After-Hours Block Trading, Short Sales, And Information Leakage: Evidence From Korea

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ABSTRACT

We investigate the impact of insider trading in after-hours block market on stock price and short sales volume, before and after the trading becomes public information. During pre-announcement period, positive (negative) abnormal stock return is generated when insiders buy (sell) their shares but does not when quasi-insiders trade, implying that stock price reflects long-lived private information of corporate governance structure. The impact is most prominent when ownership shares are transferred to (from) corporate insiders. In contrast, short sales volume generally does not depend on the identity of block holders. Short sales volume has a negative correlation with abnormal stock return only during the transaction date, indicating that a short-sale decision of tippees is based on their sole expectation on instantaneous stock returns. We also find evidence that insiders select the timing of their trades with respect to maximizing their realized profits or minimizing their purchasing costs.

Keywords: After-Hours Block Trading; Corporate Governance Structure; Insider Trading; Short Sales; Information Leakage

1. INTRODUCTION

Information of insider block trading in after-hours market might be transmitted to a small group of investors prior to the disclosure. Such informed investors allegedly earn profits from front-running which inputs buy orders on insider purchase and sell orders on insider sales. Exploiting information of insider sales, they may take short selling activities as well. At the worst, they even fulfill their own prediction by pressing the stock price downward with tremendous size of selling order flow. Motivated by such practical issues, we examine the impact of after-hours block trading executed by insiders and associated evidence of information leakage. We use a rigorous approach to investigate the anecdotal evidence that insider purchases are followed by a stock return increase and insider sales are followed by a decrease in after-hours market while the information is still undisclosed. If extra profits are achieved from trading behaviors of the kind, the presence of the tippees is verified and their short-selling activities are presumed to be severe.

Apart from practical implications, this paper suggests a perspective of long-lived private information with regard to corporate ownership structure. A number of previous literatures with regard to adverse selection focus on short-lived impact of informed trading. Since the files have a criterion of minimum percentage of shares holding, our data set of 'Report on Stocks, etc. Held in Bulk' files is comprised of *explicit* insider (considered to be well-informed) trading. Our data set of after-hours block trading also consists of *opportunistic* trading due to minimum transaction amount applied in after-hours market. With our comprehensive data set, we present evidence that the impact of block trading differs between corporate insiders and quasi-insiders. Furthermore, since insider block trades have high information contents, we consider the effect is long lasting possibly in the form of reversions or drifts. We split the event time period by stepwise dissemination phases of insider trade information.

This research investigates the existence of early-informed trading by using two different proxies, market-adjusted abnormal return and short sales volume. We examine whether our proxies are affected by insider categories and time

periods simultaneously. We use the change value of ownership shares and transaction type for each class of insiders. We contrast our events with ownership inflow and outflow by using corporate insiders as a standard. Our comprehensive analysis includes the relationship between our two proxies conditional on the time periods. Lastly, we discuss the possible motives of insiders to trade in bulk.

The remainder of this paper is organized as follows. Section 2 introduces previous literatures related to our analysis. Section 3 describes institutional backgrounds of after-hours block trading and the filing rules, and the construction method of our data set. Section 4 presents the empirical results of the impact of insider after-hours block trading, relationship between abnormal stock return and short sales volume, and opportunistic trading behavior of insiders. Finally, Section 5 concludes.

2. RELATED LITERATURES

In a standard theoretical perspective, all relevant information pertinent to the value of the stock would be revealed at once to all market participants. However, in reality, it is possible that a group of agents such as corporate executives or analysts can be tipped off material private information before the announcement is made. Thus, it has drawn research interest to investigate how early-informed agents trade on the day they acquire the information and which type of impact market receives on the same day. Hirshleifer, Subrahmanyam, and Titman (1994) and Brunnermeier (2005) take account of such information asymmetry, and suggest that informed traders exploit private information twice, once on the day they learn the information and a second time after publication. Studies also predict insiders reverse their position of informed trades in a fraction on the announcement date, though their motivations differ among underlying assumptions. For instance, Brunnermeier (2005) models an early-informed trader who receives a noisy signal about a forthcoming event. He concludes that price is more affected by the same amount of information in the short-run while the effect diminishes in the long-run. He also predicts overreaction of market to public announcement, and consequently explains "buy-the-rumor and sell-the-news" trading behavior.

Consistent with the prediction, a number of empirical studies track down both legal and illegal insider purchase and sale. Seyhun (1986) reports positive abnormal return can be generated by traders who imitate insiders. Using a collective data of illegal insider trading from the Securities and Exchange Commission, Meulbroek (1992) finds that insider trading causes abnormal returns before the takeover announcement, most likely on the trading day. Cornell and Sirri (1992) investigate a tender offer case of Campbell Targgart by using court records of corporate insider trading. They present evidence consistent with information leakage and show that insider trading has a significant impact on stock price while liquidity improves regardless of the internal signal. This result seems contrary to adverse selection model such as Kyle (1985) who predicts block traders avoid revealing his information incorporated in trade size.

It is considered short sellers are informed traders and typically more sophisticated. Though their trading activity against nonpublic information, researchers as well as uninformed investors can observe the effect of upcoming negative news on stock price (Diamond and Verrecchia, 1987). Christophe, Ferri, and Angel (2004), and Diamond and Verrecchia (1987) among others suggest that short selling activity can indicate the presence of informed trading, in particular prior to negative earnings announcements. In this paper, we do not pinpoint the identity of short sellers, yet it appears financial institutions or hedge funds enjoy profiting from early private information (Massoud et al., 2011). As a consequence, we examine the effect of informed trading by establishing two distinct proxies, abnormal returns and short sales. Our study is also related to Khan and Lu (2013) with regard to short sales prior to insider sales. They define insiders as CEOs and report that large insider sales are followed by an increase in short sales while small insider sales do not have any influence.

Easley and O'Hara (1986) suggest a theoretical model which explains price-trade size relationship. They contrast block trades with small-sized trades. Under their perspective, block trades acquire less favorable price due to informational advantages which block holders are believed to possess. A possible limitation in their model is that they consider selection of timing and trade intensity by the informed is chosen exogenously. Consistent with the viewpoint, Gemmill (1996) shows both temporary effect and permanent effect of block trades on the price level under different publication rules of London Stock Exchange. He finds the speed of price adjustment is rapid regardless of delaying publication implying information leakage.

Another strand of studies pays attention to liquidity effect associated with the motives of block traders. Though upstairs markets serve better execution than downstairs markets for large block trades, literatures suggest liquidity is more profound in downstairs market, indicating that after-hours block trade participants may have some good reasons in their choices with respect to timing and marketplace of buying and selling (Keim and Madhavan, 1996; Madhavan and Cheng, 1997; Booth et al., 2002). It is ambiguous to conclude such decisions are motivated either from reducing costs of trading shares in block or signaling that they are in need of liquidity. Thus, it is anecdotal to consider that all after-hours block trade participants possess superior informational advantage on the target firm. However, regardless of their motivation, trading after-hours contains higher information contents and lacks efficiency of price discovery due to noisier signals (Barclay and Hendershott, 2003). As a result, we limit our data of after-hours block traders to meet certain criterion of percentage of shares holding in order to directly observe the impact of *explicit* insider trading on stock prices.

3. DATA AND DESCRIPTIVE STATISTICS

We illustrate institutional grounds and the construction method of our comprehensive sample of after-hours block trades conducted by insiders. Section 3.1 briefly reviews characteristics of after-hours block trading in Korea. Section 3.2 studies the filing rule of block holders. Section 3.3 describes methods of organizing our data in detail. Section 3.4 presents descriptive statistics.

3.1 Characteristics of After-Hours Block Trading

First, it is interesting to study some unique characteristics in after-hours block trading in Korea. After-hours block trading aims to reduce price fluctuation due to block trades while the market is open, thus it occurs during after-hour trading time (07:30~08:30, 15:40~18:00). It also limits the minimum size of trades so that quantity of bid/ask should be greater than 500 times of the tick size or trade size should be greater than 100 million Korean Won. Analogous to upstairs market in New York Stock Exchange, trades are accomplished by negotiation of buyers and sellers through brokers. In this case, Korea Stock Exchange (KRX) takes the role of brokerage. If the negotiation is concluded by mutual consent, both parties notify transaction contents to KRX.

3.2 Filing Rules

Similar to disclosure requirement Rule 13(d) of the 1934 Securities Exchange Act in the U.S., in Korea anyone who exceeds 5% of total shares outstanding of a firm has a legal obligation to report her purpose of holding, status of holding, inclusion of other contracts in her shares, transaction date, transaction amount, and price of her shares traded in a file named 'Report on Stocks, etc. Held in Bulk' within 5 days. In addition to that, one who already has more than 5% shares of a firm (but less than 10%) is required to file when she buys or sells more than 1% of total shares outstanding in a cumulative manner or when she alters her purpose of holding. For one who has more than 10% shares or currently takes a position of top executives in the target firm, she is required to submit the file when she trades even only one share of her target company at most 5 days. Since the rule is regulated to monitor shareholders who can potentially become a hostile takeover and to grasp their trading behavior before such events, one who designates her purpose of holding as 'simple investment' can extend her reporting deadline to 10th of the following month. Government-related firms, sovereign-related firms, and pension funds are allowed to submit the file until 10th of the following quarter.[1]

3.3 The Sample of Our Analysis

Our data set is confined to block holders of more than 5% of total shares outstanding (and top executives) who conduct trades in after-hours block market. Not merely is it interesting to discover some puzzling aspects of after-hours block market, also our data set clearly identifies the impact of evident insider trading on stock returns and a potential source of information leakage. One of the advantages of our sample is that there is less likelihood of consecutive trading of insiders suggested by Cohen et al. (2012) due to the constraints on minimum trade size. For instance, a CEO may sell

[1] The summary is written based on the Financial Investment Services and Capital Markets Act ("FISCMA") Section 147.

four shares in two- or three-days intervals while "on-hours" market is open. Such trades are likely to be motivated by liquidity needs and presumably contain less information contents. Plus, consecutive trading affects multiple days in a sample resulting in greater noise and higher autocorrelation. By construction, we extract possible *opportunistic* trading of insiders from liquidity-motivated trading.

We compile data from two sources. We collect a comprehensive sample of after-hours block trades from 'Report on Stocks, etc. Held in Bulk' files. Other data such as stock returns, short-sale volume, and target firm size comes from FnGuide, a database company. The sample of after-hours block trades by the filers is constructed as follows. We search DART, Data Analysis, Retrieval and Transfer System in Korea Financial Supervisory Service, to identify *all the files* from 2010 January to 2015 December. We only select samples of target firms which are listed on KOSPI and which exhibit insiders' buying or selling activities in after-hours block market. We excluded amendments to previous submitted filings though we replace to the correct item if some of the items in the original filing are mistakenly recorded. We further exclude few files of target firms which announce insider transaction ahead of actual execution. For each event, we extract the following information from the file: transaction date, filing date, transaction type and amount (e.g. +20,000 if a block holder buys 20,000 shares, or -30,000 if a block holder sells 30,000 shares), transaction price, and most importantly the relationship of the trader with the target firm.

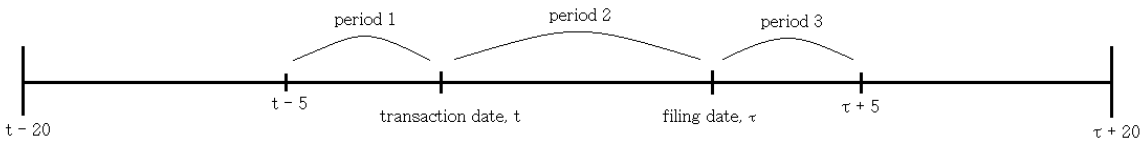
Our dataset is similar to Collin-Dufresne and Fos (2015), who use Schedule 13D filings. They find positive impact on prices while measured adverse selection decreases. The difference between their data set and ours is that ours includes not only new entries of filing resulted from exceeding 5% threshold, but also filing of more than 1% shares (or one share) trades from existing filers. Due to the difference, our data set is comprised of both buying and selling of the filers.

Item 'relationship of the trader with the target firm' includes various types of special connection to the firm. We categorize them into five groups: 'Largest shareholder', 'Major shareholder', 'Executives', 'Affiliates', and 'Others'. 'Largest shareholder' is the person or the firm who has the largest portion of the total shares and controls the firm. Largest shareholder consists of largest shareholders, relatives of largest shareholders, de facto controlling shareholders, relatives of de facto controlling shareholders, and joint holders who resolve to conduct their voting power along with the largest shareholder. 'Major shareholder' is the one who holds more than 5% of the total shares and has an influencing power over the target firm. Major shareholder also includes relatives of influencing shareholders. 'Executives' is the one who has a legal responsibility for managing the firm. We include both registered and unregistered executives. We also include CEOs and relatives of executives. 'Affiliates' is the firm which is under control of the same parent company or *Group* along with the target firm. Group-affiliated companies in Korea often exhibit a complex multilateral controlling power over each other (Chang, 2003). Lastly, 'Others' is the one who has a vague connection to the target firm. It consists of foundations, syndicates, mutual funds, private equity funds, and unidentified persons or firms. Note that Stock Exchange Act is regulated to prevent covert attempts to take over firms, thus 'Report on Stocks, etc. Held in Bulk' file informs investors of such connections. However, some classifications of the relationship in the file rely on rule of thumb. We attempt to maintain the original classifications and to newly categorize the type of insiders based on the original. Furthermore, we define Largest shareholder, Executives, and Affiliates as corporate insiders since these three classes of insiders have the strongest influence on the target firm with respect to decision making. We define Major shareholder and Others as quasi-insiders who still possess a significant amount of shares, yet their management rights are limited.

Next, we aggregate our data to daily level. More specifically, we formulate one event contains one transaction date and one filing date of a target firm to examine the in-between periods. We consider the impact of block trades differ between actual transaction date and announcement (filing) date, thus classify an event only when the dates coincide. For instance, if two files of the same target firm publicize on the same day and do not exhibit the same transaction date, we classify them into two separate events. We also exclude offsetting signals with regard to price direction, which come from the same class of insiders (e.g. +5,000 shares and -5,000 shares of Executives traded on the same transaction date cancels out). By construction, we use net amount of each class of block holders. We winsorize events by top/bottom one percent with respect to the total change in stock ownership of all aggregated block holder classes calculated as the transaction amount divided by the total shares outstanding. Finally, we obtain 264 target companies and 649 events over 5-years period. Although the majority of target firms experiences more than one time of filing about after-hours block trades over five years, this type of trades associated with insiders are indeed rare events.

We directly match our daily data of stock returns calculated as the closing price of each day with the filing data specified on certain dates. Whether the after-hours trade takes place in pre-hours or after-hours of a normal day, we consider the closing price of the day reflects the block trades even the trades are not yet to be achieved. According to the empirical finding of Khil et al. (2005), who use equivalent samples of after-hours block trades to ours, information with regard to after-hours block trades is already revealed in the closing price of the transaction date[2]. Moreover, a vast majority of our sample shows abnormal trading volume at the transaction date which is ahead of the after-hours trade, while most of the block trades are carried out during after-hours. We view this result as the presence of information leakage at least during the transaction date.

Figure 1. The Event time line



This figure summarizes the time line of our constructed events. Our sample period starts from 20 days before the transaction date, denoted as t, to 20 days after the filing date, denoted as τ. The filing date can be overlapped on the transaction date, but not before. Period 1 covers from t-5 to t-1, and refers to the period where only the insiders themselves and few tippees are aware of the after-hours block trade. Period 2 covers from day t to τ exclusion of both the transaction date and the filing date, and refers to the period where counterparties and more tippees are aware of the trade. Yet, the information is not publicized in the period. Period 3 covers from τ+1 to τ+5, and measures a long-term effect of the announcement of the after-hours block trade.

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3.4 Descriptive Statistics

Table 1 shows the number of events that each class of block holders buys or sells. Most of the after-hours block trades among insiders are executed by Largest shareholder and Affiliates. The sum of the number of buying or selling of insiders does not correspond to 649, the total number of events. This is attributable to events which contain trades of more than two classes of block holders associated (e.g. one type of buyer and two types of seller in a block trade).

Table 1 presents the number of events that each class of block holders buys or sells. Largest shareholder is the person or the firm who has the largest portion of the total shares and controls the target firm. Major shareholder is the one who holds more than 5% of the total shares and has an influencing power over the target firm. Executives is the one who has a legal responsibility for managing the firm. Affiliates is the firm which is under control of the same parent company or *Group* along with the target firm. Others is the one who has a vague connection to the target firm.

[2] Khil et al. (2005) also conduct a regression of stock abnormal returns including dummy variables which indicate the type of pre/after –hours block trades and find the coefficient is insignificant.

Table 1. The number of events that each class of block holders buys or sells

	Buy	Sell
Largest shareholder	162	137
Major shareholder	32	144
Executives	32	46
Affiliates	69	112
Others	23	48

We provide descriptive statistics of event fixed effect measured as the total change in stock ownership of each block holders' class, and other data in our full sample period and in our sub-period of transaction date. Panel A of Table 2 shows the event fixed effect. CHG.Largest, CHG.Major, CHG.Executives, CHG.Affiliates, and CHG.Others are total change in stock ownership, calculated as the transaction amount divided by the total shares outstanding, of Largest shareholder, Major shareholder, Executives, Affiliates, and Others, respectively. ABS.Largest, ABS.Major, ABS.Executives, ABS.Affiliates, and ABS.Others are the absolute value of CHG.Largest, CHG.Major, CHG.Executives, CHG.Affiliates, and CHG.Others, respectively. Over is a dummy variable which takes value of 1 if the transaction price is greater than the closing price of the transaction date, 0 otherwise. Under is a dummy variable which takes value of 1 if the transaction price is less than the closing price of the transaction date, 0 otherwise.

Block holders, with the exception of Executives, sell more than they buy in after-hours block market. Major shareholder sells the most (-2.28%) with respect to total change in stock ownership. The result corresponds to the number of events that Major shareholder trades. Though one block trade in after-hours, insiders change their stock ownership by 1.88% ~ 3.02%, in general. Underpricing in after-hours block trades accounts for 50.31% of total events. Overpricing in after-hours block trades accounts for 30.4% of total events.

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Table 2. Descriptive statistics

Panel A: Event fixed effect

	CHG.Largest	CHG.Major	CHG.Executives	CHG.Affiliates	CHG.Others	ABS.Largest
Min	-19.0000	-17.8893	-10.4476	-15.3630	-10.0506	3.45E-06
1Q	-2.5910	-3.7170	-0.9499	-1.9400	-2.2237	0.1519
Median	0.0210	-1.3864	-0.2471	-0.2066	-0.3422	1.3144
Mean	-0.8182	-2.2782	0.0217	-0.4765	-1.3033	2.7520
3Q	0.4796	-0.2475	1.0112	0.4602	0.0024	4.3555
Max	15.3630	9.5663	13.1898	15.2709	5.6000	19.0000
Std.	4.3343	3.8714	3.2936	4.0818	2.7970	3.4437

	ABS.Major	ABS.Executives	ABS.Affiliates	ABS.Others	Over	Under
Min	4.88E-06	4.32E-06	3.77E-06	0.00001	0.0000	0.0000
1Q	0.7456	0.4090	0.3425	0.0635	0.0000	0.0000
Median	1.9592	1.0037	1.0624	0.8270	0.0000	1.0000
Mean	3.0230	1.9691	2.5897	1.8812	0.3040	0.5031
3Q	4.2576	2.1481	3.6916	2.9640	1.0000	1.0000
Max	17.8893	13.1898	15.3630	10.0506	1.0000	1.0000
Std.	3.3191	2.6307	3.1852	2.4406	0.4603	0.5004

Panel B: Full sample

	AR	ShortRatio	Size	B/M	ROA	Volume
Min	-0.3557	0.0000	23.06	-2.7275	-49.53	0.00
1Q	-0.0105	0.0000	25.29	-0.1892	1.31	8.18
Median	-0.0003	0.0000	26.08	0.2500	3.67	10.42
Mean	0.0003	0.0131	26.34	0.2817	3.63	10.17
3Q	0.0097	0.0043	26.89	1.0250	6.97	12.16
Max	0.2616	4.0612	32.97	2.2225	32.01	18.40
Std.	0.0253	0.0796	1.49	0.7956	7.42	2.75

	Insti	Indiv	Forei	Period1	Period2	Period3	R.Largest
Min	-1.0000	-1.0000	-1.0000	0.0000	0.0000	0.0000	6.12
1Q	-0.9370	-0.0993	-0.5640	0.0000	0.0000	0.0000	40.29
Median	-0.0770	0.0000	-0.0260	0.0000	0.0000	0.0000	50.97
Mean	-0.0720	-0.0092	-0.0450	0.0767	0.3741	0.07652	51.12
3Q	0.5920	0.0776	0.4530	0.0000	1.0000	0.0000	64.13
Max	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	89.38
Std.	0.7394	0.2683	0.6261	0.2661	0.4839	0.2658	16.91

(table 2 continued)

Panel C: Sub-period: on the transaction date.

	AR	ShortRatio	Size	B/M	ROA	Volume
Min	-0.1750	0.0000	23.59	-2.6946	-49.53	3.40
1Q	-0.0212	0.0000	25.46	-0.3068	0.82	10.62
Median	-0.0029	0.0000	26.14	0.1643	3.22	12.96
Mean	-0.0044	0.0240	26.50	0.1768	2.98	12.42
3Q	0.0081	0.0111	27.27	0.8180	6.40	14.34
Max	0.2608	1.7570	32.86	2.1200	32.01	18.12
Std.	0.0389	0.1068	1.55	0.8227	7.95	2.74

	Insti	Indiv	Forei	Chaebol	R.Largest	CAR(-20, -1)
Min	-1.0000	-0.9971	-1.0000	0.0000	6.12	-0.4544
1Q	-0.9575	-0.1360	-0.4351	1.0000	39.05	-0.0331
Median	0.0035	0.0273	0.1405	1.0000	48.48	0.0092
Mean	-0.0120	0.0534	0.0825	0.7562	48.89	0.0261
3Q	0.7151	0.2882	0.6452	1.0000	60.55	0.0690
Max	1.0000	0.9996	1.0000	1.0000	88.85	0.6794
Std.	0.7420	0.4763	0.6428	0.4297	16.75	0.1229

Panel B and Panel C of Table 2 show other data related to stock returns and volumes in full sample period and on the transaction date, respectively. AR is the abnormal return of the stock. We calculate the market beta from daily stock return from day t-270 to t-21. ShortRatio is short-sale ratio, defined as daily short sales volume divided by the total shares outstanding. Size is the natural logarithm of the market value of equity. B/M is the natural logarithm of book-to-market ratio. ROA is return on asset ratio, measured as percentage. Volume is the natural logarithm of daily trading volume. Insti, Indiv, and Forei are order imbalances of institutional investors, individual (retail) investors, and foreign investors, respectively. The order imbalances are defined as (B-S)/(B+S) of each type of investors where B (S) is purchase (sales) volume. Period1, Period2, and Period3 are dummy variables which take value of 1 in Period 1 (before transaction), Period 2 (in-between period), and Period 3 (after filing), respectively. Chaebol is a dummy variable which takes value of 1 if the target firm is affiliated to *Group*, 0 otherwise. R.Largest is the portion of shares out of the total shares, held by the largest shareholder. CAR(-20, -1) is cumulative abnormal return from day t-20 to t-1.

We set variables to control the effect of size, value, and profitability on stock returns and on short sales volume (Diether, Lee, and Werner, 2009). Since share trades are split into three main categories of investors, it is interesting to discover the outcome of order imbalances of these groups on stock returns and short sales volume. We further control the effect of ownership structure of family *(Group)* concentration (Fidrmuc et al., 2006; Anderson et al., 2012).

4. EMPIRICAL RESULTS

In this section, we present empirical findings of our analysis. Specifically, we run the following regression of individual (event) fixed effect model to test the rapid price adjustment on the transaction date, possible reversal of share price on the publication date, and persistency of the impact due to private information, which are conditional on each class of insiders.

$$y_{j,t} = \alpha_j + \beta_1 \mu_j + \beta_2 d_{j,t} + \beta_3 \mu_j d_{j,t} + \varepsilon_{j,t}$$

In this equation, $y_{j,t}$ is the dependent variable either abnormal stock return or short-sales ratio, μ_j is the fixed effect on event j, $d_{j,t}$ is other explanatory variables such as firm-specific variables and dummy variables, and β_1, β_2, β_3 are vectors of coefficients.

We further show interesting results incorporated in our conclusion. Section 4.1 reports an overview and comprehensive results. Section 4.2 contrasts insider concentration with insider deconcentration. Section 4.3 discusses the relationship between abnormal stock return and short sales volume used as proxies of insider trading. Section 4.4 investigates opportunistic trading behavior of insiders.

4.1 Comprehensive Results

We present comprehensive results of the impact of after-hours block trades of insiders conditional on the class of insiders and the time periods. Table 3 shows the event fixed effect regression results. To save space and improve legibility, we display interaction terms between the period dummies and the stock ownership change variables of each block holder in a matrix form. TransactionDate and FilingDate are dummy variables which take value of 1 on the transaction date and the filing date, respectively.

In Panel A, we measure the event fixed effect with the change value of total stock ownership of each insiders' class. Stock return generally decreases on the transaction date and in the distance τ-t period. Consistent with previous literatures suggesting information leakage, abnormal stock return is affected by the trade size of corporate insiders (Largest shareholder, Executives, and Affiliates) on the transaction date prior to the announcement. Greater positive abnormal return is generated when corporate insiders decide to buy more shares in after-hours block market. On filing date, a reverse relationship is shown for trades of Major shareholder and Others. In addition, positive abnormal return is generated for larger firms and growth firms. Institutional investors and foreign investors make profits throughout the sample period, whereas individual investors experience a significant loss. Positive abnormal return is associated with strong ownership of the largest stockholder. Meanwhile, short sales volume shows no clear pattern of insider trading. Short sales volume significantly decreases in the events of overpricing and underpricing. Individual investors trade against the short sales throughout the sample period, whereas foreign investors trade on the same direction.

Table 3 presents the impact of after-hours block trades of insiders conditional on the class of insiders and the time periods. We run the following event fixed effect regression model $y_{j,t} = \alpha_j + \beta_1\mu_j + \beta_2 d_{j,t} + \beta_3\mu_j d_{j,t} + \varepsilon_{j,t}$ where $y_{j,t}$ is the dependent variable either abnormal stock return or short-sale ratio, μ_j is the fixed effect on event j, and $d_{j,t}$ is other explanatory variables such as firm-specific variables and dummy variables. To save space and improve legibility, we display interaction terms between the period dummies and the stock ownership change variables of each block holder in a matrix form. TransactionDate and FilingDate are dummy variables which take value of 1 on the transaction date and the filing date, respectively. In Panel A, we measure the event fixed effect with the change value of total stock ownership of each class. In Panel B, we measure the event fixed effect with dummy variables which indicate either insider purchases or sales. Panel robust t-statistics is in the parenthesis. * refers to statistical significance at 10% level. ** refers to statistical significance at 5% level. *** refers to statistical significance at 1% level.

Table 3. Event fixed effect regression

Panel A: Event fixed effect measured by the change value of total stock ownership.						
Dependent variables: AR						
Period1		0.0005 (0.61)				
TransactionDate		-0.0040** (-1.99)				
Period2		-0.0021*** (-3.30)				
FilingDate		-0.0021 (-1.34)				
Period3		-0.0005 (-0.64)				
Class of block holder:		**Largest**	**Major**	**Executives**	**Affiliates**	**Others**
Period1	* CHG.holder	0.0002 (0.61)	0.0001 (0.47)	-0.0007 (-0.90)	-0.0001 (-0.28)	0.0004 (0.99)
TransactionDate	* CHG.holder	0.0045*** (5.78)	-0.0004 (-0.37)	0.0060* (1.88)	0.0024*** (2.50)	0.0023 (1.44)
Period2	* CHG.holder	-0.0002 (-0.48)	-0.0003 (-0.89)	0.0014 (1.59)	-0.0006 (-1.26)	0.0003 (0.36)
FilingDate	* CHG.holder	0.0003 (0.41)	-0.0012* (-1.89)	0.0025 (1.09)	0.0016* (1.94)	-0.0031*** (-2.95)
Period3	* CHG.holder	0.0004 (1.48)	0.0006*** (2.87)	0.0018* (1.94)	-0.0001 (-0.32)	0.0004 (0.76)

(Table 3, Panel A continued)

Dependent variables: AR						
Under		-0.0192 (-1.51)				
Size		0.0180*** (3.06)				
B/M		-0.0072* (-1.71)				
ROA		0.0000 (0.27)				
Insti		0.0022*** (5.32)				
Indiv		-0.0272*** (-17.46)				
Forei		0.0020*** (4.90)				
R.Largest		0.0003** (2.55)				
Dependent variables: ShortRatio						
Period1		-0.0018 (-0.60)				
TransactionDate		0.0096 (1.21)				
Period2		-0.0095 (-1.37)				
FilingDate		0.0123 (1.30)				
Period3		-0.0011 (-0.50)				
Period1	* CHG.holder	0.0005 (0.85)	-0.0015** (-1.99)	-0.0002 (-0.16)	-0.0003 (-0.27)	-0.0036 (-1.11)
TransactionDate	* CHG.holder	-0.0008 (-0.49)	-0.0024 (-1.39)	-0.0026 (-1.37)	-0.0023 (-0.74)	0.0013 (0.85)
Period2	* CHG.holder	-0.0015 (-0.89)	-0.0027** (-2.23)	-0.0001 (-0.03)	-0.0010 (-0.50)	-0.0024 (-1.00)
FilingDate	* CHG.holder	-0.0001 (-0.06)	0.0005 (0.26)	0.0036** (2.27)	0.0051** (2.36)	0.0037 (1.03)
Period3	* CHG.holder	-0.0010 (-1.48)	-0.0007 (-0.72)	0.0005 (0.38)	0.0002 (0.18)	-0.0006 (-0.60)
Over		-0.0111*** (-4.20)				
Under		-0.0154*** (-4.07)				
Size		-0.0113 (-0.69)				
B/M		0.0069 (1.14)				
ROA		0.0001 (0.81)				
Insti		0.0025 (1.63)				
Indiv		0.0045** (2.43)				
Forei		-0.0094*** (-4.88)				
R.Largest		0.0016 (1.60)				

(Table 3 continued)

Panel B: Event fixed effect measured by dummy variables which indicate either insider purchases or sales.						
Dependent variables: AR						
Period1		0.0013 (0.52)				
TransactionDate		-0.0046 (-0.71)				
Period2		-0.0048** (-2.48)				
FilingDate		0.0069 (1.16)				
Period3		0.0001 (0.05)				
Class of block holder:		**Largest**	**Major**	**Executives**	**Affiliates**	**Others**
Period1	* B.holder	-0.0009 (-0.40)	0.0009 (0.31)	-0.0095* (-1.65)	-0.0007 (-0.17)	-0.0044* (-1.83)
	* S.holder	0.0014 (0.43)	-0.0002 (-0.07)	-0.0047* (-1.74)	-0.0012 (-0.50)	-0.0007 (-0.29)
TransactionDate	* B.holder	0.0194*** (3.41)	-0.0036 (-0.37)	0.0171 (1.52)	0.0106* (1.66)	-0.0047 (-0.34)
	* S.holder	-0.0159** (-2.22)	-0.0023 (-0.33)	-0.0186** (-2.27)	-0.0037 (-0.59)	-0.0027 (-0.38)
Period2	* B.holder	0.0018 (0.86)	0.0053** (2.43)	0.0056*** (3.28)	0.0019 (0.83)	0.0017 (0.49)
	* S.holder	0.0020 (0.95)	0.0034 (1.50)	-0.0042* (-1.81)	0.0014 (0.68)	0.0055** (2.18)
FilingDate	* B.holder	-0.0094* (-1.88)	-0.0153* (-1.74)	0.0030 (0.27)	-0.0025 (-0.45)	-0.0042 (-0.46)
	* S.holder	-0.0106 (-1.42)	-0.0063 (-0.93)	0.0018 (0.32)	-0.0114** (-1.99)	0.0027 (0.47)
Period3	* B.holder	0.0031* (1.75)	0.0028 (1.10)	0.0087*** (2.60)	0.0031 (1.25)	-0.0048 (-1.46)
	* S.holder	-0.0041* (-1.89)	-0.0039** (-2.07)	-0.0090*** (-2.78)	0.0015 (0.79)	-0.0023 (-0.92)
Over		-0.0020 (-0.16)				
Under		-0.0188 (-1.49)				
Size		0.0196*** (3.34)				
B/M		-0.0064 (-1.52)				
ROA		0.0000 (0.42)				
Insti		0.0022*** (5.14)				
Indiv		-0.0273*** (-17.49)				
Forei		0.0020*** (4.81)				
R.Largest		0.0003** (2.44)				

(Table 3, Panel B continued)

Dependent variables: ShortRatio						
Period1		-0.0104 (-1.09)				
TransactionDate		0.0124 (0.55)				
Period2		-0.0332* (-1.80)				
FilingDate		0.0422 (1.53)				
Period3		-0.0042 (-0.64)				
Class of block holder:		**Largest**	**Major**	**Executives**	**Affiliates**	**Others**
Period1	* B.holder	0.0138 (1.54)	0.0128 (1.25)	0.0130* (1.76)	0.0156 (1.29)	0.0060 (0.82)
	* S.holder	0.0055 (0.72)	0.0184* (1.95)	-0.0536* (-1.76)	0.0085 (1.07)	0.0166 (1.36)
TransactionDate	* B.holder	0.0094 (0.33)	-0.0037 (-0.16)	-0.0160 (-1.19)	-0.0048 (-0.29)	0.0006 (0.03)
	* S.holder	-0.0007 (-0.04)	0.0088 (0.42)	-0.0659 (-1.43)	0.0145 (0.57)	0.0016 (0.07)
Period2	* B.holder	0.0309* (1.87)	0.0617 (1.61)	0.0297** (2.13)	0.0300* (1.70)	0.0380** (2.35)
	* S.holder	0.0246 (1.45)	0.0356* (1.95)	-0.1102* (-1.70)	0.0113 (0.91)	0.0269 (1.52)
FilingDate	* B.holder	-0.0393* (-1.78)	-0.0279 (-1.11)	-0.0082 (-0.48)	-0.0516 (-1.62)	-0.0239 (-1.39)
	* S.holder	-0.0352 (-1.46)	-0.0336 (-1.34)	0.1485* (1.75)	-0.0544** (-2.26)	-0.0441 (-1.45)
Period3	* B.holder	-0.0009 (-0.15)	0.0041 (0.61)	0.0137* (1.94)	0.0034 (0.48)	0.0038 (0.69)
	* S.holder	0.0064 (0.95)	0.0059 (0.94)	-0.0241 (-1.53)	0.0040 (0.57)	0.0116 (1.40)
Over		-0.0099*** (-2.74)				
Under		-0.0118*** (-3.32)				
Size		-0.0063 (-0.41)				
B/M		0.0096 (1.38)				
ROA		0.0003 (1.41)				
Insti		0.0023* (1.87)				
Indiv		0.0036** (2.19)				
Forei		-0.0093*** (-5.06)				
R.Largest		0.0014* (1.90)				

We now separate the effect of transaction type and trade size of each class of insiders. More specifically, we measure event fixed effect with dummy variables which indicate either insider purchases or sales. In Panel B, TransactionDate dummy shows no longer significant, meaning that all the effect is captured in the model. Again, abnormal return increases about 2% when Largest shareholder buys and decreases about 1.6% when Largest shareholder sells on the transaction day. Similar results are found in trades of Executives and Affiliates. However, stock price is not dependent

on after-hours block trading activities of Major shareholder and Others. Furthermore, persistency of the impact is captured in the trades of Executives. Abnormal return triggered by corporate insiders drifts in post announcement period. In contrast, results of short sales volume exhibit no certainty of information leakage with respect to the class of insiders. Short sales volume grows the most when Executives sells on the filing date.

4.2 Insider Concentration

We view some of the opposite effects of corporate insiders (Largest shareholder, Executives, and Affiliates) and quasi-insiders (Major shareholder and Others) are due to changes in ownership structure. Thus, we contrast events by ownership inflow and outflow using corporate insiders as a standard.

Figure 2 shows CAR of contrasting events, insider concentration and insider deconcentration, around transaction date. The solid line represents CAR of ownership inflow events which includes events *at least* one type of corporate insiders (Largest shareholder, Executives, and Affiliates) buys *and* none of corporate insiders sells on the transaction date. The dashed line represents CAR of ownership outflow events which includes events *at least* one type of corporate insiders sells *and* none of corporate insiders buys on the transaction date. The number of events of ownership inflow and ownership outflow is 185 and 221, respectively.

Figure 2. Insider concentration versus insider deconcentration

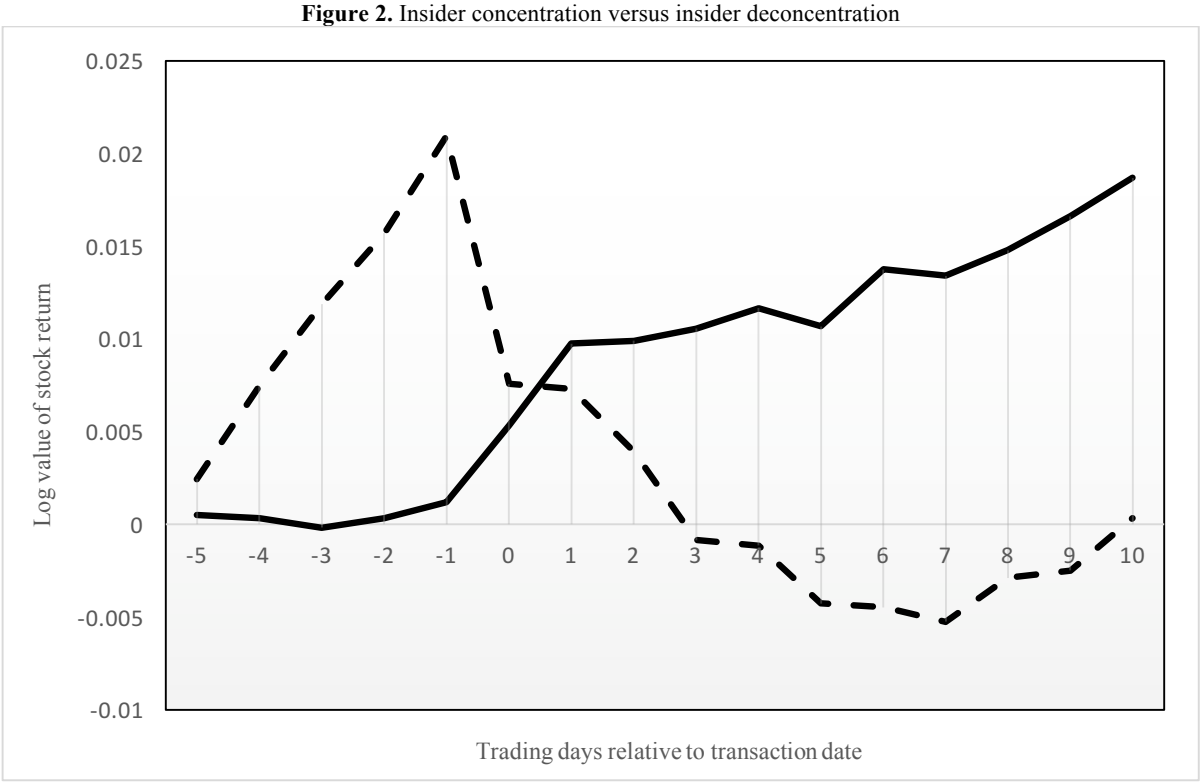

Figure 2 shows CAR of concentration and deconcentration of shares towards corporate insiders. The solid line represents CAR of ownership inflow events which includes events *at least* one type of corporate insiders (Largest shareholder, Executives, and Affiliates) buys *and* none of corporate insiders sells on the transaction date. The dashed line represents CAR of ownership outflow events which includes events *at least* one type of corporate insiders sells *and* none of corporate insiders buys on the transaction date. The number of events of ownership inflow and ownership outflow is 185 and 221, respectively. Events of ownership inflow exhibit a positive permanent shift in CAR on the transaction date and the day after. On the other hand, events of ownership outflow show a significant decrease in CAR on the transaction date. The impact persists for few days until the CAR reaches the new level.

We examine the contrasting effects of insider concentration versus insider deconcentration in detail. Table 4 provides regression results of ownership inflow and ownership outflow conditional on the time period. Own.inflow is a dummy variable which takes value of 1 if *at least* one type of corporate insiders (Largest shareholder, Executives, and Affiliates) buys *and* none of corporate insiders sells on the transaction date, 0 otherwise. Own.outflow is a dummy variable which takes value of 1 if *at least* one type of corporate insiders sells *and* none of corporate insiders buys on the transaction date, 0 otherwise.

Table 4 provides regression results of contrasting events of ownership inflow and outflow conditional on the time periods. Own.inflow is a dummy variable which takes value of 1 if *at least* one type of corporate insiders (Largest shareholder, Executives, and Affiliates) buys *and* none of corporate insiders sells on the transaction date, 0 otherwise. Own.outflow is a dummy variable which takes value of 1 if *at least* one type of corporate insiders sells *and* none of corporate insiders buys on the transaction date, 0 otherwise. We use panel robust t-statistics for statistical significance. * refers to statistical significance at 10% level. ** refers to statistical significance at 5% level. *** refers to statistical significance at 1% level.

Table 4. Regression results of Ownership inflow versus Ownership outflow

		Dependent variables: AR		Dependent variables: ShortRatio	
		Coefficient	**t-stat**	**Coefficient**	**t-stat**
Period1		-0.0007	-0.56	0.0104***	3.09
	* Own.inflow	0.0017	1.00	-0.0078*	-1.91
	* Own.outflow	0.0016	0.93	-0.0224***	-2.78
TransactionDate		-0.0037	-1.14	0.0093*	1.95
	* Own.inflow	0.0143***	3.11	0.0136	0.60
	* Own.outflow	-0.0148***	-3.20	-0.0005	-0.04
Period2		-0.0007	-0.66	0.0006	0.29
	* Own.inflow	-0.0008	-0.48	0.0063	0.88
	* Own.outflow	-0.0028**	-2.13	-0.0263*	-1.70
FilingDate		0.0049**	2.10	-0.0007	-0.19
	* Own.inflow	-0.0093***	-2.76	-0.0005	-0.10
	* Own.outflow	-0.0103***	-2.91	0.0242	1.30
Period3		-0.0023**	-2.27	0.0015	0.57
	* Own.inflow	0.0061***	3.38	-0.0006	-0.15
	* Own.outflow	-0.0004	-0.23	-0.0034	-0.87
Over		-0.0022	-0.17	-0.0118***	-4.00
Under		-0.0187	-1.44	-0.0143***	-4.00
Size		0.0187***	3.18	-0.0093	-0.59
B/M		-0.0068	-1.60	0.0089	1.37
ROA		0.0000	0.23	0.0002	1.32
Insti		0.0023***	5.40	0.0028*	1.74
Indiv		-0.0269***	-17.43	0.0049**	2.64
Forei		0.0021***	4.98	-0.0093***	-4.93
R.Largest		0.0003***	2.70	0.0015*	1.74

Consistent with the results of Section 4.1, positive (negative) abnormal return of 1.4% is generated when ownership shares are transferred to (from) corporate insiders on the transaction date. Moreover, the impact of ownership outflow lasts until the filing date since the coefficient of Period2 alone is no longer significant. On the filing date, we also discover a partial reversion of abnormal return when corporate insiders increase their shares from other parties possibly due to overshooting as the prediction of Brunnermeier (2005). This tendency, once again, is reversed to the corresponding price direction of the transaction date until day τ+5.

One possible answer to explain the occurrence of such contrasting effects is the signaling hypothesis. Corporate insiders, who are considered well-informed of the firm, signal other investors about the future stock price subject to earnings fluctuation by their trading behaviors. For instance, investors view insider sales is a prelude to negative earnings surprises. The early reflection of the signal and its persistency are due to informed trades of tippees. Another

possible explanation is investors prefer shares concentration on corporate insiders. They perceive firms with strong corporate governance perform better than firms with weak corporate governance, aside from the causality between ownership structure and performance (Shleifer and Vishny, 1986; Chang, 2003). Our empirical evidence of the suggestion is that abnormal return is proportional to ownership percentage held by the largest shareholder throughout the sample period.

Although abnormal return reflects private information of corporate ownership flow prior to the announcement, short sales volume does not provide a robust result of increasing or decreasing in particular.

4.3 What Makes Tippees to Sell Short?

Up to this point, we separate our two proxies of early-informed trading, abnormal return and short sales volume. In this section, we examine the contemporaneous relationship of these proxies conditional on the period filters of after-hours block trading. Put it concretely, we regress the following individual fixed effect model for event *j* at time *t*:

$$SSratio_{j,t} = \alpha_j + \beta_1 AR_{j,t} + \beta_2 AR_{j,t} P_{j,t} + \beta_3 g_{j,t} + \varepsilon_{j,t}$$

where $SSratio_{j,t}$ is the dependent variable short-sales ratio, $AR_{j,t}$ is the market-adjusted abnormal return, $P_{j,t}$ is a vector of our period dummy variables, $g_{j,t}$ is the firm-specific control variables, and β_1, β_2, β_3 are vectors of coefficients.

Table 5 shows results of the contemporaneous relationship of short-sale ratio and abnormal return conditional on the period filters of after-hours block trading. We regress the following individual fixed effect model for event *j* at time *t*: $SSratio_{j,t} = \alpha_j + \beta_1 AR_{j,t} + \beta_2 AR_{j,t} P_{j,t} + \beta_3 g_{j,t} + \varepsilon_{j,t}$ where $SSratio_{j,t}$ is the dependent variable short-sales ratio, $AR_{j,t}$ is the market-adjusted abnormal return, $P_{j,t}$ is a vector of our period dummy variables, $g_{j,t}$ is the firm-specific control variables, and β_1, β_2, β_3 are vectors of coefficients. We use panel robust t-statistics for statistical significance. * refers to statistical significance at 10% level. ** refers to statistical significance at 5% level. *** refers to statistical significance at 1% level.

Table 5. Contemporaneous effect of stock returns on short sales

		Coefficient	t-stat
AR		0.1038	1.44
	*Period1	-0.0444	-0.64
	*TransactionDate	-0.2806**	-2.13
	*Period2	0.0483	0.93
	*FilingDate	-0.0845	-0.56
	*Period3	-0.0983	-1.03
Size		-0.0147	-0.80
B/M		0.0067	1.07
ROA		0.0002	1.03
Insti		0.0024*	1.74
Indiv		0.0076**	2.50
Forei		-0.0095***	-4.68
R.Largest		0.0014*	1.66

Table 5 presents results of the regression. The only significant coefficient shown among the period dummies is the one on the transaction date. On the date, short sales volume and stock return have a reverse relationship. Although the absolute amount of short sales volume does not vary statistically on the transaction date, short-sales is informative to price formation when the impact of insider trading is most significant. This result is an endogenous problem, better known as stock return predictability of short sales (Diether et al., 2009). Consistent to the conclusion of Diether et al., we view that short-selling activity of tippees is based on short-term horizon of intraday changes in stock return, rather

than long-term corporate events[3]. In an untabulated analysis of contrasting large trades with small trades, an analogous approach to Khan and Lu (2013), short sales volume does not significantly increase at a large (top 30% events) sales of any class of insiders.

4.4 Opportunistic Trading of Insiders

We now turn our perspective on motives of insiders who decide to trade after-hours. Figures in previous sections exhibit a continuous increase in stock abnormal return prior to after-hours block transaction date. We test whether the participation of after-hours block trading is affected by the past performance of stock return. We use logit regression for our sub-sample period of transaction date. Table 6 presents results of the regression. The dependent variable of each model is a dummy variable indicating buying or selling activity of each class of insiders.

In Table 6, past performances of stock return influence Executives to buy and Largest shareholders to sell in after-hours block market. Interestingly, poor past performance increase the probability of corporate insider purchases, whereas outstanding performance increase the probability of corporate insider sales. The results are seemingly counter-intuitive, since large shareholders whose positions are concentrated on few firms desire to hold more (less) shares of firms with good (bad) performance (i.e. corporate insiders are hardly considered as reverse momentum traders). We view the purpose of trading is not merely for investment, but for maximizing realized profits or minimizing purchasing costs. This perspective is consistent to Chauvin and Shenoy (2001) who suggest executives take advantage of temporary stock price decreases before their stock option grant date. However, since corporate insiders already hold significant amount of shares of the target firm, we consider corporate insiders select their market timing of the block trades (e.g. insiders sell shares in bulk when the stock price hit a 20-day high) rather than divulge material information to manipulate the stock price. In addition, the outcome of transaction price negotiation does not influence the decision of insiders' trade. One conjecture is that insiders negotiate in adverse condition since they are believed to be well-informed, thus handicapped to some extent in price determination.

We test whether the participation of after-hours block trading is affected by the past performance of stock return. We use logit regression for our sub-sample period of transaction date. Table 6 presents results of the regression. The dependent variable of each model is a dummy variable indicating buying or selling activity of each insiders' class. CAR(-20, -1) is cumulative abnormal return from day t-20 to day t-1. Chaebol is a dummy variable which takes value of 1 if the firm is affiliated to *Group*, 0 otherwise. * refers to statistical significance at 10% level. ** refers to statistical significance at 5% level. *** refers to statistical significance at 1% level.

[3] According to an anonymous interviewee from financial intermediaries engaged in allegation of using undisclosed material information to short-selling in after-hours block trades, it is a business practice for the buy-side counterparties of corporate insiders to sell short on the target firm. They argue that short-selling on the transaction date is mainly to hedge instant downward deviation of the stock price. However, our result implies that the amount of short sales is reduced by positive abnormal return as well, suggesting that such front-runners are favored anyhow.

Table 6. Opportunistic trading of corporate insiders

	B.Largest	B.Major	B.Executives	B.Affiliates	B.Others
Intercept	-3.8498	-1.4483	4.0063	-1.0644	6.4340
	(-1.16)	(-0.25)	(0.73)	(-0.21)	(0.61)
CAR(-20, -1)	-1.3887	-2.2544	-4.5810*	-1.6131	-3.6000
	(-0.94)	(-1.05)	(-1.75)	(-0.98)	(-1.19)
Over	-0.4451	0.9264	-0.2847	-1.1082**	1.7730
	(-1.00)	(1.43)	(-0.47)	(-2.53)	(1.46)
Under	-0.4279	-0.5390	-1.7337***	-3.5471***	-0.0828
	(-1.07)	(-0.80)	(-2.67)	(-5.29)	(-0.07)
Size	0.0456	-0.1006	-0.2118	-0.0160	-0.4060
	(0.37)	(-0.46)	(-1.05)	(-0.09)	(-1.02)
B/M	1.2195***	0.5546	-0.1773	-0.2121	-1.0660*
	(4.95)	(1.64)	(-0.44)	(-0.65)	(-1.82)
ROA	-0.0182	-0.0169	0.0137	-0.0104	-0.0174
	(-0.66)	(-0.46)	(0.33)	(-0.41)	(-0.55)
Insti	-0.6081**	0.4490	0.1652	-0.3128	-1.1290*
	(-2.50)	(1.38)	(0.45)	(-1.05)	(-1.68)
Indiv	0.7021**	-0.5463	2.3057***	-1.4054***	0.5654
	(1.97)	(-1.15)	(3.56)	(-2.94)	(0.55)
Forei	0.0951	-0.0692	-0.3334	-0.1944	0.4230
	(0.36)	(-0.20)	(-0.76)	(-0.59)	(0.65)
Chaebol	0.7522	-0.7136	-0.1004	-0.1063	-0.5763
	(1.43)	(-1.11)	(-0.13)	(-0.20)	(-0.60)
R.Largest	0.0041	0.0331**	-0.0182	0.0149	0.0001
	(0.42)	(2.11)	(-1.12)	(1.05)	(0.00)

(Table 6 continued)

	S.Largest	S.Major	S.Executives	S.Affiliates	S.Others
Intercept	-3.5643	0.5720	5.8486	-1.0102	0.2652
	(-1.29)	(0.22)	(1.02)	(-0.36)	(0.06)
CAR(-20, -1)	2.2895**	-0.0567	-0.7124	-0.9372	0.2573
	(2.56)	(-0.06)	(-0.39)	(-0.78)	(0.20)
Over	0.7296*	0.2431	-0.2289	-0.4947	-0.7298
	(1.75)	(0.51)	(-0.34)	(-1.14)	(-1.26)
Under	0.3528	1.1110***	-0.1845	-0.3660	-0.3242
	(0.92)	(2.69)	(-0.31)	(-0.99)	(-0.69)
Size	0.0802	-0.1059	-0.3321	-0.0197	-0.1108
	(0.79)	(-1.10)	(-1.52)	(-0.19)	(-0.72)
B/M	-0.1623	-0.4242***	-0.2613	0.3154	-0.4783*
	(-0.92)	(-2.61)	(-0.83)	(1.60)	(-1.85)
ROA	0.0293*	-0.0117	-0.0603**	0.0254	0.0171
	(1.66)	(-0.77)	(-2.48)	(1.03)	(0.70)
Insti	0.0917	0.2854	-0.0143	0.5725***	-0.3129
	(0.47)	(1.45)	(-0.04)	(2.59)	(-1.08)
Indiv	-0.9613***	0.3830	-3.7744***	1.2404***	-0.1148
	(-3.35)	(1.38)	(-5.97)	(3.90)	(-0.28)
Forei	0.1060	0.2425	-0.1007	0.2546	-0.2533
	(0.48)	(1.11)	(-0.27)	(1.05)	(-0.79)
Chaebol	-0.7609**	0.5012	0.7331	0.8072*	0.4953
	(-2.26)	(1.36)	(1.15)	(1.65)	(0.93)
R.Largest	0.0049	-0.0002	-0.0163	-0.0134	0.0061
	(0.62)	(-0.03)	(-1.08)	(-1.62)	(0.53)

5. CONCLUSION

This paper sheds light on some intriguing aspects of after-hours block trading in Korea. The issue has meaningful implications in both academic perspective and practical perspective. Unlike previous literatures, we focus on long-lived component of the impact of informed trading which is associated with corporate ownership structure. We use a comprehensive sample of after-hours block trades from 'Report on Stocks, etc. Held in Bulk' files, which is equivalent to Schedule 13D files. The uniqueness of the data set allow us to extract explicit and opportunistic insider trading from liquidity-motivated trades of insiders. We apply two distinct proxies to detect early-informed trading, abnormal return and short sales volume. We find positive (negative) abnormal stock return is generated prior to the announcement of corporate insider purchases (sales) in after-hours block market, whereas the abnormal return does not respond to quasi-insiders' trades. The impact is most significant on the transaction date by the time that ownership shares are transferred to (from) corporate insiders. The effect is persistent either before the filing date or after the filing date. In contrast, analysis of short sales volume does not show a robust variation on trading of any block holder class. Although the amount of short sales volume does not particularly increase or decrease on the transaction date, we discover short sales volume is only informative on the day indicating short-selling tippees trade by the short-lived component of informed trading on intraday basis. Not only do tippees benefit from the after-hours block trades, insiders are opportunistic on their trades as well. We present evidence that past performances of stock return affect a transaction decision of corporate insiders in after-hours block market.

The main implications of the paper are following: (1) Insider block trading information leaks at least from the transaction date. (2) The long-lived impact of after-hours block trading of insiders on stock price is concerned with corporate ownership structure. (3) Short sales volume becomes informative and has a negative relationship with abnormal return on the transaction date while the amount is unchanged. (4) corporate insiders exploit after-hours block trading to maximize their realized profits or minimize their purchasing costs.

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