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Individuals' Asymmetric Choice of Order-type Depending on the Previous Returns

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A B S T R A C T

Using all of individuals' transactions on KSE over 1999-2009, I find the individuals' asymmetric choice of order-type depending on the previous returns of stocks. Individuals holding winners prefer to sell them with market orders, and individuals holding losers prefer to sell them with limit orders. However, individuals willing to buy winners tend to use limit orders and individuals willing to buy losers tend to use market orders. Individuals' order-type selections can be explained by the asymmetric change of their risk attitude depending on the previous stock performance, which is proposed by the Prospect theory. This tendency makes individuals engage in negative feedback trading in market trades and positive feedback trading in limit trades.

Keywords: Individual investors, Market orders, Limit orders, Prospect theory, Return reversal

Ⅰ. Introduction

The systematic trading pattern related to previous returns has received particular attention among financial economists, because it has the potential to exert a destabilizing impact on the stock market. The line of research tried to find the complete picture of how investors actually behave based on the past return and how they differ from one other in the way they react to the past-return. Previous researches, surveying this kind of trading pattern in different countries and on different horizons, documented some regularity in the past-return based behavior of investors; individual investors engage in negative feedback trading while institutional investors engage in positive feedback trading[1].

Assuming stock prices possessing momentum, the positive feedback trading strategy of institutional investors is profitable and reasonable, but the negative feedback trading of individuals isn't. Because of this, the researchers have debated why individuals go against the return trends despite the already-known momentum phenomenon. Some[2] insisted that individuals' contrarian tendency is attributable to their unique behavioral features such as disposition effect. However, the others claimed that the failure to

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1) Choe et al. (1999), Nofsinger and Sias (1999), Griffin et al. (2003), Kaniel et al. (2008), Jackson (2003), Grinblatt and Keloharju (2000, 2001), Grinblatt et al. (1995), Wermers (1999), Lee et al.(1999)

2) Kaniel et al. (2008), and Grinblatt and Keloharju (2000),

separate market and limit trades have mislead the prior studies and argued that individuals' contrarian behavior could be fully explained by the limit trades' property, not by their unique behavior feature. Dorn et al. (2008) and Linnainmaa (2010), analyzing a database on German and Finnish stock market, documented that the market order imbalance indicates that individuals behave as positive feedback traders, like institutions, and that the limit order imbalance indicates that they act as negative feedback traders. They concluded that the well-known tendency of individuals' contrarian could be explained by the market circumstances related to limit trades[3], not by their unique behavioral feature.

However, Lee (2016), using the individuals' transactions on Korean stock market, showed that Korean individuals behave as negative feedback traders for market trades and positive feedback traders for limit trades, concluding that individuals' contrarian pattern is their behavior features. This study attracted attention and triggered the controversy again. This is because the result is completely inconsistent with that of the prior studies (Dorn et al. 2008; Linnainmaa, 2010), and it cannot be rationalized to the existing knowledge. That is, even if the negative feedback trading in market trades is explained by their behavior feature such as disposition effect, the positive feedback trading in limit trades cannot be explained by the already-known nature of the stock market such as the execution mechanism of limit order or the role of limit trades as liquidity providing trades. (see Footnote 3.)

In this paper, I revisited the individuals' trading tendencies reported in Korean stock market[4] and examined why the contrarian in market trades and the momentum in limit trades have emerged. In order to handle this question in an integrated way, I focused on the individuals' order-type selection behavior. I examined the possibility that individuals choose order-type asymmetrically depending on previous stock returns, resulting the different feedback trading patterns in market and limit trades.

My hypothesis relies on the third feature of the Prospect theory proposed by Tversky and Kahneman (1991)[5]. They found individual investors' asymmetric risk attitude depending on whether they are above or below a reference point in a controlled experiment in which individuals choose between various risky gambles. According to the Prospect theory, individual investors show risk-averse attitude in the concave region above a reference point, and risk-seeking attitude in the convex region below it.

Some researchers have investigated whether the asymmetric risk attitude proposed by Prospect theory can be discerned in a financial market. Shefrin and Statman (1985), Odean (1998) found the investor's disposition to hold on to their losing stocks too long and sell their winners too early. Dhar and Zhu (2006), Chen et al. (2007), Barber and Odean (2011) found that individuals have the stronger tendency toward disposition effect. Genesove and Mayer (2001) examined whether investors' asymmetric risk attitude influences on their list price setting, by analyzing data from the Boston condominium market during the 1990s. They found that that changes of risk attitude influence seller's choice of list price in the housing market.

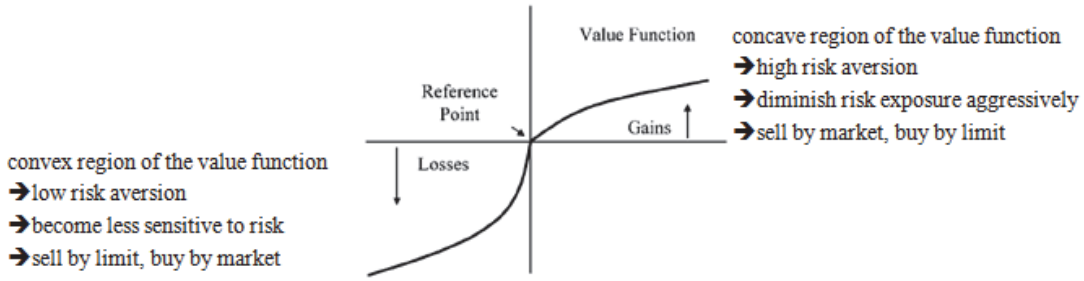
In line with these researches, this paper investigates whether the asymmetric risk attitude of individual investors would influence on their order-type choice.

3) Because a sell (buy) limit order is executed only if the stock price increases (decrease) to hit the order, the execution mechanism of limit orders naturally lead to a contrarian pattern. Since individuals' limit orders absorb the momentum behaviors of institutions due to market clearing condition, individuals' limit trades exhibit contrarian behavior.

4) Recently, studies on the influence of individual investors' personal traits and perceptions on their investment behaviors have been actively conducted.(Trang and Khuong, 2017; Honggowati et al., 2015; Chun and Shim, 2017)

5) Tversky and Kahneman(1991) suggest that there are three essential components that help explain how individuals make choices under uncertainty. First, gains and losses are examined relative to a reference point. Second, the value function in steeper for losses than for equivalently sized gains. In other words, losses from the reference point are more painful than gains. Third, the marginal value of gains or losses diminished with the size of the gain or loss. It means that the function is concave over gains and convex over losses, which leads to the prediction of risk seeking in the regions of losses and risk aversion in the region of gains.

Panel A. Asymmetric risk attitude depending on the previous returns



Panel B. Individuals' feedback trading pattern caused by their asymmetric order-type selection

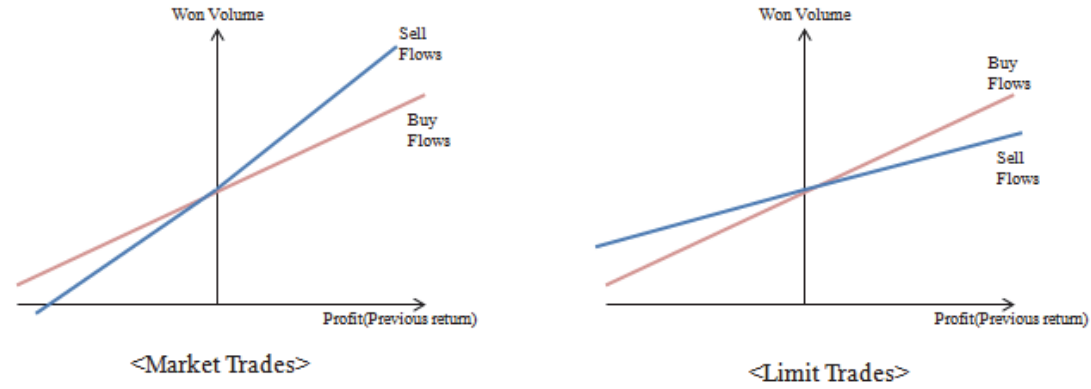


Figure 1. Individuals' asymmetric risk attitude and order-type coice

An investor above his reference point would become more risk-aversive, diminishing his risk exposure aggressively. Thus, investors would prefer to sell the winners stocks with market orders which guarantee the prompt execution. On the other hands, an investor below his reference point would become less sensitive to risk, reducing his risk exposure less aggressively. Thus, he would prefer to sell the loser stocks with limit orders which care the quality of execution rather than the prompt execution. Likewise, investors have a greater appetite for large loser than for large winners due to their asymmetric risk attitude[6]. Thus, they would prefer to buy the loser stocks with market orders promptly, but winner stocks with limit orders cautiously.

In short, I hypothesize that individual investors prefer to sell the winners with market orders and the losers with limit orders, however, individuals willing to buy the winners tend to use limit orders, and those willing to buy losers use market orders. This hypothesized order-type choice selection behavior can fully explain the unresolved puzzle; negative feedback in market trades and positive feedback trading in limit trades. According to my hypothesis, for market trades, the sell (buy) order imbalance becomes larger in winners (losers), which is reported as negative feedback trading. For limit-trades, buy (sell) order imbalance becomes larger in winners (losers), which is reported as positive feedback trading. (See Figure 1.)

In this paper, I use all of individuals' transactions for 659 common KSE (Korea Stock Exchange) stock s[7] between January 1, 1999 and August 31, 2009,

6) Grinblatt and Han (2005)

7) Since Korean individuals actively participate in trading, the Korean stock market is a proper setting to investigate individual investors' trading behavior. The percentage of individuals' trading volume in total trading volume is over 80% on KSE during 1999-2009. Also, given the prevalence of home trading

and examine whether Korean individual investors choose asymmetrically the order-type depending on the previous returns of stocks. Specifically, I analyze the weekly relation between the previous stock returns and the proportion of executed market (limit) orders submitted by individual investors in total trades for sells and buys, separately.

As expected, I find that individual investors make an asymmetric choice of order-type depending on the previous returns of stocks when both selling and buying. For sells, the proportion of executed market orders submitted by individual in total trades is positively correlated with the previous one-month returns; however, the proportion of their limit orders is negatively correlated with the previous returns. Individuals holding winner stocks prefer to sell them with market orders, while individuals holding looser stocks prefer to sell them with limit orders. For buys, the proportion of individuals' market orders in total trades is negatively correlated with the previous one-month returns; however, that of their limit orders is positively correlated with the previous returns. Individuals tend to buy winners more carefully with limit orders, which guarantee execution at the specified price; however, they tend to repurchase losers more aggressively with market orders, which ensure prompt execution.

The contributions of this paper are as follows.

To the best of my knowledge, my finding that the individual investors choose order-type asymmetrically depending on the previous stock returns when selling and buying is the first. Previous literatures have shown the asymmetric change of risk attitude depending on the previous stock performances influences on their selling decision such as the time to sell[8] and the selling list price[9]. I find that that the asymmetric risk attitude also influences on their detailed selling behavior such as the choice of order type. I expect my result to add a new empirical finding to the Behavioral finance.

This paper shows that risk attitude could be changed by previous one-month lagged returns. Although the Prospect theory specifies the shape of the utility function around a reference point, it does not suggest where people set their reference point. Shefrin and Statman (1985), who apply the Prospect theory to investors' behaviors in the stock market and find the disposition effect, treat the original purchase price as the reference point. But Heath, Huddart and Lang (1999) and Gneezy (1998)[10] insist that price trends or price maxima could be a reference point. Although I do not refute the purchase price could be an effective reference point, I suggest that the previous price path could also act as a reference point.

The remainder of the paper is organized as follows. Section 2 describes the results of related previous studies and Section 3 explains my data and main variables. Section 4 examines whether the type of order submitted by individual investors may change depending on the previous performance of each stock, when selling and buying, separately and discusses the relationship between individuals' asymmetric choice of order-type and their feedback trading pattern. Finally, section 5 concludes the paper.

Ⅱ. Review

Kahneman and Tversky (1979) examined how decision makers behave when confronted with choice under uncertainty in a controlled experimental situation, and suggested Prospect theory. The key finding of Prospect theory is that individual decision makers behave in accordance with the S-shaped value

system, individual investors make independent investment decisions without advice of brokerage professionals. Thus, Korean individuals as a group would likely exhibit a unique trading behavior feature.

8) Shefrin and Statman (1985), Odeans (1998)

9) Genesove and Mayer (2001)

10) Heath et al. (1999) show that employees exercise stock option in response to stock price trends; exercise in stock option is shown to be positively related to stock returns during the preceding month and negatively related to returns over long horizons. Gneezy(1998) finds that purchase prices are less effective predictors of reference points than maxima are through an experimental study of the disposition effect.

function which is concave in the gains region and convex in the loss region. Accordingly, they become risk-aversive in the domain of gains and risk-seeking in the domain of losses, both measured relative to a reference point.

Some researchers have investigated whether the asymmetric risk attitude proposed by Prospect theory can be discerned in actual trading. Shefrin and Statman (1985) examined decisions to realize gains and losses in a financial market setting and found the investor's disposition to hold on to their losing stocks too long and sell their winners too early. They placed this behavior pattern into the wider theoretical framework such as Prospect theory, mental accounting, regret aversion, and so on. Odean (1998), Dhar and Zhu (2006), Chen et al. (2007) showed that the disposition effect varies depending on investor' sophistication about financial markets and trading experience. Barber and Odean (2011), Her et al. (2010) found that individuals have the stronger tendency toward disposition effect.

Genesove and Mayer (2001) examined whether investors' asymmetric risk attitude influences on their list price setting, by analyzing data from the Boston condominium market during the 1990s. According to them, condominium owners subject to losses set higher asking prices tan their properties' expected selling market price, while owners subject to gains set asking prices similar to the market prices. They propose that loss aversion and Prospect theory can help explain seller's choice of list price. In line with these researches, this paper investigates whether the asymmetric risk attitude of individual investors would influence on their order-type choice.

Researchers studied the investor's order-type selection behavior. The key differences between the two types of orders are the probability of execution and the price at which each is to be executed. Limit orders are stored in a limit-order book to await execution; however, market orders are executed with certainty at the best available price. With a limit order, the trader will execute it at a price more favorable than that of a market order, but there is a risk that the limit order will not be executed. The tradeoff between the execution probability and the transaction price should play a key role in an investor's decision as to which type of order to use.

Most of the previous researches have examined traders' choice of order-type in the view of liquidity, and information. Keim and Madhaven (1995) provided the evidence related to the institutional trader's choice of order type. They showed that liquidity traders such as indexers are likely to use market orders, but the informed traders tend to use limit orders. Chung and VanNess (1999) examined the intraday variation in spreads established by limit-order traders and showed that more investors enter limit orders when the spread is wide. Bae et al. (2003) found that traders place more limit orders when they expect high transitory price volatility and the spread is large. Recently, some papers have documented how limit-order trading reacts to market conditions. Goldstein and Kavajecz (2000) found the dramatic shifts in traders' willingness to place limit orders during extreme market movements in the NYSE. I focus on individual investors and investigate their unique order-type selection depending on the previous return.

Ⅲ. Sample and Main Variables

This paper analyzes all orders which were executed on 659 common KSE stocks between January 1, 1999 and August 31, 2009[11]. The KSE database provides information about 2,223,925 stock-days and 472,941 stock-weeks. I match these KSE data to the KOCOINFO (Korean company information database provided by Korea Listed Companies Association) and the KISVALUE (database maintained by NICE, National Information and Credit Evaluation. INC) data by means of the 12-digit stock code and then construct the final sample. This procedure results in a sample of 659 common stocks and of 319,163

11) I analyze only the executed orders in order to keep imaginary or stale orders from distorting the true pattern in individuals' choice of order-type.

Table 1. Summary statistics for trading activities for market and limit trades (in million Won)

This table presents the summary statistics on trading activities for market and limit trades. The trading activities such as BV, SV, TV, IMBV, BOS, SOS are calculated for each type of investors; individuals, institutions, foreigners. BV (SV) is the weekly buy (sell) won volume and the weekly sell won volume, respectively. TV is the sum of BV and SV. IMBV is the difference between them. BOS (SOS) is calculated by weekly buy (sell) won volume divided by weekly numbers of buys (sells). I calculate the average for the entire stock-week sample and separately for the three size groups. I categorized 659 sample stocks into small, medium, large group according to average market capitalization during the sample period.

Investor	Size	Market Trades						Limit Trades					
		BV	SV	TV	IMBV	BOS	SOS	BV	SV	TV	IMBV	BOS	SOS
Individuals	Small	1394	1715	3109	-321	1.19	1.37	1732	1399	3131	333	1.34	1.20
	Medium	1978	2389	4367	-411	1.57	1.75	2437	2006	4443	431	1.64	1.56
	Large	14527	16140	30667	-1612	3.12	3.24	18201	16448	34649	1753	2.94	3.08
	Total	5956	6736	12691	-780	1.97	2.13	7443	6605	14048	838	1.98	1.96
Institutions	Small	37	46	84	-9	3.07	1.90	36	32	68	3	3.47	2.93
	Medium	177	204	381	-27	3.07	2.44	160	149	309	11	3.81	3.47
	Large	9129	9215	18344	-87	4.56	4.21	6825	6367	13193	458	5.50	5.29
	Total	3107	3147	6254	-41	3.76	3.05	2335	2178	4512	157	4.50	4.18
Foreigner	Small	16	20	36	-5	1.46	1.39	13	15	28	-2	1.56	1.37
	Medium	48	54	102	-5	2.03	1.99	50	48	98	1	2.23	1.83
	Large	3988	4017	8005	-29	4.56	4.46	4345	4829	9174	-484	4.64	4.67
	Total	1347	1360	2708	-13	3.18	3.08	1466	1627	3093	-161	3.30	3.15

stock-weeks. Because the KSE database contains detailed information about the orders of every transaction executed in KSE, I can know for each trade which type of investor submits a buy-order (sell-order) and which type of order is used in buy and sell side, respectively.

In order to identify type of order, I use quote receipt number. Each trade necessarily consists of an initiated side and a non-initiated side. An initiated side, which has a later quote receipt number, use market orders or marketable limit-orders[12]. A non-initiated side, which has an earlier quote receipt number, use limit orders except for marketable limit-orders. Thus, I regard that the traders in an initiated side submit market orders and the traders in a non-initiated side submit limit orders for the convenience of interpretation and compatibility with prior researches.

<Table 1> presents the summary statistics of trading activities for each type of order. The trading activities such as BV (Buy Volume), SV (Sell Volume), TV (Total Volume), IMBV (Imbalance Volume), BOS (Buy Order Size), and SOS (Sell Order Size) are calculated for each type of investor; individuals, institutions, foreigners. All of them are aggregated on a weekly basis for each stock and then averaged.

For both market and limit trades, the individual group participate trading most actively. The average weekly executed market order value is 12.69 billion won for individuals, 6.25 billion won for institutions, and 2.70 billion won for foreigners. The average weekly executed limit order value is 14.04 billion won for individuals, 4.51 billion won for institutions, and 3.09 billion won for foreigners. These statistics present that Korean individuals prefer limit trades to market trades, but Korean institutions prefer market trades to limit trades.

For market trades, individuals' average weekly trading imbalance is -780 million won, which is sell-oriented imbalance; however, for limit trades, it is 838 million won, which is buy-oriented imbalance.

12) Marketable limit-orders, which are priced to meet or better the opposing quote, are substantially similar to market order, and previous researches (Harris and Hasbrouk, 1996) group these orders with market order. Thus, I also group marketable limit-orders with market order.

It suggests that individuals like to use market trades when selling, but they like to use limit trades when buying. Individuals seem to care more about prompt execution when selling, while they tend to be more concerned with the quality of execution when buying.

Because each buy order must match an opposite sell order by one-to-one and each market order (including marketable limit-orders) must match an awaiting limit order by one-to-one for executing stock transactions, the aggregate trading strategies should be a zero-sum game. Actually, there are the two equalities among the numbers in <Table 1>: The sum of executed sell orders (= 6736 + 3147 + 1360 + 6605 + 2178 + 1627) equals the sum of executed buy orders (= 5956 + 3107 + 1347 + 7443 + 2335 + 1466), and the sum of executed market orders (= 5956 + 6736 + 3107 + 3147 + 1347 + 1360) equals the sum of executed limit orders (= 7443 + 6605 + 2335 + 2178 + 1446 + 1627). In addition, the sum of executed market-order imbalances (= (5956-6736) + (3107-3147) + (1347-1360)) equals the sum of executed limit-order imbalances (= (7443-6605) + (2335-2178) + (1446-1627)) with the opposite sign.

I construct a daily measure of individual market (limit) order's ratio by dividing the Won volume of the executed market (limit) order submitted by individuals by Won volume of total trades. I calculate this measure for sells and buys, separately, and refer to each as MSell, LSell, MBuy, and LBuy, respectively. For example, the MSell for stock i on day t is defined as the Won volume sold by individuals through market orders divided by Won volume of total trades. I aggregate this measure to the weekly frequency because I focus on the weekly relationship between individuals' order-selection behavior and the previous returns.

$$\text{MSell} = \frac{\textit{Won volume sold by individuals through market orders}}{\textit{Won volume of total trades}}$$

$$\text{LSell} = \frac{\textit{Won volume sold by individuals through limit orders}}{\textit{Won volume of total trades}}$$

Table 2. Summary statistics on weekly MSell, LSell, MBuy, and LBuy

I construct a daily measure of market (limit) order's ratio for each investor group by dividing the Won volume of the executed market (limit) order submitted by each investor group by Won volume of total trades. I calculate this measure for sells and buys, separately, and refer to each as MSell, LSell, MBuy, and LBuy, respectively. I aggregate these measures to the weekly frequency because I focus on the weekly relationship between individuals' order-selection behavior and the previous returns. This table reports the summary statistics on weekly MSell, LSell, MBuy, and LBuy over the sample period. MSell, LSell, MBuy, and LBuy are calculated for each type of investor; individuals, institutions, and foreigners. I calculate the average for the entire stock-week sample and separately for the three size groups formed on the basis of average market capitalization during the sample period.

Panel A. Sells

Size	Individual		Institution		Foreigner	
	MSell	LSell	MSell	LSell	MSell	LSell
Small	0.560	0.390	0.022	0.018	0.005	0.004
Medium	0.498	0.365	0.062	0.048	0.014	0.013
Large	0.346	0.305	0.153	0.108	0.041	0.047
Total	0.467	0.353	0.080	0.059	0.020	0.022

Panel B. Buys

Size	Individual		Institution		Foreigner	
	MBuy	LBuy	MBuy	LBuy	MBuy	LBuy
Small	0.385	0.554	0.024	0.029	0.004	0.004
Medium	0.348	0.494	0.066	0.066	0.012	0.014
Large	0.269	0.373	0.151	0.124	0.040	0.044
Total	0.333	0.472	0.081	0.074	0.019	0.021

$$\text{MBuy} = \frac{\textit{Won volume bought by individuals through market orders}}{\textit{Won volume of total trades}}$$

$$\text{LBuy} = \frac{\textit{Won volume bought by individuals through limit orders}}{\textit{Won volume of total trades}}$$

$$\text{Total trade} = \left(\frac{\textit{Total executed orders}}{2}\right)$$

= Total buys (sells)

= Total markets (limits)

<Table 2> presents the summary statistics for weekly MSell, LSell, MBuy, and LBuy over the sample period. MSell, LSell, MBuy, and LBuy are calculated for each type of investor; individuals, institutions, and foreigners. The individuals submit orders most actively among investor groups for both buys and sells. The proportion of orders submitted by individuals in total trades is 0.805 for buys and 0.820 for sells. The proportion of institutional orders is 0.155 for buys and 0.139 for sells. The proportion of foreign orders is 0.040 for buys and 0.042 for sells. The smaller the sample stock is, the larger proportion of the total trades is done by individual investors. For small samples, the proportion of individual orders in total trades is 0.939 for buys and 0.950 for sells.

For individuals, MSell (0.467) is larger than LSell (0.353), and LBuy (0.472) is larger than MBuy (0.333). It means that individuals like to use market orders when selling, but they like to use limit orders when buying. However, for institutional and foreigners, there are no significant difference between MSell and LSell, between MBuy and LBuy. It suggests that neither institutions nor foreigners prefer a specific order type depending on trading direction (i.e., buying or selling).

Ⅳ. Empirical Results

A. Patterns of individuals' order-type choice

To confirm whether or not individual investors make an asymmetric choice of order-type, I examine the average weekly proportion of market (limit) orders submitted by individuals in total trades (MSell, LSell, MBuy, and LBuy) of quintile portfolios formed on the basis of one-month lagged abnormal returns ($CAR_{[t-4,t-1]}$, *cumulative abnormal returns*)[13].

MSell, LSell, MBuy, and LBuy are standardized by the averages and the standard deviations of entire samples' MSell, LSell, MBuy, and LBuy during the corresponding week. According to the 'Total' row of <Table 3>, any proportions do not exhibit a monotonic pattern of increasing or decreasing across the portfolios, which is inconsistent with my hypothesis; individuals prefer to sell winners with market orders and losers with limit orders, however, individuals prefer to buy winners with limit orders and losers with market orders.

Since individual investors prefer the specific order type for each stock, I control the order type preference of the previous period and then re-examine the relationship between the previous returns and the proportion of individuals' market (limit) orders in total trades. That is, I analyzed the average weekly MSell, LSell, MBuy, and LBuy of the 25 double-sorted portfolios which are formed based on independent quintiles of the one-month lagged abnormal returns ($CAR_{[t-4,t-1]}$) and the one-month lagged proportion of corresponding type of order submitted by individuals ($MSell_{[t-4,\ t-1]}$, $LSell_{[t-4,t-1]}$, $MBuy_{[t-4,\ t-1]}$, $LBuy_{[t-4,\ t-1]}$), and rebalanced each week during the sample period.

After controlling their order type preference of the previous period, MSell, LSell, MBuy, and LBuy show the pattern which is consistent with my hypothesis. MSells are mostly higher for winner stocks (Q5) than for loser stocks (Q1) after controlling $MSell_{[t-4,t-1]}$ LSells are significantly higher for loser stocks (Q1) than for winner stocks (Q5) for all of the $LSell_{[t-4,t-1]}$ quintiles. The results present that individuals holding the appreciated stocks during the previous month prefer to sell them with market orders and individuals holding the depreciated stocks prefer to sell them with limit orders. Meanwhile, MBuy is significantly higher for loser stocks (Q1) than for winner stocks (Q5) and LBuy is mostly higher for winner stocks

Table 3. Relationship between the proportion of market (limit) orders submitted by individual and the previous returns

This table exhibits the average weekly MSell, LSell, MBuy, and LBuy of the 25 double-sorted portfolios which are formed based on the independent quintiles of the one-month lagged abnormal returns ($CAR_{[t-4,t-1]}$), the one-month lagged proportion of corresponding type of order submitted by individuals ($MSell_{[t-4,\ t-1]}$, $LSell_{[t-4,t-1]}$, $MBuy_{[t-4,\ t-1]}$, $LBuy_{[t-4,\ t-1]}$) and weekly rebalanced during the sample period. Since individual investors have the preferred order types for each stock, I control this order type preference of the previous period and then examine the relationship between the proportion of individuals' market (limit) orders in total trades and the previous returns. The columns list 5 portfolios according to past returns, meaning that Q1 contains the stocks with the worst returns and Q5 contains the stocks with the greatest returns. The rows list 5 portfolios according to past proportion of each type of order submitted by individuals, meaning that Q1 contains the stocks with weakest preference for each order-type and Q5 contains the stocks with strongest preference for each order-type.
Panel A, Panel B, Panel C, and Panel D shows the average MBuy, LBuy, MSell, and LSell that is standardized the averages and the standard deviations of entire samples' MBuy, LBuy, MSell, and LSell during the corresponding week. *** indicates significance at the 1% level, ** indicates significance at 5% level, and * indicates significance at 10% level.

Panel A. Market Sell (MSell)						
$MSell_{[t-4,t-1]}$	1(loser)	2	3	4	5(winner)	Diff(1-5)
Total	0.081	0.026	-0.018	-0.087	0.000	0.082 ***
1(weak)	-1.170	-1.236	-1.260	-1.249	-1.182	0.012
2	-0.307	-0.263	-0.240	-0.228	-0.151	-0.155 ***
3	0.178	0.202	0.254	0.269	0.345	-0.166 *
4	0.464	0.492	0.492	0.535	0.586	-0.122 *
5(strong)	0.676	0.670	0.667	0.654	0.656	0.02
Panel B. Limit Sell (LSell)						
$LSell_{[t-4,t-1]}$	1(loser)	2	3	4	5(winner)	Diff(1-5)
Total	0.001	-0.044	-0.032	-0.029	0.107	-0.106 ***
1(weak)	-0.626	-0.708	-0.804	-0.900	-1.005	0.379 ***
2	-0.010	-0.094	-0.130	-0.216	-0.303	0.293 ***
3	0.206	0.143	0.107	0.074	0.020	0.186 ***
4	0.373	0.292	0.279	0.251	0.254	0.119 ***
5(strong)	0.574	0.498	0.491	0.460	0.502	0.071 ***
Panel C. Market Buy (MBuy)						
$MBuy_{[t-4,t-1]}$	1(loser)	2	3	4	5(winner)	Diff(1-5)
Total	0.096	-0.012	-0.051	-0.090	0.061	0.035 ***
1(weak)	-0.814	-0.912	-0.983	-1.066	-1.106	0.292 ***
2	-0.041	-0.124	-0.196	-0.269	-0.325	0.284 ***
3	0.257	0.204	0.162	0.107	0.074	0.183 ***
4	0.441	0.382	0.357	0.334	0.343	0.098 ***
5(strong)	0.680	0.598	0.578	0.570	0.602	0.079 ***
Panel D. Limit Buy (LBuy)						
$LBuy_{[t-4,t-1]}$	1(loser)	2	3	4	5(winner)	Diff(1-5)
Total	0.183	0.061	-0.038	-0.144	-0.060	0.243 **
1(weak)	-1.149	-1.145	-1.155	-1.166	-1.085	-0.064 ***
2	-0.358	-0.318	-0.264	-0.249	-0.132	-0.226 ***
3	0.123	0.171	0.207	0.243	0.322	-0.199 ***
4	0.438	0.477	0.495	0.535	0.578	-0.141 ***
5(strong)	0.666	0.664	0.648	0.647	0.639	0.027 *

(Q5) than for loser stocks (Q1), after controlling their order type preference of the previous period. The results suggest that individuals willing to buy winners tend to use limit orders and individuals willing to buy losers tend to use market orders.

To examine whether or not these systematic patterns remains after controlling for other variables, I estimate Fama and MacBeth (1973) regressions relating the proportion of market (limit) orders submitted by individual and the previous returns. The dependent variables are the standardized proportion of individuals' market (limit) orders in total trades during t week, that is, $MSell_t$, $LSell_t$, $MBuy_t$, $LBuy_t$. The main independent variable is one-month lagged returns ($CAR_{[t-4,t-1]}$). The lagged returns are split into positive and negative component to examine whether there are any asymmetric reactions to positive and negative stock returns. I also control for the contemporaneous returns (CAR_t), one-month lagged proportion of the corresponding type of order submitted by individuals ($MSell_{[t-4,\ t-1]}$, $LSell_{[t-4,t-1]}$, $MBuy_{[t-4,\ t-1]}$, $LBuy_{[t-4,\ t-1]}$), size, contemporaneous volatility ($Vola_t$), and one-month lagged volatility ($Vola_{[t-4,t-1]}$). These variables have been considered in the previous literature as relevant factors that affect the order imbalances. I perform the cross-sectional regressions for each week of the sample period (556 weeks) and compute the test statistics based on the time-series coefficients. I present the mean coefficients and the t-statistics adjusted for standard errors with the Newey and West (1987) method. The regression models are as follows.

$$\begin{aligned}\mathrm{Pr}oportion_t &= \beta_0 + \beta_1 CAR_t + \beta_2 CAR_{[t-4,t-1]} \\ &\quad + \beta_3 \mathrm{Pr}oportion_{[t-4,t-1]} + \beta_4 Size \\ &\quad + \beta_5 Vola_t + \beta_6 Vola_{[t-4,t-1]} \\ \mathrm{Pr}oportion_t &= \beta_0 + \beta_1 NGCAR_t + \beta_2 PSCAR_t \\ &\quad + \beta_3 NGCAR_{[t-4,t-1]} \\ &\quad + \beta_4 PSCAR_{[t-4,t-1]} \\ &\quad + \beta_5 \mathrm{Pr}oportion_{[t-4,t-1]} + \beta_6 Size \\ &\quad + \beta_7 Vola_t + \beta_8 Vola_{[t-4,t-1]} \\ \mathrm{Pr}oportion &\in \{MSell,\ LSell,\ MBuy,\ LBuy\}\end{aligned}$$

<Table 4> shows that the coefficient of $CAR_{[t-4,t-1]}$ is significantly positive for $MSell$, but significantly negative for $LSell$. The results are the same when using $NGCAR_{[t-4,t-1]}$ and $PSCAR_{[t-4,t-1]}$ instead of $CAR_{[t-4,t-1]}$. For sells, the proportion of market orders submitted by individual in total trades is positively correlated with the previous one-month returns; however, the proportion of their limit orders is negatively correlated with the previous returns. It means that individuals holding stocks with high one-month lagged returns prefer to sell them with market orders; while individuals holding stocks with low one-month lagged returns prefer to sell them with limit orders.

Individual buyers also make an asymmetric order-type selection depending on the previous returns. In <Table 4>, the coefficient of $CAR_{[t-4,t-1]}$ is significantly negative for $MBuy$, and positive for $LBuy$. The results are the same when using $NGCAR_{[t-4,t-1]}$ and $PSCAR_{[t-4,t-1]}$ instead of $CAR_{[t-4,t-1]}$. It means that for buy flows, individuals' market order ratio is negatively correlated with the previous returns and their limit order ratio is positively correlated with the previous returns. Individuals tend to buy winners carefully with limit orders, which guarantee execution at the specified price; however, they tend to buy losers aggressively with market orders, which ensure prompt execution.

This can be explained by the asymmetric change of individuals' risk attitude depending on the previous stock performance, which is proposed by the Prospect theory. According to the Prospect theory, individual investors show risk-averse attitude in the concave region above a reference point, and risk-seeking attitude in the convex region below it. Thus, an investor above his reference point gets more risk-aversive and diminishes his risk exposure with market orders, but an investor below his reference point becomes less sensitive to risk and reduce his risk exposure with limit orders less aggressively. Likewise, investors have a greater appetite for large loser than for large winners due to their asymmetric risk attitude. Thus, they would prefer to buy the loser stocks with market orders promptly, but winner stocks with limit orders cautiously[13].

The coefficient of CAR_t is negative for MSell and

Table 4. Regressions relating the proportion of market (limit) orders submitted by individual and the previous returns

This table presents the results of the weekly regression relating individuals' order-selection behavior and previous returns. The dependant variables are the standardized proportion of individuals' market (limit) orders in total trades during t week ($MSell_t$, $LSell_t$, $MBuy_t$, $LBuy_t$). The main independent variable is the one-month lagged returns ($CAR_{[t-4,t-1]}$). I control for contemporaneous returns (CAR_t), one-month lagged proportion of corresponding type of order submitted by individuals ($MSell_{[t-4,\ t-1]}$, $LSell_{[t-4,t-1]}$, $MBuy_{[t-4,\ t-1]}$, $LBuy_{[t-4,\ t-1]}$), size, contemporaneous volatility ($Vola_t$), and one-month lagged volatility ($Vola_{[t-4,t-1]}$). Volatility is calculated by the standard deviations of daily raw returns during the specified period. In order to examine whether there exist ant asymmetric reactions to positive and negative stock returns, I split contemporaneous and one-month lagged returns (CAR) into positive and negative component (NGCAR, PSCAR) and then estimate the same regression.
I perform cross-sectional regressions for each week in the sample periods (556 weeks) and compute the test statistics based on the time-series coefficients (Fama and Macbeth, 1973). I present the mean coefficients and the t-statistics adjusted for standard errors with the Newey-West correction. The regression analysis is conducted separately for buys and sells. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variable	MSell		LSell		MBuy		LBuy	
	Coef.	T-value	Coef.	T-value	Coef.	T-value	Coef.	T-value
Intercept	0.066	6.18 ***	0.005	0.38	0.023	1.81 *	0.013	1.41
CAR_t	-2.148	-40.39 ***	4.986	47.74 ***	2.625	37.12 ***	-4.235	-49.99 ***
$CAR_{[t-4,t-1]}$	0.228	11.58 ***	-0.566	-24.50 ***	-0.591	-28.36 ***	0.272	10.86 ***
$M(L)Buy(Sell)_{[t-4,\ t-1]}$	0.184	180.76 ***	0.148	100.34 ***	0.164	123.48 ***	0.184	167.09 ***
Size	-0.096	-52.19 ***	-0.078	-32.21 ***	-0.087	-31.37 ***	-0.081	-44.64 ***
$Vola_t$	-2.309	-17.49 ***	3.278	19.43 ***	5.465	32.72 ***	0.997	6.32 ***
$Vola_{[t-4,t-1]}$	5.702	25.57 ***	1.259	6.15 ***	-0.625	-3.01 ***	3.533	19.30 ***
Intercept	0.054	4.78 ***	0.042	3.22 ***	0.037	2.80 ***	-0.023	-2.33 **
$NGCAR_t$	-2.934	-25.12 ***	7.740	41.23 ***	3.770	25.67 ***	-6.746	-44.22 ***
$PSCAR_t$	-1.742	-28.17 ***	3.356	28.16 ***	1.998	24.44 ***	-2.731	-29.96 ***
$NGCAR_{[t-4,t-1]}$	0.226	6.33 ***	-0.770	-19.75 ***	-0.874	-24.86 ***	0.365	8.74 ***
$PSCAR_{[t-4,t-1]}$	0.205	7.71 ***	-0.254	-7.25 ***	-0.287	-9.57 ***	0.093	3.07 ***
$M(L)Buy(Sell)_{[t-4,\ t-1]}$	0.184	178.28 ***	0.149	100.36 ***	0.164	123.77 ***	0.185	166.64 ***
Size	-0.096	-52.19 ***	-0.079	-32.87 ***	-0.088	-31.86 ***	-0.080	-44.54 ***
$Vola_t$	-2.601	-20.27 ***	4.378	28.72 ***	5.752	35.67 ***	-0.062	-0.43
$Vola_{[t-4,t-1]}$	5.468	25.43 ***	1.642	8.06 ***	-0.804	-3.95 ***	2.950	17.07 ***

positive for LSell, however, it is positive for MBuy and negative for LBuy. These opposite relationships may be caused by the different execution mechanisms of market and limit orders. In general, a price decreases when market sell orders are executed, causing a negative correlation between CAR_t and MSell; a price increase when market buy orders are executed, causing a positive correlation between CAR_t and MBuy. In contrast, a large price increase on a day causes limit sell orders to be executed on that day, leading positive correlation between CAR_t and LSell; a large price decrease on a day causes limit buy orders to be executed on that day, leading negative correlation between CAR_t and LBuy.

The coefficient of lagged proportions of corresponding type of order submitted by individuals is significantly

13) Their belief regarding return reversal would induce individual buyers' asymmetric choice of order-type. Andreassen (1987, 1988) showed that individuals typically expect a mean-reversion in prices when they are exposed to price paths from stock market data. (unlike institutions)

positive in all four regression models, meaning that individuals prefer one type of order to the other type continuously for a specific period of time. The coefficients of size are significantly negative, meaning that regardless of the type of order, the portion of individual investors' investment is high in small-cap stocks. Total volatility which combine the transitory volatility and information-driven volatility shows mixed results, consistent with Bae et al.(2003), who find that more limit orders than market orders are placed when transitory volatility rises, but the impact of informational volatility on order flow is indeterminate.

In short, individuals choose the type of order asymmetrically depending on the previous returns of stocks and the asymmetric patterns are maintained after controlling the relevant factors that affect the order imbalances. Individuals holding winners prefer to sell them with market orders, and individuals holding losers prefer to sell them with limit orders. However, individuals willing to buy winners tend to use limit orders and individuals willing to buy losers tend to use market orders. My finding that is individuals' asymmetric choices of order-type depending on the previous stock returns can explain the opposing trading tendencies-contrarian in market trades and momentum in limit trades. In market trades, the sell imbalance become larger in winners and the buy imbalance become larger in losers, which is reported as negative-feedback trading; however, in limit-trades, the buy imbalance become larger in winners and the sell imbalance become larger in losers, which is reported as positive-feedback trading.

I perform some robustness tests.

First, I check whether the individual investors respond to the previous returns measured over a shorter period. I regress the proportion of market (limit) orders submitted by individuals in total trades on two-week and one-week lagged returns ($CAR_{[t-2,t-1]}$, and CAR_{t-1}), respectively. According to Panel A and B of <Table 5>, the results of the regressions using short-term previous returns are very similar. The coefficient of each previous return is significantly positive for *MSell*, and significantly negative for *LSell*. And those coefficient is positive for *LBuy*, and negative for *MBuy*.

Second, since the Prospect theory suggests that investors' risk attitude may change depending on whether investors are above a reference point (in a profit region) or below it (in a loss region), I check whether their asymmetric order-type selection are related to their investment performances rather than to the previous returns. I estimate the same regression using the proxy of 1-month unrealized capital gain, constructed by Grinblatt and Han (2005)[14], as independent variables, instead of the previous returns. As Panel C of <Table 5> shows, the regression using the proxy of unrealized capital gain generates similar results. The coefficient of profit (1M) is positive for *MSell* and negative for *LSell*. This coefficient is positive for *LBuy* and negative for *MBuy*. It means the individuals' investment performances during the previous one month change their risk attitude and then influence their order-selection behavior.

Lastly, I check whether the above order type selection behaviors are the peculiar feature found only in individual investors. The same regression analyses are performed using the standardized proportions of market (limit) orders submitted by institutions and foreigners, respectively. According to Panel A of <Table 6>, in all four regressions using institutional investor's order-type ratio, the coefficient of the previous returns was significantly positive. For both buys and sells, institutions trade

14) Grinblatt and Han (2005) suggest the proxy of unrealized capital gains at the end of week (t-1) which is calculated by $\frac{P_{t-1}-R_{t-1}}{P_{t-1}}$, where P_{t-1} is the average price of week (t-1) and R_{t-1} is the relevant reference price (the proxy of average purchase price) at the end of week (t-1). R_{t-1} is calculated by $\frac{1}{k}\sum_{n=1}^{4}\left(V_{t-n}\prod_{\tau=1}^{n-1}[1-V_{t-n+\tau}]\right)P_{t-n}$, where V_t is week t's turnover ratio and P_t is week t's average stock price. The term in parentheses multiplying P_{t-n} is a weight, which is the probability that a share was last purchased at week (t-n) and has not been traded since then. k is a constant that makes the weights on past prices to one. k is calculated by $\sum_{n=1}^{4}\left(V_{t-n}\prod_{\tau=1}^{n-1}[1-V_{t-n+\tau}]\right)$. Thus, R_{t-1} could be interpreted as the average purchase price of buyers, who have bought the stocks during previous 6-months. (See Grinblatt and Han (2005) for details).

Table 5. Robustness tests: Regressions relating the proportion of market (limit) orders submitted by individual and the previous performance

This table presents the results of robustness tests. I check whether the individual investors responded to the previous returns measured over a shorter period. I regress the proportion of market (limit) orders submitted by individuals in total trades on one-week and two-weak lagged returns ($CAR_{[t-2,t-1]}$, and CAR_{t-1}), respectively. (Panel A and B). I also test whether individuals' asymmetric order-type selection are related to their investment performances rather than to the previous returns. I estimate the same regression using the proxy of 1-month unrealized capital gain, constructed by Grinblatt and Han (2005), as independent variables. (Panel C). ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A. $CAR_{[t-2,\ t-1]}$

Variable	Msell		Lsell		MBuy		LBuy	
	Coef.	T-value	Coef.	T-value	Coef.	T-value	Coef.	T-value
Intercept	0.148	14.69 ***	0.008	0.55	0.028	2.18 **	0.059	6.63 ***
CAR_t	-2.183	-40.50 ***	5.027	47.61 ***	2.677	36.67 ***	-4.267	-50.44 ***
$CAR_{[t-2,t-1]}$	0.568	19.01 ***	-0.846	-24.18 ***	-0.898	-30.15 ***	0.646	17.63 ***
$M(L)Buy(Sell)_{[t-2,\ t-1]}$	0.267	78.32 ***	0.190	51.34 ***	0.226	61.76 ***	0.257	81.15 ***
Size	-0.138	-73.30 ***	-0.101	-44.49 ***	-0.117	-41.68 ***	-0.112	-69.35 ***
$Vola_t$	-1.862	-14.05 ***	3.176	18.47 ***	5.259	31.68 ***	1.350	8.47 ***
$Vola_{[t-2,t-1]}$	5.315	25.75 ***	2.577	12.73 ***	1.168	6.05 ***	3.652	21.21 ***

Panel B. CAR_{t-1}

Variable	Msell		Lsell		MBuy		LBuy	
	Coef.	T-value	Coef.	T-value	Coef.	T-value	Coef.	T-value
Intercept	0.220	19.46 ***	0.006	0.36	0.032	2.09 **	0.097	8.51 ***
CAR_t	-2.184	-39.98 ***	5.009	47.63 ***	2.677	36.72 ***	-4.251	-51.29 ***
CAR_{t-1}	0.999	24.13 ***	-1.055	-20.87 ***	-1.255	-30.66 ***	1.036	20.67 ***
$M(L)Buy(Sell)_{t-1}$	0.493	98.97 ***	0.347	65.60 ***	0.404	76.55 ***	0.517	103.34 ***
Size	-0.187	-90.93 ***	-0.126	-48.12 ***	-0.151	-48.32 ***	-0.152	-87.50 ***
$Vola_t$	-1.726	-12.64 ***	3.363	18.93 ***	5.472	32.88 ***	1.534	9.42 ***
$Vola_{t-1}$	5.919	27.06 ***	3.901	16.92 ***	2.850	13.15 ***	4.671	23.62 ***

Panel C. Profit (1M)

Variable	Msell		Lsell		MBuy		LBuy	
	Coef.	T-value	Coef.	T-value	Coef.	T-value	Coef.	T-value
Intercept	0.048	4.67 ***	0.035	2.59 **	0.048	3.76 ***	-0.010	-1.10
CAR_t	-2.157	-39.89 ***	5.002	47.40 ***	2.643	37.14 ***	-4.249	-49.61 ***
profit(1M)	0.334	11.75 ***	-0.798	-21.93 ***	-0.857	-26.17 ***	0.328	8.93 ***
$M(L)Buy(Sell)_{[t-4,\ t-1]}$	0.184	185.56 ***	0.147	101.93 ***	0.164	124.62 ***	0.184	171.41 ***
Size	-0.096	-51.76 ***	-0.080	-32.46 ***	-0.088	-31.47 ***	-0.082	-44.58 ***
$Vola_t$	-2.314	-17.39 ***	3.265	19.22 ***	5.470	32.69 ***	1.014	6.38 ***
$Vola_{[t-4,t-1]}$	6.084	29.07 ***	0.508	2.50 **	-1.382	-6.81 ***	4.055	23.71 ***

a lot of stocks that have appreciated during the previous month with both market and limit orders. Although there are some differences in significance, the results about foreign investors' order-type selection behavior are similar to those of institutions. (Panel B of <Table 6>) Institutions and foreigners do not

Table 6. Robustness tests: Regressions relating the proportion of market (limit) orders submitted by other investors and the previous returns

This table presents the results of the weekly regression relating other investors' order-type selection behavior and the previous returns. Panel A shows the results of institutional investors and Panel B shows the results of foreign investors. The dependent variables of Panel A and B are the standardized proportions of market (limit) orders submitted by institutions and foreigners, respectively. The regression model and methodology are the same as the <Table 4>. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Institutions

Variable	MSell			LSell			MBuy			LBuy		
	Coef.	T-value		Coef.	T-value		Coef.	T-value		Coef.	T-value	
Intercept	-0.048	-4.51	***	0.008	0.76		-0.012	-1.41		0.033	3.42	***
CAR_t	-1.540	-25.72	***	-0.286	-7.81	***	1.662	30.66	***	0.786	22.17	***
$CAR_{[t-4,t-1]}$	0.255	16.66	***	0.236	14.81	***	0.098	5.49	***	0.211	12.71	***
$M(L)Buy(Sell)_{[t-4,\ t-1]}$	0.185	151.59	***	0.180	133.00	***	0.189	143.39	***	0.185	157.77	***
Size	0.091	40.89	***	0.077	36.74	***	0.076	32.41	***	0.063	27.78	***
$Vola_t$	0.443	3.51	***	-0.311	-3.17	***	-2.573	-20.45	***	-3.511	-31.39	***
$Vola_{[t-4,t-1]}$	-4.079	-20.09	***	-4.325	-24.75	***	-1.677	-9.31	***	-1.462	-8.20	***

Panel B. Foreigners

Variable	MSell			LSell			MBuy			LBuy		
	Coef.	T-value		Coef.	T-value		Coef.	T-value		Coef.	T-value	
Intercept	-0.050	-5.93	***	-0.033	-4.53	***	-0.053	-7.51	***	-0.042	-6.76	***
CAR_t	-0.887	-14.78	***	-0.400	-13.41	***	0.822	12.86	***	0.449	11.84	***
$CAR_{[t-4,t-1]}$	0.071	5.54	***	0.052	4.02	***	0.036	2.21	**	0.023	1.71	
$M(L)Buy(Sell)_{[t-4,\ t-1]}$	0.206	73.57	***	0.213	89.23	***	0.210	82.39	***	0.212	89.64	***
Size	0.043	12.38	***	0.038	12.62	***	0.041	12.98	***	0.039	12.94	***
$Vola_t$	0.222	2.47	**	-0.340	-3.55	***	-0.911	-7.06	***	-1.469	-10.51	***
$Vola_{[t-4,t-1]}$	-1.118	-7.49	***	-0.864	-6.68	***	-0.033	-0.23		0.301	2.36	**

choose the type of orders asymmetrically depending on the previous returns of stocks, unlike individuals.

B. Alternative estimation

Because the trading volume itself fluctuates according to the previous returns, the above results may have been driven by the total trading volume used as the denominator of the main variables (MSell, LSell, MBuy, and LBuy). To control the impact of the trading volume, I conduct the alternative regression analysis using individuals' buy and sell flows. Buy and sell flows are defined as individuals' daily buying Won volume and selling Won volume divided by the average daily trading Won volume in the previous 250 trading days, which has a stable value. I aggregate these measures to the weekly frequency, because this paper focuses on the weekly relation between trading imbalance and previous returns.

To examine whether individuals choose the type of order asymmetrically depending on the previous returns of stocks, I perform the following regression separately for market and limit trades. The basic idea behind the regression analysis is as follows. Unless individual investors asymmetrically select their type of order depending on the previous returns, the flows of market and limit trades should increase at a similar

velocity as previous returns increase. However, if individual investors implement an asymmetric order-selection strategy depending on the previous returns, the velocities of their increase could differ between the two types of trades. For example, if individuals holding winners choose market-sell and individuals holding losers choose limit-sell, sell flows in market trades increase more than those in limit trades do as previous returns increase, and sell flows in limit trades decrease less than those in market trades do as previous returns decrease.

I estimate Fama and MacBeth (1973) regression, for each of the market and limit trades. Specifically, I regress the standardized buy (sell) flows on contemporaneous returns (CAR_t), one-month lagged returns ($CAR_{[t-4,\ t-1]}$), past standardized buy (sell) flows ($Sell_{[t-4,\ t-1]}$, $Buy_{[t-4,\ t-1]}$), contemporaneous volatility ($Vola_t$) and one-month lagged volatility ($Vola_{[t-4,\ t-1]}$). The contemporaneous and lagged returns are split into positive and negative components and enter the regression model to examine whether there exist any asymmetric reaction to positive and negative stock returns. The regression models[15] are as follows.

$$\begin{aligned} Flows_t &= \beta_0 + \beta_1 NGCAR_t + \beta_2 PSCAR_t \\ &\quad + \beta_3 NGCAR_{[t-4,\ t-1]} + \beta_4 PSCAR_{[t-4,\ t-1]} \\ &\quad + Flows_{[t-4,t-1]} + Vola_t + Vola_{[t-4,t-1]} \\ Flows &\in \{Buys, Sells\} \end{aligned}$$

<Table 7> presents that for both market and limit trades, individuals' buys and sells increase as previous returns increase but the velocities of their increase are different. The columns of 'Sells' in <Table 7> present that the coefficients of $PSCAR_{[t-4,\ t-1]}$ and $NGCAR_{[t-4,\ t-1]}$ are larger in market trades than in limit trades. For stocks with positive lagged returns, individuals' market-sell flows increase more than their limit-sells do as previous returns increase; however, for stocks with negative lagged returns, individuals' market-sell flows decrease more than their limit-sells do as previous returns decrease. It means that individuals holding winners tend to sell with market trades, while they holding losers tend to sell with limit trades. This can be explained by the asymmetric change of their risk attitude depending on the previous stock performance, proposed by the Prospect theory.

Individual buyers also implement asymmetric order-selection strategy depending on previous returns of stocks. The columns of 'Buys' in <Table 7> show that the coefficients of $PSCAR_{[t-4,\ t-1]}$ and $NGCAR_{[t-4,\ t-1]}$ are larger in limit trades than in market trades. For winners, their limit-buy flows increase faster than their market-buy flows do as previous returns increase; however, for losers, their limit-buy flows decrease more than their market-buys do as previous returns decrease. It seems that individuals buy winners more carefully with limit trades; however, they repurchase losers more aggressively with market trades.

In short, in an alternative model, I confirm the same result, that is, individuals holding winners prefer to sell with market-orders, individuals holding losers prefer to sell with limit-orders; however, individuals willing to buy winners tend to use limit-orders, individuals willing to buy losers tend to use market-orders.

Ⅴ. Conclusion

In this paper, I revisited the trading tendencies reported in Korean stock market and investigated why the contrarian in market trades and the momentum in limit trades have emerged. I examined the possibility that individuals choose order-type asymmetrically depending on previous stock returns, resulting the different feedback trading patterns in market and limit trades.

I examine whether individual investors select the type of order asymmetrically depending on the previous returns by using all of individuals' transactions for

15) The regression models and methodologies are similar to Jackson (2003).

Table 7. Alternative estimation: Regressions relating individuals' Buys (Sells) and previous returns

This table presents the results of the weekly regressions relating individuals' buy and sell flows and the previous returns. I estimate a Fama and MacBeth (1973) regression, where standardized buys (sells) are regressed on one-month lagged positive and negative returns ($NGCAR_{[t-4,t-1]}$, $PSCAR_{[t-4,t-1]}$). I control contemporaneous returns (CAR_t), past standardized buy (sell) flows, and past weekly return volatilities. I construct buy (sell) flows measure by dividing individuals' daily buying (selling) value by the average daily trading value in the previous 250 trading days and aggregating these measures to the weekly frequency. I perform cross-sectional regressions for each week of sample period (556 weeks) and compute the test statistics based on the time-series coefficients. I present the mean coefficients and the t-statistics adjusted for standard errors with Newey-West correction. I analyze total trades, market trades and limit trades separately. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Variable	Total Trades				Market Trades				Limit Trades			
	Buys		Sells		Buys		Sells		Buys		Sells	
	Coef.	T-value	Coef.	T-value	Coef.	T-value	Coef.	T-value	Coef.	T-value	Coef.	T-value
Intercept	-0.205	-19.81 ***	-0.200	-20.08 ***	-0.167	-16.04 ***	-0.169	-15.97 ***	-0.171	-15.18 ***	-0.159	-14.79 ***
$NGCAR_t$	-0.960	-12.30 ***	-0.500	-7.01 ***	-0.113	-1.36	-0.961	-11.50 ***	-1.422	-15.02 ***	0.327	4.11 ***
$PSCAR_t$	4.232	27.08 ***	4.544	27.82 ***	4.508	26.35 ***	3.829	26.38 ***	3.553	25.12 ***	4.833	26.47 ***
$NGCAR_{[t-4,t-1]}$	0.228	7.28 ***	0.232	7.72 ***	0.158	5.22 ***	0.252	8.14 ***	0.257	7.94 ***	0.164	5.57 ***
$PSCAR_{[t-4,t-1]}$	0.631	12.63 ***	0.653	12.31 ***	0.564	9.48 ***	0.680	12.25 ***	0.667	12.82 ***	0.558	9.37 ***
$Buy(Sell)_{[t-1,\ t-4]}$	0.519	6.50 ***	0.559	5.04 ***	0.498	6.87 ***	0.576	4.90 ***	0.574	4.88 ***	0.567	4.40 ***
$Vola_t$	9.880	27.70 ***	9.465	27.34 ***	9.362	26.85 ***	9.477	27.13 ***	9.743	26.88 ***	8.932	26.51 ***
$Vola_{[t-4,\ t-1]}$	-1.747	-8.29 ***	-1.585	-7.64 ***	-1.869	-9.24 ***	-1.377	-6.47 ***	-1.604	-7.50 ***	-1.767	-8.61 ***

659 common KSE stocks between January 1, 1999 and August 31, 2009. I analyze the weekly relation between the previous stock returns and the proportion of executed market (limit) orders submitted by individual investors, for sells and buys, separately.

I find that both individual sellers and buyers make an asymmetric choice of order-type depending on the previous returns of stocks. Individuals holding stocks with positive one-month lagged returns prefer to sell them with market orders, while individuals holding stocks with negative one-month lagged returns prefer to sell them with limit orders. Individuals tend to buy winners with limit orders more carefully, while they tend to repurchase losers with market orders more aggressively. As a result, in market trades, the sell imbalance become larger in winners and the buy imbalance become larger in losers, which is reported as negative-feedback trading; in limit-trades, the buy imbalance become larger in winners and the sell imbalance become larger in losers, which is reported as positive-feedback trading.

My finding of order-type selection behavior of individual investors has allowed to explain the conflicting trading tendency-contrarian in market trades and momentum in limit trades, in an integrated way. I add new empirical findings to the Prospect theory, demonstrating that changes of risk attitude could influence not only selling decisions but also detailed selling behavior such as the choice of order type.

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References

Andreassen, P. (1987). On the social psychology of the stock market: Aggregate attributional effects and the regressiveness of prediction. *Journal of Personality and Social Psychology, 53*(3), 490-496.

Andreassen, P. (1988). Explaining the price-volume relationship: The difference between price changes and changing prices. *Organizational Behaviors and Human Decision Processes, 41*(3), 371-389.

Bae, K-H., H. Jang, & K-S, Park, (2003). Traders' choice between limit and market orders: evidence from NYSE stocks. *Journal of Financial Markets, 6*, 517-538.

Barber, B., & T. Odean, 2011, The Behavior of Individual Investors, Working Paper.

Chen, G., K. Kim, J. Nofsinger, & O. Rui, (2007). Trading Performance, Disposition Effect, Overconfidence, Representative Bias, and Experience of Emerging Market Investors. *Journal of Behavioral Decision Making, 20*, 425-451.

Choe, H., B. C. Kho, & R. M. Stultz, (1999). Do foreign investors destabilize stock markets? The Korean experience in 1997. *Journal of Financial Economics, 54*, 227-264.

Chun, H., & J. Shim, (2017). A comparison of investors' and analysts' biases in interpreting Book-Tax Difference: Evidence from Korean stock market. *Global Business and Finance Review, 22*, 16-33.

Chung, K., & B. VanNess, (1999). Limit orders and the bid-ask spread. *Journal of Financial Economics, 53*, 255-287.

Dhar, R., & N. Zhu, (2006). Up Close and Personal: Investor Sophistication and the Disposition Effect. *Management science, 52*(5), 726-740.

Fama, E., & J. Macbeth, (1973). Risk, return, and equilibrium: Empirical tests. *Journal of Political Economics, 81*, 602-636.

Genesove, D., & C. Mayer, (2001). Loss aversion and seller behaviors: Evidence from the housing market, *The Quarterly Journal of Economics, 116*, 1233-1260.

Gneezy, U. (1998). *Updating the reference level: Experimental evidence*. Working paper. University of Hifa.

Goldstein, M., & K. Kavajecz, (2000). Eighths, sixteenths, and market depth: changes in tick size and liquidity provision on the NYSE. *Journal of Financial Economics, 56*, 125-149.

Griffin, J., J. Harris, & S. Topaloglu, (2003). The dynamics of institutional and individual trading. *Journal of Finance, 58*, 2285-2320.

Grinblatt, M., & B. Han, (2005). Prospect theory, mental accounting and momentum. *Journal of Financial Economics, 78*(2), 311-339.

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

Grinblatt, M., & M. Keloharju, (2001). What makes investors trade? *Journal of Finance, 56*, 589-616.

Grinblatt M., S. Titman, & R. Wermers, (1995). Momentum investment strategies, portfolio performance, and herding:

A study of mutual fund behavior. *American Economic Review, 85*, 1088-1105.

Harris, L., & J. Hasbrouck, (1996). Market vs. limit order: The SuperDOT evidence on order submission strategy. *Journal of Financial and Quantitative Analysis, 31*, 213-231.

Heath, C., S. Huddart, & M. Lang, (1999). Psychological factors and stock option exercise. *The Quarterly Journal of Economics, 114*(2), 601-627.

Honggowati, S., Y. A. Aryani, & R. Rahmawati, (2015). Value relevance of financial and non-financial information to investor decision. *Global Business & Finance Review, 20*, 90-104.

Hur, J., M. Pritamani, & V. Sharma, (2010). Momentum and the disposition effect: The role of invididual investors. *Financial Management, 39*(3), 1155-1176.

Jackson A. (2003). *The aggregate behaviour of individual investors*. Working Paper. London Business School.

Kaniel, R., G. Saar, & S. Titman, (2008). Individual investor trading and stock returns. *Journal of Finance, 63*, 273-310.

Lee, H-J., (2016). Individuals' feedback trading in market and limit trades: Trading behaviours on Korean stock market. *Investment Analysts Journal*, *45*(3), 1-21.

Lee, Y. T., J. C. Lin, & Y. J. Liu, (1999). Trading patterns of big versus small players in an emerging market: and empirical analysis. *Journal of Banking and Finance, 23*, 701-725.

Newey, W., & K. West, (1987). A simple, positive semi-definite heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica, 55*(3), 703-708.

Nofsinger, J. R., & R. W. Sias, (1999). Herding and feedback trading by institutional and individual investors. *Journal of Finance, 54*, 2263-2295.

Odean, T. (1998). Are investors reluctant to realize their losses? *Journal of Finance, 53*, 1775-1798.

Shefrin, H., & M. Statman, (1985). The disposition to sell winners too early and ride losers too long: Theory and Evidence. *Journal of Finance, 40*, 777-790.

Trang, P. T. M., & Khuong, M. N. (2017). Personality traits, perceived risk, uncertainty, and investment performance in Vietnam. *Global Business & Finance Review, 22*, 67-79.

Tversky, A., & D. Kanhneman, (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics, 106*(4), 1039-1061.

Wermers R. (1999). Mutual fund herding and impact on stock prices. *Journal of Finance, 55*, 581-622.