Mei-Chen Lin (Taiwan)

Weekend effect in realizing gains and losses

Abstract

This paper examines the weekend effect of disposition effect based on a transaction dataset on the Taiwan stock index futures market. Individuals show higher tendency to realize both gains and losses on Friday, and dealers are also prone to realize losses on Friday. But foreign investors show lower propensity to realize loss on Friday. Taken the higher tendency of realizing gains and losses together, the paper concludes that the weekday effect of disposition effect does not exist. In addition, traders are less likely to enter a new contract on Monday regardless of buy or sell orders. But they are liable to close a long position through placing a sell order on Friday.

Keywords: disposition effect, weekend effect, order imbalance.
JEL Classification: G02, G11.

Introduction

The tendency to hold losers too long and sell winners too soon, which has been termed the "disposition effect" by Shefrin and Statman (1985), is one of the most well-known behavioral biases of investors. Behavioral researchers attribute this phenomenon to the result of loss aversion (e.g., Kahneman and Tversky, 1979; Odean, 1998; Kyle et al., 2006; Barberis and Xiong, 2009). Specifically, the decision-making under risk is associated with gains and losses, not final wealth levels; investors are more sensitive to losses than to gains, and are risk averse for gains and risk seeking for losses.

With the availability of account-level transaction data, recent studies provide direct evidence of the disposition effect in the stock market (e.g., Odean, 1998; Grinblatt and Keloharju, 2001; Shapira and Venezia, 2001; Feng and Seasholes, 2005; Shumway and Wu, 2005; Dhar and Zhu, 2006; Frazzini, 2006; Kumar, 2009). This behavior has also existed in the exercise of options and futures (e.g., Health, Huddat, and Lang, 1999; Heisler, 1994; 1998; Coval and Shumway, 2005) and in the sale of residential condominiums (Genesove and Mayer, 2001). Though many papers have studied investors with which characteristics and behaviors exhibit more tendency of disposition bias (Dhar and Zhu, 2006; Feng and Seasholes, 2005), there is relatively limited study on when disposition bias is prone to occur.

Odean (1998) and Grinblatt and Keloharju (2003) are the two exceptions, who explore the trading behavior of realizing gains and losses around the turn of the year. However, up to now, no papers has investigated the trading behavior around the turn of the week. The attitude toward risk might be different before the weekend since the inability to trade over the weekend is likely to cause investors to take a lesser risk on Friday. Moreover, for the reason of risk control, the tendency to realize gains and losses can be stronger when market-level uncertainty is higher. To control the risk of non-trading during the weekends, it is reasonable for traders to be more conservative on Friday. If traders are more likely to sell winners than losers on Fridays, this can cause a greater disposition effect at that time. By contrast, a "reverse" disposition effect will be found if traders are reluctant to sell winners than losers on Fridays.

In addition, the different trading behaviors of individuals and professionals have been examined before either through inferred from the behaviors of large stocks (e.g., Abraham and Ikenberry, 1994; Brockman and Michayluk, 1998; Chan et al., 2004; Kamara, 1997; Lakonishok and Maberly, 1990) or observed directly from the records of transactions (e.g., Venezia and Shapira, 2007). These authors propose that individuals are busy at work during the weekday and make their trading decisions mainly during the weekend, therefore are more likely to trade on Mondays. In addition, since brokers, who tend to recommend more buy orders than sell orders, do not work on the weekend, individual investors are less likely to be affected by brokers' buy order recommendations when they make their investment decisions during the weekend. They are more likely to sell rather than buy after the weekend. However, the limited attention among investors will affect trading decision, and weekends distract investors temporarily (DellaVigna and Pollet, 2006). This will cause fewer trading during the turn of the week.

The consideration of risk control and the seasonality in trading behavior may lead to the seasonality of realizing gains and losses. Therefore, this paper investigates whether the propensity to realize gains or losses varies around the-turn-of-the-week in the Taiwan stock index (TAIEX) futures market. Based on a transaction dataset on the TAIEX futures, indi-

Mei-Chen Lin, Professor of Business and Administration, College of Business, National Taipei University, Taiwan, ROC.
I am grateful to the National Science Council for Financial support (99-2410-H-305-057-MY2) and two anonymous referees for helpful comments. Many thanks are also given to the Taiwan Futures Exchange for providing data to make this research feasible.

viduals and domestic corporations are found to exhibit disposition effect. Nevertheless, foreign institutional investors and dealers do not show this behavioral bias. Interestingly, mutual funds present a "reverse" disposition effect.

When analysis is made in terms of both days of the week and investor types, individuals show higher tendency to realize both gains and losses on Friday, and dealers are also prone to realize losses on Friday. But the foreign investors show lower propensity to realize loss on Friday. Taken the higher tendency of realizing gains and losses together, there is no significant evidence of higher disposition effect on Friday.

Though traders have higher tendency to realize gains and losses only on Friday, they have significant differences in trading behaviors on both Monday and Friday. In particular, for all traders' sample, traders are less likely to enter a new contract on Monday, regardless of buy or sell orders. But they are liable to close a long position through placing a sell order on Friday. This reflects that traders with a long position are afraid of unexpected bad things, like natural disasters and catastrophes, happening during the weekend since they cannot trade in response to the events. Overall, these results reveal that the trading behaviors of the TAIEX traders are associated with the days of the week.

The paper is organized as follows. Section 1 describes the data and methodology. Section 2 analyzes the effect of the weekend on the behavior of realizing gains and losses of investors. Section 3 examines investors' trading behaviors during the turn of the week. The final section concludes.

1. Data and methodology

1.1. Data: TAIEX futures contracts. Taiwan Futures Exchange (TAIFEX) launched its first product: the Taiwan Stock Exchange Capitalization Weighted Stock Index (TAIEX) futures on July 21, 1998. Despite its short history, the derivatives market in TAIFEX has grown dramatically and has won the attention and recognition of global investors. According to statistics from the Futures Industry Association (FIA), the global ranking on total TAIFEX trading volume rose to 17th in 2008 from 57th in 1998.

The underlying asset of TAIEX futures in the TAIFEX is Taiwan Stock Exchange Capitalization Weighted Stock Index (TAIEX). It is a market capitalization weighted index composed of all stocks listed in the Taiwan Stock Exchange. Contract months of index futures are spot month, the next calendar month, and the next three quarterly months. The last trading day for each contract month is the third Wednesday of the delivery month of each contract. The normal trading hours are from Monday through Friday, 08:45-13:45. On the last trading day of futures, the trading of matured futures contracts ends at 13:30. The daily settlement price is the volume weighted average price, which is calculated by dividing the value of trades by the volume within the last one minute or otherwise determined by the TAIFEX according to the Trading Rules. The final settlement price is set to the average price of the underlying index disclosed within the last 30 minutes prior to the close of trading on the final settlement day. The TIFEX have not designated market makers. Buyers and sellers meet via the Automated Trading System (ATS). The TAIEX futures price is the same as TAIEX times NT$200. The trading unit is one contract and the minimum tick size is one index point, representing a value of NT$200. The daily price limit is 7% of previous day's settlement price.

This paper uses the trading data of all market participants in the TAIEX futures in the TAIFEX market to examine whether investors' trading behaviors differ around the weekend. The primary dataset consists of all futures transaction and limit order book records the TAIEX futures from the Taiwan Futures Exchange (TAIFEX) between January 1, 2004 and December 31, 2008. The data include a trader's ID codes, identifiers for the buying trader and the selling trader, the price, the volume and the time for each transaction and order. Each record also includes an account number that allows us to distinctively identify whether the trader is an individual, institution, or proprietary trader. In my sample, there are 36,498 investors trading in the futures market during the sample period.

This paper examines five groups of traders, including: individual traders; local companies (Locals); qualified foreign institutional investors (QFIIs); securities investment trust and consulting enterprises (Mutual Funds); as well as dealers of futures commission merchants (Dealers). During the sample period, the percentage of active individual investors is approximately 99.29%, which is strikingly higher than that of institutional investors (0.71%). However, the percentage of individual investors on the basis of trading volume is not so high. During the same period, 72.07% of the gross volume of trade was by individual investors. In contrast, 1.94% of the gross volume of trade was by locals and 1.56% was by domestic mutual funds, 15.99% was by dealers, 8.45% was by foreign investors (QFIIs).

1.2. Methodology. In testing the disposition effect, the paper compares the ratio of realized gain to the ratio of realized loss proposed by Odean (1998), as addressed in the following section.

1.2.1. Measures of gains and losses. For each trader and each contract, once the first trade is located I then track each subsequent trade until the maturity. With each trade, I calculate and update the open interests, weighted average costs of the contracts, and unrealized as well as realized gains/losses using the weighted average costs (the reference price) and current price. Gains/losses are determined by comparing the current futures price to the contract-weighted average open-long (or open-short) price. There are two types of gains and losses. If the investor offsets his position at a gain (loss), it is counted as a "realized gain (loss)". If the investor does not close-long (or close-short) futures contracts and holds the positions, it is counted as a "paper gain (loss)" when the current price is above (below) the reference price.

In calculating the gains/losses, like Locke and Mann (2005), I group trades together into rounds. For each day, there are the accumulation phase and offsetting phase within each round. In the accumulation phase, the trader builds up his position with continually increasing open interests in one position direction, either long or short. During the accumulation phase, only the unrealized gains/losses are computed. When the trader reverses the position direction and starts to unload his contracts, the offsetting phase starts and the realized gains/losses are calculated. For positions that are held until maturity and are closed by the exchange, I calculate the realized gains/losses based on the final price of the contract. It is because, at the maturity date, even the traders holding a position in a futures contract roll-over their position by realizing their profits/losses on the near contract and open a new position in the deferred contract, for tax purposes, they are bound to realize the gains/losses on the futures contract at maturity date.

1.2.2. The Odean (1998) disposition effect measure. Odean's (1998) methodology is used to measure the disposition effect, the difference between investors' propensity to realize gains and their propensity to realize losses. To examine whether the disposition effect varies with investors and with time, following Choe and Eom (2009) and Kumar (2009), the proportion of gain realized (PGR) and the proportion of loss realized (PLR) for investor type *i* on date *t* are defined as:

$$PGR_{i,t} = \frac{N^i_{RG,t}}{N^i_{RG,t} + N^i_{PG,t}}, PLR_{i,t} = \frac{N^i_{RL,t}}{N^i_{RL,t} + N^i_{PL,t}}, \quad (1)$$

where $N^i_{RG,t}$ is the number of trades in investor type *i* where a gain is realized on day *t*; $N^i_{RL,t}$ is the number of trades in investor type *i* where a loss is realized on day *t*; $N^i_{PG,t}$ is the number of trades in investor type *i* where there is a paper gain on day *t*; $N^i_{PL,t}$ is the number of trades in investor type *i* where there is a paper loss on day *t*.

The disposition effect (DE) for investor type *i* on day *t* is computed as:

$$DE_{i,t} = PGR_{i,t} - PLR_{i,t}. \quad (2)$$

A positive $DE_{i,t}$ indicates that investor *i* has more tendency to realize gains than losses on day *t*. The bigger is the disposition effect, the more likely the trader is to realize winners than losers. The t-statistics test the null hypothesis that the disposition effect is equal to zero.

2. The tendency to realize gains and losses around the weekend

Table 1 (in the Appendix) reports summary statistics within the weekdays. As can be easily seen, this table provides no evidence of Monday effect during the sample period. In particular, TAIEX futures exhibited insignificantly negative returns on Monday. Inspection of the table also shows that there are insignificant differences in the daily returns between the days of the week. Trading volume and intraday volatility also do not show significant differences during the days of the week. These differences reveal a different trading behavior around the weekday. Average returns from Tuesday to Friday are positive, with Thursday having the highest one. Specifically, Thursday has the biggest return and trading volume; Monday has the lowest return; Tuesday has the lowest trading volume; Wednesday has the lowest intraday volatility, while Friday has the biggest one.

Table 2 (in the Appendix) reports the tendency to realize gains and losses associated with each investor type. The proportion of gains realized ranges from 0.6988 of mutual funds to 0.9575 of the QFIIS; the QFIIs also have the highest proportion of losses realized (0.9506), and the individuals have the lowest one (0.7138). As expected, the individuals exhibit the strongest disposition bias, and the locals rank the second. However, QFIIs and dealers show no significant evidence of disposition effect, and, surprisingly, the DE of the mutual funds is marginally rejected at the 10% significance level, indicating a "reverse" disposition effect. The significant F-values further show that there is a significant difference in the patterns of realizing gains and losses for these five types of traders.

Table 3 (in the Appendix) reports the tendency to realize gains and losses within the days of the week for various types of investors. It shows a significant disposition effect for the samples of all investors during all days of the week. With regards to investor

types, there are some differences during the weekdays for individuals to realize gains (PGR), their propensity to realize losses (PLR) and the disposition effect. In the context of proportion to realize gains and proportion to realize losses, individual investors have the highest tendency to sell both winners and losers on Friday. Taken together the higher tendency to both realize gains and losses on Friday, their disposition bias, instead of more significant on Friday, is more prevalent on Wednesday.

Locals exhibit the disposition bias regardless of the days of the week, and there is no significant difference in their tendency to realize gains and losses within the weekdays. Foreign investors suffer from the disposition bias only on Monday and Friday, when their tendency to realize loss is weak. Mutual funds show "reverse" disposition effect on Friday. Higher propensities for dealers to realize losses on Friday also leads to an insignificant disposition effect on that day. In sum, the tendency to realize losses is stronger on Friday for individuals and dealers, but less for foreign investors; individuals are also prone to realize gains on Friday. Above results imply that individuals are more sensitive to the non-trading of the weekend than other traders.

3. Investors trading behaviors during the turn of the week

According to Miller (1988) and Lakonishok and Maberly (1990), the turn-of-the-week also affects the traders' trading activity. In particular, individual investors typically have very limited time during the weekdays, they therefore process information and make investment decisions only during the weekend. In addition, individual investors are less likely to be affected by brokers' buy order recommendations when they make their investment decisions during the week since they do not work on the weekend. Therefore, the sell transactions from individual investors tend to increase when the market reopens on Monday. Lakonishok and Maberly (1990) and Venezia and Shapira (2007) provide supporting evidence of this view.

However, the sample above is the individuals in the stock market, who are less experienced than those in the futures markets. Furthermore, due to the characteristics of high risk in trading futures, individual traders in the futures markets tend to have higher risk-taking propensity and can be a full time trader as a professional investor does. Additionally, the findings that individuals exhibit a before-weekend phenomenon of both realizing gains and losses, and QFIIS and dealers have a before-weekend phenomenon of realizing losses motivate me to examine if the traders' tendency of futures traders during the turn-of-the-week is different from that of stock traders. It may also help explain differences in the weekend effect across markets since the relative weight of amateurs vs. professionals varies across markets.

To address if the turn-of-the-week will affect the traders' tendency to short, long, open, or close a contract, I analyze the differences in trading activities between the turn-of-the-week and other days of the weeks. The regression is as follows:

$$DV_t = \beta_0 + \beta_1 DMON_t + \beta_2 DFRI_t + \beta_3 \hat{\sigma}^2_{t-1} + \beta_4 r_{t-1} + \beta_5 V_{t-1} + \varepsilon_t, \quad (3)$$

where DV_t are dependent variables like the numbers of new-long contracts, the numbers of new-short contracts, the numbers of close-long contracts, the numbers of close-short contracts, and the order imbalance (OI, the numbers of long contracts minus the numbers of short contracts). *DMON* and *DFRI* are dummy variables of Monday and Friday, respectively. Control variables include market volatility ($\hat{\sigma}^2_{t-1}$), daily returns (r_{t-1}), number of contracts traded (V_{t-1}). Returns and trading volume are included as control variables since they have been shown as the factors to affect the decisions to transact (e.g., Venezia and Shapira, 2007). Furthermore, investors are also found to exhibit stronger behavioral biases during times when market-level uncertainty is higher and the pricing of futures index becomes more difficult (Kumar, 2009). Here, the five-minute return volatility is used as one proxy for market-level uncertainty. Following Taylor and Xu (1997), Andersen, Bollerslev, Diebold, and Labys (2000a) and related papers, the realized variance for trading day t is estimated by summing the intraday five-minute squared returns, as follows:

$$\hat{\sigma}^2_t = \sum_{j=0}^{n} r^2_{t,j}. \quad (4)$$

Coefficients β_1 (β_2) represent the differences in numbers of new long contracts (numbers of new-short contracts, numbers of close-long contracts, numbers of close-short contracts, and order imbalance) between Monday, Tuesday-to-Thursday and Friday. Table 4 (in the Appendix) shows whether traders' trading behaviors change during the-turn-of-the-week. As shown, for the samples of all traders, traders are found to be less likely to enter a new contract, regardless of buy or sell orders on Monday. But they are liable to close a long position through placing a sell order on Friday. This reflects that traders with a long position are afraid of unexpected bad things, like natural disasters and catastrophes, happening during the weekend since they cannot trade in response to the events.

Furthermore, individuals are less prone to open a new contract, either long or short, and close a short contract on Monday. The fact that individuals trade less aggressively on Monday is inconsistent with the results based on the stock market that individuals are more likely to trade on Mondays. Similarly, domestic companies (Locals) are also less prone to initiate a long contract and close a short contract on Monday. This reflects that individual and local traders in the TAIEX futures markets use the beginning of the week to plan for the rest of the week and this causes reduced activity.

By contract, foreign investors neither open a long nor a short contract to a greater degree on Friday. This indicates that they are concerned with unexpected things, like natural disasters and catastrophes or good economic reports, happening during the weekend since they can not trade in response to the events. As for mutual funds, they have little propensity to initiate a short position on both Monday and Friday. This means that they not only control for unexpected risk that may happen on weekends but also do related analysis at the beginning of the week. However, dealers show no specific tendency of trading patterns around the weekends. Overall, these results reveal that the trading behaviors of the TAIEX traders are associated with the days of the week.

Conclusion

This paper shows that, on average, traders in the TAIEX futures contracts do show significant propensity to sell winners and keep losers. However, only individuals and locals shows higher propensity to sell winners quick than losers. Mutual funds, by contrast, show evidence of "reverse" disposition effect, namely that they sell losers and ride on winners. QFIIs and dealers show no evidence of either disposition or "reverse" disposition effect.

On Friday, individuals increase the proportion of realizing both gains and losses relative to the other days of the week; dealers also realize losses to a greater degree; whereas, QFIIs are less prone to realize losses on that day. The turn of the week is not only associated with the tendency to realize gains and losses, but also with the tendency to open and close a contract. Specifically, traders are less likely to enter a new contract on Monday regardless of buy or sell orders. But they are liable to close a long position through placing a sell order on Friday. This reflects that traders with a long position are afraid of unexpected bad things, like natural disasters and catastrophes, happening during the weekend since they can not trade in response to the events.

Moreover, individual traders are less likely to open a long or short contract, and to close a short contract on Monday, which is inconsistent with the viewpoints that individuals make their trading decisions mainly during the weekend therefore are more likely to trade on Mondays (e.g., Abraham and Ikenberry, 1994; Brockman and Michayluk, 1998; Chan et al., 2004; Kamara, 1997; Lakonishok and Maberly, 1990; Venezia and Shapira, 2007). These results reveal that the trading behaviors of the TAIEX traders are associated with the day of the week.

References

1. Abraham, A. and Ikenberry, D.L. (1994). The individual investor and the weekend effect, *Journal of Financial and Quantitative Analysis*, 29, pp. 263-277.
2. Andersen, T.G., Bollerslev, T.F., Diebold, X. and Labys, P. (2000). The distribution of exchange rate volatility, *Journal of the American Statistical Association*, forthcoming.
3. Barberis, N.C., Xiong, W. (2009). What drives the disposition effect? An analysis of a longstanding preference-based explanation, *The Journal of Finance*, 64, pp. 751-784.
4. Brockman, P. and Michayluk, D. (1998). Individual versus institutional investors and the weekend effect, *Journal of Economics and Finance*, 22, pp. 71-85.
5. Chan, S.H., Leung, W.K. and Wang, K. (2004). The impact of institutional investors on the Monday seasonal, *The Journal of Business*, 77, pp. 967-986.
6. Choe, H. and Eom, Y. (2009). The disposition effect and investment performance in the futures market, *Journal of futures Markets*, 29 (6), pp. 496-522.
7. Coval, J.D. and Shumway, T. (2005). Do behavioral biases affect prices? *The Journal of Finance*, 60, pp. 1-34.
8. DellaVigna, S. and Pollet, J. (2006). Investor inattention and Friday earnings announcements, *Journal of Finance*, 64 (2), pp. 709-749.
9. Dhar, R. and Zhu, N. (2006). Up close and personal: Investor sophistication and the disposition effect, *Management Science*, 52, pp. 726-740.
10. Feng, L. and Seasholes, M.S. (2005). Do investor sophistication and trading experience eliminate behavioral biases in financial markets? *Review of Finance*, 9, pp. 305-351.
11. Frazinni, A. (2006). The disposition effect and under-reaction to news, *Journal of Finance*, 62, pp. 2017-2046.
12. Genesove, D. and Mayer, C.J. (2001). Loss aversion and seller behavior: Evidence from the housing market, *Quarterly Journal of Economics*, 116 (4), pp. 1233-1260.
13. Grinblatt, M. and Keloharju, M. (2003). Tax-loss trading and wash sales, *Journal of Finance*, 65, pp. 2285-2320.
14. Grinblatt, M. and Keloharju, M. (2001). What makes investors trade? *Journal of Finance*, 56, pp. 589-616.

15. Heath, C., Huddart, S., and Lang, M. (1999). Psychological factors and stock option exercise, *Quarterly Journal of Economics*, 114 (2), pp. 601-626.
16. Heisler, J. (1994) Loss aversion in a futures market: An empirical analysis, *The Review of Futures Markets*, 13, pp. 793-815.
17. Lakonishok, J. and Maberly, E. (1990). The weekend effect: Trading patterns of individual and institutional investors, *The Journal of Finance*, 45, pp. 231-243.
18. Locke, P.R. and Mann, S.C. (2005). Professional trader discipline and trade disposition, *Journal of Financial Economics*, 76, pp. 401-444.
19. Kahneman, D. and Tversky, A. (1979). Prospect theory: An analysis of decision under risk, *Econometrica*, 47, pp. 263-291.
20. Kamara, A. (1997). New evidence on the Monday seasonal in stock returns, *The Journal of Business*, 70, pp. 63-84.
21. Kumar, A. (2009). Hard-to-value stocks, behavioral biases, and informed trading, *Journal of Financial and Quantitative Analysis*, 44 (6), pp. 1375-1401.
22. Kyle, A.S., Yang, H.O. and Xiong, W. (2006). Prospect theory and liquidation decisions, *Journal of Economic Theory*, 129, pp. 1273-1288.
23. Newey, W.K. and West, K.D. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix, *Econometrica*, 55, pp. 703-708.
24. Odean, T. (1998). Are investors reluctant to realize their losses? *Journal of Finance*, 53, pp. 1775-1798.
25. Shapira, Z. and Venezia, I. (2001). Patterns of behavior of professionally managed and independent investors, *Journal of Behavioral Finance*, 25, pp. 1573-1587.
26. Shefrin, H. and Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence, *Journal of Finance*, 40, pp. 777-790.
27. Shumway, T. and Wu, G. (2005). Does disposition drive momentum? University of Houston, Shanghai Jiao Tong University (SJTU), China Academy of Financial Research, Working paper, AFA 2006 Boston Meetings Paper.
28. Taylor, S.J. and Xu, X. (1997). The incremental volatility information in one million foreign exchange quotations, *Journal of Empirical Finance*, 4, pp. 317-340.
29. Venezia, I. and Shapira, Z. (2007). On the behavioral differences between professional and amateur investors after the weekend, *Journal of Banking and Finance*, 31, pp. 1417-1426.

Appendix

Table 1. Day-of-the-week descriptive statistics

This table presents the average returns, trading volume, and intraday return volatility ($\hat{\sigma}^2$) of TAIEX futures during the full sample period. The t-statistics are for the test of the null hypothesis that the average returns, trading volume, and daily return volatility for that day of the week are equal to zero, respectively. The sample period ranges from January 2004 to December 2008. The F-statistics are for the test of the null hypothesis that the average returns, trading volume, and daily return volatility is equal within the weekdays, respectively. T-values are for the test of these variables being equal to zero. *, **, and *** denote significance at the 10%, 5%, and 1% significance level.

	Monday	Tuesday	Wednesday	Thursday	Friday	F-statistics
Mean returns	-0.0049	0.0275	0.0636	0.1555	0.0907	0.309
t-value	(-0.039)	0.345	0.642	1.626	0.980	
Trading volume	33696.88	32533.28	33680.14	34640.51	33986.65	0.886
t-value	15.271***	15.905***	16.332***	14.586***	15.042***	
$\hat{\sigma}^2$ (%)	0.0840	0.0867	0.0824	0.0822	0.0949	0.353
t-value	9.749***	10.627***	9.852***	10.885***	8.330***	

Table 2. PGR, PLR and disposition effect measure

This table reports the mean of PGR, PLR and DE for various classes of investors over the sample period from January 2004 to December 2008. PGR is the number of realized gains divided by the number of realized gains plus the number of paper gains, and PLR is the number of realized losses divided by the number of realized losses plus the number of paper losses. DE is the difference of PGR and PLR. The F-statistics are for the test of the null hypothesis that PGR (PLR and DE) is equal for different investor classes. T-values are for the test of DE being equal to zero. *, **, and *** denote significance at the 10%, 5%, and 1% significance level.

	Total traders	Individuals	Locals	QFII	Mutual funds	Dealers	F-test
PGR	0.8525	0.8321	0.8273	0.9575	0.6988	0.8133	175.937***
PLR	0.7578	0.7138	0.7839	0.9506	0.7330	0.7876	152.033***
DE	0.0947	0.1184	0.0434	0.0069	-0.0406	0.0334	44.061***
t-value	5.057***	5.991***	2.305***	0.692	-1.877*	1.594	

Table 3. The weekend effect: the propensity to realize gains and losses

This table reports the mean of PGR, PLR and DE within the days of the week for various classes of investors over the sample period from January 2004 to December 2008. PGR is the number of realized gains divided by the number of realized gains plus the number of paper gains, and PLR is the number of realized losses divided by the number of realized losses plus the number of paper losses. DE is the difference of PGR and PLR. The F-statistics are for the test of the null hypothesis that PGR (PLR and DE) is equal within the days of the week. *, **, and *** denote significance at the 10%, 5%, and 1% significance level.

	Monday	Tuesday	Wednesday	Thursday	Friday	F-statistics
Panel A: All traders						
PGR	0.8593	0.8495	0.8491	0.8471	0.8577	0.884
PLR	0.7638	0.7592	0.7438	0.7533	0.7700	1.403
DE	0.0955	0.0903	0.1054	0.0938	0.0877	1.329
t-value	4.261***	4.131***	4.566***	4.292***	4.136***	
Panel B: Individuals						
PGR	0.8384	0.8241	0.8247	0.8303	0.8433	1.904*
PLR	0.7189	0.7143	0.6926	0.7127	0.7313	2.490**
DE	0.1195	0.1098	0.1321	0.1175	0.1120	2.501**
t-value	4.831***	4.606***	5.190***	4.869***	4.738***	
Panel C: Locals						
PGR	0.8200	0.8063	0.8334	0.8401	0.8248	1.582
PLR	0.7778	0.7628	0.7759	0.7804	0.7984	1.086
DE	0.0385	0.0447	0.0608	0.0555	0.0193	1.027
t-value	2.626**	2.835**	3.386***	3.235***	1.872*	
Panel D: QFIIs						
PGR	0.9120	0.9094	0.9148	0.9147	0.9053	0.059
PLR	0.8979	0.9078	0.9254	0.9186	0.8594	2.412**
DE	0.0207	0.0022	-0.0104	0.0022	0.0599	1.468
t-value	1.906*	0.610	-0.500	0.629	3.367***	
Panel E: Mutual funds						
PGR	0.7179	0.7114	0.7254	0.6947	0.7064	0.375
PLR	0.7206	0.7377	0.7376	0.7619	0.7845	1.689
DE	0.0115	-0.0110	-0.0063	-0.0306	-0.0641	1.086
t-value	1.412	-0.378	-0.239	-1.082	-2.324**	
Panel F: Dealers						
PGR	0.7797	0.8152	0.8168	0.8473	0.8084	0.580
PLR	0.7866	0.7464	0.7674	0.7910	0.8433	1.939*
DE	-0.0103	0.1129	0.0415	0.0782	-0.0431	0.893
t-value	-0.156	3.638***	2.288**	3.177***	-0.669	

Table 4. A test of weekend phenomenon to buy and sell contracts

To address if the turn-of-the-week will affect the traders' tendency to sell, buy, open, or close a contract, I run the regression as follows:

$$DV_t = \beta_0 + \beta_1 DMON + \beta_2 DFRI + \beta_3 \hat{\sigma}^2_{t-1} + \beta_4 r_{t-1} + \beta_5 V_{t-1} + \varepsilon_t ,$$

where DV_t are dependent variables like the numbers of new long contracts (new long), the numbers of new short contracts (new short), the numbers of close long contracts (close long), the numbers of close short contracts (close short), and the order imbalance (OI, the numbers of buy contracts minus the numbers of sale contracts); $DMON_t$ is a dummy variable that equals one if day t is a Monday, and is zero otherwise; $DFRI_t$ is a dummy variable that equals to one if day t is a Friday, and is zero otherwise; $\hat{\sigma}^2_{t-1}$ measures the market volatility on date t-1; r_{t-1} is the TAIEX returns on date t-1; V_{t-1} is the log value of trading volume on date t-1. OI denotes order imbalance, reflecting the difference of buy order (including new buy and close buy) and sell orders (including new sell and close sell). The tests are performed using the Newey-West (1987) heteroskdasticity and autocorrelation consistent covariance matrix. The values in parenthesis are p-values.

	Panel A: All traders					Panel B: Individuals					Panel C: Locals				
	New long	New short	Close long	Close short	OI	New long	New short	Close long	Close short	OI	New long	New short	Close long	Close short	OI
Intercept	-11.246 (0.000)	-9.341 (0.000)	-22.551 (0.000)	-151.607 (0.030)	-117.801 (0.087)	-11.078 (0.000)	-9.912 (0.000)	-25.198 (0.000)	-21.181 (0.000)	8.064 (0.000)	0.023 (0.787)	0.298 (0.042)	-0.133 (0.686)	0.328 (0.528)	0.212 (0.235)
DMON	-1.356 (0.044)	-1.410 (0.003)	-0.294 (0.677)	5.104 (0.924)	6.260 (0.907)	-1.240 (0.012)	-0.987 (0.006)	-0.688 (0.245)	-1.160 (0.028)	-0.706 (0.188)	-0.028 (0.006)	-0.017 (0.159)	-0.018 (0.150)	-0.028 (0.027)	-0.009 (0.520)
DFRI	0.773 (0.244)	0.327 (0.510)	1.968 (0.004)	-20.925 (0.497)	-21.285 (0.490)	-0.528 (0.307)	-0.470 (0.213)	0.444 (0.453)	-0.109 (0.817)	-0.572 (0.258)	-0.002 (0.843)	-0.014 (0.210)	0.000 (1.000)	-0.020 (0.146)	0.000 (0.987)
$\hat{\sigma}^2_{t-1}$	1.834 (0.000)	1.569 (0.000)	3.438 (0.000)	21.445 (0.010)	15.980 (0.051)	1.873 (0.000)	1.610 (0.000)	3.768 (0.000)	3.216 (0.000)	-0.805 (0.000)	0.011 (0.174)	-0.019 (0.176)	0.032 (0.327)	-0.017 (0.737)	-0.021 (0.222)
r_{t-1}	-0.130 (0.608)	-0.150 (0.483)	-0.614 (0.090)	1.656 (0.815)	2.489 (0.726)	-0.308 (0.258)	0.141 (0.290)	-0.675 (0.073)	-0.199 (0.300)	0.205 (0.363)	0.005 (0.112)	-0.009 (0.002)	0.003 (0.759)	-0.016 (0.008)	-0.004 (0.685)
V_{t-1}	0.608 (0.000)	0.570 (0.000)	0.497 (0.000)	-0.001 (0.796)	-0.002 (0.673)	0.416 (0.000)	0.434 (0.000)	0.325 (0.000)	0.323 (0.000)	0.355 (0.000)	0.236 (0.000)	0.367 (0.000)	0.163 (0.004)	0.225 (0.000)	0.574 (0.000)
$\hat{\sigma}^2_{t-1}$	Panel D: QFIIs					Panel E: Mutual funds					Panel F: Dealers				
	New long	New short	Close long	Close short	OI	New long	New short	Close long	Close short	OI	New long	New short	Close long	Close short	OI
Intercept	-0.371 (0.296)	0.600 (0.500)	-2.253 (0.000)	-4.200 (0.000)	-0.408 (0.367)	-0.041 (0.255)	1.214 (0.000)	-0.209 (0.000)	-0.716 (0.000)	0.006 (0.908)	-0.041 (0.255)	-2.222 (0.000)	-4.971 (0.000)	-4.889 (0.000)	2.197 (0.001)
DMON	-0.123 (0.106)	-0.167 (0.249)	-0.052 (0.644)	-0.002 (0.991)	0.011 (0.937)	-0.012 (0.206)	-0.087 (0.011)	-0.004 (0.726)	0.045 (0.334)	0.007 (0.660)	-0.012 (0.206)	-0.126 (0.551)	-0.260 (0.195)	-0.149 (0.489)	-0.001 (0.996)
DFRI	-0.173 (0.016)	-0.217 (0.086)	-0.174 (0.060)	-0.212 (0.183)	-0.023 (0.830)	-0.016 (0.074)	-0.101 (0.001)	-0.011 (0.292)	-0.014 (0.688)	0.005 (0.678)	-0.016 (0.074)	-0.030 (0.889)	-0.106 (0.579)	-0.072 (0.732)	-0.032 (0.878)
$\hat{\sigma}^2_{t-1}$	0.115 (0.001)	0.054 (0.529)	0.301 (0.000)	0.523 (0.000)	0.051 (0.282)	0.012 (0.000)	-0.083 (0.009)	0.031 (0.000)	0.112 (0.000)	0.000 (0.951)	0.012 (0.000)	0.331 (0.000)	0.761 (0.000)	0.764 (0.000)	-0.186 (0.010)
r_{t-1}	-0.026 (0.344)	-0.060 (0.137)	-0.008 (0.817)	-0.191 (0.030)	0.030 (0.404)	0.005 (0.101)	-0.021 (0.037)	0.008 (0.043)	-0.024 (0.050)	-0.003 (0.601)	0.005 (0.101)	-0.239 (0.057)	-0.102 (0.335)	-0.230 (0.009)	0.173 (0.127)
V_{t-1}	0.222 (0.000)	0.148 (0.000)	0.197 (0.000)	0.445 (0.000)	0.828 (0.000)	0.174 (0.000)	0.040 (0.235)	0.102 (0.001)	0.036 (0.208)	0.940 (0.000)	0.174 (0.000)	0.423 (0.000)	0.409 (0.000)	0.381 (0.000)	0.847 (0.000)