Who destabilizes the Korean stock market in the 2008 global financial crisis?

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Abstract

Motivated by Choe, Kho and Stulz (1999)'s study on the Asian financial crisis of 1997, this paper examines which type of investor among the Korean individuals, Korean institutions, and foreign investors is most responsible for the sudden drop of the Korean stock market during the global financial crisis of 2008. Between two periods the Korean stock market completely opened their equity market to foreign investors. Herding by foreign investors is higher than those of Korean individuals and institutions before and during the crisis, and foreigners' herding behaviour increases during the crisis period, especially in large stocks. In both event study with 5-minute intervals and price impact per trade, foreign investors' sales have smaller impact on stock returns in absolute value than Korean individuals' and institutions' before crisis. However, price impact of foreign investors increases dramatically during the crisis and its magnitude is not negligible. The permanent component of price impact per trade of foreign investors is greater in absolute value than other investors' in large stocks. The results imply that the equity market liberalization increases the destabilizing effect (price impact) of foreign investors during the financial crisis period.

Keywords: *Market liberalization; Global financial crisis; Foreign Investor; Herding; Price impact*

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1. Introduction

The benefits and costs of capital market liberalizations of emerging markets have long been debated. The market liberalization could be beneficial to emerging economies by reducing the cost of capital(Bekaert and Harvey (1997), Henry (2000), Bekaert and Harvey (2000) , Chari and Henry (2004)), stimulating the economic growth(Henry (2000), Bekaert, Harvey and Lundblad (2001), Bekaert, Harvey and Lundblad (2003), Bekaert, Harvey and Lundblad (2005), Quinn and Toyoda (2008), Gupta and Yuan (2009)), increasing the market efficiency(Kawakatsu and Morey (1999), Kim and Singal (2000)), and improving the corporate governance(Bae and Goyal (2010)). Despite these supportive evidences, many emerging markets are still reluctant to open their capital markets due to the costs of market liberalization. They fear the instability caused by large capital flows from foreign investors(Stiglitz (2000)). There are also evidences that more foreigner-investible stocks are more vulnerable to world market risk(Bae, Chan and Ng (2004)), and capital flows from the developed markets can transmit the liquidity shock originated in their country into the emerging markets(Jotikasthira, Lundblad and Ramadorai (2012), Schnabl (2012)). If these costs exceed the benefits, the precedent fruit of liberalization will be swallowed up.

For this debate, Choe, Kho and Stulz (1999) already investigated the impact of foreign investors on stock returns during the Asian financial crisis of 1997 using the data from the Korea Stock Exchange. They concluded that trades by foreign investors did not destabilize the Korean stock market. Their results, however, leave a curious question since in Korea the ownership limit on individual foreign investor was 7% and aggregate limit is 26% until December 11, 1997. According to their paper, average percentage of daily trading volume attributed to foreigners is only 4.44%, which is so small compared to 81.54% of Korean individuals and 12.87% of Korean institutions. It is partly expected outcome that such a tiny percentage could not destabilize the whole market.

There are also opposite researches afterward. Ghysels and Seon (2005) show the destabilizing effect of foreign investors in Korea emphasizing the role of the derivatives during the Asian financial crisis. Richards (2005) argues that foreign investors have a larger impact on emerging markets than

reported from the previous researches by analyzing the daily trading of foreign investors in six Asian equity markets.

Foreign ownership limits on both individual and aggregate investors are completely removed on May 25, 1998 in Korea. The entrance-free period afterward is not included in Choe, Kho and Stulz (1999). After a decade of the abolition of foreign restriction, the global financial crisis originated from the subprime mortgage in US and the bankruptcy of Leman Brothers influenced the Korean economy in 2008. The Won/USD exchange rate increased twice and KOSPI fell down. In this paper, I revisit the issue of the impact of foreign investor on the emerging stock markets by using the Korea stock data from January 2008 to February 2009 including the global financial crisis of 2008. Up to that time, the weight of foreign investors has increased constantly. At the end of 2009, percentage of market capitalization owned by foreign investors reaches 30.4%. (see Kho (2011) for detailed information on foreign investors in Korea).

I study the impact of foreign investors in a perfectly free and open market whereas Choe, Kho and Stulz (1999) investigate a restricted market to the foreigners. It is a difference of this paper from them. Many emerging countries fear to open their market completely due to their 'vulnerability to vacillations in international flows' as documented by Stiglitz (1998). Korea, however, has lifted its restriction to foreign investors completely from May 1998 and afterward experienced the global financial crisis in 2008. Therefore, Korean stock market provides us the opportunity of 'natural experiment' on the impact of foreign investors in the open capital market setting. The following hypothesis is examined in this paper:

Hypothesis: The relaxation or elimination of foreign ownership restriction stimulates the foreign investors' trading in the emerging markets. It will also increase the destabilizing effect (price impact) of foreign investors during the financial crisis period.

The procedure used in the paper is similar to that of Choe, Kho and Stulz (1999). At first, I investigate the herding behaviour and order imbalances. Then, the destabilizing effect is examined by

the event study with 5-minute intervals and the price impact per trade.

Main results of our research are as following. Herding behaviour of foreign investors is different from other investors. They have higher herding measures than Korean individuals and institutions. The herding measures of individuals are between -2% and 13% and those of institutions are between 8% and 15%. The herding by foreign investors ranges from 13% to 18%. Herding by both Korean individuals and institutions was weakened during crisis. However, herding by foreigners increases significantly during the crisis period, especially in large stocks.

Korean institutions are strong positive feedback traders in all times. Foreign investors have a property of positive feedback trader before crisis, but this property disappears during crisis period. They are net sellers of Korean stocks. It implies that positive feedback trading was not a source of the increase in foreigners' herding during the crisis.

In the event study with 5-minute intervals, the large net sell order imbalances by Korean individuals have the greater negative impact on stock returns than other investors. The negative impact of large net sell order imbalance is reversed to the positive after fifteen minutes. For Korean institutions and foreign investors it needs five minutes for a reversal. During crisis, this reversal becomes weaker for foreign investors whereas it becomes stronger for Korean individuals and institutions. In addition, the temporary and permanent price impacts per trade are examined before and during crisis. For the price-setting sell trades, the magnitude of foreign investor is the smallest among investors before crisis. However, their price impact increases dramatically during the crisis period, especially in the permanent components.

In summary, empirical results on price impact show that foreign investors have the smallest impact on stock returns before crisis in terms of the absolute value of price impact. However, the increase in price impact of foreign investors is the greatest during crisis and its magnitude is not negligible.

Empirical results from the 2008 global financial crisis in this paper are not consistent with those from Choe, Kho and Stulz (1999) in the Asian financial crisis of 1997. The important change of the Korean stock market between two periods is that Korea completely opened their equity market to

foreign investors. The elimination of foreign restriction results in the gradual increase of foreign ownership and in 2008 the trading volumes of foreign investors are similar to those of Korea institutions and individuals in the large stocks. The Korean evidences from the 2008 global financial crisis show that the price impact of foreign investors' trades increases dramatically during the crisis, even surpassing that of Korean traders. We cannot be caring about the trading activity of foreign investors because they already occupied much room in the Korean stock market. This is also why so many Korean media handle the news about the foreign investors weighty and Koreans pay careful attentions to the activity of foreign investors in the Korean market.

The rest of this paper is organized as follows. Section 2 introduces the background on the Korean market and Section 3 explains the data and sample. Section 4 investigates the herding and feedback trading of investors. Section 5 empirically examines the price impact of large price-setting net sell order imbalance on stock returns around and the temporary and permanent price impacts of each trade for each type of investor. Finally, Section 6 concludes the paper.

2. Background on the Korean market

2.1. The Korean stock market

The Korea Exchange (KRX) is composed of three sub-markets: Korea Composite Stock Price Index (KOSPI) market and Korea Securities Dealers Automated Quotations (KOSDAQ) market, and derivatives market. The KRX was launched in January 2005 by consolidating three domestic markets: Korea Stock Exchange (KSE), KOSDAQ, and Korea Futures Exchange. The KSE corresponds to the KRX KOSPI market nowadays.

Choe, Kho and Stulz (1999) examine the 414 common stocks listed in the KSE during the Asian economic crisis of 1997. Since then, the trading time has changed so much. Saturday is excluded from trading day from December 7, 1998. The morning session from 9:30 to 11:30, and the afternoon session from 13:00 to 15:00 are consolidated into one session by abolishing the launch time from May

22, 2000. Therefore, batch auctions are used two times a day to determine the opening prices and closing prices. For opening batch auction at 9:00, orders are submitted and collected from 8:00. After the opening price determination, trades are executed by continuous auction. For closing prices at 15:00, there is no trade from 14:50 and orders are collected for ten minutes.

The KRX is a pure order-driven market, where there is no designated market maker. It also has an automated trading system (ATS), in which orders are automatically matched and traded. The KRX has recorded investors' type for each trade since 1995. I classify investors into three groups as Choe, Kho and Stulz (1999): Korean individuals, Korean institutions, and foreign investors.[1] Foreign investors who want to trade securities in Korea must register with the Financial Supervisory Service (FSS). The restrictions to foreign ownership for equity were completely removed in May 25, 1998. Some industries such as telecommunications (33%), airlines (50%), media (49%) and electricity (30%) still have its own limits. More detailed information and discussion on foreigners' restrictions were provided by Choe, Kho and Stulz (1999), Ghysels and Seon (2005), and Kho (2011).

2.2. Korea in the 2008 global financial crisis

In 2007, investors holding subprime credit-related assets suffered major losses. Subprime lender New Century Financial filed for bankruptcy at April 2, 2007. The financial institutions such as Bear Stearns, BNP Paribas, UBS, Merrill Lynch and Citigroup also announced massive losses in the subprime-related securities. These massive defaults by subprime mortgages in US spilled over into the world in 2008. The bankruptcy filing of Lehman Brother and the purchase of Merrill Lynch by Bank of America at September 15, 2008 triggered the disturbance of global financial markets (see Longstaff (2010) for more detailed chronology of the major crisis events).

The Korean financial markets are also influenced by the subprime crisis in US. As shown by Figure 1, Korean exchange and stock market experienced severe decline after the announcement of the Lehman Brother's bankruptcy filing. At the next day of the events, KOSPI return fell from 1,478 to

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[1] Originally, the investors' type includes 9 categories; Securities companies, insurance companies, investment trusts, banks, other financial companies, endowments, government, individuals, and foreigners.

1,388 by 6% and Won/USD exchange rate rose from 1,109 to 1,160 by 5%. At October 24, 2008, the KOSPI fell below 1,000 finally marking 939 at the end of the day and exchange rate went up to 1,414 Won/USD. The propensity of financial crisis in the emerging market is that it is associated with the large turbulence of exchange rate. In Figure 1, the KOSPI started to decline from May 2008. However, the large volatile movement of exchange rate is not found till September 2008. The crisis period in this paper, therefore, is determined as the period from September 2008 to February 2009 associated with high range of Won/USD exchange rate.

3. Data and sample selection

3.1. Sample construction

Choe, Kho and Stulz (1999) investigated 414 common stocks listed in the Korea Stock Exchange, which had more than 20 days of foreign price-setting trades over the sample period, and concluded that trades by foreign investors did not destabilize the Korea's stock market during the Asian financial crisis. Ghysels and Seon (2005), however, examined the KOSPI200-included stocks emphasizing the role of derivatives during financial market meltdowns, and found that futures trades by foreign investors played a key role during crisis period. If the same situation happened in the 2008 global financial crisis, the effect of foreign investors would be more likely to be found in the KOSPI200-included stocks rather than all firms listed in the market. Therefore, the 200 firms included in the KOSPI200 index at the end of 2007 are used as sample firms.

Table 1 reports the foreign ownership and trading volume of each type of investors for size deciles from January 2008 to February 2009. Median foreign ownership documented at the end of 2007 ranges from 11.22% for the smallest decile to 39.88 for the largest. Choe, Kho and Stulz (1999) report the 13.48% of median foreign ownership for the largest 42 firms as of November 30, 1996. It shows the foreign investors increase their holding of Korean companies constantly after the Asia financial crisis of 1997.

Average daily trading volume and its percentages of individual, institutions and foreign investors are also reported. For all firms, individuals trade most actively. Their weight is 55.76% of trading volume. The next is institutions of 26.46% and the last is foreigners of 17.91%. This order is the same for all size deciles except the largest. For the largest decile, the percentages of trading volume are almost similar across each type of investor. If anything, the highest percentage corresponds to foreign investors of 35.14%.

3.2. Data Sources

For firm characteristic variables, TS2000 database provided by the Korea Listed Company Association are used. The foreign ownership and firm size are from this database. Daily individual stock returns and the KOSPI returns are obtained from the Korea Capital Market Institute (KCMI). The trading volume and price-setting buy and sell volume are obtained from the Trade and Quote (TAQ) database provided by the KRX and compiled by the Institute of Banking and Finance in Seoul National University.

4. Herding and positive feedback trading

4.1. Herding

Following Lakonishok, Shleifer and Vishny (1992), I compute the following herding measure for each stock and day:

$$H_{i,t} = |\frac{B(i,t)}{B(i,t)+S(i,t)} - p(t)| - AF(i,t) \tag{1}$$

,in which $B(i, t)$ and $S(i, t)$ are the numbers of buyers and sellers of stock i in day t, $p(t)$ is the expected proportion of buyers calculated as the total number of buyers relative to the total number of

investors across all stocks in day *t*. *AF(i, t)* is an adjustment factor, which is the expected value of |*B(i, t) /(B(i, t) + S(i, t))* − *p(t)*| under the null of no herding and a binomial distribution of *B(i, t)*, with the probability of *B(i, t)* equal to *p(t)*.

Table 2 shows the herding measures of individuals, institutions and foreigners before and during crisis, respectively. I first form the quintile portfolios sorted by firm size in Panel A and past-week return in Panel B and then compute the average for each portfolio. In Panel A, herding measures of individuals are between -2% and 13% and those of institutions are between 8% and 15%. The highest range corresponds to the foreign investors' herding measure between 13% and 18%. Difference between before and during crisis period and p-values of the Wilcoxon tests for median difference are also reported. Herding by both Korean individuals and institutions decreases during crisis period across all size quintiles. However, herding by foreigners increases during crisis period, especially in the large quintiles. Foreign investors have higher herding value than Korean individuals and institutions, and their herding behaviour becomes more severe during the crisis period. Panel B, in which all KOSPI200 stocks are sorted by the past-week returns, also shows similar results. Increases in herding measures of foreigners are found in all quintiles, except the highest past-week return portfolio.

4.2. Positive feedback trading

Positive feedback trading strategy is often blamed for their destabilizing role because they make stock price deviated from fundamental value. When the price increases, positive feedback trading props up this increase and it leads to bubble. When the price start to drop, positive feedback trading makes price fall further and even crash the market. (see, DeLong, Shleifer, Summers and Waldmann (1990), Cutler, Poterba and Summers (1990), Balduzzi, Bertola and Foresi (1995)).

To examine the positive feedback trading in the Korea stock market, the price-setting order imbalances of each type of investor are reported. For each stock, price-setting order imbalance of individuals, institutions and foreigners is calculated as price-setting buy volume minus price-setting

sell volume attributed to each type of investor, and standardized by the stock's average trading volume for the sample period. Table 3 show the average price-setting order imbalances of each type of investor conditioning on the sign of market index return. Before crisis, Korean individuals and foreign investors are net sellers irrespective of prior-day market condition and the magnitude of Korean individuals is four times larger than that of foreigners. Korean institutions act as negative feedback trader: They sell after market increases and buy after market falls.

During the global financial crisis, all types of investors are net sellers even following days with positive market return. Price-setting order imbalance of Korean individuals is the highest and its magnitude of -5.821 after the positive market return is larger than -5.389 after the negative market return. It means that Korean individuals sell more following the positive market return during crisis. Overall, Korean individual and foreigners do not act like positive feedback trader during crisis period.

In Table 4, I report the means of order imbalances of each investor for quintile portfolios sorted by prior-day stock excess returns. Here, individual stock returns rather than market return are used to investigate the positive feedback trading. Following Choe, Kho and Stulz (1999), the total order imbalance including the opening and closing session are also used. Before crisis, Korean individuals are not likely to be positive feedback trader. However, Korean institutions and foreign investor act as strong positive feedback traders in selecting the individual stocks. For these types of investors, order imbalances increase monotonically with higher stock returns on the previous day. The difference in order imbalances between the lowest and the highest return portfolio is highly significant.

During the global financial crisis, Korean individuals are net sellers and sell more with higher returns. Korean institutions are positive feedback trader since they buy the high-performing portfolios and sell the low-performing portfolios. Foreign investors are net seller for all portfolios, and they sell more stocks that have performed poorly. However, the difference between extreme portfolios is not significant.

Overall, Korean institutions are strong positive feedback trader in all times. Foreign investors have a property of positive feedback trader before crisis, but this property disappears during crisis period. It implies that positive feedback trading is not a source of increase in foreigners' herding during crisis

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period.

5. Price impact

5.1. Event study with the 5-minute intervals

To investigate the impact of each type of investor, I conduct the event study suggested by Choe, Kho and Stulz (1999). They divided the daily trading time of 9:30~15:00 into forty-six 5-minute intervals and calculated price-setting order imbalances of foreign investors for each stock.[2] They then select the five 5-minute intervals with the largest foreign order imbalances above 1,000 shares for each stock. For the selected intervals, they performed the event study using the stock returns of [-5, +5] intervals. They also selected the event from the intervals between the seventh (10:00-10:05) and the 41st (14:20-14:25) to avoid that the return surrounding the event are crossed into the previous or next day. I follow their procedure to get the extreme net sell order imbalance intervals for each stock over the sample period. In 2008, the trading time has been prolonged as documented in the previous section 2.1. The morning session and the afternoon session are consolidated into one session. Opening prices are determined at 9:00 and closing prices at 15:00. There is no trade from 14:50 to 15:00 to collect orders. In the analysis, daily trading time is divided into 70 5-minute intervals from 9:00 to 15:00, treating the time interval of 14:45~15:00 including the order collection time for the close batch as a single interval. I also selected the event from the intervals between the seventh (9:30-9:35) and the 65st (14:20-14:25). I only report the results from net sell order imbalances, excluding that from net buy order imbalances, since the focus in this paper is destabilizing effect of trades. I present the results from the Korean individuals and institutions as well as foreign investors.

Table 5 reports the distributions of the large price-setting net sell order imbalances in 5-minute intervals of individuals, institutions and foreigners, respectively. Mean of net sell order imbalances is

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[2] They treated the interval from 11:30 to 13:05 including the launch time as a single interval and similarly the time interval from 14:45 to 15:00 including the order collection time for the close batch.

the greatest for Korean individuals. Individuals' mean is about twice that of foreigners'. For all investors, the magnitudes during crisis are greater than those before crisis.

In Table 6, the returns of five 5-minute intervals preceding the event and the five 5-minute interval following it are presented. Three variables are reported in the table: raw returns, mean-adjusted return and the volatility, which is measured by the absolute value of mean-adjusted returns. Mean-adjusted return is the average of the raw return minus the average return of the same day of the week and same time of day during the sample period.

Before crisis, Panel A shows that there is a significant negative mean-adjusted return of -0.831% in the Korean individuals' event interval. Its magnitude is greater than those of Korea's institutions and foreigner investors (-0.769%, -0.597%). The pattern of returns around the event is clearly different between Korea's individuals and other investors. For individuals, one interval preceding the event has a negative return. For Korea's institutions and foreigners, all preceding-interval returns are negative, so that they sell following price decreases. It is consistent with the positive feedback trading property of Korean institutions and foreigners. Returns following the event are also different. For individuals, the price decline continues for two periods after the largest net sell order imbalances. For Korean institutions and foreigners, the returns are reversed to the positive immediately. As a result, the cumulative abnormal returns, CAR(0,5)s of Korean institutions and foreigners are smaller in absolute value than Korean individuals'. It means temporary and permanent effects of sales by Korean individuals are greater than those of other investors.

During crisis, the pattern for events is different from that before crisis. First, the magnitude of negative returns during crisis is greater than that before crisis. Differences in returns and CAR(0,5) between Korean individuals and other investors also become greater. There is a greater negative mean-adjusted return of -1.289% in the Korean individuals' event interval compared to -0.855% and -0.665% for Korean institutions and foreigner investors, respectively.[3] This temporary effect of Korean individuals is twice times greater than that of foreign investors. In the permanent effect

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[3] However, the average mean-adjusted return of -0.665% for foreign investors is smaller in absolute value than -1.027% documented by Choe, Kho and Stulz (1999) in Asian financial crisis of 1997.

measured by the cumulative return of raw return, the greatest impact corresponds to Korean individuals of -1.212%.

Second, for foreign investors the one interval return following the event becomes negative during the crisis period. It is different from other investors. For Korean individuals and institutions, the first interval returns following the event increase during crisis than before crisis. For example, the first interval mean-adjusted return of -0.039% of Korean individuals before crisis rise to 0.130% during crisis. It means that the reversal effect following the event becomes stronger during the crisis for Korean individuals and institutions. However, the opposite is for the foreign investors. The first interval mean-adjusted return of 0.054% of foreign investors before crisis decreases to -0.034% during crisis. It implies that the permanent effect of large net sell order imbalances becomes stronger during the crisis period.

In summary, the large net sell order imbalances by Korean individuals have the greater negative impact on stock returns than other investors. The negative impact of large net sell order imbalance is reversed to the positive after fifteen minutes for Korea's individuals and within ten minutes for other type of investor.

5.2. Price impact of each trade

Our results have shown so far that Korean individuals are most responsible for the negative return during crisis by showing their large net sell order imbalances have the greater impact to stock returns than other investors. It may be a plausible outcome because the magnitude of net sell order imbalances is the greatest for Korean individuals. Individuals' mean of large net sell order imbalances is about twice that of foreigners' as shown in Table 6. To circumvent this issue, here I examine the temporary and permanent price impacts associated with a trade. Following the measure of Keim and Madhavan (1996) and Ghysels and Seon (2005), for each trade, the temporary price impact is calculated as $\tau = -\ln(P_{t+1}/P_t)$, and permanent price impact is calculated as $\pi = \ln(P_{t+1}/P_{t-1})$. Each trade is also categorized into price-setting buy trade and price-setting sell trade.

Table 7 reports the means of daily temporary and permanent price impacts of all KOSPI200 stocks before and during crisis. For each stock, daily temporary and permanent price impacts of individuals, institutions and foreigners are obtained by averaging all trades executed by each type of investor on that day. For the temporary impact of price-setting sell trades, Korean institutions have the largest impact in absolute value and foreign investors have the smallest before crisis. During crisis, this order is sustained.

For the permanent component, there is a noticeable pattern. Foreign investors have the smallest magnitude of -0.00042 before crisis, but its impact increases to -0.00074 during crisis. Surprisingly, price impact of foreign investors increases about twice during crisis period. Its magnitude is even greater than those of Korean individuals and institutions (-0.00065 and -0.00068, respectively).

Table 8 shows the price impacts of price-setting sell trades for quintile portfolios sorted by firm size. For the temporary impact, foreigners' magnitudes are smaller than other investors in all size quintiles both before and during crisis. Our main concern is the permanent impacts. Before crisis, foreigners' permanent components are greater in absolute value than other investors in the two large quintiles. It is interesting since even before crisis the foreigners' selling impact is the greatest among large stocks. During crisis, foreigners have the greatest negative effect in four large quintiles. For the largest quintile, its impact is two times greater than that of Korean individuals.

In summary, for the price-setting sell trades, the price impact for foreign investor is the smallest among investors before crisis. However, their price impact increases dramatically during crisis period, especially in the permanent components. In both event study with 5-minute intervals and price impact per trade, foreign investors have the smallest impact to stock returns in absolute value than Korean individuals and institutions before crisis. However, the increase in price impact of foreign investors is the greatest during crisis and its magnitude could not be negligible.

6. Conclusion

This paper investigates which type of investor among Korean individuals, Korean institutions, and foreign investors is most responsible for the sudden drop of the Korean stock market during the global financial crisis period from September 2008 to February 2009. Trading activity of foreign investors is different from that of other investors during the crisis period. Foreigners' herding behaviour increases during the crisis period, especially in large stocks. The price impact of foreign investors also increases dramatically during crisis and its magnitude is not negligible.

The limitation of this paper is to study only on the equity market. As documented by Choe, Kho and Stulz (1999), equity markets have a well-built mechanism where foreign investor could sell fair prices. Cash outflows could occur by the channel of short-term debt market by financial institutions. The volatility of exchange rate in Korea during crisis is greater than that of stock market indexes. More synthetic analyses combined with the debt markets are expected for the future.

Figure 1. Time-series plots of daily KOSPI and Won/USD exchange rate

This figure shows the time-series plots of daily KOSPI and Won/USD exchange rate from Jan. 2007 to Dec. 2009.
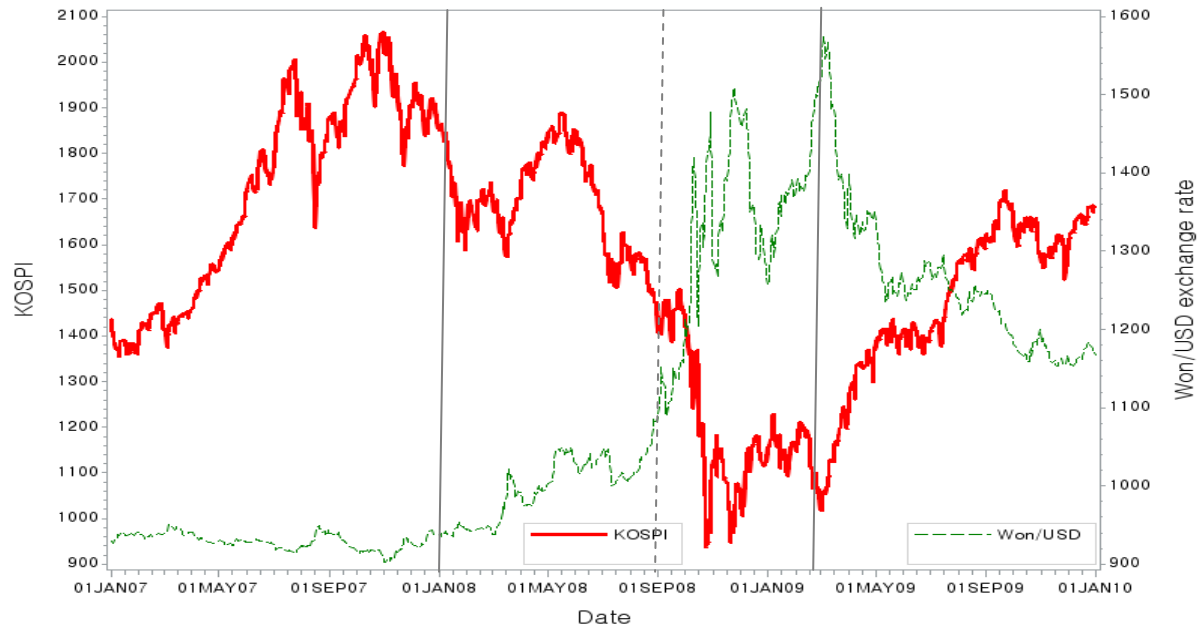
Table 1. Summary statistics of foreign ownership and trading volume of KOSPI200 stocks

This table reports the foreign ownership and trading volume of KOSPI200 stocks from January 2008 to February 2009. The 200 sample firms are stratified by the firm size at the end of 2007. The foreign ownership is at the end of 2007 and reported by the Korea Listed Company Association. Averages of daily trading volume and its percentages attributed to individuals, institutions, and foreign investors are reported.

Firm size	Foreign ownership(%)			Average daily trading volume(shares)			Average percentage of trading volume(%)		
Decile	No. of Stocks	Mean	Median	Individuals	Institutions	Foreigners	Individuals	Institutions	Foreigners
Smallest	20	13.43	11.22	909,753	28,435	34,941	78.54	13.65	9.96
2	20	18.82	8.39	230,046	37,409	20,057	66.99	21.54	11.68
3	20	16.34	11.21	270,454	35,730	20,836	64.07	22.51	14.21
4	20	13.80	6.09	525,970	97,850	45,371	60.20	26.12	11.57
5	20	21.27	18.01	196,391	75,626	33,205	53.89	31.37	14.75
6	20	24.72	22.59	440,365	159,510	91,440	50.62	33.57	15.99
7	20	28.14	29.47	857,298	294,406	199,962	51.69	27.79	20.51
8	20	18.65	15.49	1,154,477	414,950	266,853	54.25	28.49	17.26
9	20	36.60	32.44	1,501,414	570,642	633,473	45.20	26.79	28.01
Largest	20	37.08	39.87	1,656,293	951,702	1,049,297	32.12	32.75	35.14
All firms	200	22.88	18.59	774,246	266,626	239,543	55.76	26.46	17.91

Table 2. Herding measures before and during 2008 global financial crisis of KOSPI200 stocks

This table reports the Lakonishok et al.(1992) herding measures of individuals, institutions and foreigners from Jan. 2, 2008~Feb. 28, 2009. For each stock, daily herding measures are computed from the number of buy and sell trades assuming that each trade is executed by different investors. The herding measure is defined as $H_{i,t} = | \frac{B(i,t)}{B(i,t)+S(i,t)} - p(t) | - AF(i,t)$, in which $B(i, t)$ and $S(i, t)$ are the numbers of buyers and sellers of stock i on day t, $p(t)$ is the expected proportion of buyers calculated as the total number of buyers relative to the total number of investors across all stocks in day t . $AF(i, t)$ is an adjustment factor, which is the expected value of $|B(i, t) /(B(i, t) + S(i, t)) - p(t)|$ under the null of no herding and a binomial distribution of $B(i, t)$, with the probability of $B(i, t)$ equal to $p(t)$. The herding measures are averaged across size and past-week return portfolios respectively and the t-statistics of the means are reported in parentheses. The p-values of Wilcoxon rank-sum tests for median differences are in brackets.

Panel A. Herding measures by size quintile

Size quintile	Individuals			Institutions			Foreigners		
	Before Crisis (Jan.~Aug.'08)	During Crisis (Sep.'08~Feb.'09)	Difference [p-value]	Before Crisis (Jan.~Aug.'08)	During Crisis (Sep.'08~Feb.'09)	Difference [p-value]	Before Crisis (Jan.~Aug.'08)	During Crisis (Sep.'08~Feb.'09)	Difference [p-value]
Small	-0.992	-1.803	-0.812	11.635	8.788	-2.847	15.118	14.706	-0.412
	(-5.609)	(-9.326)	[0.003]	(29.207)	(17.145)	[0.000]	(53.138)	(34.162)	[0.186]
2	1.674	0.234	-1.440	11.755	8.786	-2.969	16.476	16.630	0.154
	(10.286)	(1.060)	[0.000]	(23.795)	(19.496)	[0.000]	(65.025)	(45.139)	[0.922]
3	7.757	6.121	-1.636	12.730	10.171	-2.558	16.520	18.753	2.233
	(48.146)	(24.727)	[0.000]	(34.202)	(26.429)	[0.000]	(75.567)	(57.522)	[0.000]
4	9.239	7.126	-2.113	13.360	11.387	-1.973	15.554	17.876	2.322
	(65.828)	(38.157)	[0.000]	(53.943)	(39.457)	[0.000]	(76.723)	(57.203)	[0.000]
Large	12.840	9.914	-2.925	14.219	13.092	-1.127	13.173	15.340	2.167
	(81.489)	(43.171)	[0.000]	(74.771)	(53.896)	[0.000]	(60.078)	(53.107)	[0.000]

Panel B. Herding measures by past-return quintile

Past-week return quintile	Individuals			Institutions			Foreigners		
	Before Crisis	During Crisis	Difference	Before Crisis	During Crisis	Difference	Before Crisis	During Crisis	Difference
	(Jan.~Aug.'08)	(Sep.'08~Feb.'09)	[p-value]	(Jan.~Aug.'08)	(Sep.'08~Feb.'09)	[p-value]	(Jan.~Aug.'08)	(Sep.'08~Feb.'09)	[p-value]
Low	7.072	5.346	-1.725	14.905	12.666	-2.240	15.859	17.339	1.480
	(35.651)	(18.643)	[0.000]	(41.417)	(29.353)	[0.000]	(74.997)	(53.151)	[0.000]
2	5.328	3.970	-1.358	12.412	10.636	-1.776	15.099	16.351	1.252
	(32.119)	(16.754)	[0.000]	(33.846)	(26.702)	[0.000]	(69.034)	(53.515)	[0.001]
3	5.468	3.526	-1.942	12.180	9.540	-2.641	15.153	16.286	1.133
	(32.228)	(16.318)	[0.000]	(34.158)	(24.265)	[0.000]	(67.268)	(50.185)	[0.005]
4	6.025	4.321	-1.704	11.913	9.347	-2.566	14.828	16.724	1.896
	(30.235)	(15.609)	[0.000]	(36.496)	(28.777)	[0.000]	(67.885)	(52.260)	[0.000]
High	6.739	4.448	-2.291	12.315	10.060	-2.255	15.944	16.656	0.713
	(30.289)	(15.157)	[0.000]	(46.233)	(29.037)	[0.000]	(71.288)	(48.069)	[0.159]

Table 3. Price-setting order imbalances of KOSPI200 stocks across market returns

This table reports the daily normalized price-setting order imbalances($\times$100) of individuals, institutions and foreigners conditioning on the days of increases and decreases in the market(KOSPI) return. For each stock, price-setting order imbalance of individuals, institutions and foreigners is calculated as price-setting buy volume minus price-setting sell volume attributed to each type of investor, and standardized by the stock's average trading volume for the sample period. Price-setting buy(sell) volume is summed from the buyer-initiated(seller-initiated) trades where buy(sell) order arrives later than sell(buy) order in the exchange. The t-statistics for the means difference are reported in parentheses.

Market returns	(1) Individuals Order imbalance	(2) Institutions Order imbalance	(3) Foreigners Order imbalance	Test of (2)-(1)	Test of (3)-(1)	Test of (3)-(2)
Before Crisis (Jan. 2, 2008~Aug. 31, 2008)						
$R_{m,t-1} > 0$	-3.798	-0.912	-0.778	(12.640)	(14.816)	(0.651)
<0	-4.482	2.663	-0.817	(28.583)	(18.212)	(-17.509)
t-statistics for mean difference	(2.91)	(-15.15)	(0.27)			
$R_{m,t} > 0$	-1.974	2.520	-0.130	(18.801)	(8.667)	(-13.760)
<0	-6.186	-0.487	-1.420	(23.470)	(24.738)	(-4.422)
t-statistics for mean difference	(18.00)	(12.74)	(8.91)			
$R_{m,t+1} > 0$	-4.306	0.440	-0.851	(20.138)	(18.458)	(-6.198)
<0	-4.017	1.447	-0.750	(22.241)	(15.205)	(-11.102)
t-statistics for mean difference	(-1.23)	(-4.26)	(-0.69)			
During Crisis (Sep. 2, 2008~Feb. 28, 2009)						
$R_{m,t-1} > 0$	-5.821	-0.172	-1.375	(18.232)	(15.565)	(-4.165)
<0	-5.389	-0.388	-1.520	(15.234)	(11.637)	(-3.608)
t-statistics for mean difference	(-1.31)	(0.71)	(0.50)			
$R_{m,t} > 0$	-0.991	2.246	-0.178	(9.683)	(2.469)	(-7.154)
<0	-9.701	-2.546	-2.588	(23.250)	(23.992)	(-0.154)
t-statistics for mean difference	(26.74)	(15.88)	(8.37)			
$R_{m,t+1} > 0$	-6.625	0.506	-1.532	(21.612)	(15.310)	(-6.334)
<0	-4.671	-0.993	-1.379	(11.802)	(11.142)	(-1.345)
t-statistics for mean difference	(-5.92)	(4.95)	(-0.53)			

Table 4. Order imbalances of KOSPI200 stocks portfolios sorted by prior-day excess returns over market returns

This table reports the means of daily normalized order imbalances(×100) of individuals, institutions and foreigners for quintile portfolios sorted by prior-day individual stock returns less market returns. For each stock, order imbalance of individuals, institutions and foreigners is calculated as buy volume minus sell volume attributed to each type of investor, and standardized by the stock's average trading volume for the sample period. The t-statistics of the means are reported in parentheses. The t-tests for the means difference between each type of investor are reported in parentheses.

Prior-day return portfolios	(1) Individuals Order imbalance		(2) Institutions Order imbalance		(3) Foreigners Order imbalance		Test of (2)-(1)	Test of (3)-(1)	Test of (3)-(2)
Before Crisis(Jan. 2, 2008~Aug. 31, 2008)									
Low	-4.298	(-11.29)	-3.601	(-8.50)	-1.944	(-9.21)	(1.29)	(5.80)	(3.70)
2	-4.151	(-12.41)	-0.758	(-1.51)	-1.360	(-6.63)	(5.41)	(8.04)	(-1.10)
3	-4.145	(-12.51)	0.917	(2.06)	-0.671	(-3.16)	(8.92)	(9.43)	(-3.19)
4	-4.054	(-11.73)	2.921	(6.54)	-0.102	(-0.57)	(12.88)	(10.53)	(-6.27)
High	-4.228	(-10.20)	5.389	(11.37)	0.067	(0.34)	(14.95)	(10.15)	(-10.34)
High-Low	0.070	(0.12)	8.990	(14.14)	2.011	(6.96)			
During Crisis (Sep. 2, 2008~Feb. 28, 2009)									
Low	-4.894	(-4.80)	-5.681	(-8.25)	-2.304	(-5.84)	(-0.73)	(2.61)	(4.66)
2	-4.888	(-7.06)	-2.343	(-3.96)	-1.700	(-4.61)	(2.95)	(4.77)	(1.01)
3	-4.995	(-8.52)	-0.047	(-0.08)	-0.923	(-2.74)	(6.45)	(6.87)	(-1.43)
4	-5.433	(-9.18)	1.978	(3.07)	-0.401	(-1.00)	(9.42)	(7.33)	(-3.63)
High	-7.601	(-10.80)	4.527	(6.65)	-1.860	(-3.60)	(12.50)	(7.15)	(-8.13)
High-Low	-2.707	(-2.18)	10.208	(10.54)	0.445	(0.68)			

Table 5. Summary statistics of large price-setting net sell order imbalances in 5-minute intervals

This table reports the distributions of the large price-setting net sell order imbalances in 5-minute intervals for individuals, institutions and foreigners, respectively. For each stock, price-setting net sell order imbalance within a 5-minute interval during continuous auction is calculated as price-setting sell volume minus price-setting buy volume attributed to each type of investor. For each stock, five intervals with the large price-setting net sell order imbalance are selected, but only including those with more than 1,000 shares.

	Individuals			Institutions			Foreigners		
	Full sample	Before crisis	During crisis	Full sample	Before crisis	During crisis	Full sample	Before crisis	During crisis
Observations	681	274	407	699	277	422	704	318	386
Mean	96,588	62,490	119,543	61,941	40,559	75,977	46,505	30,669	59,551
Maximum	3,794,430	2,435,320	3,794,430	1,111,650	277,820	1,111,650	1,217,350	402,350	1,217,350
Q3	75,870	55,730	101,780	68,030	58,000	70,440	41,396	33,294	49,450
Median	32,047	23,440	41,850	28,260	24,184	31,467	17,995	14,075	21,125
Q1	10,125	7,540	13,040	10,000	7,470	11,291	6,375	4,500	8,990
Minimum	1,000	1,105	1,000	1,108	1,108	1,240	1,040	1,120	1,040

Table 6. Return and volatility around 5-minute intervals with large price-setting net sell order imbalances

This table reports the return and volatility(%) around 5-minute intervals with the large price-setting net sell order imbalance of individuals, institutions and foreigners, respectively. For each stock, five intervals with the large price-setting net sell order imbalance above 1,000 shares are selected during the sample period, and these intervals are assigned as interval 0 in the table. Mean-adjusted return is the average of the raw return minus the average return of the same day of the week and same time of day during the sample period. Volatility is measured by |Mean-adj ret|, which is the average of absolute values of mean-adjusted returns. CAR(0.5) is the cumulative abnormal return from interval 0 to 5. The t-statistics are reported in parentheses.

Panel A. Return and volatility around large price-setting net sell order imbalances of individuals

Interval	-5	-4	-3	-2	-1	0	1	2	3	4	5	CAR(0,5)
Full period												
Raw ret	0.001	0.045	0.021	0.070	-0.108	-1.129	0.064	-0.024	0.012	0.019	0.010	-1.058
	(0.020)	(1.024)	(0.484)	(1.622)	(-2.114)	(-17.997)	(1.410)	(-0.600)	(0.350)	(0.597)	(0.257)	(-11.694)
Mean-adj ret	0.003	0.051	0.030	0.068	-0.103	-1.105	0.063	-0.019	0.021	0.021	0.007	-1.023
	(0.057)	(1.186)	(0.698)	(1.621)	(-2.073)	(-18.009)	(1.420)	(-0.486)	(0.629)	(0.639)	(0.192)	(-11.595)
|Mean-adj ret|	0.578	0.540	0.538	0.510	0.664	1.255	0.647	0.570	0.500	0.487	0.509	
Before Crisis												
Raw ret	-0.056	0.018	-0.103	0.048	-0.213	-0.845	-0.037	-0.025	0.030	0.006	0.044	-0.829
	(-0.892)	(0.445)	(-1.703)	(1.223)	(-3.371)	(-8.761)	(-0.814)	(-0.539)	(0.802)	(0.171)	(0.844)	(-6.082)
Mean-adj ret	-0.044	0.021	-0.088	0.051	-0.213	-0.831	-0.039	-0.025	0.038	0.006	0.034	-0.817
	(-0.693)	(0.520)	(-1.514)	(1.306)	(-3.414)	(-8.744)	(-0.885)	(-0.541)	(1.050)	(0.160)	(0.674)	(-6.137)
|Mean-adj ret|	0.421	0.366	0.373	0.321	0.509	1.028	0.444	0.424	0.382	0.362	0.429	
During Crisis												
Raw ret	0.039	0.062	0.104	0.085	-0.039	-1.319	0.131	-0.023	0.000	0.028	-0.012	-1.212
	(0.556)	(0.925)	(1.712)	(1.266)	(-0.524)	(-16.259)	(1.903)	(-0.394)	(0.003)	(0.582)	(-0.230)	(-10.107)
Mean-adj ret	0.033	0.071	0.108	0.080	-0.030	-1.289	0.130	-0.015	0.010	0.030	-0.010	-1.161
	(0.482)	(1.068)	(1.839)	(1.227)	(-0.425)	(-16.305)	(1.928)	(-0.262)	(0.194)	(0.634)	(-0.198)	(-9.935)
|Mean-adj ret|	0.682	0.655	0.648	0.636	0.767	1.407	0.781	0.666	0.578	0.569	0.559	

Panel B. Return and volatility around large price-setting net sell order imbalances of institutions

	-5	-4	-3	-2	-1	0	1	2	3	4	5	CAR(0,5)
Full period												
Raw ret	-0.047	-0.125	-0.125	-0.143	-0.288	-0.837	0.054	0.037	-0.040	0.005	0.050	-0.744
	(-1.125)	(-3.552)	(-3.618)	(-3.130)	(-5.432)	(-16.851)	(1.727)	(1.023)	(-0.953)	(0.118)	(1.850)	(-9.757)
Mean-adj ret	-0.042	-0.123	-0.122	-0.133	-0.277	-0.821	0.054	0.034	-0.038	0.004	0.046	-0.734
	(-1.029)	(-3.521)	(-3.584)	(-2.933)	(-5.364)	(-16.891)	(1.769)	(0.964)	(-0.921)	(0.095)	(1.714)	(-9.804)
|Mean-adj ret|	0.514	0.485	0.498	0.529	0.665	1.013	0.500	0.489	0.491	0.481	0.427	
Before Crisis												
Raw ret	-0.079	-0.061	-0.081	-0.077	-0.218	-0.791	0.015	0.050	0.041	0.007	0.077	-0.618
	(-1.813)	(-1.188)	(-2.118)	(-1.894)	(-4.484)	(-13.076)	(0.344)	(1.278)	(0.627)	(0.134)	(2.097)	(-6.900)
Mean-adj ret	-0.069	-0.055	-0.083	-0.062	-0.206	-0.769	0.012	0.044	0.043	0.004	0.076	-0.606
	(-1.575)	(-1.068)	(-2.152)	(-1.525)	(-4.297)	(-12.888)	(0.290)	(1.116)	(0.677)	(0.080)	(2.073)	(-6.877)
|Mean-adj ret|	0.410	0.379	0.369	0.368	0.462	0.893	0.466	0.432	0.473	0.397	0.379	
During Crisis												
Raw ret	-0.026	-0.166	-0.155	-0.186	-0.334	-0.867	0.079	0.028	-0.092	0.003	0.032	-0.828
	(-0.413)	(-3.507)	(-2.993)	(-2.641)	(-4.078)	(-12.030)	(1.845)	(0.526)	(-1.676)	(0.059)	(0.849)	(-7.404)
Mean-adj ret	-0.025	-0.167	-0.148	-0.177	-0.323	-0.855	0.081	0.028	-0.090	0.004	0.026	-0.817
	(-0.406)	(-3.557)	(-2.931)	(-2.562)	(-4.064)	(-12.155)	(1.941)	(0.526)	(-1.674)	(0.064)	(0.706)	(-7.464)
|Mean-adj ret|	0.581	0.553	0.583	0.631	0.799	1.091	0.522	0.525	0.502	0.535	0.459	

Panel C. Return and volatility around large price-setting net sell order imbalances of foreigners

	-5	-4	-3	-2	-1	0	1	2	3	4	5	CAR(0,5)
Full period												
Raw ret	-0.023	-0.101	-0.060	-0.090	-0.181	-0.654	0.008	0.047	0.003	0.043	0.009	-0.559
	(-0.706)	(-3.885)	(-2.334)	(-2.590)	(-5.573)	(-12.435)	(0.255)	(1.570)	(0.098)	(1.710)	(0.377)	(-9.697)
Mean-adj ret	-0.019	-0.088	-0.058	-0.082	-0.180	-0.634	0.006	0.055	0.005	0.043	0.010	-0.529
	(-0.590)	(-3.494)	(-2.280)	(-2.459)	(-5.648)	(-12.478)	(0.194)	(1.902)	(0.199)	(1.751)	(0.403)	(-9.338)
|Mean-adj ret|	0.407	0.390	0.411	0.458	0.492	0.869	0.464	0.436	0.418	0.398	0.368	
Before Crisis												
Raw ret	-0.016	-0.053	-0.058	-0.041	-0.126	-0.616	0.059	0.052	0.007	0.048	0.013	-0.451
	(-0.586)	(-1.877)	(-2.000)	(-1.499)	(-3.634)	(-8.786)	(1.418)	(1.689)	(0.273)	(1.585)	(0.479)	(-6.194)
Mean-adj ret	-0.009	-0.046	-0.052	-0.036	-0.126	-0.597	0.054	0.056	0.011	0.047	0.015	-0.429
	(-0.324)	(-1.636)	(-1.825)	(-1.303)	(-3.665)	(-8.758)	(1.346)	(1.803)	(0.394)	(1.603)	(0.542)	(-5.918)
|Mean-adj ret|	0.302	0.304	0.305	0.277	0.351	0.735	0.391	0.341	0.303	0.308	0.296	
During Crisis												
Raw ret	-0.029	-0.139	-0.062	-0.129	-0.226	-0.685	-0.033	0.042	-0.001	0.039	0.006	-0.647
	(-0.524)	(-3.407)	(-1.539)	(-2.204)	(-4.361)	(-8.942)	(-0.730)	(0.888)	(-0.029)	(1.021)	(0.149)	(-7.518)
Mean-adj ret	-0.027	-0.123	-0.062	-0.120	-0.226	-0.665	-0.034	0.055	0.001	0.041	0.005	-0.611
	(-0.504)	(-3.094)	(-1.574)	(-2.132)	(-4.428)	(-9.009)	(-0.743)	(1.193)	(0.021)	(1.073)	(0.143)	(-7.263)
|Mean-adj ret|	0.491	0.461	0.497	0.603	0.610	0.980	0.524	0.512	0.510	0.469	0.426	

Table 7. Temporary and permanent price impacts of KOSPI200 stocks

This table reports the means of daily temporary and permanent price impacts of all KOSPI200 stocks before and during crisis. For each trade, temporary price impact is calculated as $\tau = -\ln(P_{t+1}/P_t)$, and permanent price impact is calculated as $\pi = \ln(P_{t+1}/P_{t-1})$. Each trade is categorized into price-setting buy trade and price-setting sell trade. Price-setting buy(sell) trade is defined as the buyer-initiated(seller-initiated) trades where buy(sell) order arrives later than sell(buy) order in the exchange. For each stock, daily temporary and permanent price impacts of individuals, institutions and foreigners are obtained by averaging all trades executed by each type of investor on that day. The t-tests for the means difference are reported in parentheses.

	Temporary price impact						Permanent price impact					
	(1)	(2)	(3)	Test of	Test of	Test of	(1)	(2)	(3)	Test of	Test of	Test of
	Individuals	Institutions	Foreigners	(2)-(1)	(3)-(1)	(3)-(2)	Individuals	Institutions	Foreigners	(2)-(1)	(3)-(1)	(3)-(2)
Price-setting buy trades												
Before Crisis	0.00049	0.00061	0.00029	(22.14)	(-21.61)	(-35.52)	0.00046	0.00042	0.00049	(-2.64)	(7.21)	(8.59)
During Crisis	0.00056	0.00081	0.00023	(23.06)	(-20.08)	(-32.34)	0.00065	0.00068	0.00071	(1.35)	(12.78)	(10.93)
t-tests	(-4.18)	(-9.98)	(4.45)				(-23.15)	(-20.67)	(-20.63)			
Price-setting sell trades												
Before Crisis	-0.00049	-0.00067	-0.00031	(-29.08)	(26.51)	(42.93)	-0.00047	-0.00047	-0.00042	(-0.20)	(3.83)	(3.26)
During Crisis	-0.00057	-0.00089	-0.00030	(-27.09)	(23.21)	(38.23)	-0.00065	-0.00068	-0.00074	(1.14)	(-12.89)	(-11.02)
t-tests	(3.80)	(9.79)	(-4.93)				(26.56)	(15.10)	(28.01)			

Table 8. Temporary and permanent price impacts of price-setting sell trades for KOSPI200 stocks: Size quintile

This table reports the means of daily temporary and permanent price impacts of price-setting sell trades for quintile portfolios sorted by size for all KOSPI200 stocks before and during crisis. For each trade, temporary price impact is calculated as $\tau = -\ln(P_{t+1}/P_t)$, and permanent price impact is calculated as $\pi = \ln(P_{t+1}/P_{t-1})$. A trade is categorized as price-setting sell trade if sell order arrives later than buy order in the exchange. For each stock, daily temporary and permanent price impacts of individuals, institutions and foreigners are obtained by averaging all price-setting sell trades executed by each type of investor on that day. The t-tests for the means difference are reported in parentheses.

	Temporary price impact						Permanent price impact					
	(1)	(2)	(3)	Test of	Test of	Test of	(1)	(2)	(3)	Test of	Test of	Test of
	Individuals	Institutions	Foreigners	(2)-(1)	(3)-(1)	(3)-(2)	Individuals	Institutions	Foreigners	(2)-(1)	(3)-(1)	(3)-(2)
Price-setting sell trades												
Before Crisis												
Small	-0.00056	-0.00099	-0.00017	(-16.36)	(11.48)	(21.40)	-0.00099	-0.00092	-0.00082	(3.28)	(4.79)	(1.06)
2	-0.00041	-0.00069	-0.00025	(-18.32)	(8.85)	(20.91)	-0.00075	-0.00074	-0.00058	(1.66)	(8.31)	(5.60)
3	-0.00042	-0.00050	-0.00027	(-10.89)	(13.95)	(19.20)	-0.00038	-0.00039	-0.00034	(-2.95)	(2.47)	(4.19)
4	-0.00049	-0.00053	-0.00036	(-11.32)	(24.81)	(29.74)	-0.00017	-0.00022	-0.00023	(-13.52)	(-8.12)	(-1.23)
Large	-0.00059	-0.00065	-0.00051	(-21.22)	(25.97)	(41.68)	-0.00006	-0.00009	-0.00016	(-14.85)	(-34.61)	(-22.10)
During Crisis												
Small	-0.00056	-0.00099	-0.00017	(-16.36)	(11.48)	(21.40)	-0.00129	-0.00139	-0.00127	(3.23)	(-2.00)	(-3.96)
2	-0.00041	-0.00069	-0.00025	(-18.32)	(8.85)	(20.91)	-0.00101	-0.00098	-0.00109	(3.70)	(-2.74)	(-4.60)
3	-0.00042	-0.00050	-0.00027	(-10.89)	(13.95)	(19.20)	-0.00054	-0.00051	-0.00067	(-2.21)	(-10.29)	(-8.06)
4	-0.00049	-0.00053	-0.00036	(-11.32)	(24.81)	(29.74)	-0.00027	-0.00032	-0.00041	(-15.40)	(-19.91)	(-10.91)
Large	-0.00059	-0.00065	-0.00051	(-21.22)	(25.97)	(41.68)	-0.00012	-0.00018	-0.00027	(-24.78)	(-37.27)	(-21.95)

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