

where $AVOL_i$ and $D12_i$ are the same as before and Z_i is a binary variable that takes the value one if the turnover observation occurs in a tax-change month (March or April of 1989 and 1990) and zero otherwise.⁸ The coefficient estimates of this equation allow us to calculate the average turnover for winners and losers in tax-rate-change months and non-tax-rate-change months. The statistical significance of linear combinations of these coefficients allows tests of whether turnover during tax-rate-change months differs from turnover during non-tax-rate-change months.

Table 5 shows average winner and loser turnover in tax-rate-change and non-tax-rate-change months over the period from 1978 to 1990. In general, investors do not respond to the tax-rate changes. Panel A shows winners. Winner turnover is 1.25 percent in March 1989 and 0.88 percent in March 1990; these values are not significantly different from 1.29 percent, the average winner turnover in non-tax-rate-change months. Our conjecture was that winner volume should be lower in the last month of a high-tax fiscal year. It was not; nor was winner volume higher in April. The predictions for loser turnover are not supported either. In fact, rather than being sold to shield taxes, losers were traded at even lower levels in March of 1989 and 1990. Both in relative and absolute terms, turnover in tax-impacted months is inconsistent with systematic tax-avoiding trading behavior.

B. Non-Tax-Related Reasons

1. Dividend Capture

One plausible reason for the positive relationship between stock price changes and turnover is dividend capture. Dividend capture is the practice of buying stocks before their ex-dividend date and selling soon after. Until recently, some Japanese institutional investors were subject to regulations and performance evaluation methods that made dividends an especially desirable way to book gains.⁹ Japanese firms holding stock at the end of the fiscal year (and usually at the end of the fiscal half-year, September) receive dividends. Dividend capture on the TSE was examined by Kato and Loewenstein (1995), who found that trading volume is higher around the turn of the fiscal year. High-yield, liquid securities were aggressively traded for dividend capture reasons before the 1989 tax reform, which explicitly limited dividend capture. Our preliminary results are somewhat similar to Kato and Loewenstein. Hence, we consider dividend capture as a potential link between turnover and past prices.

⁸We present results here only for the 12-month winner definition ($D12_i$) to save space and simplify the exposition. Other winner definitions gave essentially the same results.

⁹See Anders (1988) and Power and Sesit (1989) for discussion of dividend capture by Japanese insurance companies. There is a large dividend capture literature. See, for example, Stickel (1991), Karpoff and Walking (1990) and Lakonishok and Vermaelen (1986) and the references they cite.

TABLE 5

Analysis of Variance with Interactions: Average Abnormal Turnover of Winners, Losers, and Difference by Month and Winner/Loser Definition for Tax-Impacted Months, 1989 and 1990 (Percent per Month)

	Not-Tax- Change Years	Tax-Change Year(1989)	Difference between 1989 and Not-Tax- Change Years	Tax-Change Year(1990)	Difference between 1990 and Not-Tax- Change Years
<i>Panel A. Winner</i>					
March	1.29 (9.49) ^{a**}	1.25 (3.07)**	-0.04 (-0.11)	0.88 (2.39)**	-0.41 (-1.06)
April	1.37 (10.55)**	0.98 (2.45)**	-0.39 (-0.93)	0.86 (1.93)*	-0.51 (-1.08)
<i>Panel B. Loser</i>					
March	-1.98 (-11.67)**	-3.06 (-4.81)**	-1.08 (-1.64)	-3.55 (-4.81)**	-1.57 (-2.08)*
April	-2.18 (-13.26)**	-2.45 (-3.87)**	-0.27 (-0.41)	-1.01 (-2.09)*	1.17 (2.28)*

^at-values are in parentheses.

**Significant at the 0.01 level.

*Significant at the 0.05 level.

The ex-dividend date for most Japanese firms is four days before the end of the fiscal year. Dividends might be higher for winner firms because winner firms are more likely to have had an especially profitable year and, correspondingly, are also more likely to pay relatively high dividends. High March turnover for winners could be a consequence of dividend capture at the end of the fiscal year.

We test this dividend capture conjecture by applying the same analysis of variance approach described by equation (6). Here, however, the Z_i binary variable is one for firms with March (and September) as their end of fiscal year.¹⁰ Panel A of Table 6 shows average turnover for winners and losers for the period 1983–1990. Average turnover is higher for winner stocks at the end of their fiscal year. For example, average March winner turnover for stocks at the end of their fiscal years is 1.18 percent, while March winners not at the end of their fiscal years is lower, at 0.79 percent. However, this difference is not statistically significant. A similar pattern exists for September turnover. Loser turnover is low regardless of fiscal year end. At best, the evidence weakly supports the dividend capture argument.

2. Membership in an Industrial Group

Many Japanese firms are members of industrial groups commonly called *keiretsus*. Keiretsu firms generally hold shares in other members of their group. Keiretsu firms might prefer to conduct their window dressing using the stocks of other firms in their industrial group. Fellow keiretsu firms will understand that these (sometimes substantial) wash-transactions are not threatening to management, corporate policy, or inter-keiretsu relations. Non-keiretsu firm managers,

¹⁰Fiscal year-end data was collected from the Japan Company Handbook series. These data start in 1983.

TABLE 6

Analysis of Variance with Interactions: Average Abnormal Turnover of Winners, Losers, and Difference by Month and Winner/Loser Definition, Fiscal Year End and Membership in Industrial Group Characteristics (Percent per Month)

Panel A. End of Fiscal Year and Half-Year, 1983–1990

	Winner			Loser		
	End of Fiscal Year	Not End of Fiscal Year	Diff.	End of Fiscal Year	Not End of Fiscal Year	Diff.
March	1.18 (6.93) ^{a**}	0.79 (3.10) ^{**}	0.39 (1.29)	-2.60 (-9.48) ^{**}	-2.63 (-6.77) ^{**}	0.03 (0.06)
September	1.27 (2.59) ^{**}	0.85 (6.93) ^{**}	0.42 (0.84)	-2.87 (-3.74) ^{**}	-1.95 (-10.49) ^{**}	-0.92 (-1.18)

Panel B. Keiretsu Membership, 1978–1990

	Winner			Loser		
	Not Keiretsu Member	Keiretsu Member	Diff.	Not Keiretsu Member	Keiretsu Member	Diff.
March	0.57 (1.79)	1.36 (10.47) ^{**}	-0.79 (-2.27) [*]	-2.09 (-5.42) ^{**}	-2.12 (-12.31) ^{**}	0.03 (0.07)
April	0.41 (1.28)	1.44 (11.28) ^{**}	-1.03 (-3.03) ^{**}	-2.25 (-6.07) ^{**}	-2.05 (-12.42) ^{**}	-0.20 (-0.48)

Panel C. March End-of-Fiscal-Year and Keiretsu Membership, 1983–1990

	Winner			Loser		
	Not Keiretsu Member	Keiretsu Member	Diff.	Not Keiretsu Member	Keiretsu Member	Diff.
March	0.23 (0.48)	1.33 (7.24) ^{**}	-1.10 (-2.20) [*]	-2.56 (-3.75) ^{**}	-2.61 (-8.69) ^{**}	0.05 (0.06)
April	0.04 (0.09)	0.97 (5.76) ^{**}	-0.93 (-2.04) [*]	-2.51 (-4.19) ^{**}	-2.44 (-9.48) ^{**}	-0.07 (-0.11)

^at-values are in parentheses.

**Significant at the 0.01 level.

*Significant at the 0.05 level.

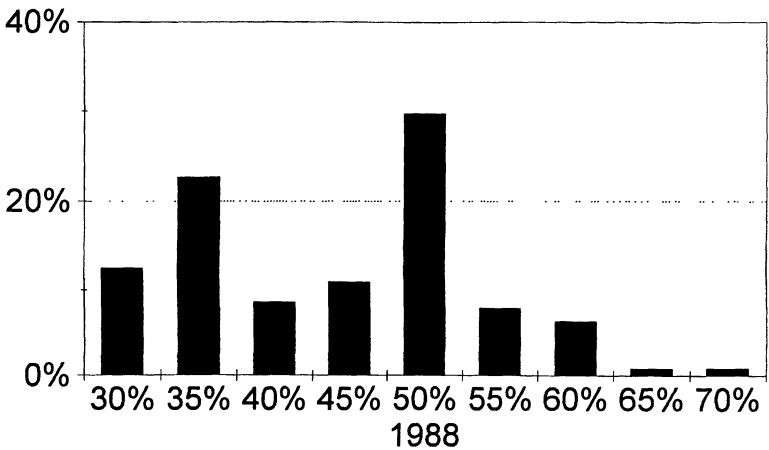
however, might regard such sales as unwelcome and potentially damaging to business relationships.

Yet another reason to suspect a link to membership in an industrial group is consolidated-basis window dressing. Firms that own more than 50 percent of a subsidiary at the end of the fiscal year must include the subsidiary's financial results in their consolidated results. This presents parent firms with an opportunity to manipulate consolidated results. Firms wishing to report higher operating income will raise their ownership in well-performing subsidiaries over the 50-percent level at the end of March. The stock of subsidiaries with good current operating results are likely to be winners. Hence, the parent would increase trading volume by buying enough winner shares to raise ownership over the 50 percent level. Parent firms avoid including poorly performing subsidiaries in their consolidated results by lowering their ownership to less than 50-percent at the end of March. The stock of subsidiaries with poor current operating results are likely to be losers. To avoid including these poor operating results, the parent would sell these losers,

again raising turnover. These temporary stock ownership adjustments might then be reversed in the next accounting period. The existence of this kind of window dressing is consistent with research by Kato and Loewenstein (1995) who found less liquid stocks had significant abnormal volume at the end of the fiscal year. They argued that this volume might be a result of manipulative intercorporate trading.

Maintaining ownership close to 50 percent permits parent firms to carry out consolidated-basis window dressing by selling or buying just enough shares to establish ownership slightly above or below the 50-percent level at the end of the fiscal year. Figure 1 shows the percent of parent ownership of TSE first section subsidiaries in 1987 as reported by *Keiretsu no Kenkyuu*.¹¹ About 30 percent of subsidiaries have parental ownership in the 47.5 percent to 52.5 percent range, represented here as the bar labeled "50%." Other years have similar parental ownership levels. Subsidiaries with parental ownership in this range are prime candidates for consolidated-basis window dressing.

FIGURE 1
Percent of Subsidiary Owned by Parent



If these explanations are valid, we expect to observe that most window dressing occurs with keiretsu stocks. We test this keiretsu explanation with an analysis of variance approach where the dummy variable, Z_i , is one if the firm was *not* a member of an industrial group and zero if the firm was a keiretsu member. Panel B of Table 6 shows average turnover for winners and losers over the period 1978–1990. March turnover for non-keiretsu firms is 0.57 percent, not significantly

¹¹We define subsidiaries as firms with more than 30 percent of their shares owned by another firm.

different from zero by the usual criteria. Yet March turnover for keiretsu firms is 1.36 percent, significantly greater than zero. Further, non-keiretsu winner volume is a significant 0.79 percent less than keiretsu winner volume. A similar relation exists for April. Non-keiretsu and keiretsu loser turnover are not significantly different.

To characterize the relationship between end-of-fiscal-year activity and keiretsu activity, Panel C of Table 6 shows turnover for only those firms with March as the end of their fiscal years. Non-keiretsu winner turnover is not different from zero, but keiretsu winner turnover is significantly larger than normal in both March and April. This confirms a link between window dressing and keiretsu activity.

VI. Summary and Discussion

This paper investigates the relationship between past stock prices and trading volume on the Tokyo Stock Exchange. Tax-related reasons give investors incentives to realize losses and defer realization of gains. If investors respond to these incentives, we should observe a negative correlation between past prices and current volume. This negative relationship should be most pronounced in March, the end of the fiscal year for most Japanese firms. Japanese investors may also respond to non-tax-related motivations that link stock prices and volume, as discussed by LS and Shefrin and Statman (1985). We describe additional motivations associated with Japan. Window dressing is the most popular non-tax-related reason (in the sense that it is mentioned so often in the financial press). Window dressing is the deliberate sale of stocks with gains to manipulate accounting profits; stocks with losses are not traded. If Japanese investors practice window dressing, we should observe a positive correlation between past prices and current volume. This positive relationship should be most significant at the end of accounting periods.

We find that abnormal volume for winner stocks is significantly positive in all periods including March, the last period of the fiscal year for most Japanese firms. Loser abnormal volume is significantly negative. The result is robust. Differing methodologies find essentially the same result: winner stocks are traded and loser stocks are held. The result is similar to Lakonishok and Smidt's research on the New York and the American Stock Exchanges. We also find strong evidence that window dressing is concentrated in the stock of keiretsu firms.

The finding that winner volume is higher than loser volume suggests that non-tax-related explanations of trading behavior are more important than tax-related reasons. We find little evidence supporting tax-related trading behavior. Subsequent research should attempt to find which non-tax-related links between past stock prices and current volume predominate. Window dressing, in particular, deserves more investigation. We describe it here in extremely simple terms. It may actually be a complex behavior involving keiretsu interfirm relations. Another promising area is the possibility that Japanese managers practice window dressing as a way of protecting their reputations and securing their careers. This explanation is consistent with recent research by Kaplan (1994), which finds a link between changes in management and stock performance and accounting profits for large Japanese companies.

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