行政院國家科學委員會補助專題研究計畫 ■ 成 果 報 告 □期中進度報告

文化差異與動能投資報酬:由中國文化談起

計畫類別:■ 個別型計畫 □ 整合型計畫

計畫編號:NSC 95－2416－H－004－026－MY2

執行期間:95 年 08 月 01 日至 97 年 07 月 31 日

計畫主持人:李怡宗

共同主持人:

計畫參與人員:

成果報告類型(依經費核定清單規定繳交):□精簡報告 ■完整報告

本成果報告包括以下應繳交之附件:

■赴國外出差或研習心得報告一份

□赴大陸地區出差或研習心得報告一份

□出席國際學術會議心得報告及發表之論文各一份

□國際合作研究計畫國外研究報告書一份

處理方式:除產學合作研究計畫、提升產業技術及人才培育研究計畫、
列管計畫及下列情形者外,得立即公開查詢
□涉及專利或其他智慧財產權,□一年■二年後可公開查詢

執行單位:

中 華 民 國 97 年 10 月 29 日

Abstract

      Recent research documents the existence of momentum effects in stock returns in most of the Western countries. Recently, Hvidkjaer（2006）provides the first/only evidence that momentum effects are partly from the slowly underreaction of small traders to past returns, using transaction data. In contrast, there is no evidence that large traders react to past returns. A unique dataset from the Taiwan stock exchange allows us to address the momentum behaviors, by examining the order flow data for types of investors directly. Contrary to Hvidkjaer (2006), our paper document momentum behaviors for both institutional and individual orders from foreign investors. Domestic investors (including institutions and individuals, big and small traders) do not tend to sluggish reaction to past returns, and they do have significant impact on moving prices in the same direction. Interestingly, foreign investors tend to react to past returns significantly, while domestic investors only show slightly reaction on past return. Besides, small domestic individuals tend to be more contrarian than big domestic individuals. Therefore, it is still a puzzle about the rationales that may explain momentums.

Keywords: momentum effects, cultural differences, Taiwan

Contents

1. Introduction

Even market efficiency has been dominated finance economics throughout several decades, the unexplained persistence of momentum returns is one of the most serious challenges to the asset-pricing literature(Fama and French (1996)).　However, the source of the profits and the interpretation of the momentum effects are widely debated, and it has attracted a lot of scholars search for the rationales.

Most of the scholars search for the rationales by borrowing theories from psychology such as representativeness, conservatism, overconfidence, and self-attribution, to explain the momentum profits (Odean 1998; Daniel, Hirshleifer, and Subrahmanyam 1998, Jegadeesh and Titman 2001). However, there is little direct evidence showing momentum effect is driven by any of the aforementioned psychology. Jaggedness and Titman (2001) argue that the momentum effect is likely to be caused by the delayed over-reaction by investors. Recently, Hvidkjaer（2006）provides a direct test of the relationship between underreaction and momentum effect recently. His findings indicate that momentum effects are partly from the slowly underreaction of small traders to past returns, using transaction data.　In contrast, there is no evidence that large traders react to past returns.

By using order flow data, this paper contributes the following aspects.　Firstly, If momentum are partly driven by underreaction of small traders to past returns, then we should expect to see that momentum phenomenon is prevailing in a market dominated by individual investors.　In Taiwan, individual trading contributes to 70% to 90% of the total trading volume during past ten years.　Hence, the Taiwanese market provides a good laboratory environment for us to test whether momentum is prevailing in a individual-dominated market.

Secondly,　Hvidkjaer（2006）does a pioneer work on a trade-based momentum, by using transaction data, however, it is an empirical questions whether small trades and large trades can be used to proxy for small and large traders.　As documented by Chakravarty (2001) and Barclay and Warner (1993) and , institutions may split their orders into small ones for stealth trading purpose.　It is also possible that institutional orders may be split into many small trades if the counterparty is from retail small investors.　Using a unique data from order flow information, we provide a direct test of order initiation (institutions or individuals).　Our dataset also provide the code of buys and sells, and there is no need to infer buy/sell initiated trades from Lee and Ready (1991)'s rule.　A complimentary data from the Taiwan market enables us to test whether underreaciotn that contributes to the momentum phenomenon in the United States is prevalent in some other market.　We divide traders into big traders vs. small traders, and institutional traders vs. individual traders to test if there is no momentum for institutional traders

and big traders and retail individuals do underreact to past returns.

Third, it is still a puzzling that whether psychology factors are the main rationales that explain momentum profitability. While Rouwenhorst (1998) document the momentum effect in 12 European countries, Liu and Lee (2001) show that the phenomenon does not exist in Japan. Hameed and Kusnadi (2002) show that momentum investment strategies do not yield significant momentum profits in six Asian stock markets, suggesting that the factors that contribute to the momentum phenomenon in the United States are not prevalent in the Asian markets. Testing momentum effects in a sample of 9 Asian stock markets, Hou, McKnight, Gao (2005) find little evidence on the existence of intermediate stocks return continuation profits.

Grinblatt and Keloharju (2000) demonstrate that Finnish investors, especially households, follow contrarian investment strategies, using a short period of time (two-year data). In contrast, foreigner investors tend to follow momentum strategies. However, in the Finnish market, most of the domestic and foreign investors are under the western culture. While, the domestic investors in our paper are Taiwanese investors, who are under eastern culture, and foreign investors are mainly from the U.S. and European investors. To separate the sophistication factor from momentum effects, we further classify traders into foreign vs. domestic investors by controlling the identification of institutions and individuals. This enables us to test if cultural differences explain the momentum effect.

Fourth, we also examine the impact of trade imbalance of the domestic and foreign investors. This test provides rationales on the sources of price momentums (contrarian), if any. Hvidkjaer （2006）shows that momentum effects are partly from the slowly under-reaction of small traders to past returns, and significantly affect momentum effects, while big traders do not contribute to momentum effects at all. Thus, if momentum returns holds in Taiwan, we should expect to see that small investors (foreign and domestic) tend to react to past returns slowly, and have impact on future returns. In contrast, if momentum returns do not exist in Taiwan, it is still plausible that some types of investors are contrarians and significantly move stock prices reversely. If small traders do contribute to momentum returns, we should expect to find that institutions (foreign and domestic) and domestic big traders drive the prices significantly in the same direction.

Contrary to the previous findings, we show that foreign investors as a group under-react to past returns, while domestic investors have no momentum behaviors. That is to say, domestic investors in Taiwan are more likely to buy past losers than winners. On the contrary, foreign investors buy more winners than losers.

Further tests also indicate that the above result is not due to the difference in the level of sophistication between domestic and foreign investors. After separating domestic investors into institution, large and small individual investors, we show that domestic individual investors (both large and small) as well as institutional investors trade differently from foreign investors. Investors of Asian cultural background are more likely to trade as contrarians, whereas foreign investors are more likely to trade on momentum. We conjecture that Yin-Yang principle may partly explain for the culture difference on momentum effect..

Both Institutions (foreign and domestic) and bid traders have positive impact on stock prices, while trades by domestic small investors have negative impact on prices. Overall, domestic investors (domestic institutions and big traders) seem to dominate the market, and their trade imbalance mostly determines the stock returns. Given this and since domestic investors (institutions and individuals) are basically contrarians, one would expect that such trading behavior would reduce the magnitude of momentum effect, if such an anomaly does exist. Following the procedures of Jegadeeh and Titman (1993) closely, we find no evidence of the momentum effect in the Taiwan Stock Exchange. The result holds for the entire sample period with various length of formation period (1 week, 1 month, 3 month, 6 month, and 1 year).

The rest of the paper is organized as follows. Section 2 introduces the data and testing hypotheses. Section 3 presents the empirical results. A discussion and conclusion is provided in Section 4.

II. Data and Hypothesis

Data

Our sample consists of all the TSE (Taiwan stock exchange) listed companies that have historical records of buys and sells and return data in the period January 1995 to December 2003. Figure 1 shows that Taiwan indices range from 10,000 to 4,000, experiencing bull and bear markets during the sample period.. Weekly and Monthly return series, risk free rate, book value of equity, closing prices and number of shares outstanding for a given stock, are from the Taiwan Economic Journal.

The order flow data are directly from the Taiwan stock exchange, enabling us to study investor behaviors directly.[1] There are several advantages of our datasets. Firstly, unlike the

III41

[1] Most of the studies use the data from the Institute for the Study of Security markets (ISSM) and the Trade And Quote (TAQ) data sets, with no indication of whether a trade was initiated by the buyer or the seller.

ISSM and TAQ data sets, our order flow data contain whether an order was buy or sell initiated, which is very import for us to separate investors' momentum/ contrarians in a pure way. Secondly, our dataset incorporates all of the orders entering the market and transactions, allowing us to use order flow information directly. The order information records all of the investors' demands/supplies without any intervention of transaction rules if transaction data were adopted instead. Thirdly, the data provide an identification of all investors' types (foreigners, domestic mutual funds, proprietary dealers, corporations and individuals), and furthermore, all of the account information that belong to one signal trader. This makes us to control for sophistication effect, which is well documented and inconclusive comparing foreign vs. domestic investors in the past studies.

All eligible buy or sell orders are aggregated based on all of the accounts for the same trader, and we assign an identification code for the same investors. Traders are then classified as either foreign individuals vs domestic individuals, foreign institutions vs domestic institutions, domestic big individuals or domestic small individuals. In Taiwan, foreign investors are foreign institutions mainly from the U.S. and Europe, while domestic institutions are mutual funds, proprietary dealers, and corporations. To further separating domestic individuals into big and small individuals, we set up the small-investor cut off points: traders were further classified as "large" if they submitted orders larger than ten lots more than 50% of the time over the entire sample period, and "small" otherwise.

We classify investors into two groups: domestic and foreign investors. Domestic investors include individual investors, corporate investors and domestic institutional investors. Foreign investors consist largely of international investment firms, primarily from the US and Europe. The tests are conduced based on the order flow data from the Taiwan Stock Exchange, covering the period of 1995 to 2003. This dataset has three key features that are crucial to our analysis. (i) It identifies whether an order is initiated by a buyer or a seller. (ii) The dataset also identifies the parties to the transaction (individual or institution). (iii) Our dataset enables us to trace all of the accounts that belong to one single trader, thus allows us to classify the cultural background of the investors.

Hypothesis

Three hypotheses are listed as below. By using the Taiwan stock market as the sample, we examine whether the momentum profits do exist in Taiwan. We take the momentum test and reverse it, and see if the opposite works. This study also examine whether or not stock momentum is shorter or longer in Taiwan than traditional US momentum for stocks.

Hypothesis 1: Taiwanese market has no momentum effect.

Are there any systematic patterns of investors' behaviors that account for momentum effect in Taiwan?   We divide investors into foreign individuals vs. foreign institutions, domestic institutions vs domestic individuals, domestic big traders vs domestic small traders to test if the following hypothesis is supported.

Hypothesis 2: Chinese investors are contrarians, while foreign investors are momentum traders, supporting Yin-Yang theory.

How does order imbalance affects stock return?   If there is no momentum, another follow-up question is that whether momentum effect is reduced by the trading behaviors from some types of investors.   Particularly, we want to address who is taking the opposite side and eliminating momentum?

Hypothesis 3:   Taiwanese investors take the opposite side and eliminating momentum.

III. Empirical Results

We capture the trading behavior of investors by the trade imbalance (buy minus sell) over a specific period of time (ranging from one week, one month to one year).   For each investor group, we calculate the total order imbalance for every stock.   Various tests are then conducted to see whether the trade imbalance is related with prior stock returns.   To control for any difference in the level of sophistication between domestic and foreign investors, we further classify domestic investors into three sub-groups: institutional investor, big individual investor, and small individual investors.[2]   Lee, Lin and Liu (1999) documents systematic differences in investment behavior among these groups, and therefore, further tests are then conducted for each sub-groups of domestic investors.

Individual stock order imbalance is calculated as net buy ratio for stock i on day t.   Net buy ratio ($NB_{i, t}$) is the difference between all of the buy shares and sell shares in a group of investors divided by the all of the buy and sell orders in the same group for stock i on day t.   The buy /sell volume (in terms of shares and dollar amounts) is measured by each day and each stock for each type of investors mentioned above. We, then, summarize all of the variables for all types of investors throughout the sample period on a weekly and monthly basis in Table 1.

---
[2] Institutional investors, who may poss better information/skill, are often considered informed, and thus is common to proxy the degree of sophistication

[Please insert Table 1]

We, thus, report order imbalance in terms of number of orders (Panels A), order in lots (Panels B) in Table 1.   The market are net buys (mean=502) in terms of number of orders, and net sellers in terms of order in lots (mean=-591).   Since most of the trading volume is contributed by individuals, it is very natural to see that individual order imbalance follow a similar pattern.   However, if we look at institutions, both domestic institutions and foreign institutions are net sellers during the sample period.   Interestingly, small domestic investors are net buyers no matter what measurements are adopted.

Furthermore, we look at order imbalance among 12 months, to investigate whether there is any systematic pattern for types of investors.   For each month from 1995 to 2003, we categorize all stocks into five size deciles based on market capitalization at the end of the month t-2.   We run regression models using 11 seasonal dummies (Feb. to Dec.) for each calendar month, and produce sixteen regressions. D, F, and   I stands for domestic institutions, foreign institutions, and individuals, respectively.   Meanwhile, the dependent variable is the monthly OIB in dollar amounts on portfolio p in month t.   The dummy coefficients indicate the average differences in OIB between January and each respective month.   The intercept is the average OIB for January. All of the coefficients are multiplied by 10,000.

[Please insert Table 2]

From Table 2, we analyze order imbalance patterns, yet we do not see institutions moving into large stocks in December.   Then, we see if institutions tend to sell losers and buy winners in December.   We do this by regressing OIB on past returns*monthly dummy.   We try different periods, 3, 6, 12 months and the results are shown   We find that foreign institutions poss momentum for large firms (size group 4 and 5), Individual are basically contrarians, in particular for small firms (size group 1 and 2).   Domestic institutions are momentums for small firms (size 1), yet contrarians for large firms (size 5).   The phenomenon is partly because that domestic (foreign) institutions window dressing in small (large) firms, while individuals do not do so.

Following Jegadeesh and Titman (1993), we construct momentum portfolios as follows. Momentum strategies/returns are calculated by building up the combination (J, K) time interval, while J is one week, 1, 3, 6 to 12 months, respectively. We rank securities based on their past *J*-week (month) performance (J = 1 week, 1, 3, 6 to 12 months) and evaluate the returns over the next K-week (month) (K = 1 week, 1, 3, 6 to 12 months) for our sample period, 1995–2003.   At the end of each month, all stocks with a return history of at least 1 week to 1 year are ranked into

ten deciles based on their past 1 week, 1, 3, 6, 12 months performances. The portfolio with the lowest (highest) past return is assigned as "Losers (Winners)". In total, there is a combination (*J, K*) of 4 * 4 *10 unrestricted momentum strategies. In addition, we also examine a second set of 160 strategies that skip a month (week) between the portfolio formation period and the holding period. The results are similar no matter when we skip a month (week) or not.

[Please insert Table 3]

Table 3 reports the returns of relative strength portfolios. The relative strength portfolios are formed based on J-month lagged returns and held for K month. The values of J and K for the different strategies are indicated in the first column and row, respectively. The stocks are ranked in ascending order on the basis of J-month lagged returns and an equally weighted portfolio of the stocks in the lowest return decile is the sell portfolio and an equally weighted portfolio of the stocks in the highest return decile is the buy portfolio. The equally (value-) weighted average monthly returns of these portfolios are presented in this table.

In Table 3, Panel A, we reports is the results measured by monthly return, while Panel B is the results measured by weekly returns. Panel A, Table 3 indicates that most of the returns of all the zero-cost portfolios are negative. The returns are statistically significant for the 6-, 9- or 12-month holding periods, and insignificant for the 1- and 3-month strategy that skip a month. The return patterns are similar no matter when returns are measured by equal-weighted or value-weighted returns. If we look at weekly return, most of the returns for different holding period become more negative and statistically significant than monthly return. However, most of the results on value-weighted returns are not statistically significant. Negative returns do appear in some of the cases. In summary, we do not find momentum return in Taiwan.

Same as Table 3, momentum portfolios are constructed for types of investors, separately, in the same way as follows. At the end of each month, all stocks are ranked into 10 deciles based on their past 1 week, 1, 3, 6, 12 months. The portfolio with the lowest (highest) past return is assigned as "SELL (BUY)". Then, we calculate net buys for different holding period to see if an investor tends to buy losers and sell winners (momentum). In the meantime, net buys are measured by equally (value-) weighted average monthly order imbalance (OIB) of these portfolios for all types of investors in terms of number of share and dollar amount. Results on number of shares are presented from Tables 3 to 6, respectively, for foreign individuals vs. domestic individuals (Table 3), foreign institutions vs. domestic institutions (Table 4) and domestic big investors vs. domestic small investors (Table 5). We report equally-weighted portfolio returns for different holding periods.

In Table 4, Panel A, we find that net buys are significantly positive in all strategies both for winners and losers.   The results imply that   the more extreme the past returns (winners or losers) are, the more likely that domestic individuals are going to buy it in the holding period.   If we look at net buys of winners (Buy) minus net buys of losers (Sell) [Buy-Sell], the values are negative and statistically significant in all strategies, meaning that domestic individuals tend to buy more losers than winners.   The phenomenon is consistent with contrarian trading strategy; that is domestic individuals trade against the market in the formation period.

The trading behaviors of foreign individuals are shown in Panel B, Table 4.   Foreign individuals are net buyers when past returns are extremely negative or positive.   However, the values of [Buy-Sell] are positive for all strategies, indicating that net buys of winners are greater than those of losers.   Thus, foreign individuals are basically momentum traders over various formation period and holding periods. (1 week, 1 month, 3 month, 6 month, 1 year).   The results of weekly net buys in Panels C and D are similar to those in Panels A and B, respectively.

[Please insert Table 4]

In Table 5, we show results on domestic institutions and foreign institutions.   Similarly, [Buy-Sell] of domestic institutions are negative, while that of foreign institutions are positive, implying that domestic (foreign) institutions are contrarian (momentum).   When the magnitude of monthly [Buy-Sell] in Tables 3 and 4, we find that the values range from -0.01 to -0.02 for domestic individuals, 0.00 to 0.14 for foreign individuals, -0.02 to 0.00 for domestic institutions, and -0.01 to 0.19 for foreign institutions.   The finding indicates the foreign investors tend to react to past returns significantly, while domestic investors only show slightly reaction on past return.

[Please insert Table 5]

This paper further divides domestic individuals into big and small individuals, and the results on net buys are shown in Table 6.   No matter what net buys of big or small individuals are considered, the finding is consistent with contrarian trading strategies for both of them.   The monthly values of [Buy-Sell] for domestic big individuals are from 0.00 to -0.02, while those for domestic small ones are from -0.05 to -0.01.   It is interesting to find that small domestic individuals tend to be more contrarian than big domestic individuals.

[Please insert Table 6]

In Table 7, we examine whether order imbalance from any type of investors have impact on prices, to provide rationales on the sources of price momentums (contrarian), if any. We regress daily value-weighted returns (R_t.) on contemporaneous and lagged positive and negative daily weighted order imbalances and past positive and negative value-weighted stock returns. Meanwhile, weighted order imbalances are value-weighted measured in number of orders and order in lots, respectively; EBO_0 (EBO_1) is the positive weighted order imbalance at day t (t-1) and ESO_0 (ESO_1) is the negative weighted order imbalance; NEG (POS) indicates negative (positive) lagged return.

According to Table 3, there is no price momentum in Taiwan, and Tables 4 and 5 shows that foreign (domestic) investors are momentum. It is an empirical question whether foreign (domestic) investors have positive (negative) impact on price. We expect to find that domestic investors contribute to more on price movement than foreign investors since there is no momentum profit in the market. Contrary to Hvidkjaer（2006）, we find that both Institutions (foreign and domestic) and bid traders have positive impact on stock prices significantly, while trades by domestic small investors have negative impact on prices. Since domestic investors (domestic institutions and big traders) seem to dominate the market, and their trade imbalance mostly determines the direction of stock movements. From Tables 3 to 5, foreign investors (institutions and individuals) are basically momentum and therefore, the price impact of such trading behavior is mitigated by the contrarian trading from domestic investors.

[Please insert Table 7]

In summary, we find that no matter what weekly data or monthly data are used, Domestic Individuals adopt contrarian strategy. In contrast, foreign investors (including individuals, eastern institution, and western institution) adopt momentum strategy. The results are very similar to what we have obtained in earlier version. The results are similar no matter in terms of shares or amounts.

IV. Discussion and Conclusion

Our paper document momentum behaviors for both foreign institutiona and individuals. Domestic investors (including institutions and individuals, big and small traders) do not tend to

sluggish reaction to past returns, and they do have significant impact on moving prices in the same direction. Interestingly, foreign investors tend to react to past returns significantly, while domestic investors only show slightly reaction on past return. Besides, small domestic individuals tend to be more contrarian than big domestic individuals. Therefore, it is still a puzzle that whether psychology factors are the main rationales that explain momentum

This study builds on prior research in two fields: Psychology and Finance. Our study also contributes to the finance literature by exploring how cultural difference might affect individual's investment decision and stock returns. In the behavioral finance studies several cognitive biases (e.g. self-attrition, conservatism, over-confidence) have been examined to provide explanation for certain observed stock market anomalies (Odean 1998; Daniel, Hirshleifer, and Subrahmanyam 1998, Jegadeesh and Titman 2001).

Jaggedness and Titman (2001) argue that the momentum effect is likely to be caused by the delayed over-reaction by investors. Such a theory, however, can not explain any difference in the magnitude of the momentum effect across countries. While Rouwenhorst (1998) document the momentum effect in 12 European countries, Liu and Lee (2001) shows that the phenomenon does not exist in Japan. Hameed and Kusnadi (2002) show that momentum investment strategies do not yield significant momentum profits in six Asian stock markets. Testing momentum effects in a sample of 9 Asian stock markets, Hou, McKnight, Gao (2005) find little evidence on the existence of intermediate stocks return continuation profits. The aforementioned evidences suggest that the factors that contribute to the momentum phenomenon in the United States are not prevalent in the Asian markets.

Though culture is influential in the financial decision-making process, behavioral finance has borrowed more from the cognitive psychology than from social psychology-culture. According to Chui, Titman and Wei (2003), a study by Hofstede (1991) found that people in Western countries tend to score higher in tests of "individualism" than do people in Asia. While it is not obvious how a tendency to think and act more or less independently relates to the momentum effect, it is quite plausible that individualism is related to "conservatism" and "overconfidence" which have been suggested by Barberis, Shleifer, and Vishny (BSV) (1998) and Daniel, Hirshleifer, and Subrahmanyam (DHS) (1998) as determinants of momentum.

One important principle underlying the dialectical lay theory is the principle of change, which argues that the universe is in a state of flux and that all objects, events, and states of being

in the world are forever alternating between two extremes or opposites (Yin and Yang).[3] The principle of *Yin-Yang* has broad implications for human cognition, emotion, and behavior and affects the manner in which lay people in East Asian countries (notably, Japan, Korea, and China) deal with unfamiliar situations (Peng & Nisbett, 1999; Spencer-Rodgers & Peng, 2004). In the context of investment decisions, the lay theory of Yin-Yang would suggest that, conditional on observing good (or bad) past stock returns, such good (or bad) stock return are more likely to reverse than to continue in the future. We conjecture that Yin-Yang belief in the Asian culture may provide a potential explanation the observed foreign momentum/domestic contrarian phenomenon between the European and Asian markets.

XI41──────────────────

[3] For example, hot becomes cold, small becomes large, light becomes dark, love becomes hatred, and so on. Each element

is transformed into its opposite in a perpetual cycle of change and reversal.

Reference

Barberis, N., A. Shleifer, and R. Vishny, 1998, A model of investor sentiment, *Journal of Financial Economics*, 49, 307-345.

Barclay, M. J., and J. B. Warner, 1993. Stealth trading and volatility: which trades. move prices? *Journal of Financial Economics,* 34, 281-305.

Chakravarty, S. 2001. Stealth-trading: Which traders' trades move stock prices? *Journal of Financial Economics*, 61 (2): 289-307.

Chui, C.W.A., S. Titman, and K.C.J. Wei, 2003, Intra-industry momentum: the case of REITs, *Journal of Financial Markets*, Vol 6(3), 363-387.

Daniel, K.D., Hirshleifer, D., Subrahmanyam, A., 1998. Investor psychology and security market under- and over-reactions, *Journal of Finance*, 53, 1839-1886.

Fama, E. F. and K. R. French, 1996, Multifactor explanations of asset pricing. anomalies, *Journal of Finance*, 51, 55-84.

Grinblatt M., and M. Keloharju, 2000, The investment behavior and performance of various investor types: A study of Finland's unique data, *Journal of Financial Economics*, 55, 43-67.

Hameed A. and Y. Kusnadi, 2002, "Momentum strategies: Evidence from Pacific Basin stock markets," *The Journal of Financial Research*, Vol. XXV, No. 3, Pages 383–397.

Hofstede, G. 1991, Cultures and organizations: Software of the mind, London. McGraw Hill.

Hvidljaer, S. (2006) A Trade-based analysis of momentum, *Review of Financial Studies*, V19, No. 2, 457-491.

Jegadeesh, N.and S. Titman 1993. Return to buying winner and selling losers: Implication for stock market efficiency. *Journal of Finance*, 48, 65-91.

Jegadeesh, N. and S. Titman 2001. Profitability of momentum strategy : A evaluation of alternative explanation. *Journal of Finance*, 56, 699-719.

Lee, Y., J. Lin, and Y. Liu 1999. Trading patterns of big versus small players in an emeerging market: An emepirical analysis. *Journal of Banking and Finance*, 23, 701-725.

Lee, M.C.C. and M.J. Ready, 1991, Inferring trade direction from intraday data, *Journal of Finance*, 46, 733-746.

Liu, C., and Y. Lee, 2001, Does the momentum strategy work universally? Evidence from the Japanese Stock Market *Asia-Pacific Financial Markets* **8:** 321–339.

Odean, T.(1998). Are investors reluctant to realize their losses?, Journal of Finance, 53,

1775-1798.

Peng, K., and R. E. Nisbett (1999) Culture, dialectics, and reasoning about contradiction. American Psychologist, 54, 741-754.

Rouwenhorst, G. (1998) International momentum strategies. *Journal of Finance*, 53(1), 267-284.

Spencer-Rodgers, J., & Peng, K. (2004). The diale ctical self: Contradiction, change, and holism in the East Asian self-concept. In R. M. Sorrentino, D. Times New Roman Cohen, J. M. Olsen, & M. P. Zanna (Eds.). Culture and social behavior: The Ontario symposium. Vol. 10, Mahwah, NJ: Lawrence Erlbaum.
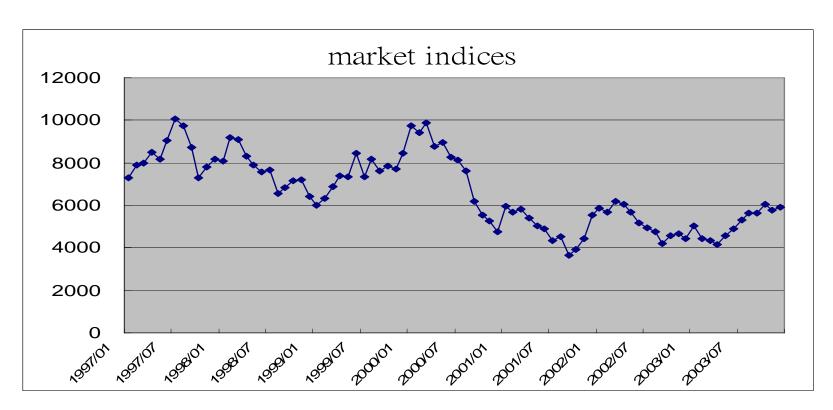
market indices

Figure 1 market return during the period of 1997 and 2003

Table 1   Order Imbalance

This study measures average daily weighted order imbalance from the TWSE (Taiwan Stock Exchange) over 1995 - 2003.   Daily weighted order imbalance was calculated using total weighted buy orders minus total weighted selling orders.   We separate total weighted order imbalance into the weighted imbalance of individual investors, domestic institutional investors and foreign investors. In addition, this paper divides the traders into big traders and small traders by tracing their order size during the sample period. A trader is classified as a big trader if he places an order greater than or equal to ten lots more than 50% of the time.   In total, six kinds of traders' types are classified.   We calculate value-weighted order imbalance for thirty stocks for every day. This table presents weighted order imbalance in number of orders and order in lots, respectively. Panels A and B present the weighted order imbalance.   Descriptive statistics are given for mean, median and standard deviation (STD) in each panel.

Panel A: Total order imbalance in terms of number of orders

	Total	Individuals	Individual Big	Individual small	Domestic Institution	Foreign Institutions
Mean	502	510	17	493	-10	2
Median	496	500	7	491	-9	-2
STD	754	785	128	734	18	69

Panel B: Total order imbalance in terms of order lots

	Total	Individuals	Individual Big	Individual small	Domestic Institution	Foreign Institutions
Mean	-591	-132	-600	468	-304	-154
Median	-975	-477	-847	441	-373	-108
STD	5854	5038	4217	1427	1530	1601

Table 2   Systematic Patterns in Order Imbalance

This table studies that whether there is a systematic pattern in order imbalance in January.   For each month from 1995 to 2003, we categorize all stocks into five size deciles based on market capitalization at the end of the month t-2.   We run regression models using 11 seasonal dummies (Feb. to Dec.) for each calendar month, and produce sixteen regressions. D, F, and   I stands for domestic institutions, foreign institutions, and individuals, respectively. Meanwhile, the dependent variable is the monthly OIB in dollar amounts on portfolio p in month t.   The dummy coefficients indicate the average differences in OIB between January and each respective month.   The intercept is the average OIB for January.   All of the coefficients are multiplied by 10,000.

Size	type	Intercept	d02	d03	d04	d05	d06	d07	d08	d09	d10	d11	d12	ADJ_R-square
	D	480	*** -1123	187	-260	1101	638	-1186	175	-705	313	179	-564	-0.119
1(smallest)	F	41	847	2549	893	407	-1521	-1319	-835	-635	-2208	805	381	-0.056
	I	-512	*** 367	-913	-670	-860	-807	921	-30	1006	-188	-132	371	-0.177
	D	604	* -4536	-2088	-7126	* 1948	15932	3607	* 410	** 639	-1441	-3281	8119	0.119
2	F	422	1508	2287	360	-546	-914	-211	1205	910	-1498	1984	520	-0.139
	I	-741	** 3910	-673	6589	* -2527	-15340	-4118	** -1320	385	1671	3833	-7859	0.139
	D	353	-350	-6325	7668	9975	* -3786	2662	1095	3007	-10054	-4612	-2846	0.026
3	F	-12	4844	** 644	-1078	-604	2356	500	2757	10778	* -4990	1205	3510	0.006
	I	-643	-1898	5952	-6282	-8965	* 4773	-2727	-1075	-1965	5489	2762	2712	-0.012
	D	422	-12666	-4748	-1201	-2654	-12938	12308	-3873	9663	2419	-13962	-21532	-0.011
4	F	1690	** -3203	1228	-1071	1527	-3867	2911	-1529	-720	-6104	-3553	-5814	-0.141
	I	-774	9493	3446	236	1534	12925	-10151	3310	-10214	7365	10731	20210	-0.051
	D	-9379	*** -8863	-19867	1375	-274	-19472	-4615	6598	-879	83530	6126	-16296	-0.150
5(Largest)	F	10886	** 41982	-9231	29923	-18020	27741	-28196	-22762	29523	102513	12152	-23758	-0.040
	I	57	7369	28488	583	17712	-2166	27981	9708	-4472	-141937	-25858	39366	-0.068
In total		319	512	40	-72	-46	638	-326	-367	3771	-471	-792	-578	-0.011

Panel B: Past six-month return

Size	type	Intercept	d02	d03	d04	d05	d06	d07	d08	d09	d10	d11	d12	ADJ_R-square
	D	448 ***	-1447 *	-183	-51	1079	2947 *	630	-916	-633	-191	110	-448	0.007
1(smallest)	F	22	1226 **	4209 **	811	246	-53	-968	-51	-74	-874	516	2117	0.078
	I	-487 ***	642	-563	-550	-786	-2968 *	-926	791	1248	5	62	280	-0.063
	D	218	1536	5215	1785	2616 *	16232 ***	2071 **	642	-557	-76	-2011	1683	0.121
2	F	456	-789	3446	197	-594	-2210	-193	933	483	-213	2758	5942	-0.087
	I	-445	-3971	-9407 **	-1192	-3005 **	-15493 ***	-2307 ***	-930	1036	63	4597	-6640	0.250
	D	-118	-721	-3411	919	7525 **	2801	3187	2589	2972	2824	-5030	2460	-0.023
3	F	69	3098 **	-384	-529	-724	48	-174	1045	2707	-3962	487	4822	-0.005
	I	-311	-480	3671	369	-6574 *	-1449	-3060	-2499	-2485	-440	3889	-3618	-0.055
	D	-73	2298	-5940	-6156	-1574	-7246	6176	-849	4338	4407	-6842	-1639	-0.067
4	F	1566 **	-80	1875	796	1942	1738	-116	-452	-773	-7297 **	-1237	-9703	-0.021
	I	-78	-7848	1588	4759	1370	7744	-4145	188	-4790	1728	4961	1259	-0.102
	D	-8346 **	20712	-5275	-4189	-2109	-28229	-2837	1041	133	18346	5943	-63688 **	-0.002
5(Largest)	F	11625 ***	-60583	29700	23948	-22002	3609	-12857	-16124	2671	4716	41074	23896	-0.061
	I	-733	9353	-6890	1685	14477	19993	13703	9674	1750	-17598	-40045	51271	-0.080
In total		295	-260	511	299	142	171	-141	-289	882	-210	12	1351	-0.012

Size	type	Intercept		d02		d03		d04	d05		d06		d07		d08		d09		d10		d11		d12		ADJ_R-square
1(smallest)	D	568	***	-1229	*	-661		289	952		2426	*	330		1165		606		691		-323		37		0.000
	F	123		646		2568	***	744	-252		250		-1171		75		359		-1311		-6		787		0.059
	I	-624	***	683		-268		-781	-412		-2464	*	-862		-625		-73		-629		391		-92		-0.074
2	D	636	*	-3739		3660		2120	3838	**	-295		1412		21		740		1641		-4250		1121		0.052
	F	389		2551	*	2477	**	395	-928		-1363		-108		549		698		-2498	**	-1174		740		0.123
	I	-936	***	221		-6548	**	-2239	-4111	**	-279		-1590	**	-382		-1346		-17		7704		-4725		0.175
3	D	205		-873		-5102	**	1132	8043	*	1572		3623	*	1406		6390	*	1064		-13333	**	-134		0.137
	F	-112		3064	**	-412		-591	-515		-486		-345		1601	**	230		-3946	***	-712		2317	*	0.141
	I	-552		-642		4935	**	-45	-5756		-216		-2865		-1834		-5449		-170		14265	**	-791		0.094
4	D	110		-4962		-7338	*	-1310	-1766		-1429		3579		-578		3191		4734	**	-8077	*	-1550		0.129
	F	1635	**	-1916		960		484	-251		-863		-127		-82		-175		-2702	***	-1951		-10361		0.013
	I	-523		3236		5778		-81	2548		1560		-2271		85		-3623		-2064		8005	*	1441		0.004
5(Largest)	D	-5699	*	-13034		-11586	*	356	-1624		-29375	**	-4273		-6694		-856		9746		-5670		-24869	** *	0.109
	F	15638	***	31245		-8240		-21958	-20406		-21095		-15379		-12414		293		3945		8002		209		-0.045
	I	-5286		11117		16833	**	11723	14648		42388	**	16085		14940		2201		-10741		-2941		25049	**	0.102
In total		323		570		-221		1	-319		-172		-57		-123		510		-254		394		359		-0.012

Table 3：Returns of Relative Strength Portfolios

The relative strength portfolios are formed based on -month lagged returns and held for K month. The values of J and K for the different strategies are indicated in the first column and row, respectively. The stocks are ranked in ascending order on the basis of J-month lagged returns and an equally weighted portfolio of the stocks in the lowest return decile is the sell portfolio and an equally weighted portfolio of the stocks in the highest return decile is the buy portfolio. The equally (value-) weighted average monthly returns of these portfolios are presented in this table. Panel A is results measured by monthly return, while panel B is the results measured by weekly returns. T-statistics are reported in parentheses.

Panel A: monthly return

		Equal-weighted Return						Value-weighted Return				
J	K=	1	3	6	9	12	K=	1	3	6	9	12
1	Sell	-0.00	-0.01	-0.01	-0.01	-0.01		0.00	-0.00	-0.01	-0.01	-0.01
1		(-0.00)	(-1.04)	(-1.96)	(-3.23)	(-3.68)		(0.24)	(-0.52)	(-1.52)	(-1.89)	(-2.21)
1	Buy	0.00	-0.01	-0.01	-0.01	-0.01		0.01	-0.01	-0.01	-0.00	-0.01
1		(0.40)	(-1.74)	(-2.35)	(-2.47)	(-3.31)		(0.65)	(-0.89)	(-1.79)	(-1.48)	(-2.24)
1	Buy-Sell	0.00	-0.00	-0.00	0.00	0.00		0.00	-0.00	-0.00	0.00	-0.00
1		(0.47)	(-0.72)	(-0.47)	(1.03)	(0.68)		(0.42)	(-0.48)	(-0.48)	(0.30)	(-0.08)
3	Sell	0.01	-0.00	-0.01	-0.01	-0.01		0.01	0.00	-0.00	-0.01	-0.01
3		(0.83)	(-0.15)	(-2.00)	(-3.36)	(-3.83)		(0.86)	(0.04)	(-1.01)	(-2.47)	(-2.32)
3	Buy	-0.00	-0.01	-0.01	-0.01	-0.01		0.00	-0.00	-0.01	-0.00	-0.01
3		(-0.24)	(-1.58)	(-1.91)	(-1.93)	(-3.07)		(0.26)	(-0.64)	(-1.33)	(-0.81)	(-2.07)
3	Buy-Sell	-0.01	-0.01	-0.00	0.00	0.00		-0.01	-0.00	-0.00	0.00	0.00
3		(-1.29)	(-1.44)	(-0.03)	(1.85)	(0.84)		(-0.75)	(-0.77)	(-0.60)	(1.59)	(0.06)
6	Sell	0.01	-0.01	-0.01	-0.01	-0.01		0.01	-0.00	-0.01	-0.01	-0.01
6		(0.92)	(-0.84)	(-2.78)	(-4.12)	(-4.92)		(1.18)	(-0.10)	(-2.23)	(-3.07)	(-2.99)
6	Buy	-0.00	-0.01	-0.01	-0.01	-0.01		-0.00	-0.00	-0.00	-0.01	-0.01
6		(-0.23)	(-1.33)	(-1.35)	(-2.11)	(-3.35)		(-0.23)	(-0.80)	(-1.10)	(-1.98)	(-3.08)
6	Buy-Sell	-0.01	-0.00	0.01	0.01	0.00		-0.02	-0.00	0.00	0.00	-0.00
6		(-1.32)	(-0.27)	(2.14)	(2.67)	(1.69)		(-1.47)	(-0.67)	(1.12)	(0.98)	(-0.26)
9	Sell	0.01	-0.01	-0.01	-0.01	-0.01		0.01	-0.00	-0.01	-0.01	-0.01
9		(0.59)	(-1.08)	(-2.89)	(-4.16)	(-4.53)		(0.99)	(-0.36)	(-2.08)	(-2.69)	(-3.18)
9	Buy	0.00	-0.00	-0.00	-0.01	-0.01		0.01	-0.00	-0.01	-0.01	-0.01
9		(0.53)	(-0.35)	(-1.16)	(-2.01)	(-3.10)		(0.62)	(-0.21)	(-1.44)	(-2.23)	(-3.10)
9	Buy-Sell	-0.00	0.01	0.01	0.01	0.00		-0.01	0.00	0.00	0.00	0.00
9		(-0.29)	(1.08)	(2.59)	(3.25)	(2.01)		(-0.60)	(0.21)	(0.75)	(0.75)	(0.36)
12	Sell	0.01	-0.01	-0.01	-0.01	-0.01		0.00	-0.01	-0.01	-0.01	-0.01
12		(0.52)	(-1.08)	(-2.91)	(-3.85)	(-4.36)		(0.15)	(-0.77)	(-1.91)	(-2.60)	(-3.24)
12	Buy	0.00	-0.01	-0.01	-0.01	-0.01		0.01	-0.01	-0.01	-0.01	-0.01
12		(0.35)	(-1.18)	(-1.99)	(-2.69)	(-3.30)		(0.58)	(-1.33)	(-2.36)	(-2.90)	(-3.43)
12	Buy-Sell	-0.00	0.00	0.01	0.01	0.00		0.00	-0.00	0.00	0.00	0.00
12		(-0.36)	(0.28)	(1.78)	(2.17)	(1.51)		(0.31)	(-0.29)	(0.01)	(0.33)	(0.16)

Panel B: weekly return

		Equal-weighted Return						Value-weighted Return				
J	K=	1	4	8	12	16	K=	1	4	8	12	16
1	Sell	-0.00	-0.00	-0.01	-0.01	-0.01		-0.00	-0.00	-0.00	-0.01	-0.01
1		(-2.69)	(-2.96)	(-2.81)	(-2.74)	(-2.60)		(-0.92)	(-1.71)	(-2.01)	(-2.06)	(-1.74)
1	Buy	0.00	-0.00	-0.00	-0.01	-0.01		0.00	0.00	-0.00	-0.00	-0.00
1		(0.47)	(-1.17)	(-2.03)	(-2.15)	(-2.75)		(1.51)	(0.42)	(-0.62)	(-0.73)	(-1.22)
1	Buy-Sell	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00

1		(4.34)	(2.78)	(1.56)	(1.31)	(0.15)	(2.66)	(2.46)	(1.68)	(1.63)	(0.71)
3	Sell	-0.00	-0.00	-0.01	-0.01	-0.01	-0.00	-0.00	-0.00	-0.00	-0.01
3		(-2.25)	(-2.08)	(-2.45)	(-2.26)	(-2.27)	(-1.47)	(-1.06)	(-1.91)	(-1.86)	(-1.72)
3	Buy	-0.00	-0.00	-0.00	-0.01	-0.01	0.00	-0.00	-0.00	-0.00	-0.00
3		(-0.07)	(-1.53)	(-2.07)	(-2.62)	(-3.31)	(0.82)	(-0.29)	(-0.25)	(-0.52)	(-1.36)
3	Buy-Sell	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00
3		(2.76)	(0.91)	(1.11)	(0.09)	(-0.96)	(2.43)	(0.86)	(2.01)	(1.71)	(0.52)
6	Sell	-0.00	-0.00	-0.01	-0.01	-0.01	-0.00	-0.00	-0.00	-0.00	-0.00
6		(-1.95)	(-2.34)	(-2.31)	(-1.98)	(-1.80)	(-1.51)	(-1.79)	(-1.84)	(-1.67)	(-1.21)
6	Buy	-0.00	-0.00	-0.00	-0.01	-0.01	-0.00	-0.00	-0.00	-0.00	-0.00
6		(-0.50)	(-1.66)	(-2.47)	(-3.20)	(-3.90)	(-0.14)	(-0.25)	(-0.21)	(-0.96)	(-1.55)
6	Buy-Sell	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
6		(1.85)	(1.34)	(0.61)	(-0.88)	(-2.02)	(1.42)	(1.78)	(2.05)	(1.06)	(-0.17)
9	Sell	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
9		(-1.87)	(-1.76)	(-1.71)	(-1.23)	(-1.14)	(-1.19)	(-1.07)	(-1.32)	(-1.05)	(-1.25)
9	Buy	-0.00	-0.00	-0.01	-0.01	-0.01	0.00	-0.00	-0.00	-0.00	-0.00
9		(-0.50)	(-2.00)	(-2.93)	(-3.55)	(-4.00)	(0.48)	(-0.04)	(-0.68)	(-1.28)	(-1.64)
9	Buy-Sell	0.00	0.00	-0.00	-0.00	-0.01	0.00	0.00	0.00	-0.00	-0.00
9		(1.73)	(0.23)	(-0.80)	(-2.14)	(-2.79)	(1.77)	(1.17)	(0.89)	(-0.11)	(-0.30)
12	Sell	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00
12		(-1.34)	(-1.33)	(-0.84)	(-0.59)	(-0.72)	(-0.65)	(-0.41)	(0.03)	(-0.05)	(-0.25)
12	Buy	-0.00	-0.00	-0.01	-0.01	-0.01	0.00	-0.00	-0.00	-0.00	-0.01
12		(-0.82)	(-2.41)	(-3.26)	(-3.75)	(-4.04)	(0.07)	(-0.46)	(-1.00)	(-1.33)	(-1.88)
12	Buy-Sell	0.00	-0.00	-0.00	-0.01	-0.01	0.00	0.00	-0.00	-0.00	-0.00
12		(0.76)	(-0.74)	(-2.15)	(-2.99)	(-3.30)	(0.77)	(0.01)	(-1.05)	(-1.26)	(-1.65)

Table 4：Order Imbalance of Relative Strength Portfolios: Foreign Individuals vs. Domestic Individuals

The relative strength portfolios are formed based on J-month lagged returns and held for K month. The values of J and K for the different strategies are indicated in the first column and row, respectively. The stocks are ranked in ascending order on the basis of J-month lagged returns and an equally weighted portfolio of the stocks in the lowest return decile is the sell portfolio and an equally weighted portfolio of the stocks in the highest return decile is the buy portfolio. The equally (value-) weighted average monthly order imbalance (OIB) of these portfolios is presented in this table. We measure order imbalance (OIB) in terms of amount for all types of investors. Panel A (C) presents the results of domestic individuals on a monthly (weekly) basis, while Panel B (D) presents the results of foreign individuals on a monthly (weekly) basis. The t-statistics are reported in parentheses. The sample period is January 1995 to December 1999.

Panel A: domestic individuals (monthly)

J		Equal-weighted OIB					Value-weighted OIB				
		K= 1	3	6	9	12	K= 1	3	6	9	12
1	Sell	0.69	0.70	0.72	0.74	0.76	0.68	0.70	0.71	0.73	0.75
1		(24.26)	(25.58)	(27.90)	(30.80)	(34.60)	(24.26)	(25.58)	(27.90)	(30.80)	(34.61)
1	Buy	0.68	0.69	0.71	0.73	0.75	0.67	0.69	0.71	0.73	0.75
1		(24.27)	(25.58)	(27.90)	(30.81)	(34.61)	(24.26)	(25.58)	(27.90)	(30.80)	(34.61)
1	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00
1		(-7.55)	(-7.59)	(-6.86)	(-6.21)	(-5.85)	(-5.95)	(-6.01)	(-5.05)	(-4.38)	(-3.78)
3	Sell	0.70	0.71	0.72	0.74	0.76	0.69	0.70	0.71	0.73	0.75
3		(24.26)	(25.58)	(27.90)	(30.80)	(34.60)	(24.26)	(25.58)	(27.89)	(30.80)	(34.60)
3	Buy	0.68	0.69	0.71	0.73	0.75	0.67	0.69	0.71	0.72	0.74
3		(24.27)	(25.58)	(27.90)	(30.80)	(34.61)	(24.27)	(25.58)	(27.90)	(30.80)	(34.61)
3	Buy-Sell	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
3		(-9.50)	(-9.22)	(-8.69)	(-8.07)	(-7.33)	(-7.32)	(-7.38)	(-6.79)	(-6.57)	(-5.96)
6	Sell	0.70	0.71	0.72	0.74	0.76	0.69	0.70	0.71	0.73	0.75
6		(24.26)	(25.58)	(27.90)	(30.80)	(34.61)	(24.26)	(25.58)	(27.89)	(30.80)	(34.60)
6	Buy	0.68	0.69	0.71	0.73	0.75	0.67	0.69	0.71	0.72	0.74
6		(24.27)	(25.58)	(27.90)	(30.80)	(34.61)	(24.27)	(25.58)	(27.90)	(30.80)	(34.60)
6	Buy-Sell	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
6		(-11.70)	(-11.24)	(-10.10)	(-9.73)	(-9.11)	(-8.19)	(-8.07)	(-7.52)	(-7.30)	(-6.42)
9	Sell	0.70	0.71	0.73	0.74	0.76	0.69	0.70	0.72	0.73	0.75
9		(24.26)	(25.58)	(27.90)	(30.80)	(34.61)	(24.26)	(25.58)	(27.90)	(30.80)	(34.60)
9	Buy	0.68	0.69	0.71	0.73	0.75	0.67	0.69	0.71	0.72	0.74
9		(24.27)	(25.58)	(27.90)	(30.80)	(34.60)	(24.27)	(25.58)	(27.90)	(30.80)	(34.61)
9	Buy-Sell	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
9		(-12.73)	(-11.95)	(-11.48)	(-11.33)	(-11.42)	(-8.87)	(-8.94)	(-8.88)	(-8.64)	(-8.14)
12	Sell	0.70	0.71	0.73	0.74	0.76	0.69	0.70	0.72	0.74	0.75
12		(24.26)	(25.58)	(27.90)	(30.80)	(34.61)	(24.26)	(25.57)	(27.89)	(30.79)	(34.60)
12	Buy	0.68	0.69	0.71	0.73	0.75	0.67	0.69	0.71	0.72	0.74
12		(24.27)	(25.58)	(27.90)	(30.80)	(34.61)	(24.27)	(25.58)	(27.90)	(30.80)	(34.61)

J		Buy-Sell	-0.02	-0.02	-0.02	-0.01	-0.01		-0.02	-0.01	-0.01	-0.01	-0.01
12			-12.08	-11.88	-11.9	-12.29	-11.97		-8.797	-8.711	-8.573	-8.305	-7.889

Panel B: foreign individuals (monthly)

		Equal-weighted OIB						Value-weighted OIB				
J	K= 1	3	6	9	12	K= 1	3	6	9	12
1	Sell	0.24	0.35	0.42	0.47	0.51		0.43	0.51	0.56	0.59	0.62
1		(13.76)	(15.60)	(17.03)	(17.85)	(19.18)		(15.72)	(17.20)	(18.82)	(19.64)	(21.26)
1	Buy	0.30	0.39	0.45	0.50	0.53		0.47	0.52	0.56	0.60	0.62
1		(14.37)	(16.11)	(17.13)	(18.83)	(19.89)		(15.91)	(17.37)	(18.25)	(20.19)	(21.44)
1	Buy-Sell	0.06	0.04	0.02	0.03	0.02		0.03	0.01	0.00	0.01	-0.00
1		(3.84)	(3.04)	(2.02)	(3.08)	(1.80)		(2.06)	(1.29)	(0.02)	(0.84)	(-0.31)
3	Sell	0.23	0.34	0.42	0.47	0.51		0.42	0.50	0.55	0.59	0.62
3		(13.87)	(15.51)	(16.87)	(17.72)	(18.95)		(15.18)	(17.41)	(18.54)	(19.54)	(21.03)
3	Buy	0.31	0.40	0.46	0.51	0.54		0.47	0.53	0.56	0.60	0.62
3		(14.66)	(16.17)	(17.29)	(19.03)	(20.18)		(16.07)	(17.35)	(18.34)	(20.42)	(21.68)
3	Buy-Sell	0.08	0.06	0.05	0.04	0.03		0.05	0.03	0.01	0.01	0.01
3		(4.78)	(4.40)	(3.60)	(3.28)	(2.41)		(2.40)	(2.03)	(0.89)	(1.27)	(0.87)
6	Sell	0.24	0.35	0.42	0.47	0.51		0.43	0.52	0.56	0.58	0.62
6		(14.09)	(15.77)	(16.79)	(17.81)	(19.15)		(15.72)	(17.56)	(18.42)	(19.45)	(21.04)
6	Buy	0.33	0.41	0.48	0.52	0.55		0.48	0.53	0.58	0.60	0.62
6		(14.64)	(16.14)	(17.79)	(19.12)	(19.92)		(16.05)	(17.22)	(19.02)	(20.55)	(21.65)
6	Buy-Sell	0.09	0.07	0.06	0.05	0.03		0.05	0.02	0.02	0.02	0.00
6		(5.38)	(5.10)	(4.96)	(4.51)	(3.33)		(2.52)	(1.35)	(1.45)	(1.77)	(0.13)
9	Sell	0.22	0.34	0.42	0.47	0.52		0.41	0.51	0.55	0.58	0.62
9		(13.78)	(15.54)	(16.82)	(17.90)	(19.29)		(15.23)	(17.16)	(18.24)	(19.40)	(20.89)
9	Buy	0.34	0.43	0.49	0.52	0.55		0.49	0.55	0.59	0.61	0.62
9		(15.00)	(16.71)	(18.02)	(19.02)	(20.09)		(16.52)	(18.01)	(19.29)	(20.52)	(21.57)
9	Buy-Sell	0.12	0.09	0.07	0.05	0.04		0.08	0.05	0.04	0.03	0.01
9		(7.51)	(7.12)	(6.47)	(5.41)	(4.19)		(4.26)	(3.76)	(3.60)	(3.05)	(0.75)
12	Sell	0.21	0.32	0.40	0.46	0.50		0.39	0.48	0.53	0.57	0.60
12		(14.10)	(15.57)	(16.60)	(17.74)	(18.65)		(15.18)	(17.00)	(18.11)	(19.43)	(20.38)
12	Buy	0.35	0.43	0.49	0.53	0.56		0.51	0.55	0.58	0.60	0.62
12		(15.12)	(16.48)	(17.61)	(18.85)	(20.15)		(17.06)	(17.96)	(19.07)	(20.14)	(21.58)
12	Buy-Sell	0.14	0.11	0.09	0.07	0.06		0.12	0.08	0.05	0.03	0.02
12		(8.09)	(7.58)	(6.91)	(5.95)	(5.08)		(6.22)	(5.69)	(4.61)	(2.96)	(2.34)

Panel C: domestic individuals (weekly)

		Equal-weighted OIB						Value-weighted OIB				
J	K= 1	4	8	12	16	K= 1	4	8	12	16
1	Sell	0.69	0.70	0.70	0.71	0.71		0.68	0.69	0.69	0.70	0.70
1		(51.13)	(52.08)	(53.38)	(54.76)	(56.23)		(51.12)	(52.07)	(53.38)	(54.75)	(56.22)
1	Buy	0.69	0.69	0.70	0.70	0.71		0.68	0.68	0.69	0.69	0.70
1		(51.14)	(52.09)	(53.39)	(54.77)	(56.23)		(51.13)	(52.08)	(53.38)	(54.76)	(56.22)
1	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01		-0.01	-0.01	-0.01	-0.00	-0.00
1		(-11.64)	(-11.17)	(-10.42)	(-9.96)	(-9.18)		(-7.27)	(-7.65)	(-7.87)	(-7.31)	(-6.62)

J		K=1	4	8	12	16	K=1	4	8	12	16
4	Sell	0.70	0.70	0.70	0.71	0.71	0.69	0.69	0.70	0.70	0.71
4		(51.13)	(52.08)	(53.38)	(54.76)	(56.22)	(51.12)	(52.07)	(53.38)	(54.75)	(56.22)
4	Buy	0.68	0.69	0.69	0.70	0.70	0.68	0.68	0.69	0.69	0.70
4		(51.14)	(52.09)	(53.39)	(54.77)	(56.23)	(51.13)	(52.08)	(53.38)	(54.76)	(56.22)
4	Buy-Sell	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
4		(-18.75)	(-19.80)	(-17.50)	(-17.19)	(-15.68)	(-13.26)	(-14.93)	(-13.97)	(-13.38)	(-12.17)
8	Sell	0.70	0.70	0.71	0.71	0.72	0.69	0.69	0.70	0.70	0.71
8		(51.13)	(52.08)	(53.38)	(54.76)	(56.22)	(51.11)	(52.07)	(53.38)	(54.76)	(56.22)
8	Buy	0.68	0.69	0.69	0.70	0.70	0.67	0.68	0.68	0.69	0.70
8		(51.14)	(52.09)	(53.39)	(54.77)	(56.23)	(51.13)	(52.09)	(53.39)	(54.76)	(56.23)
8	Buy-Sell	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
8		(-19.97)	(-21.38)	(-20.56)	(-19.64)	(-18.67)	(-15.08)	(-17.79)	(-17.75)	(-16.71)	(-15.35)
12	Sell	0.70	0.70	0.71	0.71	0.72	0.69	0.69	0.70	0.70	0.71
12		(51.12)	(52.07)	(53.38)	(54.76)	(56.22)	(51.12)	(52.07)	(53.38)	(54.76)	(56.22)
12	Buy	0.68	0.68	0.69	0.70	0.70	0.67	0.68	0.68	0.69	0.70
12		(51.15)	(52.09)	(53.39)	(54.77)	(56.23)	(51.14)	(52.09)	(53.39)	(54.77)	(56.23)
12	Buy-Sell	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01
12		(-22.48)	(-24.00)	(-22.47)	(-22.15)	(-21.41)	(-17.99)	(-20.19)	(-19.46)	(-18.51)	(-17.56)
16	Sell	0.70	0.70	0.71	0.71	0.72	0.69	0.69	0.70	0.70	0.71
16		(51.13)	(52.07)	(53.38)	(54.76)	(56.22)	(51.11)	(52.07)	(53.37)	(54.75)	(56.22)
16	Buy	0.68	0.68	0.69	0.70	0.70	0.67	0.68	0.68	0.69	0.70
16		(51.15)	(52.09)	(53.39)	(54.77)	(56.23)	(51.14)	(52.08)	(53.39)	(54.77)	(56.23)
16	Buy-Sell	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01
16		(-22.98)	(-23.63)	(-22.94)	(-22.73)	(-22.05)	(-17.57)	(-18.86)	(-18.23)	(-17.81)	(-17.36)

Panel D: foreign individuals (weekly)

		Equal-weighted OIB					Value-weighted OIB				
J	K=	1	4	8	12	16	K= 1	4	8	12	16
1	Sell	0.15	0.25	0.31	0.35	0.38	0.34	0.45	0.49	0.52	0.53
1		(25.67)	(29.83)	(31.56)	(32.94)	(33.92)	(27.13)	(33.02)	(34.98)	(36.16)	(37.25)
1	Buy	0.18	0.28	0.34	0.37	0.40	0.36	0.45	0.50	0.52	0.54
1		(26.46)	(30.70)	(32.59)	(33.82)	(34.91)	(28.16)	(33.37)	(35.27)	(36.52)	(37.47)
1	Buy-Sell	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.00	0.00	0.00
1		(4.69)	(4.00)	(3.39)	(3.59)	(3.48)	(1.86)	(0.87)	(0.55)	(0.75)	(0.45)
4	Sell	0.14	0.24	0.30	0.34	0.37	0.33	0.44	0.48	0.50	0.52
4		(25.72)	(29.64)	(31.10)	(32.41)	(33.56)	(27.41)	(32.94)	(34.67)	(35.91)	(36.91)
4	Buy	0.19	0.29	0.35	0.39	0.41	0.37	0.46	0.50	0.53	0.54
4		(25.66)	(30.75)	(32.89)	(34.27)	(35.07)	(28.73)	(33.85)	(35.64)	(36.71)	(37.50)
4	Buy-Sell	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.01
4		(7.33)	(7.16)	(7.36)	(7.09)	(6.57)	(4.06)	(3.31)	(3.44)	(3.26)	(2.37)
8	Sell	0.13	0.23	0.29	0.33	0.37	0.31	0.42	0.47	0.50	0.52
8		(25.23)	(29.20)	(31.06)	(32.55)	(33.77)	(26.25)	(32.19)	(34.44)	(35.87)	(36.91)
8	Buy	0.20	0.31	0.37	0.40	0.42	0.37	0.47	0.51	0.53	0.54
8		(26.24)	(31.12)	(33.40)	(34.43)	(35.05)	(28.76)	(33.76)	(35.95)	(36.79)	(37.51)
8	Buy-Sell	0.06	0.08	0.07	0.06	0.05	0.06	0.05	0.04	0.03	0.02

8		(9.46)	(10.23)	(10.18)	(9.20)	(7.98)	(4.99)	(5.31)	(5.58)	(4.00)	(3.51)
12	Sell	0.13	0.23	0.29	0.33	0.37	0.31	0.42	0.47	0.50	0.52
12		(25.22)	(29.07)	(31.20)	(32.65)	(33.84)	(25.78)	(31.79)	(34.50)	(36.15)	(37.34)
12	Buy	0.20	0.31	0.37	0.40	0.43	0.38	0.47	0.51	0.53	0.55
12		(26.48)	(31.44)	(33.44)	(34.44)	(35.06)	(29.07)	(34.26)	(36.02)	(37.03)	(37.59)
12	Buy-Sell	0.07	0.09	0.08	0.07	0.06	0.07	0.06	0.04	0.03	0.03
12		(10.55)	(11.35)	(10.74)	(9.64)	(8.90)	(5.99)	(5.99)	(5.00)	(4.20)	(4.12)
16	Sell	0.13	0.23	0.29	0.33	0.37	0.31	0.42	0.47	0.50	0.52
16		(25.30)	(28.81)	(30.95)	(32.50)	(33.90)	(25.89)	(31.61)	(34.49)	(36.31)	(37.56)
16	Buy	0.20	0.31	0.37	0.41	0.43	0.38	0.47	0.51	0.53	0.55
16		(26.34)	(31.21)	(33.32)	(34.26)	(35.09)	(28.82)	(33.99)	(35.99)	(36.74)	(37.59)
16	Buy-Sell	0.07	0.08	0.08	0.07	0.06	0.07	0.05	0.04	0.03	0.03
16		(10.54)	(10.99)	(10.67)	(9.92)	(9.30)	(5.54)	(5.41)	(5.40)	(4.76)	(4.28)

Table 5：Order Imbalance of Relative Strength Portfolios: Domestic Institutions vs. Foreign Institutions

The relative strength portfolios are formed based on J-month lagged returns and held for K month. The values of J and K for the different strategies are indicated in the first column and row, respectively. The stocks are ranked in ascending order on the basis of J-month lagged returns and an equally weighted portfolio of the stocks in the lowest return decile is the sell portfolio and an equally weighted portfolio of the stocks in the highest return decile is the buy portfolio. The equally (value-) weighted average monthly order imbalance (OIB) of these portfolios is presented in this table. We measure order imbalance (OIB) in terms of amount for all types of investors. Panel A (C) presents the results of domestic institutions on a monthly (weekly) basis, while Panel B (D) presents the results of foreign institutions on a monthly (weekly) basis. The t-statistics are reported in parentheses. The sample period is January 1995 to December 1999.]

Panel A: domestic institutions (monthly)

J		Equal-weighted OIB					Value-weighted OIB				
	K=	1	3	6	9	12	K= 1	3	6	9	12
1	Sell	0.70	0.72	0.74	0.76	0.78	0.70	0.71	0.73	0.75	0.77
1		(24.19)	(25.55)	(27.87)	(30.77)	(34.57)	(24.21)	(25.55)	(27.85)	(30.75)	(34.54)
1	Buy	0.70	0.71	0.73	0.75	0.77	0.69	0.70	0.72	0.75	0.76
1		(24.20)	(25.56)	(27.88)	(30.78)	(34.58)	(24.20)	(25.55)	(27.87)	(30.77)	(34.57)
1	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00	-0.00	-0.00
1		(-2.32)	(-3.82)	(-3.36)	(-3.05)	(-2.88)	(-2.85)	(-3.02)	(-1.95)	(-1.16)	(-1.74)
3	Sell	0.70	0.72	0.74	0.76	0.78	0.70	0.71	0.73	0.75	0.77
3		(24.19)	(25.54)	(27.87)	(30.76)	(34.56)	(24.21)	(25.54)	(27.84)	(30.74)	(34.54)
3	Buy	0.70	0.71	0.73	0.75	0.77	0.69	0.70	0.72	0.75	0.76
3		(24.22)	(25.56)	(27.87)	(30.77)	(34.56)	(24.20)	(25.54)	(27.87)	(30.77)	(34.57)
3	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00	-0.01
3		(-1.92)	(-4.10)	(-4.31)	(-3.83)	(-4.16)	(-3.11)	(-3.02)	(-2.30)	(-1.53)	(-2.65)
6	Sell	0.70	0.72	0.74	0.76	0.78	0.70	0.71	0.73	0.75	0.77
6		(24.19)	(25.54)	(27.86)	(30.76)	(34.56)	(24.21)	(25.53)	(27.84)	(30.76)	(34.55)
6	Buy	0.70	0.71	0.73	0.75	0.77	0.69	0.70	0.72	0.74	0.76
6		(24.22)	(25.56)	(27.88)	(30.77)	(34.57)	(24.22)	(25.56)	(27.88)	(30.78)	(34.58)
6	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
6		(-1.71)	(-4.53)	(-5.30)	(-5.75)	(-5.71)	(-4.50)	(-3.56)	(-2.61)	(-4.14)	(-5.28)
9	Sell	0.71	0.72	0.74	0.76	0.78	0.70	0.71	0.73	0.75	0.77
9		(24.19)	(25.53)	(27.86)	(30.76)	(34.56)	(24.18)	(25.51)	(27.84)	(30.75)	(34.54)
9	Buy	0.69	0.71	0.73	0.75	0.77	0.69	0.70	0.72	0.74	0.76
9		(24.22)	(25.56)	(27.87)	(30.77)	(34.57)	(24.22)	(25.56)	(27.88)	(30.78)	(34.59)
9	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
9		(-3.76)	(-6.12)	(-6.81)	(-7.24)	(-6.62)	(-4.35)	(-3.60)	(-3.87)	(-5.24)	(-5.62)
12	Sell	0.71	0.72	0.74	0.76	0.78	0.71	0.72	0.73	0.75	0.77
12		(24.17)	(25.54)	(27.86)	(30.76)	(34.55)	(24.20)	(25.52)	(27.84)	(30.74)	(34.51)
12	Buy	0.70	0.71	0.73	0.74	0.76	0.69	0.70	0.72	0.74	0.76
12		(24.23)	(25.55)	(27.87)	(30.78)	(34.57)	(24.23)	(25.56)	(27.88)	(30.79)	(34.59)

| 12 | Buy-Sell | -0.01 | -0.02 | -0.02 | -0.02 | -0.01 | | -0.01 | -0.01 | -0.01 | -0.01 | -0.01 |
| 12 | | (-2.93) | (-6.34) | (-7.87) | (-7.71) | (-6.71) | | (-5.23) | (-5.13) | (-5.11) | (-4.89) | (-4.83) |

Panel B: foreign institutions (monthly)

		Equal-weighted OIB						Value-weighted OIB				
J	K=	1	3	6	9	12	K=	1	3	6	9	12
1	Sell	0.44	0.57	0.65	0.69	0.73		0.63	0.68	0.71	0.74	0.76
1		(20.41)	(23.68)	(26.74)	(29.78)	(33.58)		(23.39)	(25.28)	(27.71)	(30.60)	(34.35)
1	Buy	0.53	0.62	0.67	0.71	0.74		0.66	0.69	0.72	0.74	0.76
1		(22.01)	(24.22)	(27.01)	(30.07)	(33.89)		(23.80)	(25.28)	(27.67)	(30.63)	(34.48)
1	Buy-Sell	0.08	0.05	0.02	0.02	0.01		0.03	0.01	0.00	0.00	0.00
1		(6.13)	(4.33)	(3.19)	(2.55)	(1.72)		(3.95)	(2.61)	(0.56)	(0.51)	(0.34)
3	Sell	0.43	0.57	0.65	0.70	0.73		0.61	0.67	0.71	0.74	0.76
3		(20.49)	(23.70)	(26.60)	(29.79)	(33.39)		(22.84)	(25.06)	(27.56)	(30.55)	(34.32)
3	Buy	0.55	0.63	0.68	0.72	0.74		0.67	0.70	0.72	0.74	0.76
3		(22.24)	(24.48)	(27.15)	(30.16)	(33.95)		(23.76)	(25.31)	(27.74)	(30.62)	(34.45)
3	Buy-Sell	0.12	0.06	0.04	0.02	0.01		0.05	0.02	0.01	0.00	0.00
3		(8.09)	(6.34)	(4.70)	(2.89)	(1.63)		(4.50)	(3.40)	(1.97)	(0.91)	(0.13)
6	Sell	0.42	0.56	0.65	0.70	0.73		0.62	0.68	0.72	0.75	0.77
6		(20.09)	(23.76)	(26.61)	(29.62)	(33.28)		(23.09)	(25.18)	(27.60)	(30.50)	(34.31)
6	Buy	0.57	0.65	0.69	0.72	0.75		0.68	0.70	0.72	0.74	0.76
6		(22.97)	(24.94)	(27.36)	(30.38)	(34.17)		(24.01)	(25.47)	(27.82)	(30.74)	(34.51)
6	Buy-Sell	0.15	0.08	0.04	0.02	0.01		0.06	0.02	0.00	-0.00	-0.01
6		(10.96)	(9.29)	(5.23)	(3.22)	(2.27)		(6.21)	(3.85)	(0.58)	(-1.24)	(-2.07)
9	Sell	0.41	0.56	0.65	0.70	0.74		0.60	0.68	0.72	0.75	0.77
9		(20.19)	(23.79)	(26.55)	(29.51)	(33.37)		(22.70)	(25.12)	(27.59)	(30.53)	(34.37)
9	Buy	0.59	0.66	0.70	0.73	0.75		0.68	0.70	0.73	0.75	0.77
9		(23.01)	(24.90)	(27.45)	(30.49)	(34.26)		(24.09)	(25.48)	(27.83)	(30.76)	(34.56)
9	Buy-Sell	0.18	0.09	0.05	0.03	0.01		0.08	0.02	0.00	-0.00	-0.00
9		(13.17)	(9.88)	(6.48)	(4.46)	(2.46)		(7.64)	(4.10)	(1.03)	(-0.61)	(-1.46)
12	Sell	0.41	0.55	0.64	0.69	0.73		0.60	0.68	0.72	0.75	0.77
12		(20.08)	(23.42)	(26.17)	(29.34)	(33.25)		(22.72)	(25.17)	(27.60)	(30.56)	(34.35)
12	Buy	0.60	0.66	0.70	0.73	0.75		0.68	0.70	0.73	0.75	0.77
12		(23.15)	(25.04)	(27.58)	(30.56)	(34.38)		(24.07)	(25.51)	(27.87)	(30.77)	(34.56)
12	Buy-Sell	0.19	0.10	0.06	0.04	0.02		0.08	0.02	0.01	-0.00	-0.01
12		(13.26)	(10.34)	(7.58)	(5.37)	(3.66)		(7.55)	(4.41)	(1.41)	(-0.29)	(-1.93)

Panel C: domestic institutions (weekly)

		Equal-weighted OIB						Value-weighted OIB				
J	K=	1	4	8	12	16	K=	1	4	8	12	16
1	Sell	0.68	0.71	0.72	0.72	0.73		0.70	0.70	0.71	0.71	0.72
1		(50.53)	(51.94)	(53.28)	(54.67)	(56.14)		(50.86)	(51.94)	(53.28)	(54.68)	(56.15)
1	Buy	0.68	0.70	0.71	0.72	0.72		0.70	0.70	0.71	0.71	0.72
1		(50.69)	(51.95)	(53.28)	(54.68)	(56.15)		(50.88)	(51.96)	(53.29)	(54.68)	(56.15)
1	Buy-Sell	0.01	-0.00	-0.00	-0.00	-0.00		0.00	-0.00	-0.00	-0.00	-0.00
1		(3.81)	(-1.63)	(-3.55)	(-3.21)	(-3.67)		(0.44)	(-0.69)	(-1.90)	(-2.63)	(-3.27)

J		1	4	8	12	16		1	4	8	12	16
4	Sell	0.68	0.71	0.72	0.72	0.73		0.70	0.71	0.71	0.72	0.72
4		(50.42)	(51.94)	(53.28)	(54.68)	(56.14)		(50.83)	(51.95)	(53.29)	(54.69)	(56.15)
4	Buy	0.69	0.70	0.71	0.72	0.72		0.70	0.70	0.70	0.71	0.71
4		(50.76)	(51.96)	(53.29)	(54.68)	(56.15)		(50.90)	(51.95)	(53.29)	(54.68)	(56.15)
4	Buy-Sell	0.01	-0.01	-0.01	-0.01	-0.01		-0.00	-0.01	-0.01	-0.01	-0.01
4		(4.10)	(-5.68)	(-7.76)	(-8.15)	(-8.64)		(-2.04)	(-5.16)	(-6.67)	(-6.91)	(-7.19)
8	Sell	0.68	0.71	0.72	0.73	0.73		0.70	0.71	0.71	0.72	0.72
8		(50.34)	(51.94)	(53.29)	(54.68)	(56.15)		(50.76)	(51.93)	(53.28)	(54.67)	(56.13)
8	Buy	0.69	0.70	0.71	0.71	0.72		0.70	0.70	0.70	0.71	0.71
8		(50.83)	(51.96)	(53.30)	(54.69)	(56.16)		(50.90)	(51.95)	(53.30)	(54.69)	(56.16)
8	Buy-Sell	0.01	-0.01	-0.01	-0.01	-0.01		-0.00	-0.01	-0.01	-0.01	-0.01
8		(4.66)	(-7.27)	(-9.59)	(-10.52)	(-9.45)		(-2.02)	(-6.00)	(-6.91)	(-7.56)	(-6.83)
12	Sell	0.68	0.71	0.72	0.72	0.73		0.70	0.71	0.71	0.72	0.72
12		(50.34)	(51.92)	(53.28)	(54.67)	(56.14)		(50.78)	(51.95)	(53.29)	(54.67)	(56.14)
12	Buy	0.69	0.70	0.71	0.71	0.72		0.70	0.70	0.70	0.71	0.71
12		(50.88)	(51.97)	(53.31)	(54.70)	(56.17)		(50.90)	(51.96)	(53.30)	(54.68)	(56.16)
12	Buy-Sell	0.01	-0.01	-0.01	-0.01	-0.01		-0.01	-0.01	-0.01	-0.01	-0.01
12		(5.11)	(-5.94)	(-9.29)	(-10.57)	(-9.79)		(-3.24)	(-6.65)	(-7.61)	(-8.17)	(-7.18)
16	Sell	0.68	0.71	0.72	0.73	0.73		0.70	0.71	0.71	0.72	0.72
16		(50.32)	(51.92)	(53.28)	(54.67)	(56.15)		(50.81)	(51.93)	(53.28)	(54.67)	(56.14)
16	Buy	0.69	0.70	0.71	0.71	0.72		0.70	0.70	0.70	0.71	0.71
16		(50.90)	(51.99)	(53.32)	(54.71)	(56.17)		(50.91)	(51.96)	(53.29)	(54.68)	(56.16)
16	Buy-Sell	0.01	-0.01	-0.01	-0.01	-0.01		-0.01	-0.01	-0.01	-0.01	-0.01
16		(5.46)	(-6.33)	(-10.04)	(-11.02)	(-10.30)		(-4.55)	(-8.21)	(-9.03)	(-9.17)	(-7.57)

Panel D: foreign institutions (weekly)

		Equal-weighted OIB					Value-weighted OIB				
J	K= 1		4	8	12	16	K= 1	4	8	12	16
1	Sell	0.33	0.46	0.53	0.58	0.61	0.57	0.63	0.67	0.69	0.70
1		(39.03)	(44.45)	(47.85)	(50.31)	(52.56)	(45.10)	(49.74)	(52.17)	(53.93)	(55.61)
1	Buy	0.38	0.50	0.57	0.60	0.63	0.59	0.65	0.68	0.69	0.70
1		(40.41)	(46.02)	(49.06)	(51.27)	(53.21)	(46.40)	(50.27)	(52.32)	(53.98)	(55.54)
1	Buy-Sell	0.04	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.00
1		(5.93)	(6.60)	(6.11)	(5.14)	(5.00)	(2.81)	(3.52)	(3.20)	(2.68)	(1.79)
4	Sell	0.32	0.45	0.52	0.57	0.61	0.56	0.63	0.66	0.68	0.70
4		(37.98)	(43.27)	(47.28)	(50.35)	(52.63)	(45.10)	(49.37)	(52.02)	(53.84)	(55.45)
4	Buy	0.40	0.53	0.59	0.62	0.64	0.60	0.66	0.69	0.70	0.71
4		(41.11)	(46.67)	(49.78)	(51.82)	(53.79)	(46.39)	(50.50)	(52.63)	(54.21)	(55.74)
4	Buy-Sell	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.02	0.02	0.01
4		(10.12)	(10.56)	(11.04)	(9.81)	(8.98)	(5.38)	(6.32)	(6.97)	(6.41)	(5.37)
8	Sell	0.31	0.44	0.52	0.57	0.60	0.55	0.62	0.66	0.68	0.69
8		(37.02)	(43.24)	(47.25)	(50.13)	(52.48)	(44.00)	(49.08)	(51.98)	(53.73)	(55.34)
8	Buy	0.42	0.54	0.59	0.63	0.65	0.61	0.67	0.69	0.70	0.71
8		(42.67)	(47.27)	(49.82)	(51.95)	(53.93)	(47.56)	(50.79)	(52.68)	(54.25)	(55.80)
8	Buy-Sell	0.11	0.10	0.08	0.06	0.05	0.07	0.05	0.03	0.02	0.02

8		(13.25)	(13.63)	(12.75)	(11.62)	(10.54)	(7.67)	(8.57)	(9.06)	(8.38)	(7.06)
12	Sell	0.31	0.44	0.52	0.57	0.60	0.54	0.62	0.66	0.68	0.69
12		(37.36)	(43.28)	(47.39)	(50.17)	(52.54)	(44.20)	(49.37)	(52.08)	(53.74)	(55.41)
12	Buy	0.43	0.55	0.60	0.63	0.65	0.62	0.67	0.69	0.70	0.71
12		(42.78)	(47.37)	(50.04)	(52.20)	(54.10)	(47.87)	(50.91)	(52.71)	(54.23)	(55.75)
12	Buy-Sell	0.13	0.11	0.09	0.07	0.05	0.08	0.05	0.04	0.03	0.02
12		(15.20)	(15.49)	(14.65)	(13.55)	(12.11)	(8.99)	(9.68)	(9.68)	(8.47)	(6.83)
16	Sell	0.30	0.43	0.51	0.56	0.60	0.54	0.62	0.66	0.68	0.70
16		(36.69)	(43.25)	(47.33)	(50.36)	(52.71)	(43.85)	(49.46)	(51.94)	(53.84)	(55.50)
16	Buy	0.44	0.56	0.61	0.64	0.66	0.62	0.67	0.69	0.70	0.71
16		(42.90)	(47.71)	(50.26)	(52.37)	(54.28)	(47.57)	(50.89)	(52.60)	(54.20)	(55.76)
16	Buy-Sell	0.14	0.12	0.10	0.07	0.06	0.09	0.05	0.04	0.02	0.01
16		(16.92)	(17.00)	(16.38)	(15.14)	(13.78)	(9.39)	(10.07)	(9.19)	(7.55)	(5.68)

Table 6：Order Imbalance of Relative Strength Portfolios: Domestic Big Individual vs. Domestic Small Individual

The relative strength portfolios are formed based on J-month lagged returns and held for K month. The values of J and K for the different strategies are indicated in the first column and row, respectively. The stocks are ranked in ascending order on the basis of J-month lagged returns and an equally weighted portfolio of the stocks in the lowest return decile is the sell portfolio and an equally weighted portfolio of the stocks in the highest return decile is the buy portfolio. The equally (value-) weighted average monthly order imbalance (OIB) of these portfolios is presented in this table. We measure order imbalance (OIB) in terms of amount for all types of investors. Panel A (C) presents the results of domestic big individuals on a monthly (weekly) basis, while Panel B (D) presents the results of domestic small individuals on a monthly (weekly) basis. The t-statistics are reported in parentheses. The sample period is January 1995 to December 1999.

Panel A: domestic big individuals (monthly)

		Equal-weighted OIB					Value-weighted OIB				
J	K=	1	3	6	9	12	K= 1	3	6	9	12
1	Sell	0.67	0.68	0.70	0.71	0.73	0.66	0.67	0.69	0.71	0.72
1		(24.25)	(25.57)	(27.89)	(30.79)	(34.59)	(24.25) (25.57)	(27.89)	(30.79)	(34.60)
1	Buy	0.66	0.67	0.69	0.71	0.73	0.65	0.67	0.68	0.70	0.72
1		(24.26)	(25.58)	(27.89)	(30.80)	(34.60)	(24.26) (25.58)	(27.90)	(30.80)	(34.60)
1	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00	-0.00	-0.00
1		(-5.74)	(-5.88)	(-5.42)	(-4.90)	(-4.63)	(-4.22) (-4.42)	(-3.58)	(-3.03)	(-2.52)
3	Sell	0.67	0.68	0.70	0.72	0.73	0.66	0.67	0.69	0.71	0.73
3		(24.25)	(25.57)	(27.89)	(30.79)	(34.59)	(24.25) (25.57)	(27.89)	(30.79)	(34.59)
3	Buy	0.66	0.67	0.69	0.71	0.73	0.65	0.66	0.68	0.70	0.72
3		(24.26)	(25.58)	(27.89)	(30.80)	(34.60)	(24.26) (25.58)	(27.90)	(30.80)	(34.61)
3	Buy-Sell	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
3		(-7.50)	(-7.26)	(-6.89)	(-6.29)	(-5.76)	(-6.01) (-6.18)	(-5.57)	(-5.18)	(-4.77)
6	Sell	0.67	0.68	0.70	0.72	0.73	0.66	0.67	0.69	0.71	0.73
6		(24.25)	(25.57)	(27.89)	(30.79)	(34.59)	(24.26) (25.57)	(27.89)	(30.79)	(34.60)
6	Buy	0.66	0.67	0.69	0.71	0.72	0.65	0.66	0.68	0.70	0.72
6		(24.26)	(25.58)	(27.90)	(30.80)	(34.60)	(24.26) (25.58)	(27.90)	(30.80)	(34.60)
6	Buy-Sell	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
6		(-9.26)	(-8.90)	(-7.84)	(-7.36)	(-7.09)	(-6.66) (-6.28)	(-5.75)	(-5.42)	(-4.77)
9	Sell	0.68	0.68	0.70	0.72	0.73	0.66	0.67	0.69	0.71	0.73
9		(24.25)	(25.57)	(27.89)	(30.79)	(34.60)	(24.26) (25.58)	(27.90)	(30.80)	(34.60)
9	Buy	0.66	0.67	0.69	0.71	0.72	0.65	0.66	0.68	0.70	0.72
9		(24.26)	(25.58)	(27.89)	(30.79)	(34.60)	(24.26) (25.58)	(27.90)	(30.80)	(34.61)
9	Buy-Sell	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
9		(-10.15)	(-9.57)	(-8.91)	(-8.97)	(-9.36)	(-7.05) (-6.92)	(-6.79)	(-6.58)	(-6.22)
12	Sell	0.68	0.69	0.70	0.72	0.74	0.66	0.67	0.69	0.71	0.73
12		(24.25)	(25.57)	(27.89)	(30.80)	(34.60)	(24.25) (25.57)	(27.89)	(30.79)	(34.60)

J		Equal-weighted OIB						Value-weighted OIB				
12	Buy	0.66	0.67	0.69	0.70	0.72		0.65	0.66	0.68	0.70	0.72
12		(24.26)	(25.58)	(27.89)	(30.79)	(34.60)		(24.26)	(25.58)	(27.90)	(30.80)	(34.61)
12	Buy-Sell	-0.02	-0.02	-0.01	-0.01	-0.01		-0.01	-0.01	-0.01	-0.01	-0.01
12		(-9.76)	(-9.43)	(-9.60)	(-9.99)	(-9.80)		(-7.10)	(-6.98)	(-6.81)	(-6.27)	(-5.97)

Panel B: domestic small individuals (monthly)

J	K=	Equal-weighted OIB					K=	Value-weighted OIB				
		1	3	6	9	12		1	3	6	9	12
1	Sell	0.73	0.75	0.77	0.79	0.82		0.72	0.73	0.75	0.78	0.80
1		(24.22)	(25.54)	(27.84)	(30.74)	(34.55)		(23.75)	(24.99)	(27.21)	(30.08)	(33.75)
1	Buy	0.72	0.73	0.76	0.78	0.80		0.69	0.71	0.74	0.76	0.79
1		(24.21)	(25.51)	(27.84)	(30.75)	(34.55)		(23.66)	(25.08)	(27.42)	(30.34)	(33.99)
1	Buy-Sell	-0.02	-0.02	-0.01	-0.01	-0.01		-0.03	-0.02	-0.01	-0.01	-0.01
1		(-5.49)	(-5.41)	(-4.34)	(-4.32)	(-4.46)		(-2.68)	(-2.11)	(-1.63)	(-1.53)	(-1.80)
3	Sell	0.74	0.76	0.78	0.80	0.82		0.72	0.73	0.75	0.78	0.81
3		(24.24)	(25.55)	(27.87)	(30.77)	(34.58)		(23.48)	(24.70)	(26.87)	(29.62)	(34.34)
3	Buy	0.71	0.73	0.76	0.78	0.80		0.69	0.71	0.73	0.76	0.78
3		(24.20)	(25.50)	(27.84)	(30.75)	(34.53)		(23.93)	(25.18)	(27.46)	(30.29)	(33.91)
3	Buy-Sell	-0.03	-0.03	-0.02	-0.02	-0.02		-0.03	-0.02	-0.02	-0.02	-0.03
3		(-8.87)	(-7.92)	(-7.32)	(-7.51)	(-7.31)		(-2.75)	(-2.49)	(-2.06)	(-2.27)	(-5.06)
6	Sell	0.75	0.76	0.78	0.80	0.82		0.72	0.73	0.76	0.79	0.82
6		(24.24)	(25.56)	(27.87)	(30.78)	(34.58)		(23.13)	(24.31)	(26.67)	(30.11)	(34.43)
6	Buy	0.71	0.73	0.76	0.78	0.80		0.69	0.71	0.73	0.76	0.78
6		(24.21)	(25.52)	(27.86)	(30.75)	(34.53)		(23.93)	(25.20)	(27.42)	(30.22)	(33.80)
6	Buy-Sell	-0.03	-0.03	-0.03	-0.02	-0.02		-0.02	-0.02	-0.02	-0.03	-0.04
6		(-9.83)	(-9.34)	(-9.79)	(-10.35)	(-9.69)		(-2.19)	(-1.99)	(-2.44)	(-4.29)	(-6.35)
9	Sell	0.75	0.76	0.78	0.80	0.82		0.74	0.75	0.78	0.80	0.82
9		(24.25)	(25.57)	(27.88)	(30.79)	(34.59)		(23.76)	(25.01)	(27.83)	(30.79)	(34.59)
9	Buy	0.72	0.73	0.76	0.78	0.80		0.70	0.72	0.74	0.76	0.78
9		(24.23)	(25.55)	(27.86)	(30.75)	(34.55)		(23.95)	(25.30)	(27.58)	(30.37)	(34.01)
9	Buy-Sell	-0.03	-0.03	-0.03	-0.03	-0.02		-0.04	-0.03	-0.04	-0.04	-0.04
9		(-11.68)	(-11.62)	(-11.79)	(-11.70)	(-11.20)		(-4.42)	(-4.07)	(-7.47)	(-8.01)	(-7.60)
12	Sell	0.75	0.77	0.79	0.81	0.83		0.75	0.76	0.78	0.80	0.82
12		(24.27)	(25.58)	(27.90)	(30.80)	(34.61)		(24.26)	(25.57)	(27.89)	(30.79)	(34.59)
12	Buy	0.72	0.73	0.76	0.78	0.80		0.70	0.72	0.74	0.76	0.78
12		(24.24)	(25.55)	(27.86)	(30.76)	(34.56)		(23.97)	(25.26)	(27.52)	(30.31)	(33.95)
12	Buy-Sell	-0.04	-0.03	-0.03	-0.03	-0.03		-0.05	-0.04	-0.04	-0.04	-0.04
12		(-14.03)	(-13.84)	(-14.21)	(-13.91)	(-13.73)		(-8.80)	(-8.56)	(-8.43)	(-8.09)	(-7.79)

Panel C: domestic big individuals (weekly)

J	K=	Equal-weighted OIB					K=	Value-weighted OIB				
		1	4	8	12	16		1	4	8	12	16
1	Sell	0.67	0.68	0.68	0.68	0.69		0.66	0.67	0.67	0.68	0.68
1		(51.10)	(52.06)	(53.36)	(54.74)	(56.21)		(51.09)	(52.06)	(53.37)	(54.75)	(56.21)
1	Buy	0.66	0.67	0.67	0.68	0.68		0.66	0.66	0.67	0.67	0.68
1		(51.12)	(52.07)	(53.37)	(54.75)	(56.22)		(51.10)	(52.06)	(53.37)	(54.75)	(56.22)

J		1	4	8	12	16		1	4	8	12	16
1	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01		-0.01	-0.01	-0.01	-0.00	-0.00
1		(-10.05)	(-9.64)	(-8.86)	(-8.16)	(-7.46)		(-6.82)	(-7.10)	(-7.05)	(-6.37)	(-5.77)
4	Sell	0.68	0.68	0.68	0.69	0.69		0.67	0.67	0.67	0.68	0.68
4		(51.10)	(52.06)	(53.36)	(54.74)	(56.20)		(51.10)	(52.07)	(53.37)	(54.75)	(56.21)
4	Buy	0.66	0.66	0.67	0.68	0.68		0.65	0.66	0.66	0.67	0.68
4		(51.12)	(52.07)	(53.38)	(54.75)	(56.22)		(51.10)	(52.07)	(53.37)	(54.75)	(56.22)
4	Buy-Sell	-0.02	-0.01	-0.01	-0.01	-0.01		-0.01	-0.01	-0.01	-0.01	-0.01
4		(-16.17)	(-16.93)	(-14.56)	(-14.09)	(-12.60)		(-11.76)	(-13.05)	(-11.84)	(-11.45)	(-10.36)
8	Sell	0.68	0.68	0.68	0.69	0.69		0.67	0.67	0.67	0.68	0.68
8		(51.10)	(52.05)	(53.36)	(54.74)	(56.20)		(51.09)	(52.06)	(53.37)	(54.75)	(56.21)
8	Buy	0.66	0.66	0.67	0.68	0.68		0.65	0.66	0.66	0.67	0.67
8		(51.12)	(52.07)	(53.38)	(54.75)	(56.22)		(51.10)	(52.07)	(53.38)	(54.76)	(56.22)
8	Buy-Sell	-0.02	-0.02	-0.01	-0.01	-0.01		-0.01	-0.01	-0.01	-0.01	-0.01
8		(-16.60)	(-17.94)	(-16.93)	(-15.91)	(-14.84)		(-12.95)	(-15.39)	(-15.37)	(-14.51)	(-13.25)
12	Sell	0.68	0.68	0.68	0.69	0.69		0.67	0.67	0.67	0.68	0.68
12		(51.09)	(52.05)	(53.35)	(54.74)	(56.20)		(51.10)	(52.06)	(53.37)	(54.75)	(56.21)
12	Buy	0.66	0.66	0.67	0.67	0.68		0.65	0.66	0.66	0.67	0.67
12		(51.12)	(52.07)	(53.38)	(54.76)	(56.22)		(51.12)	(52.08)	(53.38)	(54.76)	(56.23)
12	Buy-Sell	-0.02	-0.02	-0.02	-0.01	-0.01		-0.02	-0.01	-0.01	-0.01	-0.01
12		(-18.47)	(-19.88)	(-18.15)	(-17.74)	(-16.96)		(-15.40)	(-17.42)	(-16.83)	(-16.16)	(-15.28)
16	Sell	0.68	0.68	0.68	0.69	0.69		0.67	0.67	0.67	0.68	0.68
16		(51.09)	(52.05)	(53.36)	(54.74)	(56.21)		(51.09)	(52.06)	(53.37)	(54.75)	(56.21)
16	Buy	0.66	0.66	0.67	0.67	0.68		0.65	0.66	0.66	0.67	0.67
16		(51.12)	(52.07)	(53.38)	(54.76)	(56.22)		(51.11)	(52.07)	(53.38)	(54.76)	(56.23)
16	Buy-Sell	-0.02	-0.02	-0.02	-0.01	-0.01		-0.02	-0.01	-0.01	-0.01	-0.01
16		(-19.03)	(-19.30)	(-18.32)	(-17.91)	(-17.24)		(-14.67)	(-15.99)	(-15.36)	(-15.01)	(-14.56)

Panel D: domestic small individuals (weekly)

		Equal-weighted OIB						Value-weighted OIB				
J	K=	1	4	8	12	16	K=	1	4	8	12	16
1	Sell	0.73	0.74	0.74	0.75	0.76		0.71	0.72	0.73	0.73	0.74
1		(51.02)	(51.96)	(53.26)	(54.64)	(56.11)		(49.76)	(50.65)	(51.94)	(53.26)	(54.69)
1	Buy	0.72	0.73	0.74	0.74	0.75		0.71	0.71	0.72	0.73	0.74
1		(51.01)	(51.95)	(53.24)	(54.62)	(56.07)		(50.13)	(51.02)	(52.26)	(53.65)	(55.01)
1	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01		-0.00	-0.00	-0.01	-0.00	-0.01
1		(-5.00)	(-5.26)	(-5.29)	(-5.50)	(-5.79)		(-0.77)	(-0.92)	(-1.17)	(-1.08)	(-1.30)
4	Sell	0.74	0.74	0.75	0.75	0.76		0.71	0.72	0.73	0.73	0.74
4		(51.05)	(51.98)	(53.28)	(54.66)	(56.12)		(49.45)	(50.40)	(51.72)	(53.02)	(54.40)
4	Buy	0.72	0.73	0.73	0.74	0.75		0.71	0.71	0.72	0.73	0.74
4		(51.03)	(51.96)	(53.25)	(54.62)	(56.08)		(50.44)	(51.34)	(52.58)	(54.10)	(55.66)
4	Buy-Sell	-0.01	-0.01	-0.01	-0.01	-0.01		-0.00	-0.00	-0.01	-0.00	-0.00
4		(-8.61)	(-8.88)	(-8.74)	(-9.15)	(-9.09)		(-0.72)	(-1.09)	(-1.38)	(-0.85)	(-0.47)
8	Sell	0.74	0.74	0.75	0.76	0.76		0.71	0.72	0.73	0.73	0.74
8		(51.07)	(52.00)	(53.31)	(54.68)	(56.13)		(49.23)	(50.16)	(51.52)	(52.57)	(53.98)
8	Buy	0.72	0.72	0.73	0.74	0.75		0.71	0.71	0.72	0.73	0.74

8		(51.01)	(51.93)	(53.21)	(54.57)	(56.05)	(50.45)	(51.35)	(52.57)	(54.08)	(55.57)
8	Buy-Sell	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01	-0.00	-0.00
8		(-11.61)	(-11.63)	(-11.75)	(-11.73)	(-11.02)	(-1.19)	(-1.54)	(-1.90)	(-0.75)	(-0.40)
12	Sell	0.74	0.75	0.75	0.76	0.77	0.72	0.73	0.73	0.74	0.75
12		(51.08)	(52.02)	(53.32)	(54.70)	(56.15)	(49.64)	(50.66)	(51.89)	(53.25)	(54.68)
12	Buy	0.72	0.72	0.73	0.74	0.75	0.71	0.71	0.72	0.73	0.73
12		(51.03)	(51.95)	(53.24)	(54.61)	(56.08)	(50.68)	(51.59)	(52.87)	(54.19)	(55.65)
12	Buy-Sell	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.01	-0.01	-0.01
12		(-15.03)	(-15.53)	(-15.23)	(-14.96)	(-14.05)	(-3.20)	(-3.82)	(-3.62)	(-3.61)	(-3.21)
16	Sell	0.75	0.75	0.76	0.76	0.77	0.73	0.73	0.74	0.75	0.75
16		(51.09)	(52.03)	(53.33)	(54.70)	(56.16)	(50.16)	(51.07)	(52.33)	(53.66)	(55.04)
16	Buy	0.72	0.72	0.73	0.74	0.75	0.70	0.71	0.72	0.73	0.73
16		(51.03)	(51.95)	(53.24)	(54.61)	(56.08)	(50.58)	(51.55)	(52.70)	(54.16)	(55.64)
16	Buy-Sell	-0.03	-0.03	-0.03	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
16		(-18.50)	(-18.76)	(-18.23)	(-17.47)	(-16.74)	(-6.19)	(-6.12)	(-6.04)	(-5.69)	(-4.98)

Table7   Price Impact of Order Imbalance

The dependent variable is the daily value-weighted returns for thirty stocks, denoted R_t. The explanatory variables include contemporaneous and lagged positive and negative daily weighted order imbalances and past positive and negative value-weighted stock returns.   In Panel A and B, weighted order imbalances are value-weighted measured in number of orders and order in lots, respectively.   Meanwhile, EBO_0 (EBO_1) is the positive weighted order imbalance at day t (t-1) and ESO_0 (ESO_1) is the negative weighted order imbalance.   NEG (POS) indicates negative (positive) lagged return. We also regress stock return on lagged positive and negative weighted order imbalances for individual investors, domestic institutional investors and foreign institutional investors, separately, and lagged returns in the regression. Coefficients are multiplied by 10,000. *, **, and *** represent the significance of 0.1, 0.05 and 0.01, respectively.

Panel A: Total order imbalance in terms of number of orders

	Total	Individuals	Individual Big	Individual small	Domestic Institution	Foreign Institutions
EBO_0	-5.873***	-5.833***	77.26***	-7.01***	639.44***	62.009**
ESO_0	-4.181***	-4.229***	26.52***	-5.08***	513.10***	206.967***
EBO_1	1.155	1.169	-15.87*	1.42*	123.41	-10.674
ESO_1	0.729	0.789	-11.86	1.22	-102.40	-84.768*
NEG	-0.254***	-0.254***	0.28***	-0.26***	0.05	-0.090
POS	-0.021	-0.023	0.22***	-0.03	0.09	0.083
INTERC	638.609	627.166	-828.98	1073.54	2980.62**	-379.153
AR^2	0.143	0.146	0.15	0.03	0.10	0.042

Panel B: Total order imbalance in terms of order lots

	Total	Individuals	Individual Big	Individual small	Domestic Institution	Foreign Institutions
EBO_0	2.53***	2.64***	3.37***	-0.94*	4.52***	4.799***
ESO_0	1.68***	1.52***	2.49***	-1.34***	5.82***	7.833***
EBO_1	-0.51**	-0.78***	-0.43	-0.07	1.01	-0.911
ESO_1	-0.26*	-0.47***	-0.45**	-0.17	-0.74	-3.546***
NEG	0.38***	0.42***	0.34***	-0.12	0.03	-0.098
POS	0.31***	0.38***	0.26***	0.03	0.04	0.007
INTERC	2659.10***	1052.44	2938.54***	-867.28	2823.16**	-835.666
AR^2	0.143	0.36	0.56	0.02	0.17	0.123

計畫成果自評

　　This study achieves the goal of research proposal.　　We find the difference in trading behavior of foreign investors and domestic investors, especially for momentum strategy vs. contrarian strategy. One of potential rationale of such phenomenon could be attributed to culture difference. This study contributes academic research, since in the literature of behavioral finance the comparison of foreign investors with domestic investors is lack of investigation under the constraints of data availability.　　Also, we provide complementary evidences suggest that the aforementioned factors that contribute to the momentum phenomenon in the United States are not prevalent in the Asian markets.　　For practitioner, it is valuable to notice such puzzle because culture difference may affect the difference in psychology, in trading strategy, and then, in investment profits. How to adjust belief and trading strategy is worthwhile to be discussed further in the future. We are still revising this paper for publishing it in a SSCI journal.

附件

赴國外短期研究之報告書

報告人姓名：李怡宗

服務機構及職稱：政治大學會計系／教授

補助經費之計畫名稱：文化差異與動能投資報酬:由中國文化談起(2/2)

計畫編號： NSC 95-2416-H-004 -026 -MY2

一、赴美短期研究之期間及行程

簡單而言，晚的訪問行程如下：

班機時間	行程	行程目的
08 月 02 日（四）22:50	台北出發至舊金山	受美國 UC Davis 之邀請，前往短期研究
08 月 16 日（四）08:35	舊金山出發至夏威夷	受 University of Hawaii 的 Ghon Rhee 與 Rosita Chang 邀請參加學術 Seminar
08 月 19 日（日）7:50	夏威夷出發至台北	

二、August, 2007 出國研究報告

　　此次訪問了三個學校，分別是 UC, Berkeley 的 Terrance Odean, UC, Davis 的 Brad Barber 與 Ning Zhu 與 University of Hawaii 的 Ghon Rhee 與 Rosita Chang。

　　August 2, 2007 到達當日稍做休息後，即與上述幾位學者聯絡。August 6, 2007 先行拜訪 Terrance Odean, 討論目前我們所進行的當沖交易論文如何修改。該論文曾在 NBER 會議發表，也吸引了許多學者的注意，並曾被美國商業週刊轉載。目前可能進行的方向為:

（1）To study the relationship between day traders and price impact. On the one hand, day traders buy and sell their stocks in one day. They are not supposed to have price impact, yet since they are noise traders, their trading may still have some influence.

(2) To look at whether day traders persistently participate the market. We found that 98% of day traders lose a lot of money, so it is possible that they dropped out from the market. If the survivorship of day traders is high, then it is still an interesting question to address why they behave like this way.

(3) Do day traders provide liquidity to the market? There are no designated market makers in Taiwan, and it could be that day traders provide liquidity to the market.

　　除了討論 Day traders 外，我們也於 August 15 在與 Terrance Odean 再次見面，討論的是與資訊揭露攸關的主題。 Basically, we were focusing on who are beneficial from information disclosure: Institutions or individuals? Regulations tend to enforce information disclosure so as to improve market efficiency and fairness to access information for all investors, in particular for retailed investors. However, it is an unknown question whether individuals do make use of market limit order book in a short period of time, and whether they tend to be overreacting when there is too much

information in the market.

August 9, 2007 拜訪 UC, Davis 的 Brad Barber, 針對我們未來是否可能進行事件研究進行討論，比方說：如何利用 stock repurchase, earning announcements events to do some tests on individual behaviors, in particular we try to look at whether there are informational drifts and whether institutions can make use of the information drifts. We worked with the data analysis of the two events on UC Davis for two days, and since there are a lot of data errors in the TEJ, and therefore, I need to get back and forth to verify the corrections of all variables.

後來兩天，我們拜訪了 UC, Davis 的 Ning Zhu, 目前我們初步的構想是進行 insider trading 的研究。 Specially, we may focus on whether insider trading is informative, and whether the SEC disclose sufficient insiders information to the public. We spent two days in Ning's office and worked very hard on how to measure insider trading.

Regarding the analyses, we will follow Lakonishok and Lee (2002) and construct order-flow information for companies and relate insider trading to future stock performance, at different horizons.

1. Does the current disclosure requirement fail to capture the information content of insider trades?

    Related to this point, but more emphasis on the methodological side, we pose the question whether there is difference in the results, depending whether we use the exchange level trading data or SEC-level disclosure data. Ideally, we will find that insider trades indeed forecast future stock returns using our data. This will

contrast with the existing JFI paper showing that public disclosure of insider trades has little impact on stock returns

2. To use insider trading as proxy for management private information or belief and test a series of corporate events, such as the timing of IPO and other equity and bond offering, the information content of signaling events, such as share repurchase, stock split (stock dividends), and earnings announcement.

3. The information content of domestic vs. foreign insiders. There are some extant studies investigating the relative information content of domestic vs. foreign investors at the exchange level. We can bridge the gap by investigating the trades by the more informed domestic and foreign investors.

August 16-19, 2007 ，我們訪問了 University of Hawaii 的 Ghon Rhee 與 Rosita Chang. 劉玉珍教授受邀在其學術 Seminar 發表論文，與會者包括來自美國、日本、大陸、泰國等各地的學者。討論內容相當精采，尤其是 Ghon Rhee 提出了許多精彩的問題，劉教授的回答也增進與會人士對行為財務學與台灣證券市場的瞭解。

此外，Ghon Rhee 亦邀請我們進行一個結合 Market Microstructure 與 Behavioral Finance 的研究。初步構想是利用 price limit event 找出 who are price takers and who move the prices. This may help us understand the roles of institutions and individuals and address the questions of who are sophisticated investors. We are looking forward to studying the issues with Ghon in the future.