SELECTIVE DISCLOSURE

- THE CASE OF THE KOREAN SECURITIES MARKET -

by

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ABSTRACT

Korea adopted Regulation Fair Disclosure (FD) in November 2002. Regulation FD, designed with a goal of levelling the playing field among market participants, has created considerable debate among practitioners and academics. This thesis examines the effect of Regulation FD on the Korean securities market, using a large sample of 161,343 forecast-year observations and 2,311 firm-year observations from 2000 to 2007. We uncover four main sets of findings. First, we find that analysts' forecast accuracy has increased after the adoption of Regulation FD. We attribute this finding to the improved quality of public information and reduced importance of private access to managers in the post-FD period. Second, we provide evidence of significant change in firms' disclosure policy in the post-FD period. We report that private earning guidance and private information in analysts' forecasts have decreased as a consequence of curtailing selective disclosure in the post-FD period. Our findings are consistent with the intentions of Regulation FD to increase management disclosure to the general public. Third, we find no evidence of an increase in herding behaviour in the post-FD period. Our results contradict Regulation FD's opponents' claims that elimination of private channels may lead to increasing herding behaviour due to the chilling effect. We find no evidence that Regulation FD makes firms withhold their disclosure. To the contrary, our evidence suggests that Regulation FD has led to an increase in the quality and quantity of public information. Finally, we provide strong evidence for a reduction in informed trading and information leakage prior to unscheduled earnings announcement and release of analysts' recommendations. Overall, our results suggest that Regulation FD

has been successful in eliminating selective disclosure and levelling the playing field for investors.

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LIST OF ABBREVIATIONS

AIMR	Association for Investment Management and Research (now the CFA institute)
FD	Fair Disclosure
FSC	Financial Supervisory Committee (now the Financial Service Committee)
FSS	Financial Supervisory Service
IR	Investor Relation
KRX	Korea Exchange
NIRI	National Investor Relation Institute
Regulation FD	Regulation Fair Disclosure
SEC	Securities and Exchange Commission
SIA	Securities Industry Association
VD	Voluntary Disclosure

CHAPTER 1

INTRODUCTION

Analysts have been regarded as important providers of information in capital markets for a long time. They are also known to play a role in resolving the imbalance in information between investors and firms and enhancing efficiency in the market (Givoly et al., 1979, Imhoff et al., 1992). A firm transmits information to analysts who then perform their duty through a press release, investor relations (IR), and reference call, before making public disclosure to investors. However, the analysts' reports may cause information asymmetry among investors if analysts depend on management-guided information as an information interpreter. A typical feature of the practice called selective disclosure is to provide material information to favoured investors in advance, which arguably forms an "uneven playing field" in terms of information asymmetry.

This practice of a firm disclosing private information selectively to privileged individuals is prevalent (Bailey et al., 2003; Strazer, 2002; Sunder, 2002; Lee et al., 2004). The practice has long been criticized as a scourge plaguing information dissemination because selective disclosure can act as a factor hindering the development of the securities market and lowering the investor's faith in the financial market (Arya et al., 2005). The Securities Exchange Commission (SEC) viewed the practice of selective disclosure as a serious threat to fairness to public investors and thus implemented Regulation Fair Disclosure (hereafter "Regulation FD") from October 2000. Korea adopted Regulation FD in November 2002. Regulation FD is represented as follows;[1]

[1] Arthur Levitt, the 25th Chairman of the SEC, served from 1993 to 2001, available at http://www.sec.gov/about/commissioner/levitt.htm

> *Whenever a public company, or any person acting on its behalf, discloses material private information to certain enumerated persons, the company must simultaneously, in the case of intentional disclosures, or promptly, in the case of unintentional disclosures, make public disclosure of that same information (Selective Disclosure and Insider Trading, SEC 17 CFR pts 243,100, August 2000).*

The basic purpose of Regulation FD is to prevent selective disclosure, expand the scope of public disclosure, and realize information democracy. SEC intended that Regulation FD should curtail analysts' private channels to management that they had previously enjoyed. Numerous empirical research supports SEC's view, while complaints and opposition to the new regulation emanated from critics, who suggested that Regulation FD may lead to more return volatility and less information disclosure in the capital market.[2]

At the time of the adoption of Regulation FD, many pros and cons were also raised in Korea. However, the view of the financial supervisory authority[3] is superior to that of the critics because investors were aware that the Korean economy was on the point of escaping from the economic crisis, and that unfair trading like insider trading thrives in the securities market. The amicable atmosphere meant that the regulation was settled without disturbance. Actually, most Korean researchers report that Regulation FD plays a positive role in enhancing the efficiency of the Korean capital market.[4] Researchers provide evidence that Regulation FD reduces imbalanced information among market

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[2] See section 8.1 in Chapter 2 and section 1 in Chapter 3.

[3] Financial Supervisory Committee (FSC, now the "Financial Service Committee") and Financial Supervisory Service (FSS).

[4] See section 8.2 in Chapter 2.

participants and improves the fairness and reliability of information in the Korean securities market.

This thesis consists of four distinct essays (chapters) on the different six areas affected by Regulation FD. Our first essay is on the effect of Regulation FD on the analysts' forecasts performance (i.e., forecast accuracy and forecast dispersion). The second essay looks at whether Regulation FD affects the firms' disclosure policy by examining changes in private earnings guidance and private information in analysts' forecasts. The third essay examines whether Regulation FD leads firms to suppress the disclosure to the public by exploring the change in herding behaviour among analysts. In the last essay, we discuss the effect of Regulation FD on the informed trading prior to earnings announcement and information leakage of analysts' recommendations.

However, we study one common topic: How has Regulation FD influenced the Korean securities market? Our study empirically analyzes the implications of Regulation FD on several changes in the information environment among market participants. Using analysts' forecasts made for a large of sample of 161,343 observations for 2,311 firms over two time intervals: (1) two years pre-FD period (24,969 observations) and (2) five years post-FD period (136,374 observations), we verify whether firms stop providing private information or choose public disclosure as a substitute for selective disclosure after the adoption of Regulation FD. To our knowledge, our research covers the most comprehensive sample size and longest sample period in analysts' forecasts research, compared to those of existing Korean research, which use at most about ten thousand forecast observations.

In response to concerns about Regulation FD decreasing analysts' forecasting ability, the first empirical study examines whether Regulation FD influences their forecast performance. We expect that there will be a significant difference in analysts' forecasts in the post-FD period since Regulation FD influences firms' disclosure policy. We find that forecast errors and forecast dispersion have decreased after the adoption of Regulation FD. The finding is consistent with the Korean research, Oh et al., (2005). We extend previous research by analysing analysts' forecasts performance in accordance with the level of information uncertainty. Specifically, we examine the change in (absolute) forecast errors (*AFE*) and forecast dispersion (*DISP*) for lower information uncertainty groups (*earnings decrease firms* and *sell-side recommendations*) as compared to higher information uncertainty groups (*earnings increase firms* and *buy-side recommendations*) after the adoption of Regulation FD. We find greater improvements in forecast accuracy and forecast dispersion for lower information uncertainty groups than for higher information uncertainty groups in the post-FD period. This study contributes to the current debate over the effectiveness of Regulation FD. Our results provide positive evidence of analysts' forecasting performance after the adoption of Regulation FD.

The second empirical study explores the effect of Regulation FD on private earnings guidance. Regulation FD prohibits managers from communicating privately with groups of favoured analysts. Therefore, analysts are likely to depend on public information in their earnings forecasting instead of private access to management. In order to measure private earnings guidance, following Matsumoto (2002) and Wang (2007), we calculate the change in private earnings guidance in analysts' forecasts. We find evidence of a

decrease in private earnings guidance after the adoption of Regulation FD. Our study contributes to the research on the effect of Regulation FD by calculating the change in disclosure practice of firms.

The third empirical study is to provide evidence of the effect of the Regulation on private information in analysts' forecasts. In order to measure private information in analysts' forecasts, we adopt the model designed by Barren, Kim, Lim and Stevens (1998), who show that the content of information affects forecast dispersion and forecast errors in the mean value of these forecasts. If Regulation FD has a positive effect on alleviating the imbalance in information, there should be a significant difference in private information in the post-FD period. We also find evidence of a decrease in the ratio of private information in earnings forecasting after the adoption of Regulation FD. Our study differentiates itself by measuring the private information in analysts' forecasts in order to corroborate the effect of Regulation FD.

The fourth empirical study provides unified results on analysts' herding behaviour after the adoption of Regulation FD. Previous empirical evidence regarding the effects of Regulation FD on herding behavior in analysts' forecasts shows mixed results. Some literature suggests that herding behaviour may be more pronounced in the post-FD period as the regulation reduces private information (Zitzewits, 2002; Arya et al., 2005). On the other hand, using two different methods (*DHI* and *S-statistic test*), Mensah et al., (2008) find no evidence that Regulation FD results in an increase in analysts' herding behaviour since the regulation has not led to a negative influence on the analysts' forecast ability. In order to measure changes in herding behaviour in analysts' forecasts,

we calculate herding propensity (i.e., *S-statistic* and *Boldness*) developed by Bernhardt et al., (2006) and Clement et al., (2005). We find evidence of anti-herding behaviour in Korean analysts' forecasts. This finding is not consistent with Ahn et al., (2007). We also provide evidence that herding behaviour in analysts has not significantly changed in the post-FD period since analysts gain available public information complementing their lost private information after the adoption of Regulation FD. Our research reconciles the opposing papers on the effect of Regulation FD on herding behaviour by providing a convincing interpretation of the conflicting results.

The fifth empirical study looks at whether Regulation FD influences informed trading prior to unscheduled earnings announcement. In order to provide evidence of informed trading, we measure the abnormal trading volumes (*CAV, AV*) and abnormal stock price returns (*CAR, AR*) over six event windows [5] around an unscheduled earnings announcement date. We expect to see a reduction in abnormal stock returns and trading volume prior to unscheduled earnings announcement if the regulation contributes to a decrease in selective disclosure. We find that cumulative abnormal volumes (*CAV*) and cumulative abnormal returns (*CAR*) prior to unscheduled earnings announcements have significantly decreased in the post-FD period. This research contributes to the previous research on the Regulation FD by exploring informed trading prior to unscheduled earnings announcements.

Our last empirical study examines whether important clients of securities companies possess private information on the analysts' recommendations after the adoption of

[5] [*Day-9*, *Day-1*], [*Day-7*, *Day-1*], [*Day-5*, *Day-1*], [*Day-3*, *Day+1*], [*Day+0*, *Day+1*], and [*Day+0*, *Day+3*].

Regulation FD. In order to examine the effect of Regulation FD on the information leakage of analysts, following Heggen et al., (2008) and Jackson et al., (2003), we also measure the abnormal volumes (*CAV, AV*) and abnormal returns (*CAR, AR*) around release of analysts' recommendations. We find that for buy-side recommendations, there is a significant decrease in cumulative trading volume and stock returns in the post-FD period, compared to the pre-FD period. On the other hand, for sell-side recommendations, there is no significant difference in abnormal volumes and abnormal returns. This research extends the research on the effect of Regulation FD by examining informed trading prior to the release of analysts' first buy-side recommendations as a way of offering more reliable evidence.

This research can be found to be of interest by academics and regulators. Our research contributes to studies on Regulation FD in several ways. First, our study differs basically from the extant research in the way we assess consistently various approaches on the effect of Regulation FD in the capital market. Information can be transmitted to markets via several channels. To assess the effect of the regulation, we analyze collectively changes in information environment among market participants: (1) firms and analysts (2) analysts and brokers' clients (3) analysts and analysts (4) firms and recipients from insider information.

Second, our research contributes to research on the positive effects of Regulation FD. Numerous opponents claim that Regulation FD has had an adverse effect on the capital market. We discuss the potential effect of Regulation FD on six aspects of the disclosure practices of firms, forecasts practices of analysts and informed trading. Our

empirical results provide a reliably and comprehensively positive interpretation of the effect of Regulation FD on the Korean capital market. We do not support the arguments developed by Regulation FD's opponents suggesting that the regulation has impaired firms' disclosure policy.

Third, we provide evidence based on a more comprehensive sample than those in other researches. We analyse 161,343 observations for 2,311 Korean firms over a period from 2000-2007 while previous Korean studies used a small sample of the latest forecasts just before earnings are announced. If analysts enjoy selective disclosure from managers, there is more room for information advantage over forecasts with a longer forecast horizon than the latest forecasts just before earnings announcement. Managers usually have little room for selective disclosure by the time earnings are released in public. However, our sample includes most forecasts by analysts employed by Korean securities companies. Therefore, our study can cover the various forecast behaviours of analysts, not just the latest forecasts. This feature of our analysis is of practical value to researchers who are interested in the effect of Regulation FD.

We have several main findings. First, we find evidence that Regulation FD provides a level playing field for all market participants. The most important reason given by the SEC for the adoption of Regulation FD is selective disclosure. The SEC asserts that Regulation FD has a positive effect on eliminating unfair trading in advance and alleviating imbalances in information between institutional investors and individual investors. In order to assess the effect of Regulation FD on selective disclosure, we extend previous studies by examining the relation of Regulation FD and four different

research aspects (i.e., private earnings guidance, private information in analysts' forecasting, informed trading and information leakage). The results of the four analyses consistently support the SEC's intention, indicating that Regulation FD contributes to the change in firms' disclosure practice and the information leakage of analysts' recommendations. We suggest that Regulation FD has decreased the differences in information symmetry among market participants.

Second, we find no evidence that quantity of information reduced drastically due to firms' non-disclosure after the adoption of Regulation FD. The finding is not consistent with some U.S. research results. Regulation FD's opponents suggested that Regulation FD would result in a cutting off of the communication between companies and market participants, what we call the "chilling effect". For example, the Association for Investment Management and Research (AIMR, now the CFA institute) generally opposed Regulation FD. According to their survey conducted in October 2001, a majority of financial analysts and managers responded that the quality and quantity of information had decreased after the adoption of Regulation FD. Another survey conducted later showed no significant change in that point (The CPA Journal, 2001).[6] This now raises the question of herding behaviour among analysts. Arya et al., (2005) and Zitzewitz (2002) report evidence that Regulation FD results in an increase in

6 The CPA Journal (2001) stated as follows;
"Regulation FD promised fair disclosure, and it seems to have achieved that, but apparently at the expense of full disclosure" said AIMR president and CEO Thomas A. Bowman. "Everyone has access to the same information at the same time, and that's laudable, but if there is less information in the marketplace, that's lamentable. Our focus now needs to be getting corporations to be more forthcoming in their public disclosures, to provide the level of detailed information investors need to make better-informed investment decisions."

analysts' herding behaviour[7] since regulation may suppress firms' disclosure. However, we are opposed to this criticism of Regulation FD. We find no evidence that Regulation FD makes analysts mimic their colleagues' forecasts and makes firms withhold the voluntary disclosure of material information. To the contrary, we find evidence that Regulation FD encourages firms to increase the amount of information available to the public.[8]

Third, Regulation FD influences analysts' ability to accurately forecast earnings. This finding is different from the U.S. research results of Regulation FD's proponents, indicating that Regulation FD may lead analysts' forecasts to become more difficult because the regulation prohibits private communications between management and analysts. For example, Mohanram et al., (2002) find that a decrease in analyst forecasting performance occurs after the adoption of Regulation FD because analysts with top initial placements on forecast accuracy have less of an information advantage than they did in the pre-FD period. Similarly, Findlay et al., (2006) also find that analysts' forecasting accuracy declines overall in the post-FD period. Their findings are consistent with Shane et al., (2002), Agrawal et al., (2006) and Kwag et al., (2007). On the other hand, in this study we find no evidence of a significant deterioration in analysts' earnings forecasting. To the contrary, we find that forecast accuracy has increased and forecast dispersion has decreased after the adoption of Regulation FD.

[7] The herding behaviour used in the paper is rooted in the information cascades model. See section 2.6.1.1 in Chapter 2.

[8] See section 3.6 in Chapter 3.

The remainder of this thesis is structured in the following manner. Chapter 2 contains a review of the theoretical and empirical literature. Chapter 3 reviews the effect of Regulation FD on analysts' forecasts performance and earnings management. Chapter 4 provides evidence of the effect of Regulation FD on private earnings guidance and private information in analysts' forecasts. Chapter 5 presents empirical results on the effect of Regulation FD on herding behaviour in analysts' forecasts. Chapter 6 presents a discussion on the effect of Regulation FD on information leakage and informed trading prior to unscheduled earning announcement and analysts' recommendations. Finally, Chapter 7 presents concluding remarks, limitations of the research and some suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

This chapter focuses on several aspects of the research literature on analysts' forecasts' properties, earnings management, management guidance and information content levels, analysts' herding behaviour, informed trading and Regulation FD. The following section summarizes the important findings for these areas. Section 2.2 reviews the types of analysts' forecasts' properties. Section 2.3 discusses the research on earnings management. Section 2.4 discusses the literature on management guidance. Section 2.5 reviews the research on the analysts' information environment. Section 2.6 addresses herding behaviour in analysts' forecasts. Section 2.7 reports on information leakage and informed trading. Section 2.8 reviews the empirical studies of Regulation FD in the U.S. and Korea.

2.2. The Properties of Analyst Forecasts

Analysts gather information from private communications and public disclosure, assess the current earnings performance that they cover and forecast about their future earnings. This evidence indicates that analysts play an important role in the capital market. For a long period of time, researchers have examined analysts' forecast properties such as forecast bias, forecast accuracy and forecast dispersion. Several questions arise about analyst forecast properties. We provide a review of these issues. First, why do analysts forecast optimistically? Second, what determines forecast accuracy? Third, what are the different interpretations of forecast dispersion?

2.2.1. Forecast Bias

Early research related to analysts' performance in earnings forecasting focuses on the superiority of the analyst forecast relative to time-series models. Analyst forecasts are found to be accurate relative to random walk model forecasts and time series model forecasts (Brown et al., 1979; Givoly, 1985; Brown et al., 1987; Capstaff et al., 1995; Abarbanell et al., 2003). For instance, Brown et al., (1987) compare analysts' forecasts with forecasts derived from statistical models. They prove evidence that the sources of analysts' forecast superiority are better utilization of information and timing advantage. Their finding is in line with Abarbanell et al., (2003) and Givoly (1985), who suggest that analysts' forecasts are not biased and are formed in an efficient manner. Similar results have been reported for the U.K. (Capstaff et al., 1995). In contrast, despite analysts' superiority over time-series models, some literature argues that analysts' forecasts are biased.[9] The literature suggests that analysts set optimistic forecasts of the next periods' earnings per share.

Broadly, as shown in *Table 2-1*, there are at least three incentives for forecast bias (i.e., analyst optimism): (1) relationship with management (2) relationship with an interested party (3) selection bias. The first incentive for forecast bias is related to management. Management may limit or cut off analysts' contact with themselves to impose a penalty on the analysts based on the content of the forecasts. For instance, Francis et al., (1993) provide evidence that analysts report unjustifiably favourable earnings forecasts as a way of managing good relations with management. The results are consistent with their premise that optimistic forecasts are intended to cultivate or maintain good management

[9] Ciccone (2005) suggests that forecast optimism decreases as analysts move from being optimistically biased to being pessimistically biased as earnings announcement approaches.

relationships. Ke et al., (2006) also show evidence that analysts' forecasts tend to be optimistically biased in order to curry favour with a firm's management to get better access to that management's private information.

[Insert *Table 2-1* about here]

The second incentive for forecast bias is to resolve conflict with interested parties such as the investment banking and research departments. For example, Dechow et al., (2000) shows evidence that affiliated analysts are motivated to issue more optimistic forecasts than unaffiliated analysts. Lin et al., (1998) find that favourable relationships with investment banking can optimistically bias analysts' forecasts. Their findings are in agreement with Dugar et al., (1995), Das et al., (1998) and Lim (2001), indicating that analysts are reluctant to issue unfavourable forecasts because they fear jeopardizing the client relationship. These results indicate that analysts are rewarded for providing optimistic forecasts that generate stock trading volume and investment banking fees for their brokerage house.

The third explanation for forecast bias is selection bias.[10] Selection bias assumes that analysts report their forecasts selectively based on their private information about firms' favourable prospects. McNichols et al., (1997) suggest that self-selection by analysts is a commonly observed phenomenon that leads to analysts' forecasts being generally overoptimistic. They suggest that the ratings analysts assign to stocks they have just

[10] Analysts tend to adopt firms they view favourably and drop firms they view unfavourably. If analysts add new stocks to their forecasts portfolio, their forecasts about the stocks will be more positive than the existing consensus forecast. On the other hand, if analysts exclude some stocks from their forecast portfolio, their forecasts about these stocks will be lower than the mean of all expectations. If analysts reported without self-selection, their forecasts would be more exact.

added to their list of followed stocks are more heavily weighted toward strong buy recommendations relative to previous recommendations. However, recent studies report that analyst have reduced in their forecast optimism over time (Matsumoto, 2002; Richardson et al., 2005).

Added to these findings, several researchers have examined whether there is any relation between analyst decisions and other variables. Their findings suggest that forecast bias is more prominent (1) at higher forecast dispersion (Ackert et al., 1997) (2) at the first few month of the year (Richardson et al., 1999) (3) with negative earnings (Ali et al., 1992). On the other hand, Lim (2001) finds that forecast bias is inversely correlated to firm size analyst coverage.

2.2.2. Forecast Accuracy

Early research concludes that there is no evidence of differential forecast accuracy (O'Brien et al., 1990; Butler et al., 1991). However, recent researchers provide evidence that forecast accuracy has been the major basis of investment decisions (Ertimur et al., 2007). What determines analysts' forecasts? *Table 2-2* suggests that studies of forecast accuracy have explored whether it varies systematically with major variables surrounding the firms' and analysts' information environment. The literature suggests that forecast accuracy is correlated the following characteristics of firms or analysts: (1) firm size (2) forecast dispersion (3) analyst turnover (4) analyst experience (5) analyst following (6) earnings volatility (7) special items (8) forecast frequency (9) broker's specialty in industry (10) forecast horizon (11) broker size (12) number of firms or industries followed (13) conservative accounting policy (Bhushan, 1989; Brown et al.,

1987; Wiedman, 1987; O'Brien, 1988; Stickel, 1992; Bamber et al., 1997; Alford et al., 1999; Clement, 1999; Jacob et al., 1999; Mensa et al., 2004; Ahn et al., 2006).

[Insert *Table 2-2* about here]

For instance, Brown et al., (1987) suggest that firm size and forecast dispersion are the key determinants of forecast accuracy. Mikhail et al., (1999) find that lower analyst turnover and greater analyst experience lead to higher forecast accuracy. Dugar (1995) finds that analysts issuing accurate forecasts are likely to issue more profitable stock returns. Alford et al., (1999) show evidence that forecast accuracy is associated with analyst following.[11] They also find that forecast accuracy is negatively associated with two information uncertainty related variables: earnings volatility and special items[12].

Jacob et al. (1999) find evidence that forecast accuracy is affected by forecast frequency, broker-industry specialisation, forecast horizon, analysts following and broker size. Clement (1999) finds that more experience and bigger broker size and less number of firms and industries followed lead to higher forecast accuracy. Mensah et al., (2004) suggest that conservative accounting policy choices influence forecast accuracy. Stickel (1992) finds that All-Americans Research Team[13] forecasts are more accurate and

[11] The results are consistent with Bhushan (1988).

[12] The variables represent variance of price-relevant information during the year and absolute value of lagged nonrecurring or unusual items affecting pre-tax income.

[13] In October each year, Institutional Investor (II) asks about 2,000 managers to evaluate analysts on the basis of four criteria: stock picking, earnings forecasts, written reports, and overall service. Stickel (1990) documents that analysts on the Institutional Investor (II) All-Americans Research Team forecasts are less likely to follow other colleagues' forecasts, and are less predictable, indicating that All-Americans are leaders in their field.

frequent than other analysts and All-Americans who are about to become Non-All-Americans issue less accurate forecasts than other All-Americans.

On the other hand, several Korean researchers have studied forecasts accuracy since year 2000.[14] Jeong (2003) suggests that Korean analysts' forecasts are more accurate than random walk models. Jeong (2003) find that firm size, business group affiliation and leverage are significantly related to forecast accuracy. Ahn et al., (2006) find that forecast accuracy is significantly higher for analysts with more forecast frequency and for industry specialised analysts. They also provide evidence that forecast accuracy is associated with forecast horizon, analysts following, return volatility, return on invest, leverage and financial clique. The above results suggest that analysts and firms characteristics may be useful in predicting differences in earnings forecasts.

2.2.3. Forecast Dispersion

Previous empirical research shows two implications in forecast dispersion. Forecast dispersion refers to disagreement among analysts with regard to a firm's future earnings performance (Brown et al., 1987; Imhoff et al., 1992; Lang et al., 1996; Barron et al., 1998; Dische, 2002). Forecast dispersion is also used as a benchmark for information uncertainty, which captures both the volatility of a firm's underlying fundamentals and poor information (Irani, 2003; Zhang, 2006; Au, 2007). In *Table 2-3*, previous research on the effect of forecast dispersion on market reaction provides mixed results.

[14] FNGuide, which could collect analysts' earnings forecasts and recommendation from forty domestic brokerage houses and six economic research institutions, was established in 2000. Before this, researchers could only study limited data on analysts' forecasts from some daily economic newspapers and analysts' reports in brokerage houses.

[Insert *Table 2-3* about here]

First, some researchers report that forecast dispersion is positively associated with future returns (Cragg et al., 1982; Barron et al., 1998; Athanassakos et al., 2003; Dische, 2002). The researchers use forecast dispersion as a proxy for information uncertainty. Their findings suggest that high forecast dispersion implies low forecast ability, indicating a decrease in public information and increase in information uncertainty around earnings announcement. Therefore, the results suggest that high market returns are a reward for high uncertainty about future earnings. By contrast, other researchers find that forecast dispersion is negatively related to future returns (Ackert et al., 1997; Diether, et al., 2002; Alexandridis et al., 2007). These researchers use forecast dispersion as a proxy for differences of opinion. They provide evidence that higher forecast dispersion, on average, leads to lower future stock returns.

In addition, several studies document that forecast dispersion is positively associated with (1) value stocks rather than growth stocks (Fama et al., 1993; Diether et al., 2002) (2) the number of forecast revisions (Barron et al., 1998), while additional studies document that there is less dispersion for high-tech firms than for low-tech firms (Kwon, 2002).

2.3. Earnings Management

Earnings management[15] has become one of the most important topics in recent years because of the influence of a series of major accounting scandals (e.g., WorldCom,

[15] Schipper (1989) documents that earnings management is a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process). He insists that management could manage earnings by

Enron). In *Table 2-4*, studies of earnings management offer more systematic evidence of managers' incentives as follows: (1) gaining positive stock returns (2) gaining compensation (3) avoidance of negative earnings surprise or losses.

[Insert *Table 2-4* about here]

Managers' first incentives for earnings management are to achieve higher market returns**.** Kasnik et al., (2001) find that managers use their discretion over accounting accruals to gain a market premium over those firms that miss their forecasts. Bartov et al., (2002) also find that firms that meet or beat analysts' expectations enjoy a higher stock returns than firms that fail to meet these expectations. Their findings are consistent with Barth et al., (1999) and Lopez et al., (2002). Second incentives for earnings management are closely related to managers' bonuses. Managers are likely to manage earnings upward for their own compensation if earnings are near the acceptable range. Healy (1985) finds that changes in accounting procedures are related to the modification of a bonus plan. Clinch et al., (1993) find that income from discretionary transactions influences the CEO compensation function. Similarly, Matsunaga et al., (2001) find evidence of a significant negative effect on a manager's bonus when the firm reports earnings below the analysts' forecasts or below the earnings of the previous year.

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selecting accounting methods within generally accepted accounting principles (here after "GAAP") or by applying given methods in particular ways such as changing estimates of services lives of depreciate assets. Healy et al., (1999) suggest that earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports in order to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers. Dechow et al. (2000) and Graham et al. (2005) point out that earnings management can incorporate both fraud and aggressive accounting practitioner choice within GAAP.

Third, managers are likely to manage earnings by taking action to avoid a negative earnings surprise or loss when the firm releases earnings. Burgstahler et al., (1997) find evidence of unusually low frequencies of small decreases in earnings and small losses and unusually high frequencies of small increases in earnings and small positive income. DeGeorge et al., (1999) find an extra pileup of observations or a long jump around zero in the histogram of the explanation variables. Brown (2001) also shows evidence that the median surprise for profits exceeds that for losses in a full 16 years. In a similar paper, Matsumoto (2002) suggests that firms are likely to manage earnings upward or guide analysts' forecasts downward to avoid missing expectations at the earnings announcement. These results have much in common with Payne et al., (2000). In the same vein of research, Charoenwong et al., (2008) find that there is a considerable jump around zero-value in Singapore and Thailand. This discontinuity suggests that both firms in Singapore and Thailand manage earnings to avoid losses.

2.4. Management Guidance

Table 2-5 shows that studies of management guidance[16] raise the question of why managers voluntarily guide. Previous literature has offered motives for management guidance as follows: (1) screening their firms from other firms (2) avoidance of litigation risk (3) avoidance of negative earnings surprises.

[Insert *Table 2-5* about here]

[16] Management guidance can take several forms such as preannouncements, management forecasts, conference calls, and the use of other more elaborated investor relations (Lin, 2006). Analysts could often email detailed spreadsheets to members of the firm's investor relations group, who would review the future earnings performance and provided detailed comments if they maintained favourable relations with the firms (Hutton, 2005).

First, managers make good news disclosures to screen their firms out from other firms. Lev et al., (1990) suggest that managerial information implies that firms' values is larger than the average valuation assumed by the market and means that the firms' value will be revised upward. Therefore, market values of firms without managerial information can be expected to decrease.[17]

The second motivation for management guidance is to pre-empt litigation. Managers tend to voluntarily disclose bad information as the legal costs of disclosure increase. Voluntary disclosure of bad news may contribute to the decrease in litigation risk. For instance, Skinner (1994) argues that managers voluntarily preannounce bad news to reduce legal risks like shareholder suits[18] caused by large stock price declines on earnings announcement. Kasznik et al., (1995) find that firms in high-litigation industries have a higher probability of warning before large negative earnings surprises. Johnson et al., (2001) suggest that high litigation risk firms issue significantly more forecasts containing specific quantitative information as well as more forecasts of general qualitative information. Similarly, Rogers et al., (2008) find that management pre-announces bad news when it knows that the current earning news is adverse for legal or reputational reasons. Their findings provide direct evidence of the relation between the litigation environment and firms' managerial disclosure of forward looking information.

[17] On average, firms disclose good news more frequently than bad news (Penman, 1980; Waymire, 1984).

[18] This example is drawn from Skinner (1994). Stockholder lawsuits based on earnings disclosures are typically brought under SEC Rule 10*b*-5 which makes it unlawful for any person to make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in light of the circumstances under which they were made, not misleading.

Third, managers guide analysts' forecasts in order to avoid negative earnings surprises. In general, managers have a strong incentive to provide management guidance since analysts' forecasts are optimistically biased at the beginning of the fiscal period.[19] Therefore, firms systematically fail to meet or beat analysts forecast without analysts' forecast revisions. This motive is of particular interest to our research. Several studies document a decline in the level of optimism over time. For instance, Richardson et al., (1999) find evidence of a switch from upward-biased to downward biased forecasts as the earnings announcement date approaches. Brown (1997) shows evidence that optimistic forecast bias from 1993 to 1996 has significantly diminished over time as earnings announcement approaches. Matsumoto (2002) finds evidence consistent with managers being more likely to guide analysts downward in order to meet or beat the forecasts when the initial forecast is optimistic. Their findings indicate that firms are increasingly prone to provide management guidance over time.

Other literature shows whether analysts react to public management guidance. Cotter et al., (2006) provide evidence that the majority of analyst activity takes place immediately, in direct response to management guidance. Stickel (1989) shows evidence that analysts avoid revising for two weeks before management guidance and more frequently revise immediately after the guidance. Similarly, Soffer et al. (2000) conclude that managers choose to guide earnings to create positive earnings surprises on the assumption that firms with negative earnings surprises have more negative returns. Their findings indicate that analysts quickly revise their earnings forecasts following public

[19] However, analysts' forecasts become systematically pessimistic prior to the earnings announcement. See section 2.2.1. Forecast Bias.

management guidance. Managers are likely to guide analysts' forecasts and tailor their earnings performance so as not to miss analysts' expectations.

2.5. Analysts' Information Environment

In *Table 2-6*, studies of analysts' forecasts show that analysts can acquire information about firms from three main sources: (1) firms' public disclosure (i.e., financial reports) (2) managers' transactions (i.e., trading their stocks) (3) analysts' private information searching. The research suggests that disparity of knowledge among analysts is usually generated by the acquisition of private information, because analysts are likely to have equal access to public information (Abdel-khalik, 2008). The issue of how private and public information affects firms' information environments has several implications.

[Insert *Table 2-6* about here]

There are two implications around acquiring public information. First, public information reduces information asymmetry among analysts. Public disclosure eliminates the information asymmetry that prevailed in the pre-announcement period between informed and uninformed traders. For example, Bushman et al., (1997) suggest that an earnings announcement, which reduces an insider's private information, may lead to a less liquid market in the post-announcement period. Kreps (1990) suggests that managers should provide full disclosure of private information for investors, in order to mitigate the information asymmetry between managers and other investors. Healy et al., (2001) suggest that the best solution for information asymmetry is that managers have to fully disclose their private information.

The second discussion around public information, also raised by Hui et al., (2007), proposes that public disclosures stimulate market participants to acquire more private information. Holthausen et al., (1990) and Indjejikian (1991) find that trading volume increases at the time of earnings announcements and that trading volume is positively correlated with the absolute value of the unexpected component of earnings announcements. Their results indicate that public announcements can create idiosyncratic beliefs. Kim et al., (1994, 1997) suggest that earnings announcements motivate analysts to generate the acquisition of private information. Barron et al., (2002) conclude that idiosyncratic information increases over time after earnings announcements.

Thirdly, private information increases information asymmetry among analysts, which leads them to generate different predictions. For example, analysts' forecasts immediately before the earnings announcement are more informative relative to their forecasts immediately after earnings announcements. Ivkovic et al., (2004) find that analysts' forecasts immediately prior to the earnings announcement are significantly more precise than the consensus. Ivkovic et al., (2004) also find that market reactions to analysts' forecasts issued prior to earnings announcement are stronger than the forecasts issued after earnings announcement, which indicates that the forecasts before earnings announcement may be informed by private information. This explanation has implications for academics examining the association between private information and information leakage.

In addition to the research discussed above, Barron et al., (1998) measure the private information in analysts' forecasts. Using the component of forecast dispersion that is not explained by publicly available information, they present a model of how analysts' forecasts are related to their information environment. They develop a model that allows for the inference of fundamental properties of analysts' information from observed forecasts. Barron et al., (1998) base their analysis on a model of expectations in which analysts' forecasts are determined by common information or idiosyncratic information. They show that the quality of public and private information available to analysts can be measured by using the overall uncertainty and the average covariance among analysts' beliefs.

2.6. Herding Behaviour in Analysts' Forecasts

Why herd? We review three possible theories explaining why analysts herd. We provide several factors that provide incentives for analysts to ignore their own private information and follow the consensus forecast. We briefly discuss the empirical study of herding behaviour.[20]

2.6.1. Models of Herding Behaviour

Recent research on herding behaviour in analysts' forecasts improves our understanding of analysts' forecasting behaviour (Scharfstein et al., 1990; Stickel, 1990; Trueman, 1994; Welch, 2000; Clement et al., 2005; Bernhardt et al., 2006; Mensha et al., 2008). The herding studies can be divided into three explanation models: (1) the informational

[20] Previous literature suggests that herding behaviour occurs when individuals follow their predecessors to modify their private beliefs.

cascades model (2) the principal-agent model (3) the information acquisition model. This theoretical background offers insights into why analysts choose to mimic previous colleagues' forecasts.

2.6.1.1. Informational Cascade Model

The most general explanation of herding may be the informational cascade, and this is applied in a variety of social and business settings (Devenow et al., 1996). Informational cascade indicates that the sequence in which information is received may affect analysts' herding. An informational cascade occurs when it is optimal for an analyst, having observed the forecasts of those ahead of him, to follow the preceding analysts' forecasts regardless of his own information (Bikhchandani et al., 2000). When acting in a herd, analysts undertake the same action, but they may have acted differently from one another if the realisation of their private signals had been different. In an informational cascade, an analyst considers it optimal to follow his predecessors' forecasts without heeding his private signal.[21] This domino-like model is often referred to as cascade. Papers by Gul et al., (1995), Gale (1996), Zhang (1997), Hirshleifer et al., (1998), and Smith et al., (2000) fall into this group.

2.6.1.2. Principal-Agent Model

This model was introduced early in herding research and has been called the reputational herding model. Reputational herding occurs when analysts choose to ignore

[21] Similarly, bank credit policy changes are correlated with changes in fundamental business conditions. Rajan (1994) provides evidence from banking in New England in the early 1990s of delays in increasing loan-loss reserves and finds that bank managers with short horizons set credit policies which influence and are influenced by other banks. Rajan (1994) finds that market observers don't blame a banker as much for setting aside loan-loss reserves if other banks admit to poor earnings, despite the dramatic deterioration of the financial environment. These phenomena trigger a delay in increasing loan-loss reserves.

their own private information. Scharfstein et al., (1990) examine how managers might herd their opinion. There are two types of manager facing identical binary investment choices (i.e., smart or dumb) in their research, although neither manager nor capital market can identify the type. The smart manager receives informative (true) signals about investment projects, while the dumb manager receives purely uninformative (noisy) signals. This herding explanation model shows the phenomenon that the smart manager tends to choose whatever the signals indicate, while the dumb manager always mimics the action of the previous manager regardless of his own signal. If a second manager follows their own signal, the observer's assessment puts both managers in trouble, because observers doubt both managers' ability.

On the other hand, if the second manager herds after the first manager, even though the results are bad, the reputation of both managers' ability stays high and there is an assumption that the poor result happened accidently. Consequently, when an analyst forecasts with lower accuracy in a firm, it reveals his poor forecasting if the other analyst did not forecast the same. Thus, lower accuracy in analyst forecast is not as bad for reputation when other analysts make the same mistake. This "sharing-the-blame effect" arises because smart analysts tend to receive the correct signals unlike dumb ones. Such a result causes analysts to follow the other analysts' forecasts instead of giving a better performance although they have private information.[22]

[22] This view is congruent with the result of Graham (1999). Graham (1999) develops the model and shows pertinent evidence for analysts who publish investment newsletters. He finds that a newsletter analyst is likely to herd on Value Line's recommendation (market leader) if (1) follower analyst ability is low (2) private informative signals are highly correlated (3) follower analyst initial reputation is high (4) prior information is strong and consistent with the leader's announcements.

2.6.1.3. Information Acquisition Model

Another line of research is the information acquisition model, which is known as investigative herding. This model assumes that information that uncovered only slightly later is less valuable even if it has not yet been publicly revealed (Hirshleifer et al., 1994), and the payoff may also drive the decision of agents for which stocks they acquire information (Devenow et al., 1996). Under certain circumstances, investigative herding happens when analysts choose to investigate a piece of information they think other analysts also will cover. Froot et al., (1992) suggest that analysts tend to focus on information that they think other analysts will forecast. An analyst tends to ignore the information, if he/she thinks other analysts will not soon discover the information. The analyst will herd toward consensus forecast even if he/she is the first recipient who will get a benefit or share the valuable information about the price of stock market.[23] Papers by Brennan (1990) and Dow et al. (1994) also fall into this group. In addition, there are numerous models in which there is a strong but not dominant influence of early agents on later agents (Genotte et al., 1990; Romer, 1993; Bulow et al., 1994; Maug et al., 1995; Persons et al., 1995).

2.6.2. Incentives to Herding and Anti-Herding Behaviour

Table 2-7 shows that studies of herding behaviour fail to reach an agreement as to the existence of herding behaviour. The theoretical literature has identified several models of analysts' herding behaviour, while empirical evidence to corroborate these rationales shows mixed results.

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[23] Hirshleifer et al., (1994) suggest that investors who discover information early aggressively in the initial period and then partially can profit by the information with lower long-term risk associated with price movements that arise from future events they cannot predict. On the other hand, the late informed appear to "follow the leader" as they are positively correlated with those of the early informed.

On the other hand, the empirical literature is filled with diverse findings. Analysts choose to herd toward prior forecasts even if their private information justifies more extreme earnings forecasts. Analysts tend to be decided more by forecast consensus based on their colleagues' opinion than their own information (Olsen, 1996; Cote et al., 1997; DeBondt et al., 1999; Kim et al., 2003; Ahn et al., 2006; Krishnan et al., 2006).

[Insert *Table 2-7* about here]

Do analysts have motives to herd? Previous research suggests that analysts have incentives to herd for the following reasons: (1) reputation concerns (2) forecast ability (3) difficulty of task. We provide a brief review of this research. First, firms will reward analysts who can keep a good reputation since economic profits accrue to firms based on analysts' reputations. As a result, analysts have a motive to engage in herding behaviour in order to protect their reputation by avoiding the downside risk of a unique opinion (Trueman, 1994; Cote et al., 1997; Cote et al., 1999; Holmstrom, 1999).[24]

Second, in order to enhance analysts' demand, analysts should demonstrate their superior forecasting ability. High-ability analysts may receive wages and bonuses in accordance with their forecast performance and business ability (Stickel, 1990, 1992, 1995; O'Brien, 1990). However, it is difficult to keep up consistently superior

[24] Trueman (1994) suggests that herding behaviour is undertaken in order to decrease the downside risk of a sole opinion and favourably affect investors' assessment of the analysts' forecasting ability. Such recent change in the environment of securities analysis makes analyst research reports liable to not contain their private analyses and just follow prior expectations, in order to avoid risk.

performance in their competitive industry.[25] Average analysts can sustain their services by engaging herding behavior because herding behavior mitigates the probability of being perceived as an inferior analyst (Cote et al., 1997; Graham, 1999; Clement et al., 2005).

Third, the higher difficulty of the analysts' task associated with diversified companies is likely to lead to more herding behaviour (Olsen, 1996).[26] As the environment of security analysts industry is characterized by a high degree of competition, weak analysts may have an incentive to use the opportunity to act in their self-interest. However, the analysts have extreme difficulty in evaluating their own product since the forecasts they offer are actually other experts' opinions (Cote et al., 1997; Kim et al., 2003).

On the other hand, other literature suggests that anti-herding behaviour is prevalent in analysts' forecasts (Bernhardt et al., 2006; Naujoks et al., 2007; Mensah et al., 2008). Studies of anti-herding behaviour are all associated with the Bernhardt et al., (2006). Using a simple non-parametric *S-Statistic*, for evaluating degree of herding, Bernhardt et al., (2005) developed an innovative new methodology. Computing the probability of anti-herding, they report that *S* equals 0.592 (59.2%), which means that analysts overshoot earnings in the direction away from the consensus.

25 *The Wall Street Journal* (19th June, 1995) suggests that only 33 of the original 215 analysts on the first All-Star List remained on this list for three consecutive years.

26 Olsen (1996) highlights the importance of the level of disclosure to forecast accuracy. Using a sample of 520 stocks over the 1985-1987, Olsen (1996) separates the stocks into five portfolios on the basis of the earning predictability index. He finds that analysts' forecast errors, negative abnormal returns and herding behaviour gradually increase as the level of predictability declines.

Several studies provide evidence on analysts' incentives to deviate toward consensus forecast. Laux et al., (1999) document that analysts have a tendency to forecast according to their best knowledge. In a subsequent paper, Zitzewitz (2001) analyses high-ability analysts who will have opinions that are differ more greatly from the consensus forecast. Finally, Bernhardt et al., (2006) find that performance compensation causes later analysts to bias their forecasts away from those of earlier analysts as they try to distinguish themselves from other analysts.

To concentrate on Korea, in addition, using Ahn's model developed by Cote et al., (1997), Ahn et al., (2006) examine whether analysts' herding behaviour exists in the Korean securities market. They find that herding behaviour occurs from 2001 to 2003 and the level of herding behaviour is related to the number of the companies that the analyst covers and forecast accuracy. They also find analysts employed by smaller brokers and analysts covering companies with a higher ratio of institutional investors are likely to follow their colleagues' forecasts. They interpret the results as being due to the environmental factors surrounding analysts, and suggest that analysts employed by smaller brokers are more likely to have an incentive to mimic the consensus forecast in order to reduce the danger of unemployment or loss of bonus caused by forecast inaccuracy, than analysts employed by larger broker.

2.7. Information Leakage around Public Announcement

Finance researchers have considered the case of informed trading leading to information asymmetry based on private information prior to public announcements. We provide a review of these studies in *Table 2-8*. The above evidence suggests that abnormal trading

volume and stock returns increase where information asymmetry exists among market participants. Collett (2004) find evidence that abnormal trading volume and market reactions before earnings announcement provide evidence of informed trading in U.K. firms. Therefore, an understanding of informed trading prior to earnings announcements is also essential to an understanding of trading volume and market reactions to earnings announcement, because stocks are traded primarily due to differences in private information. Thus, trading volume and market reactions are considered to be important measures of information asymmetry prior to earnings announcements.

Additional questions arise as to whether market reactions to earnings announcements differ systematically with firm size. Schneible Jr et al., (2005) suggest that abnormal trading volume around earnings announcements increases over time and that this increase is greater for large firms than small firms. This finding is in line with Atiase (1985), who finds that large firms are likely to have informed traders because private information acquisition increases with firm size.

Another branch of finance research reports the difference in inequality of opportunity between institutional investors (informed traders) and individual investors (uninformed traders). Institutional traders are likely to possess superior private information regarding actual earnings to that of individual investors. For instance, Lee (1992) finds that individual investors trade less often and generally depend on a different set of information sources to a firm's professional investors. Cready (1988) finds that trading volume reaction around earnings announcement is weaker in small traders due to the different information they, as opposed to large traders, possess. More comprehensive discussion of this literature is provided by Bhattacharya (2001), who shows evidence

that the trading activities of small traders may not stimulate large price or volume reactions because they tend to rely more heavily on the seasonal random-walk model.[27] Their findings indicate that small investors respond to different information signals than do large professional traders. To the contrary, Lev (1988) finds no evidence on trading volume reactions of individual and institutional traders.

Several studies provide evidence that Korean analysts tend to offer recommendations information first to their important clients and then to the public. For example, Kim et al., (2005) find that Korean analysts start to leak their recommendations information from 20 days prior to the release. Lee et al., (2003) find that Korean analysts tend to leak upward recommendations to their important clients from 7 days before the announcement date, but no information leakage of downgrade recommendations prior to the release.

On the other hand, empirical evidence also suggests how the market incorporates private information into stock prices. Kyle (1985) suggests that all private information is incorporated into the stock price by the end of trading. Kim et al., (1997) find that an informed trader can earn substantial 3% stock returns for 10 minutes after the stock market opens. These results are consistent with Holden et al., (1992), who suggest that informed traders trade very aggressively and cause most of their private information to be revealed very rapidly.

[27] The Random Walk Model by Ross et al., (1993) in corporate finance is used to characterize the weak form efficient market, which is a market whose investors only have full information on past stock prices.

Much of the evidence shows a positive correlation between insider trading[28] and market reaction. The implication of the literature is that insiders capitalize on their informational advantage by realizing abnormal stock returns. Trading strategically, the insiders are likely to release their insider information to the market after they trade. Therefore, insiders are indeed better informed traders and earn abnormal future profits. For example, Seyhun (1992) reports 2.6 and 5.3% abnormal profits, respectively, in the six-month period following insider purchase and sale transactions. Chakravarty et al., (1999) provide evidence that insider traders have a differential impact on price discovery to non-insider trades.

2.8. Regulation Fair Disclosure

Is Regulation FD likely to materially solve the SEC's concerns over market imperfections? Numerous researchers and the business press have reported widely differing effects of Regulation FD. Researchers suggest that the information transfer process in the securities market has changed after the adoption of Regulation FD while others indicate that firms are providing less disclosure. We provide an overview of the empirical results on Regulation FD in the U.S. and in Korea.

2.8.1. Empirical studies on Regulation FD in the U.S.

In order to shed some light on the reviews in this field, we have divided this review into six sections: (1) analysts' forecast performance (2) earnings guidance (3) informed trading (4) volatility of stock returns (5) trading cost (6) other factors. In *Table 2-9*,

[28] Insider trading refers to transactions by top officers, directors, and large shareholders who own 10 percent or more of a company's shares (Lakonishok et al., 2001).

some empirical studies show evidence of decreasing selective disclosure without impairment of information after the adoption of Regulation FD. However, other studies question the positive impact of Regulation FD on the financial market. We summarize the previous research on Regulation FD.

[Insert *Table 2-9* about here]

2.8.1.1. Analysts' Forecasts Performance

The change in analysts' forecasting ability has been of interest to finance researchers, since Regulation FD prevents managers from disclosing selectively to analysts. However, empirical findings showed mixed results. First, some researchers argue that earnings forecasting has become more difficult after the adoption of Regulation FD. For example, Mohanram et al., (2002), Shane et al., (2002) and Agrawal et al., (2006) find that analysts closely linked to management are more likely to decline in forecast accuracy in the post-FD period. They suggest that analysts who were likely to enjoy superior information access through their private contacts with managers in the pre-FD period are more likely to be adversely affected in the post-FD period.

In addition, Findlay et al., (2006) and Kwag et al., (2007) also find that analysts who had relatively high levels of forecast accuracy prior to the adoption of Regulation FD do not maintain their performance afterwards. They suggest that Regulation FD adversely affects forecast accuracy. One possible explanation for these findings is that Regulation FD eliminates private communications between managers and analysts.

On the other hand, other researchers argue that forecast ability has not been changed in the post-FD period because Regulation FD has not led to a deterioration of information flow. For example, Heflin et al., (2003) find that informational efficiency has improved after the adoption of Regulation FD and that there is no significant change in analyst forecast accuracy and forecast dispersion.

In contrast to the proponents' research, opponents of Regulation FD argue that Regulation FD leads to less forecast accuracy and higher forecast dispersion since the regulation leads to 'cookie cutter' disclosure resulting in a "chilling" effect on information. Irani et al., (2003) find that forecast dispersion has increased in the post-FD period since Regulation FD may lead to a decrease in the quantity and quality of available information.

In addition to the research discussed above, Chen et al., (2006) examine whether managers provide more information to analysts based on their more favourable recommendations. Managers generally discriminate among analysts by providing more private access to an analyst issuing more positive reports and by retaliating against an analyst releasing negative reports of the firms (Kelly, 2003). Chen et al., (2006) find that the relatively greater increase in relative accuracy for the more favourable recommendation groups does not exist in the post-FD period. Chen et al., (2006) suggest that Regulation FD has not eliminated the manager's ability to provide or withhold information to analysts with its recommended changes.

2.8.1.2. Earnings Guidance

As we studied in section 8.4, prior research has generally focused on the motivation for management guidance. How does Regulation FD influence firms' disclosure policy? What are the economic consequences of this regulation? Studies of Regulation FD have offered several explanations for changes in earnings guidance after the adoption of the Regulation. For example, Wang (2007) finds that about half of the firms classified as pre-FD private disclosers replace private disclosure with nondisclosure. These firms suffer from an economically significant deterioration in their information.

In contrast, pre-FD private disclosers that replace private earnings guidance with public disclosure experience no significant deterioration in their information environments. The above evidence suggests that firms replace pre-FD private disclosures with post-FD new public disclosures that are valuably informative. The most significant conclusion of this study is that the regulation influences the firms' disclosure policy.

Studies of earnings guidance examine whether managers now issue their guidance to the public instead of disclosing it to a selective group of analysts after the adoption of Regulation FD. Feldman et al., (2006) suggest that investors can now access the information disclosed by firms in their earnings guidance as the regulators intended. Their evidence suggests that there has been a considerable change in management guidance in the post-FD period.

2.8.1.3. Informed Trading

Are managers and analysts still leaking their forthcoming earnings information or recommendation information? Studies of Regulation FD assume that informed trading decreases in the post-FD period since the regulation contributes to equal access to material information. Therefore, these studies addressing the effect of Regulation FD on informed trading prior to public announcement are of particular interest to academic and our research.

Studies provided by Chiyachantana et al., (2004), Gadarowski et al., (2008) and Ahmed et al., (2007) conclude that Regulation FD contributes to the elimination of informed trading and information leakage. For example, Chiyachantana et al., (2004) find that Regulation FD has been effective in decreasing the level of information asymmetry in the days both immediately prior to and after the release of earnings. Gadarowski et al., (2008) find evidence of positive correlation between stock returns two days before earnings announcement in the pre-Regulation FD period, but not in the post-Regulation FD period. They ascribe this to the reduction in informed trading. Ahmed et al., (2007) compare abnormal trading volume and absolute abnormal stock returns around earnings announcements in post-FD quarters. They find strong evidence of a decrease in information asymmetry in the post-FD period. Their results suggest that Regulation FD accomplishes its goal by decreasing information asymmetry. However, Collver (2006) finds no evidence of decline in informed trading during earnings announcement in the post-FD period.

In addition to the research discussed above, Cornett et al., (2007) examine whether a potential disparity of material information between affiliated and unaffiliated analysts exists with the passage of Regulation FD. They find that stock price reactions to analysts' (both affiliated and unaffiliated) recommendation changes decrease after the passage of Regulation FD. Cornett et al., (2007) suggest that Regulation FD is successful in curbing selective disclosure among competing analysts. The pattern of findings suggests that Regulation FD contributes to reducing informed trading and information leakage.

2.8.1.4. Return Volatility

Higher stock returns indicate more informative prices. Atiase (1985) suggests that a larger market response would be consistent with increased market volatility. Ross (1989) verifies that a more informative price should be more volatile. Papers studying Regulation FD examine whether the regulation influences returns volatility around earnings announcement. The researchers show no evidence of increase in return volatility around earnings announcement after the adoption of Regulation FD. For example, Shane et al., (2002) find evidence that market reaction to earnings announcement has significantly reduced after the adoption of Regulation FD. They suggest that investors have been more successful in gathering uncertainty-reducing information in the post-FD period. Heflin et al., (2003) find no significant increase in returns volatility to earnings release in the post-FD period. They report that Regulation FD results in more discrete information by means of significant information releases from firms.

Adopting a similar approach, Eleswarapu et al., (2004) find no evidence of change in volatility at the time of mandatory announcements in the post-FD period. This finding would be consistent with Regulation FD's proponents' case that firms adopt other forms of public disclosure to convey information previously released by selective disclosure. Bailey et al., (2003) also evidence that market reaction around earnings releases displays no significant change in return volatility. Overall, this evidence indicates that Regulation FD does not influence stock return volatility.

On the other hand, other researchers, such as Ferreira et al., (2006) examine the markets' response to investment recommendation change after the adoption of Regulation FD. Ferreira et al., (2006) find that markets respond to analysts' recommendations change in the same way since Regulation FD as they did before, which suggests that the regulation does not influence the analyst recommendation process.

2.8.1.5. Trading Cost

Some studies of the effect of Regulation FD examine whether the regulation influences trading cost.[29] Studies report evidence that firms that adopted selective disclosure face higher bid-ask spreads compared to firms that did not disclose selectively. Research shows that except for one study, most of the research coincides on their results. For example, Eleswarapu et al., (2002) find that the risk of adverse selection during

[29] The trading cost measures the bid-ask spread and includes both an adverse selection component and a pure trading cost component. The adverse selection component compensates market makers for the risk of inadvertently trading against superior information (Eleswarapu et al., 2002). The adverse selection component should be an increasing function of the fraction of traders who are informed and the quality of their superior information (Glosten et al., 1985).

information events has significantly reduced in the post-FD period. The results indicate that the regulation has reduced the degree of preferential access to material information around earnings announcements. Sunder (2002) subsequently verifies that there are no longer differences in bid-ask spreads for open and restricted firms in the post-FD period. Sunder (2002) ascribes these results to the decrease in information asymmetry in the post-FD period. Once again, Lee et al., (2004) find evidence of little or no increase in the adverse-selection component after the adoption of Regulation FD, not supporting the critics of the regulation.

In contrast, Straser (2002) finds that the bid-ask spread has increased and the proportion of informed traders has significantly decreased. He suggests that firms provide a lower quality of public information in the post-FD period, as Regulation FD limits private information.

2.8.1.6. Other Factors

Some research on Regulation FD examines whether there can be information asymmetry among institutional investors even after the adoption of Regulation FD. The research indicates that credit analysts at rating agencies have access to confidential information that is not available to securities analysts because some favoured investment professionals have exclusive power to access non-public disclosures. For example, Jorion et al. (2005) examine the changes in the information content of ratings announcement in the post-FD period. Jorion et al., (2005) find that market reaction to

upgrades, generally insignificant in prior research,[30] has become significant after Regulation FD. They interpret these results as indicating that Regulation FD gives them an unexpected advantage.

Other research has looked into the effect of Regulation FD on the first-forecast horizon.[31] Janakiraman et al., (2007) find that the first-forecast horizon has significantly decreased in the post-FD period. However, their research has been criticized by Brown (2007). Brown (2007) points out the unreasonableness of Janakiraman et al., (2007) as follows; citing Campbell et al., (1966): (1) quite different test years; (2) no control group; (3) inability to control when the intervention occurs; (4) inability to determine whether there is both an intercept shift and a slope shift by using only time-series data.

2.8.2. Empirical studies on Regulation FD in Korea

How does Regulation FD influence the Korean market? As shown *Table 2-10*, most papers show positive evidence of the effect of Regulation FD on the Korean stock market. There is a consensus in the research that selective disclosure decreases and public information increases after the adoption of Regulation FD as reported in, for example, Lee et al., (2003), Kim et al., (2005), Jang et al., (2007) and Oh et al., (2006).

[Insert *Table 2-10* about here]

30 See Holthausen et al., (1986), Hand et al., (1992) and Dichev et al., (2001).

31 The forecast horizon is computed as the number of calendar days between the issue of the analysts' first earnings forecast for a quarter and the fiscal quarter-end date. For further details of forecast horizon, see Bandyopadhyay et al., (1995), Das et al., (1998), Raedy et al., (2006), Lustgarten et al., (2008).

The first three studies examine the change in market reaction to public announcement around public release in the post-FD period. Lee et al., (2003), the first Korean empirical research on Regulation FD, tries to answer the research question: Has Regulation FD contributed to the levelling of information asymmetry among market participants? They find clear evidence of information leakage before recommendation announcement in the pre-FD period, but not in the post-FD period. Similarly, using a sample of 1,500 Korean firm-observations during 2002-2003, Kim et al., (2005) examine the information asymmetry between firms and market participants. They find that both return volatility and trading volume around earnings release have decreased and that the quantity of the disclosures has significantly increased in the post-FD period. Kim et al., (2005) find that promotional disclosures[32] do not generate any significant price action while earnings-related disclosures have a strong market reaction. Oh et al., (2006) find evidence that forecast errors and forecast dispersion have decreased in the post-FD period. Their results are not consistent with U.S. results. They ascribe the results to an increase in the dissemination of available public information.

This result led us to research further. Jang et al., (2007) show evidence of a decrease in stock returns to good-news and trading volume to bad-news in the post-FD period. They suggest that informativeness of earnings may have increased after the adoption of the regulation. Overall, the results above imply that Regulation FD compells firms to disseminate material information effectively to all market participants, consistent with Regulation FD's goal in eliminating selective disclosure.

[32] Kim et al. (2005) classified firms' fair disclosure into two categories: promotional disclosure and earnings-related disclosure. Promotional disclosures include corporate disclosures regarding contract signing, corporate planning, investor relationships and new product development, and account for about 60% of the cases; and earnings-related disclosures include look-forwarding financial information and earnings guidance (i.e., earnings warnings).

On the other hand, Lee et al., (2005) have taken a position against the proponents of Regulation FD. They find that the quantity of earnings forecasts by analysts covering small-size firms has decreased. They interpret their results as following a notion that small-size companies may have a chilling effect on information due to the comparative large cost of information. They also find that forecast accuracy has not changed in the post-FD period.

In conclusion, analytical research provides evidence that Regulation FD has performed as expected by the SEC, specially reducing selective disclosure among market participants. To date, however, empirical research documents mixed results regarding analysts' forecast ability and quality of information to the public after the adoption of Regulation FD, especially outside US. Specifically, many proponents of Regulation FD suggest that the regulation made forecasting more difficult due to the decrease in private communications between analysts and management.

In addition, some opponents of the Regulation FD's suggest that the regulation may lead firms suppressing their disclosure. On the other hand, one can argue that analysts' forecasts ability should not decrease since private information can be compensated by more available public information in the post-FD period. We address the above controversial issues by providing novel evidence, utilizing the most comprehensive data set on Korean market.

ANNEX 1

Table 2-1 Summary of Empirical Studies on Forecast Bias

Study	Sample Source	Sample Country	Sample Size	Firm Type	Type of Data	Time Period	Econometric Measures used	The Result of Empirical Analysis
Givoly (1985)	S&P	U.S.	6,020	NYSE	Annual Forecasts	1969-1972	Regression	Analysts' forecasts are formed in a rational manner in the sense that they incorporate available information in the forecasts.
Brown et al., (1987)	Compustat, I/B/E/S Value Line	U.S.	702	Firms included in the Value Line	Quarterly Forecasts	1977-1982	Regression	Analysts' forecasts are superior to the time series model.
Ali et al., (1992)	Compustat, I/B/E/S	U.S.	5,365	NYSE, NASDAQ	Forecasts	1978-1989	Regression	Overestimation bias in forecast is most pronounced for firms that recently experienced negative earnings
Francis et al., (1993)	Value Line Investment Survey	U.S.	918	Firms included in the Value Line	Quarterly and annual forecasts	1987-1989	Regression	Analysts' forecasts are optimistic, on average, and are more optimistic for sell and hold stocks than buy stocks.
McNichols et al., (1997)	Research Holdings, Limited Standard &Poor	U.S.	1,832	All	Annual forecasts	07.1987-12.1994	Regression	Analysts revise their forecasts of newly added stocks' earnings more frequently than for other stocks, suggesting that more intense effort may underlie the greater accuracy.
Ackert et al., (1997)	Compustat, I/B/E/S	U.S.	34,876	All	Consensus Forecasts	1980-1991	Brown-Mood Test	Analysts are not overoptimistic for firms with low uncertainty as proxied by forecast dispersion.
Dechow et al., (2000)	Securities Data Company, Inc Compustat, I/B/E/S Compustat	U.S.	1,179	Firms with Common stock offerings	forecasts within 12 months surrounding the offer date	1981-1990	Regression	Analysts affiliated with the lead underwriter of an offering tend to issue more overly optimistic forecasts than unaffiliated analysts.
Lin et al., (2000)	Securities Data Company, Inc Compustat, I/B/E/S Compustat, Research Holdings, Limited	U.S.	2,400	Firms with Common stock offerings	Lead underwriter annual forecasts	1985-1994	Regression	Underwriter analysts' forecasts are significantly more favorable than those made by unaffiliated analysts although their earnings forecasts are not generally greater.
Lim (2001)	Compustat, I/B/E/S	U.S.	103,242	All	Quarterly Forecasts	1984-1996	Regression	Company size and analyst coverage are inversely related with forecast bias

Abarbanell et al., (2003)	Compustat, I/B/E/S	U.S.	123,822	All	Quarterly Forecasts	1985-1998	Regression	Analysts' forecasts errors are relatively small but statistically influential asymmetries.
Richardson et al., (2005)	Compustat, I/B/E/S	U.S.	703,877	All	Annual Forecasts	1983-1997	Regression	Forecast errors are more pessimistic in recent years (1992-1997). At the beginning of the fiscal year, analysts place more weight on pleasing management and less on forecast accuracy, and so report optimistic initial forecasts.
Ke et al., (2006)	First Call/Thomson Financial Insider Research Services Historical Files I/B/E/S, Securities Data Company	U.S.	228,904	All	Quarterly and annual forecasts	01.1983-06.2000	Regression	Analysts try to please firms' management and obtain the associated benefits by issuing optimistically biased forecast.

Table 2-2 Summary of Empirical Studies on Forecast Accuracy

Study	Sample Source	Sample Country	Sample Size	Firm Type	Type of Data	Time Period	Econometric Measures used	The Result of Empirical Analysis
Brown et al., (1987)	Compustat, I/B/E/S Value Line	U.S.	702	Sample	Quarterly Forecasts	1977-1982	Regression	Analysts' forecasts are superior to the time series model. Forecast accuracy is positively related to firm size and forecast dispersion.
Bhushan (1988)	Nelson's Directory of Wall Street Research	U.S.	1,409	Firms listed in NYSE, AMEX	Forecasts	1985	Regression	Analyst following is associated with higher forecast accuracy.
Stickel (1992)	Compustat, I/B/E/S ZACKS	U.S.	211,054	All	Annual Forecasts	1981-1985	Regression	Members of the Institutional Investor All-American Research Team supply more accurate earnings forecasts than other analysts.
Dugar (1995)	Compustat, I/B/E/S CRSP	U.S.	32,147	All	Quarterly Forecasts	04.1994-03.2000	Regression	Profitability of the stock recommendations of superior earnings forecasters significantly outperforms the recommendations of inferior forecasters.
Mikhail et al.,(1997)	Compustat, I/B/E/S ZACKS	U.S.	38,505	All	Quarterly Forecasts	1980-1995	Regression	Analysts' experience improves the consensus forecast accuracy.
Mikhail et al.,(1997)	Compustat, I/B/E/S ZACKS	U.S.	5,434	All	Quarterly Forecasts	1985-1995	Regression	An analyst is more likely to turn over if his forecast accuracy is lower than that of his peers.
Jacob et al., (1999)	Compustat, I/B/E/S ZACKS	U.S.	31,406	All	Quarterly Forecasts	1981-1992	Regression	Forecast horizon, analysts following, forecast frequency, broker industry specialization, and broker size are associated with higher forecast accuracy, while outgoing broker analyst turnover is associated with lower forecast accuracy.
Clement (1999)	Compustat, I/B/E/S	U.S.	890,429	All	Annual Forecasts	1983-1994	Regression	Forecast accuracy is positively associated with analysts' experience and broker size and negatively associated with the number of firms and industries followed by the analyst.
Mensah et al., (2004)	Compustat, I/B/E/S	U.S.	3,716	All	Annual Forecasts	1987-1999	Regression	Accounting conservatism is associated with higher forecast errors and forecast dispersion.

Table 2-3 Summary of Empirical Studies on Forecast Dispersion

Study	Sample Source	Sample Country	Sample Size	Firm Type	Type of Data	Time Period	Econometric Measures used	The Result of Empirical Analysis
Dische et al., (2002)	I/B/E/S	Germany	2,384	German firms	Annual forecasts	1987-2000	Regression	Dispersion in analysts' consensus forecasts contains incremental information to predict future stock returns
Kwon (2002)	Compustat CNNFN.com	U.S.	2,728	Sample	Annual forecasts	1990-1997	Regression	Forecast error and forecast dispersion for high-tech firms is lower relative to that for low-tech firms.
Ackert et al., (1997)	Compustat, I/B/E/S CRSP	U.S.	59,643	Firms listed in NYSE, AMEX and NASDAQ	Annual forecasts	1976-2000	Regression	Stocks with higher dispersion in analysts' earnings forecasts earn lower future returns
Athanassakos et al., (2003)	Compustat, I/B/E/S CRSP	U.S.	30,720	All	Consensus forecasts	1981-1996	Regression	There is a strong and positive relationship between analysts' forecast dispersion and future return volatility
Alexandridis et al., (2007)	Thomson Financial Datastream	U.K.	4,641	U.K public firms	Annual forecasts	1986-2002	Regression	Negative long-run abnormal returns are mainly detected when opinion dispersion is high

Table 2-4 Summary of Empirical Studies on Earnings Management

Study	Sample Source	Sample Country	Sample Size	Firm Type	Type of Data	Time Period	Incentive to sooth Management	Econometric Measures used	The Result of Empirical Analysis
Barth et al., (1999)	I/B/E/S, CRSP Compustat,	U.S.	21,173	All	Annual actual earnings and analysts forecast	1982-1992	To achieve market premium	Regression	Firms with increasing earnings have higher stock returns than other firms.
Kasnik et al., (2002)	I/B/E/S, Compustat	U.S.	3,373	All	Annual analyst forecast	1988-1993	To achieve market premium	Regression	Firms meeting forecasts' expectations have a market premium than those for missing the expectations.
Bartov et al., (2002)	I/B/E/S	U.S.	64,872	All	Quarterly actual earnings and analysts forecast	1983-1997	To achieve market premium	Regression	Firms that meet or beat analysts' forecasts enjoy a higher return than firms that fail to meet these expectations.
Lopez et al., (2002)	I/B/E/S, Compustat, CRSP	U.S.	73,151	All	Quarterly actual earnings and analysts forecast	1983-1998	To achieve market premium	Regression	Meeting analysts' forecast is a powerful variable in explaining abnormal return than profit or loss position of the firms.
Healy (1985)	Moody's Industrial Manual	U.S.	1,527	Companies listed on the 1980 Fortune Directory of the 250 largest U.S. firms	Bonus plan information	1964-1980	To maximize their compensation	Regression,	Managers are more likely to choose income-decreasing accruals when their bonus plan upper or lower bounds are binding, and income-increasing accruals when these bounds are not binding.
Clinch et al., (1993)	bank holding companies on survey of Forbes	U.S.	63	Banks	Compensation for CEOs -Salary plus bonus-	1985-1989	To maximize their compensation	Regression	Income from discretionary transactions influences the CEO compensation function.
Matsunaga et al., (2002)	ExecuComp, First Call, Compustat, and CRSP	U.S.	1,324	All	Quarterly actual earnings and analysts forecast	1993-1997	To maximize their compensation	Regression	CEO bonus provides CEOs with economic incentives to meet earnings forecast and earnings from the prior year.
Matsumoto (2002)	Zacks, Compustat, Spectrum, and CRSP	U.S.	29,460	All	Quarterly actual earnings and analysts forecast	1993-1997	To report positive profits.	Regression	Managing earnings likely yields more optimal terms of trade with stakeholders. Firms are likely to manage earnings upward or guide analysts' forecasts downward to avoid missing expectations at the earnings announcement.

Burgstahler et al., (1997)	Compustat database	U.S.	64,466	All	Price-scaled earnings change	1976-1994	To avoid negative earnings surprise and achieve compensation	Cross-sectional distribution	Frequencies of small earnings decreases and small losses are abnormally low relative to adjacent regions of the distributions, while the frequencies of small earnings increases and small positive earnings are abnormally high.
Degeorge et al. (1999)	Abel-Noser, I/B/E/S	U.S.	5,387	All	Quarterly actual earnings	1974-1996	To avoid negative earnings surprise	T-statistic test	Positive profits threshold proves predominant.
Payne et al., (2000)	I/B/E/S	U.S.	13,532	All	Analyst forecast	1988-1997	To avoid negative earnings surprise	Regression	Managers move earnings toward analysts' forecast when pre-managed earnings are below market expectations.
Brown (2001)	I/B/E/S, Compustat	U.S.	176,519	All	Quarterly actual earnings and analysts forecast.	1984-1999	To avoid negative earnings surprise	Cross-sectional distribution	Median surprise for profits exceeds that for losses in every year.
Charoenwong, et al., (2008)	Pacific-Basin Capital Market, Bureau Van Dijk's Osiris	Singapore and Thailand	915	Singapore stock Exchange and The Stock Exchange of Thailand listed company	Quarterly actual earnings	1975-2003	To avoid negative earnings surprise	T-statistic test	There is significant evidence of earnings management to report or positive profits.

Table 2-5 Summary of Empirical Studies on Management Guidance

Study	Sample Source	Sample Country	Sample Size	Firm Type	Type of Data	Time Period	Why Managers Guide Earnings?	Econometric Measures used	The Result of Empirical Analysis
Stickel (1989)	Zacks Investment Research	U.S.	3,544	Firms forecasted by management	Managerial earnings forecasts, analysts forecasts	1982-1985	To adjust investor's expectations about firm performance	Regression	Analysts avoid revising for two weeks before management guidance and frequently revise immediately after the guidance.
Lev and Penman (1990)	Wall Street Journal	U.S.	3,420	Firms forecasted by management	Managerial earnings forecasts	1968-1975	To distinguish their firms from other firms	Regression	Managerial information implies that firms' values are larger than the average valuation assumed by the market and the firms' values will be revised upward
Skinner (1994)	Nasdaq NMS, CRSP	U.S.	93	Firms forecasted by management in NASDAQ listed firms	Random earnings-related voluntary disclosures	1981-1990	To preempt legal risk	Maximum-likelihood estimates	Managers voluntarily disclose earnings information to avoid legal ability or reputation effects.
Kasnik et al., (1995)	Compustat, I/B/E/S	U.S.	3,373	Firms forecasted by the 523 sample firms	Managerial earnings forecasts and sales	1986-1993	To preempt legal risk	Regression	Firms in high-litigation industries have a higher probability of warning before large negative earnings surprises.
Richardson et al., (1999)	I/B/E/S	U.S.	179,471	Firms forecasted by management	Managerial earnings forecasts, analysts forecasts	1983-1997	To adjust investor's expectations about firm performance	Regression	Management guides the analyst toward a final forecast to avoid an earnings disappointment.
Soffer et al., (2000)	First Call, Compustat, CRSP	U.S.	541	Firms forecasted by management	Managerial earnings forecasts, analysts forecasts	09.1992-12.1996	To adjust investor's expectations about firm performance	Regression	Managers strategically select preannouncement amounts to circumvent negative earnings announcement surprise.
Johnson et al., (2001)	Nasdaq NMS, CRSP	U.S.	547	Computer hardware, computer software, pharmaceutical industry	Managerial earnings forecasts and sales	1994-1996	To preempt legal risk	Regression	High litigation risk firms issue significantly more forecasts containing specific quantitative and qualitative information.
Cotter et al., (2006)	First Call's Guidelines	U.S.	8,198	Firms forecasted by management	Managerial earnings forecasts, analysts forecasts	1995-2001	To adjust investor's expectations about firm performance	Regression	Analysts react quickly to management guidance to meet or beat earning targets when managers preannounce.
Rogers et al., (2008)	First Call, CRSP, I/B/E/S, Option Metrics	U.S.	23,474	Firms forecasted by management	Managerial earnings forecast and sales	1996-2006	To preempt legal risk	Regression	Managers preannounce bad news when current earning news is adverse for legal or reputational reasons.

Table 2-6 Summary of Empirical Studies on Analysts' Information Environment

Study	Sample Source	Sample Country	Sample Size	Firm Type	Type of Data	Time Period	Econometric Measures used	The Result of Empirical Analysis
Barron, et al., (2002)	CRSP, I/B/E/S, Compustat	U.S.	990	All	Annual forecasts	1986-1997	Regression	The consensus among security analysts decreases after quarterly earnings announcement, which means that earnings announcements lead analysts to acquire private information.
Ivković et al., (2004)	CRSP, I/B/E/S, Compustat	U.S.	544,972	All	Quarterly Forecasts	01 1990-03.2002	Regression	Analysts revising forecasts have access to more precise information immediately prior to earnings announcements relative to the other analysts, while there is no evidence of superior information immediately after the earnings announcement.
Hui et al., (2007)	CRSP, I/B/E/S, Compustat	U.S.	5956	All	Annual forecasts	1986-2004	Regression	Earnings announcements trigger analysts to acquire private information about upcoming annual earnings.

Table 2-7 Summary of Empirical Studies on Analysts' Herding Behaviour

Study	Sample Country	Sample Source	Sample Size	Company Type	Frequency and Type of Data	Time Period	Herding Measures used	Result of Empirical Analysis	Result for Herding
Olsen (1996)	U.S.	I/B/E/S and CRSP	4,160	All	Quarterly forecasts	1985-1987	Olsen	Herding behaviour gradually increases as forecast bias increases.	Herding
Cote et al., (1997)	U.S.	National Association of Investors (NAIC)	275	Sample	Annual forecast and four year financial summary	-	Cote and Sanders (CS)	Analysts with a highly valued reputation and analysts evaluating consensus forecast credibility are likely to engage in herding behaviour while forecast ability is inversely related to the level of the herding behaviour.	Herding
De Bondt et al., (1999)	U.K.	I/B/E/S and CRSP	441,000	All	Quarterly and yearly forecast	1986-1997	De Bondt and Forbes (DF)	Herding behaviour occurs weakly, but nevertheless significantly in the U.K. securities market.	Herding
Kim et al., (2003)	U.S.	I/B/E/S and Standard &Poor's Compustat	15,024	All	Annual forecasts	1980-1998	Kim and Pantzalis (KP)	Herding behavior increases with the degree of both geographical and industrial diversification. Geographically or industrially diversified firms are more herding than domestic or industrially focused firms.	Herding
Bernhardt et al., (2004)	U.S.	I/B/E/S and CRSP	387,756	All	Quarterly forecasts	1989-2001	Bernhardt, Campello and Kutsoati	59.2% of the analysts' forecasts show anti-herding behaviour.	Anti-herding
Ahn et al., (2006)	Korea	FN-Guide	3,951	All	Annual forecasts	2001-2003	Ahn's	Herding behaviour occurs from 2001 to 2003 in Korean securities market.	Herding
Krishnan et al., (2006)	U.S.	I/B/E/S	1,293,487	All	Quarterly actual earnings and analysts forecast	1990-2004	Fama and MacBeth (FM)	75% of the analysts' forecasts show herding behaviour	Herding
Naujoks et al., (2007)	Germany	I/B/E/S	77,279	All	Annual forecasts	1994-2005	BCK	An average S-statistic of 0.583 is either above or below the consensus forecast and actual earnings.	Anti-herding
Mensah, et al., (2008)	U.S.	I/B/E/S	126,605	All	Quarterly forecasts	1998-2004	DHI, BCK	Regulation FD is not associated with increase in herding behaviour. (Anti-herding : Pre-FD: 63.3, Post-FD: 65.5)	Anti-herding

Table 2-8 Summary of Empirical Studies on Informed Trading

Study	Sample Source	Sample Country	Sample Size	Firm Type	Type of Data	Time Period	Econometric Measures used	The Result of Empirical Analysis
Cready (1988)	Compustat	U.S.	2,327	listed firms in the NYSE	Earnings announcement	01.1981-08.1982	Mean difference test	High-wealth investors are associated with speedier responses to information releases than firms characterized by low-wealth investors.
Lee et al., (1992)	Institute for the Study of Security Markets	U.S.	1,463	listed firms in the NYSE, the AMEX, or the NASDAQ	first announcement after earnings announcement	1988	Mean difference test	Volume reaction in small and large trades to different types of earnings news.
Kim et al., (1997)	Dow Jones News Wire	U.S.	115	Firms reported on the Dow Jones News Wire	analyst's announcements of initial buy recommendation,	1991	Mean difference test	It takes five minutes of trading for NYSE/AMEX stocks and 15 minutes for NASDAQ stocks to reflect the private information contained in these analyst recommendations, when informational asymmetry is high.
Bhattacharya (2001)	Institute for the Study of Security Markets	U.S.	1,972	listed firms in the NYSE, the AMEX, or the NASDAQ	quarterly earnings announcements	1988-1992	Regression	Small traders' abnormal trading increases in the seasonal random-walk forecast errors. In contrast, large traders' abnormal trading response is not positively associated with seasonal random-walk forecast errors
Schneibel Jr et al., (2005)	Thomson Financial Ownership Database. CRSP	U.S.	34,030	all	Quarterly earnings announcement	2000-2003	Regression	Firm size and institutional ownership are determinants of pre-announcement and event-period private information acquisition

Table 2-9 Summary of U.S. Studies on the Impact of Regulation FD

Study	Sample Source	Sample Size	Firm Type	Frequency and Type of Data	Time Period	Research field	Econometric Measures used	The Result of Empirical Analysis	Impact of Regulation FD
Mohanram et al., (2002)	I/B/E/S	11,528	All	Quarterly forecasts	10.1999-09.2000 and 01 2001-12.2001	Forecast performance	Regression	Forecast accuracy has decreased.	Positive
Shane et al., (2002)	I/B/E/S	33,642	All	Quarterly forecasts	24/10/1984-24/09/2001	Forecast performance, Return volatility	Regression	Forecast accuracy has decreased. Market reaction to earnings announcement has significantly reduced.	Positive
Heflin et al., (2003)	First Call, CRSP, or Compustat	10,148	All	Quarterly forecasts	10.1999-01.2000 and 10.2000-01.2001	Forecast performance and Return volatility	Regression	Forecast errors and forecast dispersion have not changed. Return volatility has decreased. Volume of firms' voluntary, forward-looking, earnings-related disclosures has increased	Positive
Irani et al., (2003)	First Call	11,941	All	Annual forecasts	1995-2001	Forecast performance	Regression	Analyst following has decreased and forecast dispersion has increased.	Negative
Chen et al., (2006)	I/B/E/S	19,596	All	Quarterly forecasts	09.1993-06.2002	Forecast performance	Regression	Difference in forecast accuracy for the more favourable recommendation groups before and after Regulation FD is not significant.	Positive
Agrawal et al., (2006)	I/B/E/S	179,729	All	Quarterly forecasts	03.1995-01 2004	Forecast performance	Regression	Forecast accuracy has decreased and forecast dispersion has increased.	Positive
Findlay et al., (2006)	I/B/E/S	321,672	All	Annual and quarterly forecasts	1982-2001	Forecast performance	Regression	Forecast accuracy has decreased.	Positive

Kwag et al., (2007)	I/B/E/S, Compustat, CRSP	1,099	All	Annual forecasts	1999-2000	Forecast performance	Regression	Forecast accuracy has decreased.	
Wang (2007)	I/B/E/S, Compustat, CRSP	20,218	All	forecasts	1996-1999 and 2001-2003	Private earnings guidance	Regression	Firms classified as pre-FD private disclosers replace private disclosure with nondisclosure. The firms suffer from significant deterioration in their information. In contrast, pre-FD private disclosers that replace private earnings guidance with public disclosure experience no significant deterioration.	Positive
Feldman et al., (2007)	Comtext	3,495	Firms listed in NYSE, AMEX or NASDAQ.	earnings guidance announcements	10.2000-07.2002	Earnings guidance	Text-mining	Market reactions are significant when firms issue a qualitative guidance without specifying a forecasted earnings	Positive
Chiyachantana et al., (2004)	CRSP DJNS	6.992	Firms listed in NYSE	Quarterly earnings announcement	11.1999-08.2000	Informed trading	Mean difference test	Retail trading activity increases after earnings announcements in the post-FD period but there is a significant decline in institutional trading around earnings announcements in the pre-FD period	Positive
Cornett et al., (2007)	I/B/E/S, SDC, CRSP	9,600	All	Analysts' forecasts change	10.1998-11.2002	Informed trading	Regression	Markets react more significantly to recommendation downgrades by affiliated analysts than unaffiliated analysts prior to the adoption of Regulation FD	Positive
Ahmed et al., (2007)	CRSP	2,559	All	Quarterly earnings announcement	1999-2001	Informed trading	Regression	Regulation FD has reduced differences in information quality between investors prior to earnings announcements consistent with the intent of the regulation	Positive
Gadarowski et al., (2008)	FCHD CRSP	4,359	All	Voluntary management disclosure	10.1998-12.1999 and 10.2000-12.2001	Informed trading	Regression	After the adoption of Regulation FD, pre-announcement abnormal return as a percentage of total return has decreased by *26.1%* (*21.4%*) for large firms with good (bad) news.	
Bailey et al., (2003)	First Call, CRSP	13,401	All	Quarterly forecasts	10.1999-01.2001	Forecast performance, Return volatility	Regression	Return volatility has not significantly changed. Trading volume has significantly increased. Quantity of information has significantly increased. Volume trading reaction has increased.	Positive

Ferreira et al., (2006)	Yahoo! Finance, CRSP	1,272	167 S&P 500 Index Stocks	Analysts upgrade or downgrade data	08.1999-12.2001 and 01.2001-12.2001	Return volatility	Regression	Market response to analysts' recommendation is the same in the post-FD as in the pre-FD.	Non Negative
Eleswarapu et al., (2002)	I/B/E/S, Dow Jones News Retrieval Service	1,153	NYSE listed common stock	Quarterly Earnings conference call	11.2000-03.2001	Bid-ask Spread and Return volatility	Regression	Bid-ask spreads have decreased and return volatility has increased.	Positive
Sunder (2002)	I/B/E/S, CCBN	1,530	All	Quarterly Earnings conference call	03.1999-06.2001	Bid-ask spread	Regression	Difference in bid-ask spread for open and restricted firms are no longer in post-FD period.	Non Negative
Straser (2002)	NYSE TAQ and CRSP	488	130 S&P 500 Index Stocks	Randomly elected, Intra-day quoted and trade data	18.07.2000-31.01.2001	Bid-ask spread	Regression	Informed trading has decreased. Bid-ask spreads have increased.	Neutral
Lee et al., (2004)	Bestcall.com, NYSE's trade and Quotes database	7,600	All	Quarterly Earnings conference call	02.1999-02 2001.	Bid-ask Spread	Regression	Both return volatility and bid-ask spreads have insignificantly increased.	
Jorion et al., (2004)	Mergent Fixed Investment Securities Database	2,204	U.S. taxable corporate bond	Rating changes	11.2000-12.2002	Rating agency	Regression	Market response to upgrades has become significant, which means Regulation FD rating gives agencies unexpected advantage.	Not Available
Janakiraman et al., (2007)	I/B/E/S	590,465	All	Quarterly forecasts	1992-2002	Forecast-horizon	Regression	Difference in first-forecast horizon across leaders and followers has decreased considerably.	Positive

Table 2-10 Summary of Korean Studies on the Impact of Regulation FD

Study	Sample Source	Sample Size	Firm Type	Frequency and Type of Data	Time Period	Research field	Econometric Measures used	The Result of Empirical Analysis
Lee et al., (2003)	FNGuide, KIS-SMAT	1,822	KOSPI listed companies	Analysts upgrade or downgrade data	06.2001-03.2002 and 11.2002-03.2003	Stock returns and Trading volume	Event study	There is clear evidence of information leakage before recommendation announcement in the pre-FD period, but not in post-FD period.
Kim et al., (2005)	FSS, Korea Exchange, FNGuide	1,500	KOSPI listed companies	FD and earnings forecasts	11.2002-03.2003	Stock returns	Event study	Abnormal stock returns to earnings forecast performance has increased after Regulation FD.
Oh et al., (2005)	FNGuide	10,728	Manufacturing Companies	Annual forecasts	01.2001-12.2004	Forecast performance	Regression	Optimistic forecasts of analysts have decreased. Forecast accuracy and dispersion have decreased. Firms with more earnings variance, and more foreign investor shares have a tendancy to release more fair disclosure.
Jang et al., (2007)	FSS, Korea Exchange, FNGuide, KIS	148	KOSPI listed companies	FD and earnings forecasts by three big brokers	2000-2004	Stock returns and Trading volume	Event study	Abnormal stock returns to good news and bad news has increased. Trading volume to bad news in pre-announcement has decreased.
Lee et al., (2005)	FNGuide, KSRI	600	KOSPI listed companies	Annual forecasts	01.2001-03.2005	Forecast performance	Regression	Forecasts frequency of analysts covering large-size has increased but that of analysts covering small-size has decreased. Forecast accuracy has not changed.

CHAPTER 3

FORECAST PERFORMANCE AND EARNINGS MANAGEMENT

3.1. Introduction

Regulation Fair Disclosure (FD)[33] requires firms to disseminate information in public forums such as public filings and press statements rather than in private communications, effectively preventing selective disclosure to a privileged few (i.e., security analysts and institutional investors). The Securities and Exchange Commission (SEC) claims that Regulation FD curbs the prevalent practice of selective disclosure. In the words of the former SEC's Chairman, Arthur Levitt,

> *Issuers should not selectively disclose information to certain influential analysts, in order to curry favour with them and reap a tangible benefit, such as a positive press spin and you should counsel your clients that during the window of time in which only some analysts have been told material information the news has not yet been publicly disseminated. No one who knows that information should be trading.*[34]

Despite the SEC's intent to impose these requirements on the disclosure practices of companies, there has been considerable controversy about the effect of Regulation FD (Jenkins, 2000; Opdyke et al., 2000). Critics suggested that the quantity of information would reduce drastically due to firms' non-disclosure, the so-called "chilling effect", which would result in cutting off communication between companies and market

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33 Regulation FD states: When firms disclose non-public company information to favoured stakeholders such as financial analysts or institutional investors, they shall make it available to the public simultaneously (for intentional disclosure) or promptly (for non-intentional disclosures). The Securities Exchange Commission (SEC, U.S.) ratified Regulation Fair Disclosure on 23rd October 2000 and the Financial Supervisory Committee (FSC, Korea) enacted it on 1st November 2002 following the U.S. regulation.

34 http://www.sec.gov/news/speech/speecharchive/1998/spch202.txt.

participants. One source, the Association for Investment Management and Research (AIMR, now the CFA institute) survey (2001), showed that 55% of the responding analysts and portfolio managers suggested that the quality and quantity of substantive information had declined as a result of the new regulation. For example, earnings guidance, forward looking information about costs, pricing, internal operation and sales volume had been less available to analysts.[35] Similarly, the survey of analysts by the Securities Industry Association (SIA) (2001) suggested that 72% of the responding analysts believed that information communication had deteriorated since the adoption of Regulation FD, whereas 28% believed that the quality had remained the same. This result could be a consequence of companies choosing not to release information at all.

On the other hand, the survey of the National Investor Relation Institute (NIRI) indicated that 77% of respondents provided earnings guidance to analysts and 98% of them said that analysts wanted earnings guidance. Among surveyed U.S. CFOs, 64.2% supported Regulation FD, while 20.8% opposed it. The survey argued that the most noticeable change brought by Regulation FD has been the way in which companies choose to communicate with Wall Street. For example, the percentage of CFOs that had private conversations with analysts dropped from 57.0% to 37.2% with the introduction of Regulation FD (CFO FORUM, 2001).

The results of the Korean survey on Regulation FD significantly differ from the SIA's survey. After 7 months' application of Regulation FD, the Korea Exchange (KRX) reports that it is unable to find any deterioration in the information environment after

35 http://www.cfainstitute.org/aboutus/press/release/01releases/01RegFD.html

Regulation FD.[36] The survey shows that rumours on firms had decreased 42% compared to the previous year, 2001. Over two thirds (69.2%) of the respondents expressed positive views on Regulation FD whilst 11.5% expressed negative views on the regulation.[37] In other words, the main difference appears to be a change in the information environment.

Many academic researchers suggest that Regulation FD influences change in the information communication process between firms and analysts. The consensus from these researchers is that Regulation FD forces firms to provide equal access to company information and decreases the level of information asymmetry. Three research questions are examined in this study: (1) the effect of Regulation FD on forecast accuracy (2) the effect of Regulation FD on forecast dispersion (3) the effect of Regulation FD on earnings management.

First, we study forecast errors and forecast dispersion among analysts to measure the impact of Regulation FD on the information environment of firms and analysts. Although numerous previous studies have investigated forecast attributes, it is still not clear why forecast attributes may be influenced by the content of information and analysts' degree of consensus. This paper examines the relation of forecast attributes and changes in the content of information after the adoption of Regulation FD.[38] We posit that Regulation FD influences the content of information in analysts' forecasts and thus forecast attributes will change.

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36 The survey was released on 5th June 2003.

37 19.3% of the respondents said that the information environment has not changed.

38 Previous studies have used forecast errors and forecast dispersion as proxies for analyst forecast attributes (Barron et al., 1998; Sunder, 2002; Yang, 2004).

Some extant studies use a sample of earnings conference calls to investigate the determinants and effects of the decision to broadly disclose information (Sunder, 2002; Bowen et al., 2002; Bushee et al., 2003). For example, Bushee et al., (2003) hypothesize that the decision to host an open conference call depends on the managers' incentive to provide all investors and stakeholders with immediate access to information. They examine whether Regulation FD influences firms' disclosure policies. For the study, they consider firms included in the Bestcalls.com list as "open-call" firms, while they consider firms on the First Call corporations list to be "closed-call" firms.[39] They find that firms providing open calls have a greater number of shareholders, lower institutional ownership, lower analyst following and a higher average share turnover than closed call firms. The results are consistent with firms opening conference calls to meet common shareholders' demand for information.

In order to study the difference in analysts' forecast ability after the adoption of Regulation FD, following Adut et al., (2007) and Chen et al., (2006),[40] we classify our sample into *good news* and *bad news*. By comparing the absolute forecast errors (*AFE*) and forecast dispersion (*DISP*) for the *good news* group and the *bad news* group in accordance with earnings persistence and analysts' recommendations levels, we examine the change in the information environment in the post-FD period. For the study,

39 On the other hand, Sunder (2002) classifies firms as either, (1) "*open*" firms, which always held conference calls accessible to all investors; or (2) "*restricted*" firms, which held conference calls for only analysts and institutional investors in the pre-FD period.

40 Adut et al., (2007) put forward three reasons why forecast variance is different regarding good news and bad news. First, good news comes out early, but bad news comes out late. Second, analysts have a motivation to make buy recommendations and therefore may have more incentive to put forecasting resources into analysing good news rather than bad news. Third, if so, forecasts under a bad news environment may suffer from inadequate attention and would be less precise, leading to higher forecast variance during bad news.

by focusing on analysts' recommendations and persistence of earnings, we examine the effect of Regulation FD on forecast accuracy. The first method is based on the level of analysts' recommendations. Analysts tend to work closely with management in the development of their earnings forecast because managers are one of the most significant information sources for analysts (Lang et al., 1996). Analysts, therefore, may issue optimistically biased recommendations to maintain business ties with the companies.[41]

Consistent with this view, Chen et al., (2006) provide empirical evidence that analysts who upgrade recommendations gain a greater increase in their relative forecast accuracy compared with analysts who downgrade their recommendations. Analysts, therefore, might issue favourable recommendations as a reward for information provision if managers provide favoured analysts with material information. In the same way, it is possible that analysts who issue buy-side recommendations experience an increase in forecast accuracy, relative to analysts who issue sell-side recommendations. We expect that there would be some changes in forecast accuracy and forecast dispersion among the recommendations levels following the adoption of Regulation FD.

The second method is based on earnings persistence. Managers that realize large persistence of earnings increases have an incentive to increase disclosure prior to the earnings announcement (Verrecchia, 1983, Jung et al., 1988). This result is consistent with Miller (2002), who suggests that firms with a relatively permanent increase have a further incentive to provide information within the earnings announcement that confirms the high quality of the earnings increase. Consequently, prior to Regulation FD,

[41] For details see Siconolfi (1995).

analysts' forecasts were likely to be more accurate when earnings increased than when earnings declined.

Controlling for other factors that affect forecast attributes, we examine the incremental effect of Regulation FD on both "*earnings increase firms*" and "*earnings decrease firms*". We define *INCREASE* (*DECREASE*) as when a firm reports profit (loss) and an increase (decrease) in earnings from last year's earnings. Based on a sample of 2,311 firms and 161,643 firm-year observations on analysts' forecasts before and after Regulation FD, we find a significant decrease in forecast errors and forecast dispersion in the post-FD period relative to the pre-FD period. For sell-side recommendations, improvement in forecast accuracy and forecast dispersion is more evident than for buy-side recommendations. We also find that improvement in forecast accuracy and forecast dispersion for *DECREASE* is more significant than for *INCREASE*.

Third, we examine the effect of Regulation FD by accounting for the relationship between analysts' forecasts accuracy and earnings management. Previous literature provides evidence that earnings are managed for the following reasons: meeting analysts' forecasts (Payne et al., 2000; Brown, 2001), avoidance of reporting losses (Burgstahler et al., 1997; DeGeorge et al., 1999; Matsumoto, 2002) and gaining positive stock returns (Bartov et al., 2002; Lopez et al., 2002; Kasznik et al., 2002). Managers are likely to manage earnings upward because the market rewards (penalizes) firms meeting (missing) analysts' forecasts. Management's largest incentive to manage earnings occurs when earnings would not meet earnings forecasts (Brown, 2001). Thus, if Regulation FD leads to a change in the analysts' forecasting ability, the change should

also influence earnings management. In order to examine how changes in analyst's forecast performance in the post-FD period influence earnings management, we measure the level of earnings management after the adoption of Regulation FD. Healy (1985) suggests that there are two general approaches to measure earnings management: accruals accounting policy (timing of expenses and revenue recognition) and accounting procedure changes (e.g., FIFO or LIFO). He concludes that first method is preferred since the accruals accounting choice is cheaper and easier to manage than accounting procedure change. Therefore, we focus on the management of discretionary accruals as a means of gaining better performance. Specifically, the discretionary accruals are computed using the modified Jones model (Subramanyam, 1996; Masumoto, 2002; Bartov et al., 2002). However, we provide no evidence that changes in forecast accuracy have significantly influenced firm's accounting policy.

This study makes a contribution to the literature on the effect of Regulation FD in several ways. First, this study contributes to the current debate over the effectiveness of Regulation FD. Our results provide positive evidence of a decrease in information asymmetry from private communications after the adoption of Regulation FD. Second, it provides novel evidence of the effect of Regulation FD on analysts' forecast attributes. Prior researchers mainly focused on conference calls or change in recommendations levels while we use good news and bad news such as *earnings increase firms* and *buy-side recommendations* as information surroundings. Third, we contribute to the existing literature by providing additional insights on whether improved forecast accuracy influences earnings management in response to forecast accuracy. Finally, this study

provides evidence based on a much larger and more comprehensive sample than any other prior study on the effect of Regulation FD.

This chapter proceeds as follows. Section 3.2 introduces and develops the hypotheses. Section 3.3 discusses research design. Section 3.4 describes the sample selection procedure. Section 3.5 presents the major empirical results on the effect of Regulation FD. The final section provides a brief summary and presents conclusions.

3.2. Hypotheses Development

3.2.1. The Impact of Regulation FD on Forecast Accuracy

Prior research shows two opposing explanations for the impact of Regulation FD on forecast errors. First, analysts may exhibit poorer forecast accuracy because Regulation FD curtails previously available analysts' private access to firms (Mohanram et al., 2002; Agrawal et al., 2006; Findlay et al., 2006). Second, forecast errors may not change or decrease because Regulation FD may encourage firms to release more public information (Heflin, 2003; Oh, 2005). Therefore, the impact of Regulation FD on forecast errors is essentially an empirical question. Analysts play an essential role in the securities market by collecting and evaluating information released by firms.

Prior to Regulation FD, many firms disclosed important non-public information to securities analysts or selected institutional investors, before making disclosure of the same information to the public. This common practice allowed analysts and institutional investors to act on information before the information was released in public. As SEC

stated, those who were privy to the information beforehand could make a profit or avoid a loss at the expense of those kept in the dark (SEC Release 2000).[42]

The above behaviour is, however, prohibited by Regulation FD. Analysts who had enjoyed favourable relationship with firms prior to Regulation FD may lose their existing superiority as the regulation curtails analysts' private channels to firms. If the Regulation encourages broad public disclosure and provides vast new information to analysts, the regulation helps forecast accuracy. We, therefore, expect some differences in forecast accuracy during the post-FD period. We investigate whether change in forecast accuracy is influenced by publicly disclosed earnings information in the post-FD period.

H_1: Analysts' forecast accuracy in post-FD period is different from their forecast accuracy in the pre-FD period.

Siconolfi (1995) reports that some analysts are excluded from meetings as a result of their sell recommendations. Similarly, Kelly et al., (2003) report that managers tends to refuse to reply to the questions of analysts who downgraded the firm's recommendation level during conference calls. Chen et al., (2006) find that analysts issuing more favourable recommendations experience a relatively greater forecast accuracy compared with analysts with less favourable recommendations. The consensus of the above results indicates that analysts who issue negative recommendations would have higher forecast errors because they may rely less on management-provided information. However,

[42] See Securities and Exchange Commission. 2000. Final Rule: Selective Disclosure and Insider Trading. Release No. 33-7881, 34-43154.

Regulation FD makes firms increase the amount of information disclosed publicly. We expect that analysts issuing unfavourable recommendations would have more improved forecast accuracy from the available public information after the adoption of Regulation FD. We, therefore test the following hypothesis:

H_2: The effect of Regulation FD on forecast accuracy is stronger for analysts issuing unfavourable recommendations.

To examine the effect of Regulation FD, some researchers use change in an analyst recommendation (e.g., upgrade or downgrade) as a proxy for analysts' forecast surroundings (e.g., favourable or unfavourable recommendations to firms that analysts cover). Chen et al., (2006) examine forecast accuracy before and after recommendation release under the assumption that management-provided information will increase forecast accuracy. Chen et al., (2006) find that a relatively greater increase in forecast accuracy for upgrade recommendations groups exists in the pre-FD period, but not in the post-FD period. Ferreira et al., (2006) examine the effect of Regulation FD on the information content of analysts' recommendation changes. Based on announcements of analyst upgrades and downgrades with a random sample of S&P 500 Index stocks, they find that trading volume declines after Regulation FD, but that there is no significant difference during the post-FD period. They conclude that investors' responses to analysts' recommendations have remained the same since Regulation FD.

On the other hand, Cornett et al., (2007) use analysts' recommendation levels to study the effect of Regulation FD. Cornett et al., (2007) examine whether affiliated analysts provide optimistically biased recommendations from selective information provided to

them by firms. They find that Regulation FD curbs the selective disclosure of information that affiliated analysts are given by the firm. For the second analysis, we take the analysts' recommendation levels as the analysts' forecasts surroundings.

Earnings performance is one of the important variables influencing managers' choice on disclosure policy. Adut et al., (2007) define good news and bad news in accordance with the firms' information environment, and most news is related to earnings performance.[43] Actually, they find that *earnings increase firms* provide more information relative to *earnings decrease firms*. In addition, prior research provides evidence that managers with lower earnings may choose not to release the information or to hide current poor performance. Miller (2002) and Lang et al. (1996) find that firm disclosure is greater during a period of increasing earnings. Li (2007) finds that the annual reports of firms with increasing earnings are easier to read and more persistent than annual reports of firms with decreasing earnings. This is consistent with Bloomfield (2002), who suggests that managers make it harder for investors to uncover information that the managers do not want to affect their firms' stock prices. Firms could use vague expressions and formats in their disclosures to hide adverse information even if they are reluctantly releasing disclosure of lower earnings.

The next hypothesis is based on the premise that, without Regulation FD, *earnings decrease firms* tend to release less public information. However, Regulation FD

[43] Adut et al., (2007) define good news and bad news as follows; (1) When a firm meets or beats 30-day analysts' consensus forecast (good news) versus when it misses (bad news) (2) When a firm reports an increase in earnings from last year's earnings (good news) versus when it reports a decrease (bad news) (3) When a firm reports profit (good news) versus when it reports a loss (bad news) (4) When the firm experiences positive stock price return during the year (good news) versus when it experiences negative stock price return (bad news).

encourages firms to supply available disclosure in public. Similar to the previous hypothesis, therefore, we expect that change in the accuracy of analysts' forecasts that cover *earnings decrease firms* should increase in the post-FD period due to the impact of public information. We examine the following hypothesis:

> *H_3: The effect of Regulation FD on forecast accuracy is stronger for analysts covering earnings decrease firms relative to those covering earnings increase firms.*

3.2.2. The Impact of Regulation FD on Forecast Dispersion

Prior research also shows empirical evidence that forecast dispersion is influenced by the disparity of disclosure practice (Welker, 1995; Lang et al., 1996; Barron et al., 1998; Healy et al., 2001; Adut, 2003). Welker (1995) suggests that firms with a high level of disclosure policy have lower information asymmetry. Lang et al., (1996) find that firms with more informative disclosures have a large number of analysts, less dispersion among analyst forecasts, and less volatility in forecast revisions. Barron et al., (1998) present that dispersion in analysts' forecasts reflects uncertainty about firms' future economic performance. Healy et al., (2001) conclude that firms with sustained improvements in disclosure experience lower information asymmetry. Adut (2003) provides evidence that high forecast dispersion indicates that there is little consensus among analysts with respect to the future earnings performance.

However, opinions are divided among researchers on the effect of Regulation FD on forecast dispersion. Some researchers find evidence that Regulation FD leads to an increase in forecast dispersion due to the lack of available private information after the

Regulation (Mohanram et al., 2002; Bailey et al., 2003; Irani et al., 2003; Agrawal et al., 2006). On the other hand, Heflin et al., (2003) do not find any change in forecast dispersion after the adoption of Regulation FD. Oh et al., (2005) find evidence of a decrease in forecast dispersion after the adoption of Regulation FD.

After the adoption of Regulation FD, firms may significantly increase the quantity and quality of material information disclosed through public release. As is the regulator's intention, if firms release material information to the public rather than privately, analysts may lose their exclusive access to management. However, Regulation FD helps analysts' forecasts if analysts can replace private information acquired directly from firms with information obtained publicly. Thus, we expect to see a reduction in information asymmetry among investors after Regulation FD. These expectations provide the basis for the next hypothesis.

H_4: Analysts' forecast dispersion in post-FD period is different from their forecast dispersion in the pre-FD period.

Firms with higher information asymmetry have significantly different forecast dispersion than firms with lower information asymmetry. Some researchers examine differences in information asymmetry between the two groups after the adoption of Regulation FD (Sunder, 2002; Bushee et al., 2002; Yang, 2004). Sunder (2002) focuses on the impact of Regulation FD on analysts' forecasts' properties for closed conference calls (i.e. calls that restrict access to invited analysts and institutional investors) and open conference calls (i.e. calls that allow unlimited access). Sunder (2002) finds that information asymmetry for closed conference call firms are higher than open conference

call firms. The results are similar to Yang (2004) and Bushee et al., (2002), who suggest that forecast dispersion for non-conference-call firms are significantly larger than those for both closed-firms and open-call firms.

Forecast dispersion is higher for firms with higher information uncertainty compared to firms with lower information uncertainty because increases in public information can improve analysts' forecasting performance. If selective disclosure results in higher information asymmetry, we expect that firms with higher information asymmetry would have a more significant decrease relative to firms with lower information asymmetry. Following Chen et al. (2006)[44] and Adut et al., (2007), we classify our sample into two different environmental groups using two criteria: (1) *sell-side* (sell or strong sell) *recommendations* and *buy-side* (buy or strong buy) *recommendations* (2) *earnings increase firms* and *earnings decrease firms*. We expect the difference between the two groups to have significantly disappeared after the adoption of Regulation FD. We hypothesize that the change in analysts' forecast dispersion for the firms with higher information uncertainty should be significantly more than that for firms with lower information uncertainty.

H_5: The effect of Regulation FD on forecast dispersion is stronger for analysts covering earnings decrease firms relative to earnings increase firms.

H_6: The effect of Regulation FD on forecast dispersion is stronger for sell-side recommendations relative to buy-side recommendations.

[44] Chen et al., (2006) classify the favourable recommendations in two ways. The first method is based on the change in an analyst's recommendations. The second method is based on the analyst's recommendations relative to the consensus recommendation.

3.2.3. The Impact of Regulation FD on Earnings Management

Regardless of the commonality levied by regulatory accounting standards, in part, firms have incentives to adopt different degrees of earnings management in their accounting policies. Prior literature provides evidence that firms have several incentives for earnings management. For example, Kasnik et al., (2002) finds that earnings are managed upward when earnings have a possibility to fall below management earnings forecasts. Burgstahler et al., (1997) report that firms manage earnings in order to avoid earnings decreases and losses. On the other hand, Payne et al., (2002) and Brown (2001) show evidence that managers are motivated to manage earnings in order to meet analysts' forecasts.[45]

Based on the above studies on earnings management, managers make the choice of the degree of earnings management in financial reporting within a rational decision-making standpoint. The studies suggest that earnings management may be related to levels of several thresholds (i.e., management forecasts, earnings and analysts' forecasts). Thus, we expect that changes the analysts' information environment may influence earnings management after the adoption of Regulation FD.

Kwag et al., (2007) suggest that the propensity of firms with higher analyst forecast accuracy to manage earnings is higher compared to those with lower forecast accuracy. The ability of firms to meet the more inaccurate forecasts may be reduced if analysts'

[45] Several earnings benchmarks used in the avoidance of negative earnings surprise have been proposed in the extant literature: (1) previous quarter's earnings (2) last year's earnings (3) analyst's earnings forecast (DeGeorge et al., 1999; Granham et al., 2005; Barua et al., 2006).

forecasts are less accurate. Therefore, we expect that firms' propensity to manage earnings to meet analysts' forecasts increases if analysts' forecast accuracy improves after the adoption of Regulation FD. Managers tend to have an incentive to manage earnings for better performance or stock returns. If analysts' forecasting ability improves after the adoption of Regulation FD, there is an increasing propensity for firms to meet analysts' forecasts by managing earnings after the adoption of the regulation. We examine the seventh hypothesis.

H_7: Earnings management increases with the adoption of Regulation FD.

3.3. Sample Selection

Our sample includes Korean analysts' forecasts and Korean publicly-listed nonfinancial firms. We construct a merged sample covering analysts' forecast data and earnings management from 2000 to 2007. We merge firm-year observations on analysts' forecasts and data on earnings management after the year 2000, collected from FNguide and the FSS database. FNguide, established in 2000, is the sole Korean company that provides market participants with analysts' forecasts data such as consensus analyst forecasts and recommendations levels that are acquired from the individual analysts' reports of forty Korean securities companies and six economic research institutes. FNguide selects a best analyst and best research securities company every year in conjunction with the Chosun-ilbo, one of the biggest daily newspapers in Korea. The annual financial information and audit committee information are retrieved from FSS. Analysts' forecasts observations are obtained from FNguide.

The forecasts and recommendations included in our sample meet the following criteria:

- Analysts' forecasts or recommendations with recorded EPS
- Price, trading volume and return data available on FNguide
- Year-end dates of December 31
- Earnings forecasts with at least two analysts

The variables on earnings forecast performance and earnings management are winsorized in the top and bottom 3 percents of of forecast variable. Korea enacted the quarterly financial statement in 1999 and introduced the quarterly cash flow statement and the quarterly analysts' forecast in 2003. Therefore, it would not be positive to explain the difference between the Pre-FD period and post-FD period with quarterly observations. In addition, we have to eliminate the data for year 2002 included in both periods, because Regulation FD was enacted in November. 2002. For this reason, we use yearly instead of quarterly observations from 2000 to 2007 (excluding 2002).[46] Our sample requires at least two forecasts in order to calculate the analysts' forecast attributes.

Table 3.2 and *Table 3.4* summarize the sample selection. Our two final samples consist of 161,343 observations and 2,311 observations: (1)24,969 (571) *pre-FD period* and 136,374 (1,740) *post-FD period* (2) 2,310 with *Sell-Side Recommendations*, 58,702 with *Hold Recommendations* and 100,331 *Buy-Side Recommendation*s (3) 85,038 with *Earnings Increase Firms*, 12,094 with *Earnings Decrease Firms* and 64,211 with *All Other Firms*. The number of observations varies by the determinants being

46 Nevertheless, this study is using the most comprehensive sample of Korean analysts' forecasts.

investigated. Forecast attributes by earnings persistence has the fewest number of observations: 97,132 observations.

[Insert *Table 3.2* and *Table 3.4* bout here]

We analyse forecasts made over two time intervals: the pre-FD period and the post-FD period. The pre-FD period is from 2000 to 2001 (2 years). The post-FD period is from 2003 to 2007 (5 years). We use analyst reports provided by 40 Korean securities companies, and 6 economic research institutes in order to analyse forecasting performance.

3.4. Research Design

3.4.1. Forecast Accuracy and Forecast Dispersion

3.4.1.1. Measurement of Analysts' Forecast Performance

Recent studies have found that Regulation FD has changed the information transfer process in the market. Our hypotheses, H_1-H_6, predict significant differences in analysts' forecasts from the pre-FD period to the post-FD period. To evaluate how well the individual analysts forecast actual earnings after the adoption of Regulation FD, we use forecast errors as a proxy for the analyst's forecast accuracy (Eames et al., 2002; Lopez et al., 2001). For each observation, we calculate the forecast errors (*FE*) and absolute forecast errors (*AFE*) as the difference between realized earnings and an analyst's forecast. *FE* and *AFE* used in this study are defined as:

$$FE_{j,t} = (AEPS_{j,t} - FEPS_{j,t})/P_{j,t-1} \quad (3.1)$$

$$AFE_{j,t} = |AEPS_{j,t} - FEPS_{j,t}|/P_{j,t-1} \quad (3.2)$$

where:

$AEPS_{j,t}$ = realized annual earnings per share for firm j in year t;
$FEPS_{j,t}$ = analyst forecast for $EPS_{j,t}$;
$P_{j,t-1}$ = ending price of previous year.

The quantity and quality of firms' financial information should affect forecast dispersion. Forecast dispersion is defined as standard deviation of analysts' forecasts, scaled by the ending price of the previous year. We use a forecast dispersion measure that has been commonly used in the previous literature (Adut, 2003: Irani et al., 2003; Barron et al., 2002).

$$Dispersion = std_{it}(Y_{ijt}) = \sqrt{\frac{1}{J_{it}-1}\sum_{j=1}^{J_{it}}(Y_{ijt} - \overline{Y_{ijt}})^2} \quad (3.3)$$

where:

J_{it} = analysts following firm i at time t ($J_{it} \geq 2$);
$\overline{Y_{ijt}}$ = all price-deflated consensus forecasts;
Y_{ijt} = analyst j's forecast for firm i.

3.4.1.2. Changes in Analysts' Forecast Performance

We expect that changes in forecast accuracy and forecast dispersion are caused by changes in the information flow of firms. To examine the change in the information environment, some researchers use conference calls as a proxy for information uncertainty (open conference call, closed conference call). We use two proxies for measuring information uncertainty: (1) analysts' recommendations level (2) earnings

performance. It is desirable that two research settings representing both analysts' and firms' information environments are included in the research settings. First, we examine the change in forecast attributes by analysts' recommendation levels. Second, extending Findlay et al., (2006) and Chen et al., (2006)'s research, we examine the change in forecast accuracy and forecast dispersion in accordance with the persistence of earnings performance. Following Miller (2002), we define firms that continue to report two years of positive (negative) and increase (decline) in earnings from last year's earnings as "*INCREASE* (*DECREASE*)".

We examine the above implications using univariate and multivariate methods. We will compare the mean of *AFE* (*FE*) and *DISP* among *BUY* (buy and strong buy recommendations), *HOLD* and *SELL* (sell and strong sell recommendations). We expect that the mean of *AFE* and *DISP* for *SELL* will be larger than those for *HOLD* and *BUY*. By using t-test and z-test, we also expect that *AFE* and *DISP* are significantly different between *BUY*, *HOLD* and *SELL* in the pre-FD period while the difference between the three groups decreases in the post-FD period. Next, we compare the mean of *AFE* and *DISP* between *INCREASE* and *DECREASE*. Similarly, we expect that the mean of *AFE* and *DISP* for *DECREASE* will be larger than those for *INCREASE*. Then, by using t-test and z-test, *AFE* and *DISP* are expected to be significantly different between *INCREASE* and *DECREASE* in the pre-FD period while the difference between the two groups decreases in the post-FD period.

Next, using a multiple regression, we expect that the change in forecast attributes would be different in the post-FD period. We use various determinants that relate to analysts'

forecasts mentioned in the previous research; analysts following, firm size, forecast horizon, forecast age, earnings surprise, forecast revision, high-tech industry, leverage and volatility of daily stock price (Atiase, 1985; Freeman, 1987; Stickel, 1992; Sinha et al., 1997; Brown et al., 1987, Bhushan 1989, Jacob et al., 1999; Lang et al., 1996; Mikhail et al., 1997; Barron et al., 1998: Mensah et al., 2004; Oh et al., 2005).

Among these determinants, analyst following (*ANALY*) and firm size (*SIZE*) are used for the richness of a firms' information environment. Lang et al., (1996) find evidence that *ANALY* and *SIZE* are associated with the informativeness of a firm's disclosure policy. Volatility of daily stock returns (*VOLA*) is used for the uncertainty of a firm's information environment. Bhusan (1989) suggests that firms with a lower information uncertainty have smaller forecast errors and forecast dispersion. Forecast horizon (*HORI*) is also an important determinant of forecast dispersion. Jacob et al., (1999) provide evidence that the greater *HORI*, the less accurate forecast. We test the above implications with univariate and multivariate methods. We include four control variables in our model and estimate the following regression equations.

$$AFE = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 HORI + \beta_4 SIZE + \beta_5 VOLA + \varepsilon \quad (3.4)$$

$$AFE = \alpha + \beta_1 SELL + \beta_2 HOLD + \beta_3 ANALY + \beta_4 HORI + \beta_5 SIZE + \beta_6 VOLA + \varepsilon \quad (3.5)$$

$$AFE = \alpha + \beta_1 DECREASE + \beta_2 ANALY + \beta_3 HORI + \beta_4 SIZE + \beta_5 VOLA + \varepsilon \quad (3.6)$$

$$DISP = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 HORI + \beta_4 SIZE + \beta_5 VOLA + \varepsilon \quad (3.7)$$

$$DISP = \alpha + \beta_1 SELL + \beta_2 HOLD + \beta_3 ANALY + \beta_4 HORI + \beta_5 SIZE + \beta_6 VOLA + \varepsilon \quad (3.8)$$

$$DISP = \alpha + \beta_1 DECREASE + \beta_2 ANALY + \beta_3 HORI + \beta_4 SIZE + \beta_5 VOLA + \varepsilon \quad (3.9)$$

All variables are defined in *Table 3.1*. β_1s, coefficients on *FD* in *Equations* (*3.4*) and (*3.7*) represent the incremental effect in *AFE* and *DISP* from the pre-FD period to the post-FD period. Negative β_1 is expected in *Equations* (*3.4*) and (*3.7*), which indicates an decrease in *AFE* and *DISP* after the adoption of Regulation FD. β_1 and β_2, *SELL* and *HOLD*, in *Equations* (*3.5*) and (*3.8*) represent the incremental effect of *AFE* and *DISP* for hold and buy-side recommendations compared to sell-side recommendations. β_1 and β_2, the coefficients on *SELL* and *HOLD*, are expected to be siginificantly positive in the pre-FD period because managers tend to provide more (less) available information to analysts who issue more (less) favourable recommendations,while β_1 and β_2 in the post-FD period are expected to be smaller compared to the pre-FD period. Similarly, β_1, the coefficient on *DECREASE*, in *Equations* (*3.6*) and (*3.9*) represents the incremental effect of *AFE* and *DISP* for income decrease firms (*DECREASE*) compared to income increase firms (*DECREASE*). β_1 in the post-FD period is expected to be lower than that of pre-FD period.

However, *Equations* (*3.4*) to *Equations* (*3.9*) cannot explain the significant difference in the change of *AFE* and *DISP* after the adoption of Regulation FD. The changes in *AFE* and *DISP* capture the effect of Regulation FD on forecast attributes. Namely, the change in analysts' forecast attributes may be smaller when the change in both *AFE* and *DISP* is measured as the difference between the pre-FD and post-FD period. We conduct Chow's breakpoint test (1960) to examine whether there is a structural change in *AFE* and *DISP* from the pre-FD period to the post-FD period. Chow (1960) test is generally accepted as the most powerful test among the analytical methods. The *Chow test* is applied in the analysis, since our exact break-point date is 1st November 2002. The

regression model below consisting of constant and error terms to explain this dependent variable is assumed;

$$Y_t = \beta + \varepsilon_t \qquad t= 1, \ldots \quad T \tag{3.10}$$

If a certain date (T_1) is the point to test the structural change, *Equation* (*3.10*) is divided into two equations. There are two regression models below.

$$Y_{1t} = \gamma + \varepsilon_{1t} \qquad t= 1, \ldots T_1 \tag{3.11}$$

$$Y_{2t} = \theta + \varepsilon_{2t} \qquad t= T_1+1, \ldots T \tag{3.12}$$

Therefore, the null hypothesis is

$$H_0 : \gamma = \theta \tag{3.13}$$

We show the F-Statistics with probabilities for the hypotheses of parameter stability over different periods. To isolate the effect of Regulation FD, we also compare the changes in *AFE* and *DISP* between two groups ((1) *SELL* and *BUY* (2) *INCREASE* and *DECREASE*) around Regulation FD. We identify the variables causing the structural change by examining whether each parameter in the regression model has been significantly changed in the post-FD period.

3.4.2. Earnings Management

3.4.2.1. Measurement of Earnings Management

Following previous research (Healy, 1985; DeAngelo, 1986; Jones, 1991; Dechow et al., 1991; DeFond et al., 1994; Dechow et al., 1995; Kothari et al., 2005), we use discretionary accruals as a proxy for earnings management. Among the discretionary accruals measures, our study uses the modified Jones model to measure the level of earnings management. The modified Jones model was developed by Dechow et al., (1995).[47] Following the modified Jones model (1995), we regress total accruals on a constant, change in sales, and gross property, plant and equipment (*PPE*). Mathematically, this study estimates the parameters α_1, α_2, and α_3 in *Equation* (*3.14*).

$$\frac{TA_{j,t}}{A_{j,t-1}} = \alpha_1 \frac{1}{A_{j,t-1}} + \alpha_2 \frac{\Delta REV_{j,t-1} - \Delta AR_{j,t}}{A_{j,t-1}} + \alpha_3 \frac{PPE_{j,t}}{A_{j,t-1}} + e_{j,t} \qquad (3.14)$$

where:

$TA_{j,t}$	=	total accruals (earnings minus operating cash flow) for firm j in previous year t;
$A_{j,t-1}$	=	total assets at end of period for firm j in previous year t;
$\Delta REV_{j,t}$	=	revenues for firm j in year t, less revenues in year t-1;
$\Delta AR_{j,t}$	=	accounts receivable for firm j, less accounts receivable for year t-1.
$PPE_{j,t}$	=	gross property plant and equipment for firm j in year t.

Total accruals ($TA_{j,t}$) are the difference between net income and cash from operations and the Δ operator represents a one-year change in a variable. Total accruals ($TA_{j,t}$) are decomposed into discretionary accruals ($DA_{j,t}$) and non-discretionary accruals

[47] Dechow et al., (1995) suggest that the modified Jones model (1995) provides the most powerful test of earnings management, although the model was criticized in the earnings management literature.

($NDA_{j,t}$).[48] Using the model to separately estimate abnormal accruals by industry and year for all firms from 2000 to 2007, we measure the absolute value of the error term, e_{it}, as our measure of abnormal accruals. The estimated coefficients are used to calculate nondiscretionary accruals according to the following equation:

$$\frac{NDA_{j,t}}{A_{j,t-1}} = \alpha_1 \frac{1}{A_{j,t-1}} + \alpha_2 \frac{\Delta REV_{j,t} - \Delta AR_{j,t}}{A_{j,t-1}} + \alpha_3 \frac{PPE_{j,t}}{A_{j,t-1}} \qquad (3.15)$$

After the parameters are estimated by regression analysis, they are applied to the firm's reported values. This is an estimated value of normal industry accruals. Firms j in the same industry have the same coefficients α_1, α_2, and α_3 for a given year t. The difference between the firm's industry normal accruals and the firm's reported accruals represents abnormal accruals, a proxy for discretionary accruals. Following Dechow et al., (1995), we remove components of accruals that are "nondiscretionary". Discretionary accruals are calculated by subtracting non-discretionary accruals from the total accruals as follows;

$$\frac{DA_{j,t}}{A_{j,t-1}} = \frac{TA_{j,t}}{A_{j,t-1}} - \frac{NDA_{j,t}}{A_{j,t-1}} \qquad (3.16)$$

Since earnings management involves both positive and negative values of discretionary accruals, we report the absolute value of discretionary accruals (*ADA*).

[48] Discretionary accruals is used as a proxy for earnings management (Becker et al., 1998; DeFond et al., 1998; Francis et al., 1999).

3.4.2.2. Regulation FD and Earnings Management

We use absolute forecast errors (*AFE*) as a proxy for analysts' forecast ability. To verify the validity of H_1, and to understand the association between forecast accuracy and earnings management, we estimate the following regression equation.

$$ADA=\alpha + \beta_1 FD + \beta_2 AFE + \beta_3 FD*AFE + \beta_4 BM + \beta_5 EARN + \beta_6 AGR + \varepsilon \qquad (3.17)$$

All variables are defined in *Table 3.1*. We control for (1) book to market (*BM*) (2) realized earnings (*EARN*) (3) asset growth ratio (*AGR*). Based on the prior research, positive signs are expected for *EARN* and *AGR* and negative signs are expected for *BM*. The coefficients of interest in the *Equation* (*3.17*) are β_1 (*FD*), β_2 (*AFE*) and β_3 (*FD*AFE*). Due to an increase in analysts' forecast ability after the adoption of Regulation FD, we expect that managers' propensity to manage earnings also increases. Thus, we expect the coefficients of β_1 (*FD*) and β_3 (*FD*AFE*) to be significantly positive.

3.5. Empirical Results

3.5.1. Forecast Accuracy and Forecast Dispersion

3.5.1.1. Univariate Results

We employ both univariate and multivariate analyses to test our hypotheses. First, for the univariate analyses, *Table 3.3* represents the major descriptive statistics on both pre-period and post-period variables used in analysts' forecast attributes.

[Insert *Table 3.3* about here]

Table 3.3 reveals that the means of forecast errors (*FE*) in the pre-FD and post-FD period are 0.056 and 0.021 respectively, implying analysts' optimism in the Korean market. The result is consistent with Abarbanell (1991) and Capstaff et al., (2001), who report that analyst forecast bias is, on average, optimistic in U.S. and nine European countries[49].

However, analysts' optimism has decreased in the post-FD period. The difference in the mean of absolute forecast errors (*AFE*) in the pre-FD and post-FD period declines from 0.079 to 0.044. In addition, the difference in the mean of forecast dispersion (*DISP*) declines from 0.055 to 0.030 after the adoption of Regulation FD. These preliminary results generally support H_1 and H_4. The results are consistent with the hypothesis that Regulation FD has increased the average quality of information.

Table 3.4 summarizes the sample distribution of events by the three groups: (1) forecast year (2) recommendations levels and (3) earnings performance. *Table 3.5* presents the significant difference in the means of forecast attributes. *Table 3.4* shows evidence that *AFE* and *DISP* have gradually decreased annually after the adoption of Regulation FD. Next, we compare the *AFE* and *DISP* of two sets of groups (*SELL* vs *BUY* and *INCREASE* vs *DECREASE*). Both the *AFE* and *DISP* of all the recommendations levels in the pre-FD period are higher than those in the post-FD period. Only a small fraction of observations fall in the *SELL* (sell or strong sell recommendations) portion in both our samples (1.5%), and the majority of recommendations are *BUY* (buy or strong buy recommendations, 61.8%), followed by *HOLD* (hold recommendations, 36.7%).

[49] Belgium, France, Germany, Ireland, Italy, Netherlands, Spain, Switzerland and United Kingdom.

[Insert *Table 3.4* and *Table 3.5* about here]

We note that our sample consists of a greater proportion of *BUY*. This phenomenon is generally found, for example in U.S. research. Lin et al., (1998) indicate that 61.2% is buy strong buy recommendations, 33.0% is hold recommendations, and 5.8% is sell-side recommendations.

Previous literature and financial press suggest that analysts are reluctant to issue unfavourable recommendations. For example, according to the Korean financial publication, Naeilshinmoon (2009), an analyst revealed that "fund managers who invested in firms opposing the recommendations of analysts will issue sell recommendations because they are concerned about the declines of the stock price." Other analysts confessed "Specially, it is difficult for analysts in small securities company to issue candid recommendation reports".[50] This is consistent with prior research, which suggests that analysts' recommendations are related to the business of the investment bank that employs the analyst[51] and that analysts follow other analysts' forecasts for a "sharing-the-blame effect".[52]

Similarly, both *AFE* and *DISP* for *INCREASE* are smaller than those for *DECREASE*. For the univariate analysis, we find evidence that the *AFE* and *DISP* of lower information uncertainty groups (*DECREASE* and *SELL*) tend to be larger than that of

50 See Kim (2009) *Naeilshinmoon (Korean Daily Newspaper)*

51 For details see Browning (1995), Konrad (1989), Raghavan (1997) and Siconolfi (1995)

52 For details see Scharfstein et al., (1990)

higher information uncertainty firms (*INCREASE* and *BUY*). Also, both *AFE* and *DISP* for *SELL* and *INCREASE* are greater than those for *BUY* and *DECREASE* both in pre-FD period and post-FD period.

In addition, the difference in the means of *AFE* and *DISP* between the two groups declines after the adoption of the Regulation. Specifically, *Table 3.5* shows the significant difference in the means of *AFE* and *DISP* using t-test in both the pre-FD and post-FD periods. *Table 3.5* presents the comparisons in means, which are significantly different at the 1% level between the two groups, respectively, in the pre-FD and post-FD periods.

However, z-test shows that *DISP* for *DECREASE* is not significantly different in both periods. Prior to Regulation FD, it is possible that favourable recommendations are associated with access to managers, resulting in increased forecasting ability. Regardless of the recommendations level, however, the *AFE* and *DISP* of each group tend to be equalised after the adoption of Regulation FD. Overall, except for higher *FE* for *INCREASE* in the post-FD period, *Table 3.5* shows that the means of *AFE* and *DISP* for *INCREASE* are lower than *DECREASE* in both sets of tests. This result is consistent with Miller (2002), which suggests that firms may withhold disclosure during a decline in earnings performance.[53]

53 Prior research shows that various variables generate differential motivation to announce good news versus bad news to all investors. For instance, a litigation risk can encourage firms to quickly release bad news (Kasznik et al., 1995; Skinner, 1994, 1997).

Table 3.7 presents the correlation coefficients between forecast attributes and their determinants. In general, the correlation coefficients have signs consistent with those expected for the equation coefficients and all are significant among forecast attributes and their determinants except for *DISP* and *HORI* (forecast horizon). *DISP* is the highest related to *AFE* among other variables, which is consistent with Mensah et al., (2004).

[Insert *Table 3.7* about here]

3.5.1.2. Regression Results

Table 3.8 and *Table 3.9* present the regression results of *AFE* and *DISP* in the pre-FD and post-FD periods. In *Equation* (*3-4*) and *Equation* (*3-7*), the coefficients of interest are the FD dummy variables. The binary coefficients, β_1, capture the difference in *AFE* and *DISP* between the pre-FD and the post-FD period. As expected, the coefficients (β_1) of FD variables in *Model 1* of *Table 3.9* and *Table 3.10* are significantly negative, which is consistent with our hypothesis (H_1 and H_4) that Regulation FD influences the information environment around firms and analysts. A negative coefficient indicates that *AFE* and *DISP* in the post-FD period were smaller than in the pre-FD period.

[Insert *Table 3.8* and *Table 3.9* about here]

The coefficients of *SELL* (β_1) and *HOLD* (β_2) in *Equation* (*3-5*) and *Equation* (*3-8*) of *Table 3.8* and *Table 3.9* are significantly positive in both the pre-FD and post-FD period. The results suggest that *AFE* and *DISP* for *SELL* are higher than those for *BUY* and

HOLD. Similarly, β_1, the coefficients *AFE* and *DISP* of *DECREASE*, in *Equation* (*3-6*) and *Equation* (*3-9*) in *Table 3.8* and *Table 3.9* are higher than that of *INCREASE* both in the pre-FD and post-FD period. The results indicate that *AFE* and *DISP* of higher information uncertainty firms are higher than those of lower uncertainty firms after controlling for variables documented by prior studies associated with forecast attributes.

In both sets of tests, the coefficients on *ANALY* and *SIZE* are positive and highly significant, capturing the fact that forecasts for firms with more analysts following and bigger size tend to be more accurate. However, the coefficients on *DISP* and *HORI* are negative and highly significant, indicating that analysts' disagreements and older forecasts tend to be less accurate. Unfortunately, the above results cannot explain our hypotheses, H_2, H_3, H_5 and H_6, which supports that the differences may have appeared between the two groups after the adoption of Regulation FD.

3.5.1.3. Chow's Test Results

Table 3.10 presents the significant difference in means of the change in *AFE* and *DISP* using Chow tests. *Table 3.10* reports the results of Chow's test. *Table 3.10* shows that the results reject the hypotheses that binary β_1 are the same at the 1% level. The results from the Chow-test show that the comparisons in means are significantly different at the 1% level between lower and higher information uncertainty.

[Insert *Table 3.10* about here]

The results of Chow's breakpoint test indicate that the hypotheses on *AFE* and *DISP* of parameter stability over pre-FD and post-FD period are rejected on both *DECREASE* and *SELL* at 1 percent of significance level. The post-FD structural change in *AFE* and *DISP* is, therefore, verified for both *DECREASE* and *SELL*. The result is consistent with our expectation that Regulation FD has a strong impact on high information uncertainty firms.

These results are consistent with prior research, which suggests that the significant increase in forecast accuracy for favourable (upgrade) recommendations relative to that for unfavourable (downgrade) recommendations in the pre-FD period, does not persist in the post-FD period (Chen et al., 2006). We ascribe the result to the improvement of the forecast ability in *SELL* and *DECREASE*. The results support hypotheses H_2, H_3, H_5, and H_6. Regulation FD may have contributed to the information quality.

3.5.2. Earnings Management

We examine the level of *DA* and *ADA* before and after Regulation FD. *Table 3.6* presents the difference in the level of *DA* and *ADA* in both the pre-FD and post-FD period. The mean of *DA* in the pre-FD is not closer to zero relative to the post-FD period. *ADA* decreases from the pre-FD period to the post-FD period. Using t-test and z-test, we find evidence that the level of earnings management has significantly decreased after the adoption of Regulation FD. The results are not consistent with our hypothesis H_7.

[Insert *Table 3.6* about here]

Table 3.11 reports the regression results on the effect of Regulation FD on the earnings management in accordance with forecast accuracy. β_1 is interpreted as the mean change in earnings management from the pre-FD period to the post-FD period. Binary β_1s in *Model 1* and *Model 2*, are significantly negative at the level of 1%. This result indicates that earnings management has decreased after the adoption of Regulation FD.

[Insert *Table 3.11* about here]

The most interesting two coefficients, β_2 and β_3 on *AFE* and *AFE*FD* in *Model 1* and *Model 2* are not significant factors that influence earnings management. Controlling for book to market (*BM*), earnings performance (*EARN*) and asset growth rate (*AGR*), we find no evidence that changes in analysts' forecast accuracy in the post-FD period exhibits an impact on earnings management.

On the basis of the findings of prior research, we cautiously ascribe the results, presented in *Table 3.11*, on the decrease in earnings management (β_{1s}) to the new rules introduced in Korea. Korea adopted a regulation on the functioning of the audit committee in 2000[54] and internal accounting control system in 2005. Prior research has shown that audit committee and internal controls are associated with reduction in earning management. Xie et al., (2003) and Bédard et al., (2004), who suggest that the audit committee is the important factor in constraining the propensity of managers to

[54] Audit committee has developed among Korean listed firms since 2000. However, audit committee did not significantly influence the earnings management during the early stage of the regulation. Jeon et al., (2004) suggest that there is no significant difference in earnings management between firms with audit committee and firms without audit committee from 2000 to 2001.

engage in earnings management. Cho et al., (2008) suggest that the Korean firms with audit committee are related to higher financial reporting quality.[55] Similarly, Doyle et al., (2007) find that weak internal controls are associated with relatively low quality accruals. Kim (2008) suggests that Korean firms with internal control are related to higher earnings quality. Above research presents a fairly cohesive picture of how audit committee and internal controls affect earnings quality.

In conclusion, our results are not consistent with our expectations that improved forecast accuracy may influence earnings management.

3.6. Summary and Conclusions

In this chapter, this study examines the effect of Regulation FD on forecast performance and earnings management. First our paper investigates whether Regulation FD influences forecast errors (*AFE*) and forecast dispersion (*DISP*) for the lower information uncertainty groups (*INCREASE*, *BUY*) as compared to the higher information uncertainty groups (*DECREASE*, *SELL*) after the adoption of the Regulation. The empirical results provide evidence that *AFE* and *DISP* have decreased after the adoption of Regulation FD.

Also, there is a significant difference between forecast attributes for the higher information uncertainty groups and lower information uncertainty groups in the post-FD period. The results support the hypothesis that Regulation FD succeeds in elimating

[55] They use a sample consisting of Korean firms listed in the Korean Exchange (KRX) from 2000 to 2004.

selective disclosure. Actually, the release from the Korea Exchange (*KRX*) supports these results.[56] The release shows that Fair Disclosure (FD) and Voluntary Disclosure (VD) have significantly increased in the post-FD period, which means that Regulation FD encourages firms to disclose useful information to market. The results are consistent with Heflin et al. (2003), who find an increase in the number of earnings related voluntary disclosures in the post-FD period.

There are two methods to improve forecast accuracy; access to managers (private information) or increase in useful information to the market (public information). Supposing that managers will not provide private information to analysts who issue favourable recommendations any longer, the increase in forecast ability can be explained by the increase in useful public information available to the analysts. In other words, even if analysts lose their private access to managers, the firms may significantly enhance the quality and quantity of released information. Analysts could therefore replace information gathered directly from the managers with information obtained from available public information and other sources. Therefore, it is possible that analysts increase in their forecasting ability without a private channel to management, if companies release available public information to all market participants.

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[56] Managers may choose either *fair disclosure* or *voluntary disclosure* if they want to release material information in public. Therefore, *fair disclosure* and *voluntary disclosure* may be complementary to each other. This table shows the number of *fair disclosures* and *voluntary disclosures* released after year 2000. The difference between *fair disclosure* and *voluntary disclosure* is whether the information is delivered to a certain few favoured subjects in advance or not. *Voluntary disclosure* is literally not compulsory disclosure, but *fair disclosure* is compulsory disclosure because firms should disclose the information after they release the material information to the favoured few. The number of disclosure including *disclosure* and *voluntary disclosure* has increased after the adoption of Regulation FD: 88 cases in 2000, 239 cases in 2001, 1920 cases in 2002, 9,024 cases in 2003, 8,405 cases in 2004, 6,299 cases in 2005, 6,363 cases in 2006, 6,817 cases in 2007.

Second, we explore the effect of change in analyst forecast on earnings management. On the assumption that improved forecast accuracy encourages managers to increase earnings management, we investigate the cross-sectional effect of forecast accuracy on the firms' accounting policy on earnings management after the adoption of Regulation FD. We show evidence that absolute discretionary accruals, proxy of earnings management, has gradually decreased over the time. However, contrary to our expectations, after controlling for variables that are known to be associated with earnings management in the previous research, our analysis presents evidence that forecast accuracy does not influence firms' earnings policy after the adoption of Regulation FD.

In conclusion, our research suggests that a "chilling" effect does not occur after the adoption of Regulation FD, regardless of the critics' apprehension. On the contrary, Regulation FD contributes to increases in the quality and quantity of information from firms. We find evidence that forecast performance does not influence firms' accounting policy choices.

ANNEX 2

Table 3.1 Definition of Variables

This table outlines the definitions of variables used in our hypothesis testing.

AFE	=	Analysts' absolute forecast errors at the earnings announcement deflated by beginning stock price;
DISP	=	the standard deviation of all analysts' forecasts made at the end of the year from the consensus of analysts' forecasts deflated by stock price at the end of the previous year;
FD	=	dummy variable that equals 1 for firms take in the post-FD (year 2003-2007) period and 0 otherwise;
SELL	=	dummy variable for sell or strong sell recommendation in the analysts' recommendations and 0 otherwise;
HOLD	=	dummy variable for hold recommendation in the analysts' recommendations and 0 otherwise;
BUY	=	dummy variable for buy or strong buy recommendation in the analysts' recommendations and 0 otherwise;
DECREASE	=	dummy variable that equals 1 if the observation continues to report two year of negative and decrease in earnings from the last year' earnings;
INCREASE	=	dummy variable that equals 1 if the observation continues to report two year of positive and increase in earnings from the last year' earnings;
ANALY	=	the number of analysts providing earnings forecasts;
HORI	=	the number of the day between the end of the following fiscal year and the date of the analysts' forecast;
SIZE	=	the natural log of the total asset at the end of the last year of forecast;
VOLA	=	standard deviation of past one year's stock returns prior to the release of the analysts' recommendations;
ADA	=	absolute value of the discretionary current accrual;
BM	=	book value of equity divided by the market value of equity;
EARN	=	realized earnings to total asset;
AGR	=	ratio of asset growth.

Table 3.2 Sample Selection

Sample A is based on the firm-year observations while Sample B is based on the forecast-year observations. Sample A and Sample B consist of 161,343 and 2,311 observations from 2000 to 2007 (excluding 2002).

	2000	*2001*	*2003*	*2004*	*2005*	*2006*	*2007*	*Total*
Sample A	*5,014*	*19,955*	*21,772*	*21,424*	*41,270*	*33,543*	*18,365*	*161,343*
Sample B	*300*	*271*	*264*	*303*	*374*	*385*	*414*	*2,311*

Table 3.3 Descriptive Statistics for Variables

This table presents the descriptive statistics for 161,343 analyst-year observations (Panel A) and 2,311 firm-year observations (Panel B) from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. Variables are forecast errors (*FE*), absolute forecast errors (*AFE*), forecast dispersion (*DISP*), analyst following (*ANALY*), forecast horizon (*HORI*), firms size (*SIZE*) and standard deviation of daily stock returns (*VOLA*), discretionary accruals (*DA*), absolute discretionary accruals (*ADA*), book to market (*BM*), earnings size (*EARN*), and asset growth rate (*AGR*).

< *Panel A: 161,343 analyst-year observations* >

Variables	*Pre-FD period (n=24,969)*				*Post-FD period (n=136,374)*			
	Mean	*25th Percentile*	*Median*	*75th Percentile*	*Mean*	*25th Percentile*	*Median*	*75th Percentile*
FE	*0.056*	*-0.004*	*0.019*	*0.076*	*0.021*	*-0.005*	*0.009*	*0.038*
AFE	*0.079*	*0.011*	*0.034*	*0.089*	*0.044*	*0.073*	*0.021*	*0.052*
DISP	*0.055*	*0.019*	*0.034*	*0.062*	*0.030*	*0.011*	*0.019*	*0.035*
ANALY	*23*	*15*	*23*	*33*	*24*	*14*	*24*	*33*
HORI	*206*	*107*	*198*	*299*	*214*	*115*	*216*	*313*
SIZE	*3,058*	*1,031*	*3,033*	*13,256*	*7,511*	*1,651*	*7,477*	*35,554*
VOLA	*0.71*	*0.60*	*0.70*	*0.80*	*0.47*	*0.37*	*0.45*	*0.55*

< *Panel B: 2,311 firm-year observations* >

Variables	*Pre-FD period (n=571)*				*Post-FD period (n=1,740)*			
	Mean	*25th Percentile*	*Median*	*75th Percentile*	*Mean*	*25th Percentile*	*Median*	*75th Percentile*
DA	*-0.071*	*-0.126*	*-0.062*	*0.005*	*0.022*	*-0.047*	*0.015*	*0.092*
ADA	*0.108*	*0.042*	*0.087*	*0.141*	*0.084*	*0.031*	*0.067*	*0.122*
AFE	*0.079*	*0.012*	*0.034*	*0.090*	*0.044*	*0.075*	*0.022*	*0.054*
DISP	*0.056*	*0.019*	*0.034*	*0.063*	*0.030*	*0.012*	*0.019*	*0.036*
BM	*2.15*	*0.88*	*1.64*	*2.85*	*1.24*	*0.54*	*0.92*	*1.57*
EARN	*0.063*	*0.021*	*0.045*	*0.088*	*0.088*	*0.04*	*0.072*	*0.118*
ASSETGR	*0.315*	*0.00*	*0.108*	*0.309*	*0.196*	*0.025*	*0.106*	*0.239*

Table 3.4 Comparison of Forecast Errors and Forecast Dispersion (1)

This table summarizes the absolute forecast error (*AFE*) and forecast dispersion (*DISP*) by analysts between 2000 and 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. Panel A shows the absolute forecast errors (*AFE*) and forecast dispersion (*DISP*) by year while Panel B presents *AFE* and *DISP* by forecast recommendations level and Panel C provides *AFE* and *DISP* by the earnings performance.

<Panel A> Absolute Forecast Errors (AFE) and Forecast Dispersion (DISP) by Year

	Pre-FD				*Post-FD*			
	Obs	*%*	*AFE*	*DISP*	*Obs*	*%*	*AFE*	*DISP*
2000	*5,014*	*0.031*	*0.073*	*0.071*				
2001	*19,955*	*0.124*	*0.081*	*0.051*				
2003					*21,772*	*0.135*	*0.052*	*0.040*
2004					*21,424*	*0.133*	*0.051*	*0.036*
2005					*41,270*	*0.256*	*0.042*	*0.028*
2006					*33,543*	*0.208*	*0.042*	*0.026*
2007					*18,365*	*0.114*	*0.032*	*0.021*
(n=161,343)	*24,969*	*0.155*	*0.079*	*0.055*	*136,374*	*0.845*	*0.055*	*0.030*

<Panel B> Absolute Forecast Errors (AFE) and Forecast Dispersion (DISP) by Forecast Recommendations Level

		Pre-FD			*Post-FD*		
		Obs	*AFE*	*DISP*	*Obs*	*AFE*	*DISP*
SELL (n=2,310)	*Mean*	*1,617*	*0.146*	*0.076*	*693*	*0.062*	*0.043*
	Median	*1,617*	*0.081*	*0.041*	*693*	*0.027*	*0.031*
HOLD (n=58,702)	*Mean*	*11,417*	*0.091*	*0.062*	*47,285*	*0.050*	*0.034*
	Median	*11,417*	*0.039*	*0.039*	*47,285*	*0.024*	*0.022*
BUY (n=100,331)	*Mean*	*11,935*	*0.058*	*0.046*	*88,396*	*0.040*	*0.027*
	Median	*11,935*	*0.027*	*0.030*	*88,396*	*0.020*	*0.018*
Total (n=161,343)	*Mean*	*24,969*	*0.079*	*0.055*	*136,374*	*0.055*	*0.030*
	Median	*24,969*	*0.034*	*0.034*	*136,374*	*0.021*	*0.019*

<Panel C> Absolute Forecast Errors (AFE) and Forecast Dispersion (DISP) by Earnings Performance

		Pre-FD			*Post-FD*		
		Obs	*AFE*	*DISP*	*Obs*	*AFE*	*DISP*
INCREASE (n=85,038)	*Mean*	*12,235*	*0.041*	*0.041*	*72,803*	*0.030*	*0.024*
	Median	*12,235*	*0.021*	*0.025*	*72,803*	*0.014*	*0.015*
DECREASE (n=12,094)	*Mean*	*3,991*	*0.236*	*0.086*	*8,103*	*0.165*	*0.071*
	Median	*3,991*	*0.164*	*0.058*	*8,103*	*0.129*	*0.056*
ALL-OTHERS (n=64,211)	*Mean*	*8,743*	*0.061*	*0.061*	*55,468*	*0.045*	*0.030*
	Median	*8,743*	*0.036*	*0.039*	*55,468*	*0.029*	*0.022*
Total (n=161,343)	*Mean*	*24,969*	*0.079*	*0.055*	*136,374*	*0.055*	*0.030*
	Median	*24,969*	*0.034*	*0.034*	*136,374*	*0.021*	*0.019*

Table 3.5 Comparison of Forecast Errors and Forecast Dispersion (2)

This table presents the results of t-tests and z-tests for the difference in absolute forecast error (*AFE*) and forecast dispersion (*DISP*) in the pre-FD versus post-FD period. The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. Z-test (Wilcoxon signed test) is used to measure whether the medians are statistically different from each other while t-test is used to measure whether the means between the pre-FD and post-FD periods are statistically different from each other. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: By FD Period* >

	Pre-FD	*Difference (Pre-FD=Post-FD)*		*Post-FD*
	(n=24,969)	*t-test*	*z-test*	*(n=136,374)*
AFE	*0.079*	*65.11****	*45.80****	*0.055*
DISP	*0.055*	*83.14****	*90.81****	*0.030*

< *Panel B: By Recommendation Level* >

Variables	*SELL-SIDE RECOMMENDATIONS*				*BUY-SIDE RECOMMENDATIONS*			
	Pre-FD (n=1,617)	*Difference (Pre-FD=Post-FD)* *t-test*	*z-test*	*Post-FD (n=693)*	*Pre-FD (n=11,935)*	*Difference (Pre-FD=Post-FD)* *t-test*	*z-test*	*Post-FD (n=88,396)*
AFE	*0.146*	*11.88****	*12.89****	*0.062*	*0.058*	*27.80****	*20.51****	*0.040*
DISP	*0.076*	*8.36****	*8.76****	*0.043*	*0.046*	*48.92****	*62.42****	*0.027*

< *Panel C: By Earnings Performance* >

Variables	*INCREASE*				*DECREASE*			
	Pre-FD (n=12,235)	*Difference (Pre-FD=Post-FD)* *t-test*	*z-test*	*Post-FD (n=72,803)*	*Pre-FD (n=3,991)*	*Difference (Pre-FD=Post-FD)* *t-test*	*z-test*	*Post-FD (n=8,103)*
AFE	*0.041*	*22.88****	*28.13****	*0.024*	*0.236*	*21.88****	*16.03****	*0.165*
DISP	*0.041*	*40.62****	*65.80****	*0.030*	*0.086*	*11.49****	*1.26*	*0.071*

Table 3.6 Comparison of Absolute Discretionary Accruals

This table presents the results of t-tests and z-tests for the difference in discretionary accruals (*DA*) and absolute discretionary accruals (*ADA*) in the pre-FD versus post-FD period. The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. Z-test (Wilcoxon signed test) is used to measure whether the medians are statistically different from each other while t-test is used to measure whether the means between the pre-FD and post-FD periods are statistically different from each other. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

	Pre-FD (n=571)	*Difference of DA (Pre-FD=Post-FD)*		*Post-FD (n=1,740)*	*Pre-FD (n=571)*	*Difference of ADA (Pre-FD=Post-FD)*		*Post-FD (n=1,740)*
		t-test	*z-test*			*t-test*	*z-test*	
Mean	*-0.071*	*-17.39****	*-15.98****	*0.022*	*0.108*	*6.47****	*4.54****	*0.084*
(Median)	*(-0.062)*			*(0.015)*	*(0.087)*			*(0.067)*

Table 3.7 Correlation between Forecast Attributes and Other Variables

This table shows the matrix of Pearson correlation coefficients among the possible explanatory variables to the events of forecasting earnings. The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The explanatory variables are forecast errors (*FE*), absolute forecast errors (*AFE*), forecast dispersion (*DISP*), analyst following (*ANALY*), forecast horizon (*HORI*), firms size (*SIZE*) and standard deviation of daily stock price (*VOLA*). The numbers below are t-stats of the null hypothesis where the correlation coefficient is zero.

< Panel A: Pre-FD Period >

Variables	*FE*	*AFE*	*DISP*	*ANALY*	*HORI*	*SIZE*	*VOLA*
FE	*1*						
AFE	*0.8078* *<.001*	*1*					
DISP	*0.2971* *<.001*	*0.4073* *<.001*	*1*				
ANALY	*-0.1800* *<.001*	*-0.2425* *<.001*	*-0.2191* *<.001*	*1*			
HORI	*0.1164* *<.001*	*0.1831* *<.001*	*-0.0375* *0.3926*	*0.0276* *<.001*	*1*		
SIZE	*-0.0500* *<.001*	*-0.0651* *<.001*	*-0.0388* *<.001*	*0.2998* *<.001*	*-0.0025* *0.6888*	*1*	
VOLA	*0.1623* *<.001*	*0.1668* *<.001*	*0.0564* *<.001*	*-0.0212* *<.001*	*0.0320* *<.001*	*-0.2078* *<.001*	*1*

< Panel B: Post-FD Period >

Variables	*FE*	*AFE*	*DISP*	*ANALY*	*HORI*	*SIZE*	*VOLA*
FE	*1*						
AFE	*0.4901* *<.001*	*1*					
DISP	*0.1725* *<.001*	*0.4800* *<.001*	*1*				
ANALY	*-0.1996* *<.001*	*-0.1874* *<.001*	*-0.0963* *<.001*	*1*			
HORI	*0.1148* *<.001*	*0.2640* *<.001*	*0.0217* *<.001*	*-0.0212* *<.001*	*1*		
SIZE	*-0.0764* *<.001*	*-0.0896* *<.001*	*-0.0840* *<.001*	*0.4051* *<.001*	*-0.0142* *0.6888*	*1*	
VOLA	*0.0934* *<.001*	*0.1805* *<.001*	*0.2012* *<.001*	*-0.0757* *<.001*	*-0.0094* *<.001*	*-0.3204* *<.001*	*1*

Table 3.8 Regression of the Changes in Forecast Errors

This table reports the results of regressions to examine the variation in analyst's forecast accuracy for 161,343 observations from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is absolute forecast errors (*AFE*). The explanatory variables are post-FD period (*FD*), analyst following (*ANALY*), forecast horizon (*HORI*), firms size (*SIZE*) and standard deviation of daily stock price (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

(MODEL 1) AFE = α + β_1FD + β_2ANALY + β_3HORI + β_4SIZE + β_5VOLA + ε

(MODEL 2) AFE = α + β_1SELL + β_2HOLD + β_3ANALY + β_4HORI + β_5SIZE + β_6VOLA + ε

(MODEL 3) AFE = α + β_1DECREASE + β_2ANALY + β_3HORI + β_4SIZE + β_5VOLA + ε

Model 1		*Coef.*		*t*	*P>|t|*				
INTERCEPT	*α*	*0.0234*	***	*12.43*	*0.000*				
FD	β_1	*-0.0152*	***	*-22.99*	*0.000*				
ANALY	β_2	*-0.0010*	***	*-52.61*	*0.000*				
HORI	β_3	*0.0002*	***	*95.03*	*0.000*				
SIZE	β_4	*-0.0032*	***	*-8.95*	*0.000*				
VOLA	β_5	*0.0839*	***	*54.14*	*0.000*				
		Number of obs = 161,343							
		Adj R-squared = 0.1375							
Model 2		*< Pre-FD >*				*< Post-FD >*			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	*α*	*-0.0386*	***	*-4.90*	*0.000*	*0.0157*	***	*10.13*	*0.000*
SELL	β_1	*0.1019*	***	*21.86*	*0.000*	*0.0170*	***	*6.81*	*0.000*
HOLD	β_2	*0.0158*	***	*8.58*	*0.000*	*0.0055*	***	*15.05*	*0.000*
ANALY	β_3	*-0.0032*	***	*-32.41*	*0.000*	*-0.0007*	***	*-38.91*	*0.000*
HORI	β_4	*0.0002*	***	*26.25*	*0.000*	*0.0001*	***	*100.36*	*0.000*
SIZE	β_5	*0.0117*	***	*7.25*	*0.000*	*-0.0059*	***	*-17.80*	*0.000*
VOLA	β_6	*0.1503*	***	*21.50*	*0.000*	*0.0706*	***	*49.03*	*0.000*
		Number of obs = 24,969				*Number of obs = 136,374*			
		Adj R-squared = 0.1619				*Adj R-squared = 0.1357*			
Model 3		*< Pre-FD >*				*< Post-FD >*			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	*α*	*0.0752*	***	*7.74*	*0.000*	*-0.0132*	***	*-6.70*	*0.000*
DECREASE	β_1	*0.2494*	***	*84.06*	*0.000*	*0.1253*	***	*164.64*	*0.000*
ANALY	β_2	*-0.0020*	***	*-17.81*	*0.000*	*-0.0003*	***	*-12.17*	*0.000*
HORI	β_3	*0.0002*	***	*21.01*	*0.000*	*0.0001*	***	*72.54*	*0.000*
SIZE	β_4	*0.0029*		*1.49*	*0.136*	*-0.0023*	***	*-5.25*	*0.000*
VOLA	β_5	*-0.0382*	***	*-4.44*	*0.000*	*0.0626*	***	*34.38*	*0.000*
		Number of obs = 16,226				*Number of obs = 80.906*			
		Adj R-squared = 0.4749				*Adj R-squared = 0.3424*			

Table 3.9 Regression of the Changes in Forecast Dispersion

This table reports the results of regressions to examine the variation in analyst's forecast dispersion for 161,343 observations from 2000 to 2007 (excluding year 2002). Pre-FD period is from 2000 to 2001 and post-FD period is from 2003 to 2007. Dependent variable is forecast dispersion (*DISP*). The explanatory variables are post-FD period (*FD*), analyst following (*ANALY*), forecast horizon (*HORI*), firms size (*SIZE*) and standard deviation of daily stock price (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$\textbf{(MODEL 1) } DISP = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 HORI + \beta_4 SIZE + \beta_5 VOLA + \varepsilon$$

$$\textbf{(MODEL 2) } DISP = \alpha + \beta_1 SELL + \beta_2 HOLD + \beta_3 ANALY + \beta_4 HORI + \beta_5 SIZE + \beta_6 VOLA + \varepsilon$$

$$\textbf{(MODEL 3) } DISP = \alpha + \beta_1 DECREASE + \beta_2 ANALY + \beta_3 HORI + \beta_4 SIZE + \beta_5 VOLA + \varepsilon$$

Model 1		*Coef.*		*t*	*P>|t|*				
INTERCEPT	α	*0.0501*	***	*46.16*	*0.000*				
FD	β_1	*-0.0144*	***	*-37.74*	*0.000*				
ANALY	β_2	*-0.0002*	***	*-18.79*	*0.000*				
HORI	β_3	*0.0000*	***	*3.67*	*0.000*				
SIZE	β_4	*-0.0053*	***	*-25.81*	*0.000*				
VOLA	β_5	*0.0391*	***	*43.83*	*0.000*				
		Number of obs = 161,343							
		Adj R-squared = 0.0815							
Model 2		*< Pre-FD >*				*< Post-FD >*			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.0698*	***	*15.63*	*0.000*	*0.0311*	***	*34.52*	*0.000*
SELL	β_1	*0.0384*	***	*14.48*	*0.000*	*0.0156*	***	*10.80*	*0.000*
HOLD	β_2	*0.0084*	***	*8.06*	*0.000*	*0.0059*	***	*27.97*	*0.000*
ANALY	β_3	*-0.0015*	***	*-27.48*	*0.000*	*-0.0000*	**	*-2.32*	*0.020*
HORI	β_4	*-0.0000*	**	*-1.98*	*0.047*	*0.0000*	***	*7.44*	*0.000*
SIZE	β_5	*0.0013*		*1.38*	*0.168*	*-0.0062*	***	*-31.72*	*0.000*
VOLA	β_6	*0.0224*	***	*5.65*	*0.000*	*0.0400*	***	*47.86*	*0.000*
		Number of obs = 24,969				*Number of obs = 136,374*			
		Adj R-squared = 0.0898				*Adj R-squared = 0.0624*			
Model 3		*< Pre-FD >*				*< Post-FD >*			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.0706*	***	*13.73*	*0.000*	*0.0258*	***	*20.25*	*0.000*
DECREASE	β_1	*0.0627*	***	*39.92*	*0.000*	*0.0430*	***	*87.05*	*0.000*
ANALY	β_2	*-0.0013*	***	*-22.11*	*0.000*	*0.0002*	***	*10.26*	*0.000*
HORI	β_3	*0.0000*		*0.25*	*0.800*	*0.0000*	***	*7.29*	*0.000*
SIZE	β_4	*0.0032*	***	*3.09*	*0.002*	*-0.0063*	***	*-22.31*	*0.000*
VOLA	β_5	*-0.0112*	**	*-2.46*	*0.014*	*0.0364*	***	*30.79*	*0.000*
		Number of obs = 16,226				*Number of obs = 80.906*			
		Adj R-squared = 0.2119				*Adj R-squared = 0.1333*			

Table 3.10 Chow's Breakpoint Test on Regression of Forecast Errors and Forecast Dispersion

This table shows the results of the Chow test on regression of forecast errors and forecast dispersion. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

	Forecast Errors (AFE)		*Forecast Dispersion (DISP)*	
	F-Statisitics	*Probability*	*F-Statisitics*	*Probability*
DECREASE	*1423.14****	*0.000*	*921.83****	*0.000*
SELL	*742.99****	*0.000*	*1317.43****	*0.000*

Table 3.11 Regression of Regulation FD and Earnings Management

This table reports the results of regressions to examine the variation in analyst's forecast accuracy for 161,343 observations from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is defined as the absolute discretionary accruals (*ADA*) for earnings management. The explanatory variables are post-FD period (*FD*), absolute forecast errors (*AFE*), book to market (*BM*), earnings size (*EARN*), and asset growth rate (*AGR*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

(Model 1) $ADA=\alpha + \beta_1 FD + \beta_2 AFE + \beta_3 FD*AFE + \varepsilon$

(Model 2) $ADA=\alpha + \beta_1 FD + \beta_2 AFE + \beta_3 FD*AFE + \beta_4 BM + \beta_5 EARN + \beta_6 AGR + \varepsilon$

	(Model 1)				*(Model 2)*				
		Coef.		*t*	*P>|t|*		*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.1101*	***	*30.03*	*0.000*	α	*0.1040*	***	*20.18*	*0.000*
FD	β_1	*-0.0248*	***	*-5.85*	*0.000*	β_1	*-0.0267*	***	*-6.10*	*0.000*
AFE	β_2	*-0.0293*		*-1.32*	*0.186*	β_2	*-0.0171*		*-0.78*	*0.438*
*FD*AFE*	β_3	*-0.0036*		*-0.12*	*0.908*	β_3	*-0.0076*		*-0.25*	*0.805*
BM						β_4	*-0.0024*	*	*-1.93*	*0.053*
EARN						β_5	*0.0869*	***	*3.38*	*0.001*
AGR						β_6	*0.0149*	***	*5.08*	*0.000*
	Number of obs = 2,311 *Adj R-squared = 0.0182*					*Number of obs = 2,311* *Adj R-squared = 0.0420*				

** Significant at the 10% level or better*
*** Significant at the 5% level or better*
**** Significant at the 1% level or better*

CHAPTER 4

PRIVATE EARNINGS GUIDANCE AND FORECASTS

4.1. Introduction

Firms have strong incentives to guide earnings in order to meet or beat market expectations.[57] Previous literature documents that managers are more likely to guide market expectations following positive earnings surprises (i.e. actual earnings exceeding analysts' consensus forecast). Management has two ways to avoid negative earnings surprises. First, they can manage earnings upwards to exceed expectations (i.e. increase earnings by managing accruals or postponing expenses to next year).[58] Second, they can manage market expectation downward in order to reduce level of optimistic forecasts. Anecdotal evidence suggests that managers guide earnings expectations when market earnings forecasts differ from theirs:

> *After a typically grim presentation by CEO Bill Gates and sales chief Steve Ballmer at an analysts' meeting two years ago, Goldman Sachs analyst Rick Sherlund ran into the pair outside and said, 'Congratulations. You guys scared the hell out of people.' Their response? 'They gave each other a high five,' Sherlund recalls (Fox, 1997).*

Graham et al., (2005)'s survey results supports the above anecdotal evidence. They find evidence that 85.5% of the 577 managers surveyed guide analysts. They suggest that 80.7% of the managers guide analysts to circumvent negative earnings surprises, which may reduce stock price, by managing analysts' expectations. They report that managers

[57] Approximately 50 percent of firms meet or beat analysts' forecasts during the years 1984-1992 while this ratio dramatically increased in the years after 1992 to approximately 65 percent (Lopez et al., 2002).

[58] See Chapter 2.

want to preannounce earnings early to (1) avoid potential lawsuits (2) promote a reputation of transparent reporting.[59] Focusing on forecast at a given point in time prior to the earnings announcement, Richardson et al., (2005) examine earnings guidance before earnings announcements. Consistent with the findings of the above studies, they find that management guides the analyst toward a final forecast that is just beatable in order to avoid an earnings disappointment. The consensus of the research indicates that firms are likely to guide earnings forecasts when the expectations gap is large (Ajinkya et al., 1984; King et al., 1990).

Prior to Regulation FD, many firms worked closely with analysts in the development of their earnings forecasts. However, not all analysts acquired material information from managers. Consequently, a few favoured analysts were more accurate than the unguided analysts (Lim, 2001; Hutton, 2005). Regulation FD was supposed to change the way firms release material information to market participants. If the regulation leads to change in information environment surrounding market participants, the change should also influence earnings management and earnings guidance, which are closely related to analysts' forecasts. We shall, therefore, study the effect of Regulation FD on earnings guidance.

Before Regulation FD, analysts often emailed their detailed numerical forecasts to managers, who then provided detailed responses. Thus, both sides enjoyed the benefits. Managers can guide analysts' forecasts while they can meet or beat analysts' forecasts

[59] Soffer et al., (2000) examine cross-sectional differences in how much of the news is disclosed at the preannouncement date versus the earnings announcement date and find that managers voluntarily preannounce bad news to avoid negative earnings announcement surprises. They suggest that the possibility of earnings guidance increases the optimism of analysts' prior consensus earnings forecasts.

(Hutton, 2005). However, Regulation FD prohibits this practice. Our interest is whether Regulation FD influences firms' practice of earnings guidance. Only a few papers discuss how Regulation FD affects earnings guidance from management. For example, using text mining, Feldman et al., (2003) identify over 3,400 earnings guidance disclosures from October 2000 to July 2002. They find that private earnings guidance has decreased in the post-FD period.

First, we examine the change in private earnings guidance after the adoption of Regulation FD. Following Matsumoto (2002) and Wang (2007), we calculate private earnings guidance in analysts' forecasts. Using 2,311 firm-year observations for earnings guidance and analysts' consensus forecasts, we measure private earnings guidance by subtracting 'factors that contribute to the variability of total earnings guidance' (i.e. earnings volatility, incidence of losses and fair disclosure) from total earnings guidance. We analyze the association of Regulation FD and private earnings guidance over the period 2000 to 2007.

Second, we examine the Korean market's price reaction to firms' meeting, beating or missing analysts' forecasts. Previous research focuses on the market's reaction to reported earnings that meet or beat analysts' expectations (Lopez et al., 2002; Brown et al., 2005).[60] For example, Lopez et al., (2002) examine whether the market penalizes firms more for falling short of expectations than it rewards them for exceeding expectations. They find that firms that meet or beat analysts' forecasts enjoy higher stock returns than firms that fail to meet these expectations. Brown et al., (2005) report

60 To date, market reaction to firms' strategies has never been studied in Korea.

that managers focus more on avoiding negative earnings surprises rather than on avoiding losses or earnings decreases. The results indicate that markets provide stronger rewards (penalties) for meeting or beating (missing) current analysts' forecasts than any other earnings thresholds.

Third, we examine the extent to which the content of private information in analysts' forecasts has changed after the adoption of Regulation FD. We then examine how changes in private information affect the analysts' forecasting ability. Barron, Kim, Lim and Stevens (1998, hereafter *BKLS*) show evidence that information content affects forecast dispersion and forecasts errors in the mean value of these forecasts. They find that lack of *BKLS* consensus (1-ρ), proxy for information asymmetry, reflects the ratio of private information to total information in analysts' forecasts. Their findings suggest that an increase in the precision of public (private) information implies the impact of increased public (private) disclosures by firms (Mohanram et al., 2006).

Using *BKLS* (1998), Adut (2003) examines the effect of Regulation FD on private information. He finds that low dispersion firms have more public information. We extend Adut (2003) by examining the extent to which the content of the information influences analysts' forecasts. Similarly, following *BKLS* (1998), we measure the ratio of private information in analysts' forecasts. Using a large sample of analysts' forecasts (161,343 observations), we examine whether Regulation FD contributes to a decrease in private information in earnings forecasts. We hypothesize that a change in private information will influence analysts' forecasts. We find that the ratio of private information in analysts' forecasts significantly decreases. We show evidence that

analysts' forecasting ability has significantly improved even though private information decreases after the adoption of Regulation FD.

This study contributes to the literature on the effect of Regulation FD in several ways. First, our study investigates how changes in private information affect analysts' forecasting ability after the adoption of Regulation FD. Most prior literature focuses on the effect of Regulation FD on the analysts' forecasts' attributes. Our study differentiates itself by measuring the ratio of private information in analysts' forecasts. Second, we extend previous research by exploring private earnings guidance. Third, this study contributes to the research by examining the economic consequences of meeting or beating analysts' forecasts in the Korean market.

This chapter proceeds as follows. Section 4.2 explains and develops the hypotheses. Section 4.3 describes the sample selection procedure. Section 4.4 discusses research design. Section 4.5 presents the main empirical results on the effect of Regulation FD. The final section provides a brief summary and presents conclusions.

4.2. Hypotheses Development

4.2.1. Regulation FD and Private Earnings Guidance

Numerous studies provide evidence that analysts tend to make optimistic forecasts at the start of the fiscal year but then tend to be pessimistic as earnings announcement approaches. For example, Richardson et al., (1999) find that analysts issue systematically optimistic forecasts early in the year and then talk down their forecasts to a level that managers can beat. Bernhardt et al., (2002) also find that earnings forecasts

tend to grow pessimistic over the forecast horizon. These results are in line with O'Brien (1988) and Abarbanell (1991). Arthur Levitt, Chairman of the Securities and Exchange Commission (SEC) reported in a speech that managers cannot be solely blamed for the above practices. Levitt commented that many corporate managers, auditors, and analysts all participate in a game of nods and winks.

> *This is the pattern earnings management creates: companies try to meet or beat Wall Street earnings projections in order to increase the value of stock options. Their ability to do this depends on achieving the earnings expectations of analysts. And analysts seek constant guidance from companies to frame those expectations. Auditors, who want to retain their clients, are under pressure not to stand in the way (The "Number Game", 28 Sep 1998*).

Prior to Regulation FD, if analysts' expectations were too high, managers could normally hold a conference call to adjust analysts' expectations. Consequently, some analysts could obtain informational advantage over others through their private access to management. Previous research documents that managers tended to reward (or punish) analysts with more favourable (unfavourable) recommendations (Francis et al., 1993; Mayew, 2007; Chen et al., 2006). All the above studies find evidence that managers discriminate among analysts by granting more management access to more favourable analysts.

However, Regulation FD restricts private earnings guidance or discrimination among analysts, which leads to information asymmetry. This motivates us to examine private earnings guidance after the adoption of Regulation FD. An underpinning of Regulation FD is that dissemination of available public information complements managers' private earnings guidance. It is possible that more managers issue public earnings guidance

instead of engaging in private communications with favoured analysts in the post-FD period. If analysts can obtain less private information from management, they are likely to depend on the available public information. Thus, we expect that private earnings guidance from the management decreases after the adoption of Regulation FD. Our first hypothesis is stated as follows:

H_1: Private earnings guidance decreases after the adoption of Regulation FD.

Managers' decisions to manage analysts' forecasts through earnings guidance depends on whether managers have incentives to have their expectations of future earnings before releasing earnings information to all market participants. Managers perceive a benefit from guiding earnings forecasts in order to avoid negative earnings surprises. On the other hand, if managers fail to meet or beat analysts' forecasts, then the market is likely to react strongly to such surprises. Earnings performance is one of the most critical variables influencing firms' disclosure policies.

Previous research suggests that firms with higher earnings provide the information relative to firms with lower earnings (Matsumoto, 2002; Miller, 2002; Adut et al., 2007). For example, Matsumoto (2002) finds that managers of earnings increase (decrease) firms are more (less) likely to be associated with earnings guidance to avoid negative earnings surprises. The finding indicates that managers of firms with higher earnings are more likely to face higher pressure to satisfy stakeholders. Therefore, we conjecture that firms with higher earnings have more incentives to provide earnings guidance relative to firms with lower earnings.

Prior to Regulation FD, especially, managers with high earnings performance could disclose their assessment of future earnings to selected groups of analysts. However, Regulation FD may diminish managers' ability to avoid such surprises since the regulation forbids private dissemination of earnings guidance to selected analysts. We expect that changes in the information environment will lead to a decrease in private earnings guidance for earnings increase firms in the post-FD period. We examine the following hypothesis:

H_2: Private earnings guidance for earnings increase firms has significantly changed after the adoption of Regulation FD.

4.2.2. Market Price Reaction

Prior research finds evidence that the market rewards (penalizes) firms for meeting or beating (missing) analysts' earnings forecasts (Lakonishok et al., 1992; Burgstahler et al., 2001; Skinner et al., 2002; Lopez et al., 2002). For example, firms tend to lose their market value after reporting earnings that miss analysts' forecasts (so-called earnings torpedoes). Lopez et al., (2002) report lower mean cumulative three-day abnormal returns for firms that miss analysts' expectations than for firms that beat analysts' expectations. Skinner et al., (2002) find that investors tend not to forgive firms that miss earnings expectations. Fox (1997) also highlights the importance of the meeting of the analysts' earnings expectations.

> *In January, for the 41st time in the 42 quarters since it went public, Microsoft reported earnings that met or beat Wall Street estimates... This is what chief executives and chief financial officers dream of: quarter after quarter after blessed quarter of not disappointing Wall Street. Sure, they dream about other things…. But the simplest, most visible, most merciless measure of corporate success in the 1990s has become this one: Did you make your earnings last quarter? (Fox, 1997)*

This is consistent with DeGeorge et al. (1999) and Bartov et al., (2002), who suggest that markets also reward firms who report profits instead of losses. We examine the Korean market reaction to firms' meeting or beating to analysts' forecasts. Consistent with previous empirical literature, we expect that markets respond strongly to meeting or beating analysts' forecasts. Our third hypothesis is stated as follows:

> *H_3: Korean market price reaction is stronger for meeting or beating analysts' forecasts than missing analysts' forecasts, ceteris paribus.*

4.2.3. Private Information in Analysts' Forecasts

SEC suggests that Regulation FD may result in an increase in the level of publicly available information to the capital market and an elimination of the flow of private information.[61] Regulation FD makes the market efficient by increasing the amount of available information to the public and limiting the amount of private information available exclusively to some favoured investors such as broker dealers, institutional investors and analysts. It is obvious that the aim of the regulation is to curtail analysts' private channels to management that they had formerly enjoyed and to disseminate material information to the public.

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[61] See the 'SEC Plans New Disclosure Rules To Speed Corporate Filings', Dow Jones News Wire, 5th Mar. 2002.

Therefore, if firms stop using selective disclosure and release a high quality of public information, information asymmetry would be reduced. After the adoption of Regulation FD, we expect that firms would decrease the flow of private information provided to favoured analysts and increase the scope of information provided to the public. Based on the expectation, our fourth hypothesis posits that the ratio of private information in analysts' forecasts decreases after the adoption of Regulation FD.

> *H_4: The ratio of private information in analysts' forecasts decreases after the adoption of Regulation FD.*

To further our investigation, we examine whether change in the content of information in analysts' forecasts influences analysts' forecasting ability. If there has been a change in analyst forecast ability, there would be two fundamental sources of information: high quality information through public channels; and private information from managers.

In Chapter 3, we conclude that Regulation FD may lead to the improvement of analysts' forecasting ability although public information in analysts' forecasts increases. After Regulation FD took effect, analysts should seriously depend on the public information since managers should preclude the analysts from private information. Namely, analysts should turn to public channels in order to acquire alternative less direct sources of private information. Therefore, we should see lower information asymmetry if Regulation FD makes firms provide public information of higher quality to all analysts. This will be the last focus of this paper. We hypothesize that analysts' forecasting ability will not change even if private information has decreased after the adoption of Regulation FD.

H_5: Analysts' forecast accuracy has not changed even if private information has decreased after the adoption of Regulation FD.

H_6: Analysts' forecast dispersion has not changed even if private information has decreased after the adoption of Regulation FD.

4.3. Sample Selection

In order to study the effect of Regulation FD on private earnings guidance and private information in earnings forecasting, we use two samples from FSS and FNguide. Individual analysts' forecasts of annual earnings per share (*EPS*) are obtained from the FNguide and financial information was retrieved from FSS. In this study, unlike the previous chapter, we use firm-observations (2,311) additionally.

We use forecast-year observations to examine the change in private information in analysts' forecasts and firm-year observations to calculate the private information in firms' earnings guidance. Firm-year observations are based on the forecast-year observations. Therefore, firm-year observations included in our sample meet the following criteria adopted in choosing forecast-year observations:

- Firms are covered by at least two individual analysts' forecasts with EPS
- Firms with stock price and trading volume data available on FNguide
- Firms ending dates of December 31
- Firms do not belong to financial institutions

Finally, elimination of four outliers resulted in a final sample of 2,311 firm-year observations. We sort our data into two groups: 571 (24,969) *pre-FD period* and 1,740

(136,374) *post-FD period*. The pre-FD period covers two years (2000-2001) and post-FD period covers five years (2003-2007). Using the firm year observations in accordance with analysts' forecasts, we then calculate the changes in private earnings guidance in analysts' forecasts after the adoption of Regulation FD. In this sample, observations include private information in analysts' forecasts (*PI*), private earnings guidance (*PEG*), analysts following (*ANALY*), firm size (*SIZE*), forecast horizon (*HORI*), volatility of stock returns (*VOLA*) and cumulative abnormal returns (*CAR*). *Table 4.3* represents the major descriptive statistics on both pre-period and post-period variables used in analysts' forecast attributes.

[Insert *Table 4.3* about here]

4.4. Research Design

4.4.1. Effect of Regulation FD on Private Earnings Guidance

4.4.1.1. Measurement of Private Earnings Guidance

Matsumoto (2002) develops a measure of forecast guidance using analysts' forecasts, earnings per share (*EPS*) and cumulative stock returns. In order to reflect the market risk, we extend the Matsumoto (2002)' model to control for the market portfolio returns. The Matsumoto (2002) model consists of four stages. We first calculate expected yearly change in analysts' forecasts based on yearly earnings change ($\triangle EPS$) and cumulative abnormal returns (*CAR*) in *Equation* (*4.8*).

$$\frac{\Delta EPS_{i,j,t}}{P_{i,j,t-1}} = \alpha_{j,t} + \beta_{1,j,t}\frac{\Delta EPS_{i,j,t-1}}{P_{i,j,t-2}} + \beta_{2jt}CAR_{i,j,t} + \varepsilon_{i,j,t} \qquad (4.1)$$

where:

$\Delta EPS_{i,j,t}$	=	earnings per share for firm i in year t less earnings per share for the same firm in prior year;
$P_{i,j,t-1}$	=	price per share for firm i at the end of year t-1;
$CAR_{i,j,t}$	=	cumulative stock returns on stock j for year t less cumulative returns on the market portfolio for year t.

In *Equation* (*4.2*), we use the parameter estimates (α, β_1 and β_2) from the prior year to calculate the expected change in earnings per share.

$$E[\Delta EPS_{i,j,t}] = [\alpha_{j,t-1} + \beta_{1,j,t-1}(\frac{\Delta EPS_{i,j,t-1}}{P_{i,j,t-2}}) + \beta_{2,j,t-1} CAR_{i,j,t}] \times P_{i,j,t-1} \qquad (4.2)$$

In order to calculate expected analyst' forecast in *Equation* (*4.3*), we add prior year's EPS ($EPS_{i,j,t-1}$) to expected change in EPS ($E(\Delta EPS_{i,j,t})$).

$$E[F_{i,j,t}] = [EPS_{i,j,t-1} + E(\Delta EPS_{i,j,t}) \qquad (4.3)$$

where:

$E[F_{i,j,t}]$	=	Expected analyst' forecast;
$EPS_{i,j,t-1}$	=	Prior year's earnings per share;
$E(\Delta EPS_{i,j,t})$	=	Expected change in analyst' forecast

In order to measure the magnitude of earnings guidance, we deduct the expected analyst' forecast from the consensus forecast for the year.

$$UF_{i,j,t} = F_{i,j,t} - E(F_{i,j,t}) \qquad (4.14)$$

where:

$UF_{i,j,t}$ = unexpected analysts forecasts;
$F_{i,j,t}$ = actual analysts' forecasts

Wang (2007) defines the unexplained portion of $|UF|$ as private earnings guidance. Controlling for earnings volatility, incidence of losses and number of fair disclosure of earnings related information, Wang (2007) measures private earnings guidance in analysts' forecasts. Following Wang (2007), we select variables that contribute to the variability of $|UF|$ (volatility of daily stock returns (*VOLA*), earnings decrease (*DECRESE*) and number of fair disclosure (*NFD*)). We consider the unexplained portion of unexpected analysts' forecasts (*absolute value of the sum of the firms-specific intercept and error term*) as a proxy for private earnings guidance (*PEG*).

$$|UF|_{i,j,t} = \gamma_0 + \gamma_1 VOLA_{i,j,t} + \gamma_2 DECREASE_{i,j,t} + \gamma_3 NFD_{i,j,t} + \mu_{i,j,t} \qquad (4.5)$$

where:

VOLA = standard deviation of daily stock returns
DECREASE = dummy variable that equals 1 if the observation continues to report two year of negative and decrease in earnings from the last year' earnings
NFD = number of fair disclosure released in year t

4.4.1.2. Regulation FD and Private Earnings Guidance

Our first hypothesis (H_1) predicts that the amount of private earnings guidance (*PEG*) in analysts' forecasts decreases after the adoption of Regulation FD. In order to examine

the effect of Regulation FD on private earnings guidance, we estimate the following equation.

$$PEG = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 BM + \beta_4 SIZE + \beta_5 VOLA + \varepsilon \qquad (4.6)$$

All variables defined in *Table 4.1*. We identify and control for factors other than Regulation FD that may cause differences in *PEG* between pre-FD period and post-FD period. Matsumoto (2002) and Hutton (2005) suggest that management's decision to guide analysts' earnings is associated with book-to-market value, value-relevance of earnings, firm size, market value and earnings volatility. Hutton (2005) suggests that analyst following or earnings performance is one of the strongest determinants of managerial earnings guidance.

Our objective is to provide evidence on how Regulation FD influences manager's disclosure policy by observing change in *PEG*. Accordingly, we include four control variables capturing any change in *PEG*: analysts following (*ANALY*), book value to market value (*BM*), firm size (*SIZE*) and volatility of daily stock returns (*VOLA*).

The most interesting coefficient in the *Equation* (*4.6*) is β_1 (*FD*). A significant and negative coefficient β_1 indicates that private earnings guidance decreases in the post-FD period. The variable β_1 in this specification is interpreted as the mean change in private earnings guidance from the pre-FD period to the post-FD period, while controlling for four above variables. To further test for a decline in private earnings guidance after the adoption of Regulation FD, we additionally estimate the following equation.

$$PEG = \alpha + \beta_1 INCREASE + \beta_2 ANALY + \beta_3 BM + \beta_4 SIZE + \beta_5 VOLA + \varepsilon \qquad (4.7)$$

We partition our sample period into two sub-periods: pre-FD period (2000-2001) and post-FD period (2003-2007). In *Equation* (*4.7*), we compare observed signs of β_1, on *INCREASE* of pre-FD period with that of post-FD period. We expect that β_1, on *INCREASE* is significantly positive in the pre-FD period while β_1 in the post-FD is not significant.

4.4.2. Market Price Reaction to Missing, Meeting and Beating

As stated in the previous chapter, we compute cumulative abnormal returns ($CAR_{j,t}$) by subtracting the cumulative market portfolio returns as expressed in following equation. The initial market reaction is measured for trading day [day-1, day+1] when day 0 is the earnings announcement release date, and longer term ([day-3, day+3] and [day-5, day+5]) stock returns are measured. In order to test the market's reaction to firms strategies on analysts' forecasts, we compare the cumulative stock returns ($CAR_{j,t}$) to firms meeting, beating or missing the analysts' forecasts. We use the *KOSPI* composite index (similar to the U.S. Dow Jones Index) or the *KOSDAQ* composite index (similar to the U.S. NASDAQ composite index) as a proxy for market portfolio returns ($R_{m,t}$).

$$CAR_{j,t} = R_{j,t} - R_{m,t} \qquad (4.8)$$

where:

$R_{j,t}$ = returns on stock j for day t.

$R_{m,t}$ = returns on the market portfolio (*KOSPI INDEX* or *KOSDAQ INDEX*) for day t.

Regression analysis is also used to test whether the Korean stock market recognises the firms' meeting or beating the analysts' forecasts. The independent variables, analysts following (*ANALY*), firm size (*SIZE*), leverage (*LEVER*) and standard deviation of daily stock price (*VOLA*) serve as controls for market price reaction. Prior research has found these variables to be important of the market reaction to reported earnings that meet/beat or missing analysts' forecasts (Lopez et al., 2002). Dummy variables (β_1 and β_2) are included for meeting or beating analysts' forecasts. The dummy variables capture the hypotheses that the Korean market will distinguish the meeting or beating from missing the analysts' forecasts. The following model is used to test this market reaction to firms' strategies subsequent to analysts' forecasts.

$$CAR = \alpha + \beta_1 MEET + \beta_2 BEAT + \beta_3 ANALY + \beta_4 SIZE + \beta_5 LEVER + \beta_6 VOLA + \varepsilon \qquad (4.9)$$

All variables are defined in *Table 5.1*. Meeting/Beating analysts' forecasts are defined as a zero or positive earnings surprise, which is the difference between the realised earnings and the consensus forecast. One of the most important coefficients in this regression model is β_1 (*MEET*) or β_2 (*BEAT*) variables. Significant positive β_1 (*MEET*) and β_2 (*BEAT*) are consistent with our hypothesis that Korean stock markets respond strongly to firms that meet or beat analysts' forecasts.

4.4.3. Measurement of Private Information in Analysts' Forecasts

We found that analysts' forecasting ability has improved after the adoption of Regulation FD in the previous chapter. We attributed the results to the increase in available public information in analysts' forecasts. Thus, measuring the private

information in analysts' forecasts is a critical issue to the assessment of Regulation FD. For the study, we measure the private information used in analysts' forecasts.

In order to capture analysts' information environments, some recent empirical studies use the *BKLS model*: price reaction (Ivkovic et al., 2004; Hui et al., 2007), earning surprises (Barron et al., 2007), analysts' forecasts (Barron et al., 2002; Adut, 2003) and firm disclosure (Lang et al., 2003; Mohanram et al., 2006). *BKLS* presents a model how analysts' forecasts are related to their information environment.[62] The *BKLS model* presents two properties of analysts' forecasts: analysts' forecasts dispersion (*D*) and the mean forecasts error (*SE*), as a measure of the accuracy of analysts' public and private information.

$$V(Uncertainty) = \frac{\sum_{i=1}^{N}(FC_i - \overline{F}\overline{C})^2}{N} = \left(SE - \frac{D}{N}\right) + D \qquad (4.10)$$

$$Information\ Asymmetry\ (1-\rho) = 1 - \frac{SE - \frac{D}{N}}{\left(SE - \frac{D}{N}\right) + D} \qquad (4.11)$$

$$Common\ Information\ (\rho) \quad = \frac{SE - \frac{D}{N}}{\left(SE - \frac{D}{N}\right) + D} \qquad (4.12)$$

$$D(Dispersion) = V(1-\rho) = \sum_{i=1}^{N} \frac{(F_{i,j,t} - \overline{F}_{i,t})^2}{N-1} \qquad (4.13)$$

62 Mohanram et al., (2006) suggest that the information sources are aggregated into idiosyncratic information, which referring to information specific to an individual analyst and common information, referring to the information available to all analysts.

where:

SE = expected squared error in the mean forecast, $(\bar{F}_{i,t} - A_{i,t})^2$

N = number of the individual forecasts;

$\bar{F}_{i,t}$ = mean forecast for firm i, year t;

$A_{i,t}$ = actual earnings for firm i, year t;

$F_{i,j,t}$ = analyst j's forecast of earnings for firm i, year t.

Equations (*4.11*) and (*4.12*) show the definition of *BKLS* consensus (ρ) and information asymmetry ($1-\rho$). Information asymmetry ($1-\rho$) means the portion of private information to the total information and *BKLS* consensus (ρ) means the portion of analysts' information that is common. *Equations* (*4.10*) and (*4.11*) imply that dispersion among individual analysts' forecasts (*D*) is relatively small (large) and mean forecasts error (*SE*) is large (small) when individual forecasts include more public (private) information. Dispersion (*D*) is the multiple of uncertainty (*V*) and information asymmetry ($1-\rho$) while, consensus (ρ) is measured as 1-*D*/*V*.

In order to provide evidence on the first, second and third hypotheses, we examine whether changes in the content of information influence forecast accuracy and forecast dispersion. Based on the *BKLS* model (1998), we measure a proxy for the content of information of individual analysts.[63] If Regulation FD has enhanced the information environment then the ratio of private information should be lower in the post-Regulation FD period. This reasoning provides the basis for my hypothesis. Our fourth hypothesis predicts that the private information (*PI*) contained in analysts' forecasts decreases following the regulation.

[63] Adut (2003) and Mohanram et al., (2006) use information asymmetry (1-ρ) as a proxy for private information and consensus (ρ) as a proxy for public information.

To test the overall impact of Regulation FD on private information (*PI*) in analysts' earnings forecasts, the ratio of private information is compared to their respective empirical distributions before and after the FD-period. Next, the coefficients tested in the regression model will provide evidence regarding the relation of forecast attributes and the ratio of private information. We expect that binary β_2, coefficients of *PI* in *Equation* (*4.14*) and *Equation* (*4.15*) are to be significant and negative, which suggests that forecast attributes are negatively associated with private information (*PI*) in the pre-FD period. We also expect that binary β_3, coefficients of *PI*FD* in *Equation* (*4.14*) and *Equation* (*4.15*) are to be significant and positive, which suggests that reduction in private information (*PI*) may lead to a decrease in forecast errors and forecast dispersion. To test the effect of Regulation FD on private information related to forecast attributes, we estimate the following regression models.

$$AFE = \alpha+\beta_1 FD+\beta_2 PI+\beta_3 PI*FD+\beta_4 ANALY+\beta_5 HORI+\beta_6 SIZE+\beta_7 VOLA+ \varepsilon \quad (4.14)$$

$$DISP = \alpha+\beta_1 FD+\beta_2 PI+\beta_3 PI*FD+\beta_4 ANALY+\beta_5 HORI+\beta_6 SIZE+\beta_7 VOLA+ \varepsilon \quad (4.15)$$

All variables are defined in *Table 5.1*. The control variables in *Equation* (*4.15*) and (*4.21*) are used in the previous chapter: analysts following (*ANALY*), forecast horizon (*HORI*), firms size (*SIZE*) and volatility of daily stock returns (*VOLA*). Prior research suggests that these four variables are important determinants in analysts' forecast performance (Brown et al., 1987; Jacob et al., 1999; Mensah et al., 2004; Seyhyun, 1986; Lakonishok et al., 2001).

4.5. Empirical Results

4.5.1. Effect of Regulation FD on Private Earnings Guidance

Equation (*4.6*) is used to examine whether Regulation FD influences private earnings guidance in analysts' forecasts. We examine whether use of private access to management has the same trend as firms' propensities to guide analysts' earnings forecasts downward after the adoption of Regulation. We expect to find a significant decrease in private earnings guidance in analysts' forecasts. *Table 4.5* reports the difference in the level of the *unexplained portion in unexpected earnings forecasts* (*PEG*) during both periods. In order to test whether the difference in *PEG* between pre-FD and post-FD period is statistically significant, we use the t-test and z-test. Consistent with my predictions and Wang (2007)[64], there is a significant drop in the *unexplained portion in unexpected earnings forecasts* (*PEG*), which is our proxy for private earning guidance.

[Insert *Table 4.5* about here]

Table 4.8 shows the results of the regressions used to test our hypothesis H_1 and H_2. *Model 1* in *Table 4.8* captures the estimated results of *Equation* (*4.7*) on changes of private earnings guidance (*PEG*) from the pre-FD to the post-FD period. This result in *Table 4.8* corroborates *Table 4.5* and our hypothesis H_1 that Regulation FD improves the information flow between analysts and management. The result is consistent with Feldman et al., (2003) and Wang (2007). Feldman et al., (2003) suggest that more

[64] Wang (2007) suggests that firms relying more on private earnings guidance replace private earnings guidance with non-disclosure instead of public earnings guidance after the adoption of Regulation FD; these firms suffer significant deterioration in the information environment.

managers now issue their guidance to the public instead of disclosure to a selected group of analysts, in conformity with Regulation FD. Wang (2007) finds the evidence that firms that replace private earnings guidance with public earning guidance prevent significant deterioration in their information environment after the adoption of Regulation FD.

[Insert *Table 4.8* about here]

Controlling for the variables that influence analysts' forecasts, coefficient β_2, on *FD*, is negative as predicted and statistically significant at the 1% level (β_2 = -0.0089), supporting our hypothesis of decreased private earnings guidance in the post-FD period. We interpret this to mean that private earnings guidance has become less prevalent in the post-FD period, a result consistent with the results that inform the univariate analysis. The tests also indicate that coefficient β_4 (book value to market value) is significantly positive while coefficient, β_5 (volatility of daily stock returns) is significantly negative at the 1% level (β_5 = -0.0000).

The results indicate that firms with higher book value than market value are likely to disclose earnings information to favoured analysts and firms with higher information uncertainty are less likely to guide earnings through private channels. However, β_3 (analysts following) and β_5 (firm size) are not associated with private earnings guidance. The findings are inconsistent with Atiase (1985) and Bhushan (1988), who suggest that firm size and analysts following are likely to be positively related to greater private information acquisition.

Model 2 in *Table 4.8* presents the level of private earnings guidance for *earnings increase firms* in the pre-FD and post-FD periods. The binary coefficients, β_1, indicate the difference in private earnings guidance for *earnings increase firms* between the pre-FD and the post-FD period. Coefficient (β_1) in the pre-FD period, is significantly positive, but in the post-FD period in not significant, which is consistent with our second hypothesis (H_2). The results suggest that private earnings guidance for earnings increase firms has diminished after the adoption of Regulation FD. The results have the implication that more managers issue their guidance to the public instead of using disclosure to a selective group of analysts after the adoption of Regulation FD.

In summary, the results reported in *Table 4.8* show evidence of changes in the information environment between managers and analysts. Overall, the results are consistent with the notion that regulation seems to improve the importance of public information for analysts' forecasts.

4.5.2. Market Price Reaction

Table 4.6 presents the difference in the Korean market reaction to firms missing, meeting and beating analysts' forecasts. Using t-test and z-test we find evidence that there is a significant difference between reactions to meeting/beating and missing analysts' forecasts. Our univariate results support our hypothesis H_3 that stronger market reaction to firms beating rather than missing can be a rationale in the ongoing game between managers and analysts.

[Insert *Table 4.6* about here]

Table 4.9 establishes a link between cumulative abnormal returns (*CAR*) and the firms' missing, meeting or beating analysts' forecasts. *Table 4.9* shows the evidence of difference in *MEET*/*BEAT* and *MISS*. The results indicate that the Korean market reacts strongly to firms beating analysts' forecasts for cumulative abnormal returns *CAR* [*D-3, D+3*] and *CAR* [*D-5, D+5*] around earnings announcements as compared to firms missing analysts' forecasts.[65] These results are robust to controlling for other determinants of stock returns around earnings announcement.

[Insert *Table 4.9* about here]

These findings confirm prior finding and our hypothesis H_3. The results are consistent with Lopez et al., (2002) and Skinner et al., (2002), who report that the cumulative stock return (*CAR*) for firms announcing earnings that miss analysts' forecasts, after controlling for other determinants, is lower than that for firms beating forecasts.

However, we find no significant return differences between firms missing and meeting analysts' forecasts over the three short windows around earnings announcements. Our results support the notion that the market rewards firms for beating analysts' forecasts while it penalizes firms which fail to exceed the forecasts.

[65] To further our investigation, we measure the markets reaction to analysts missing, meeting and beating analysts' forecasts following earnings announcement. The additional market reaction is measured for three windows ([day+0, day+1], [day+0, day+3], [day+0, day+5]). The results are similar to the above results. The Korean market reacts strongly to firms beating analysts' forecasts for *CAR* [*D+0, D+3*] and *CAR* [*D+0, D+5*] compared to firms missing analysts' forecasts. On the other hand, there is no significant difference in meeting/beating and missing analysts' forecasts for *CAR* [*D+0, D+1*].

4.5.3. Effect of Regulation FD on Private Information in Forecasts

In our study, we examine whether Regulation FD influences the ratio of private information and whether there is a significant correlation between private information and analysts' forecast attributes (i.e., absolute forecast errors (*AFE*) and forecast dispersion (*DISP*)). We hypothesize that Regulation FD leads to a decrease in the ratio of private information in analysts' forecasts. In order to evaluate the impact of Regulation FD on the analysts' information environment, we first examine the ratio of private information (*PI*). This analysis is presented in *Table 4.3* and *Table 4.7*.

[Insert *Table 4.3* and *Table 4.7* about here]

These results on the preliminary basis support hypothesis H_4. Univariate analysis shows that the *PI* has significantly decreased from the pre-FD to the post-FD period. The average *PI* in the pre-FD period is 0.5265 and the average in the post-period is 0.4938. Both t-tests and z-tests (Wilcoxon rank sum tests) show that *PI* in the post-FD is significantly different from *PI* in the post-FD at the level of 1%. The results of the univariate analysis indicate that the information environment in analysts' forecasts has significantly changed after the FD took effect, which is consistent with our original hypothesis.

Next, *Table 4.4* reports the correlation between the dependent variables (forecast accuracy and forecast dispersion) and the test variable (private information), as well as control variables (analysts following, forecast horizon, firms size and volatility of daily

stock returns). Forecast errors (*AFE*) and forecast dispersion (*DISP*) are significantly negatively correlated with private information (*PI*) during the both periods. The correlation coefficient (-0.35) between *AFE* and *PI* has increased, compared to the pre-FD period (-0.43). These findings are consistent with our expectations that the positive relation between private information and forecast accuracy has decreased due to the improvement of information flow from firms to analysts without selective disclosure in the post-FD period.

[Insert *Table 4.4* about here]

Next, we find a significant negative association between private information (*PI*) and two control variables (forecast horizon, (*HORI*) and volatility of stock returns (*VOLA*)). Finally, the other two variables (analysts following (*ANALY*), firm size (*SIZE*)) are significantly positively correlated with private information (*PI*). The results of the multiple regressions are presented in *Table 4.10*. *Table 4.10* contain the results from the two regression specifications (i.e., *Equation* (*4.14*) and *Equation* (*4.15*)).

[Insert *Table 4.10* about here]

Binary coefficients (β_1) in *Model 1* and *Model 2* of *Table 4.10* mean change in the *AFE* and *DISP* from the pre-FD period to the post-FD period. The results indicate that *AFE* and *DISP* have significantly decreased in the post-FD period. The results are consistent with our univariate analysis and previous hypotheses in Chapter 3. One of the most interesting coeffecients in this specification is β_2 or β_3. The binary coefficients estimates

on the β_2, *PI* variables in *Model 1* and *Model 2* of *Table 4.10* are -0.1739 and -0.0166 respectively, and are significant at the 1% level. The results suggest that a one percentage point increase in the private information ratio is associated with an 17.39 *(Model 1)* and 1.66 *(Model 2)* basis point decrease in forecast errors (*AFE*) and forecast dispersion (*DISP*) in the pre-FD period. These negative and significant coefficients indicate that private information (*PI*) is negatively associated with both forecasts attributes (*AFE* and *DISP*) in the pre-FD period.

The binary coefficient estimates on β_3, *PI**FD variables are 0.1047, and 0.0145 respectively, and are significant at the 1% level. A movement from 17.39 (*AFE*) and 1.66 (*DISP*) to 10.47 and 1.45 would be associated with a 5.92 (*AFE*) and 0.21 (*DISP*) basis point decrease in the forecast errors and forecast dispersion. The results indicate that analysts' forecasting ability has improved although private information has decreased in the pre-FD period. Therefore, H_1, H_2, and H_3 are accepted. Analysts placed more weight on public disclosures for forecasting as Regulation FD restricted private communications with managers. The results seem to indicate that Regulation FD may influence the amount of private information by disseminating the information to market participants publicly.

4.6. Summary and Conclusions

We provide an empirical study of the effect of Regulation FD on the change in private information in analysts' forecasts and private earnings guidance. Knowing Regulation FD's aim of levelling the playing field, we expect a decrease in information asymmetry. First, we examine the relation between Regulation FD and private earnings guidance.

Following Matsumoto (2002) and Wang (2005), we compare the degree of private earnings guidance in the pre-FD and post-FD period. Our results show a significant decrease in private earnings guidance after the adoption of Regulation FD. These results are consistent with Feldman et al., (2003) and Wang (2007), who suggest that more managers issue public guidance instead of selective disclosure to favoured analysts in the post-FD period. We document that Regulation FD makes firms replace private earnings guidance with public guidance. Even if analysts depend on public disclosure, there is no significant deterioration in their earnings forecasts.

Second, we provide empirical evidence on the differential market response to firms that beat market expectations versus firms that do not exceed the expectations. We find the evidence that the Korean stock market generally recognizes firms beating analysts' forecasts. Controlling for four variables (analysts following, firm size, leverage and volatility of daily stock returns), we find that the market strongly responses to beating analysts' forecasts for *CAR* [*D-3, D+3*] and *CAR* [*D-5, D+5*].

Third, relying on analytical models of *BKLS*, we hypothesize that private information in analysts' forecasts significantly decreases in the post-FD period. For the study, we compare the ratio of private information in analysts' forecasts before and after Regulation FD. The differences in availability of private information between the two periods suggest that Regulation FD leads to an improvement in the information environment for analysts' forecasting. We also find that analysts' forecasting ability has improved in the post-FD period despite the decrease in private information. Consistent

with the previous chapter, we show that Regulation FD contributes to firms disseminating available information in public.

In conclusion, we support the notion that private information acquired from private channels can be replaced by public information from firms and analysts' research efforts after the adoption of Regulation FD.

ANNEX 3

Table 4.1 Definition of Variables

This table outlines the definitions of variables used in our hypothesis testing

PEG	=	Private earnings guidance
FD	=	dummy variable that equals 1 for firms take in the post-FD (year 2003-2007) period and 0 otherwise;
ANALY	=	the number of analysts providing earnings forecasts;
BM	=	book value to market value;
SIZE	=	the natural log of the total asset at the end of the last year of forecast;
VOLA	=	standard deviation of daily stock returns for year prior to earnings announcement;
INCREASE	=	dummy variable that equals 1 if the observation continues to report two year of positive and increase in earnings from the last year' earnings;
CAR	=	cumulative abnormal returns over three windows surrounding release day of earnings announcement;
LEVER	=	leverage ratio
AFE	=	analyst forecast error at the earnings announcement deflated by stock price at the end of the previous year;
DISP	=	the standard deviation of all analyst forecasts made at the end of the year from the consensus of analysts' forecasts deflated by stock price at the end of the previous year;
PI	=	the ratio of private information in analysts' forecasting;
HORI	=	the number of days between the end of the following fiscal year and the date of the analysts' forecast

Table 4.2 Sample Selection

Sample A is based on the firm-year observations while Sample B is based on the forecast-year observations. Sample A and Sample B consist of 161,343 and 2,311 observations from 2000 to 2007 (excluding 2002).

	2000	*2001*	*2003*	*2004*	*2005*	*2006*	*2007*	*Total*
Sample A	*5,014*	*19,955*	*21,772*	*21,424*	*41,270*	*33,543*	*18,365*	*161,343*
Sample B	*300*	*271*	*264*	*303*	*374*	*385*	*414*	*2,311*

Table 4.3 Descriptive Statistics for Variables

This table presents the descriptive statistics for 161,343 forecast-year observations from 2000 to 2007 (excluding 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. Variables are private information in analysts' forecasts (*PI*), forecast errors (*AFE*), forecast dispersion (*DISP*), analyst following (*ANALY*), forecast horizon (*HORI*), firm size (*SIZE*), broker size (*SECU*) and standard deviation of daily stock returns (*VOLA*).

Variables	*Pre-FD period (n=24,969)*				*Post-FD period (n=136,374)*			
	Mean	*25^{th} Percentile*	*Median*	*75^{th} Percentile*	*Mean*	*25^{th} Percentile*	*Median*	*75^{th} Percentile*
PI	*0.527*	*0.254*	*0.459*	*0.807*	*0.494*	*0.238*	*0.429*	*0.770*
AFE	*0.079*	*0.011*	*0.034*	*0.089*	*0.044*	*0.073*	*0.021*	*0.052*
DISP	*0.055*	*0.019*	*0.034*	*0.062*	*0.030*	*0.011*	*0.019*	*0.035*
ANALY	*23*	*15*	*23*	*33*	*24*	*14*	*24*	*33*
HORI	*206*	*107*	*198*	*299*	*214*	*115*	*216*	*313*
SIZE	*3,058*	*1,031*	*3,033*	*13,256*	*7,511*	*1,651*	*7,477*	*35,554*
VOLA	*0.71*	*0.60*	*0.70*	*0.80*	*0.47*	*0.37*	*0.45*	*0.55*

Table 4.4 Correlation between Private Information and Analysts' Forecasts

This table shows the matrix of Pearson correlation coefficients among the possible explanatory variables to the events of forecasting earnings. The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. These explanatory variables are ratio of private information (*PI*), forecast dispersion (*DISP*), absolute forecast errors (*AFE*), analyst following (*ANALY*), forecast horizon (*HORI*), firm size (*SIZE*) and standard deviation of daily stock returns (*VOLA*). The numbers below are t-stats of the null hypothesis where the correlation coefficient is zero.

< *Panel A: Pre-FD Period* >

Variables	*PI*	*DISP*	*AFE*	*ANALY*	*HORI*	*SIZE*	*VOLA*
PI	*1*						
DISP	*-0.0120* *0.0588*	*1*					
AFE	*-0.4311* *<.001*	*0.4073* *<.001*	*1*				
ANALY	*0.1817* *<.001*	*-0.2191* *<.001*	*-0.2425* *<.001*	*1*			
HORI	*-0.0651* *<.001*	*-0.0375* *<.001*	*0.1831* *<.001*	*0.0276* *<.001*	*1*		
SIZE	*0.2030* *<.001*	*-0.0388* *<.001*	*-0.0651* *<.001*	*0.2988* *<.001*	*-0.0025* *0.6888*	*1*	
VOLA	*-0.1949* *<.001*	*0.0564* *<.001*	*0.1668* *<.001*	*0.0320* *<.001*	*0.0320* *<.001*	*-0.2078* *<.001*	*1*

< *Panel B: Post-FD Period* >

Variables	*PI*	*DISP*	*AFE*	*ANALY*	*HORI*	*SIZE*	*VOLA*
PI	*1*						
DISP	*-0.0522* *<.001*	*1*					
AFE	*-0.3517* *<.001*	*0.4800* *<.001*	*1*				
ANALY	*0.2023* *<.001*	*-0.0963* *<.001*	*-0.1874* *<.001*	*1*			
HORI	*-0.0536* *<.001*	*0.0217* *<.001*	*0.2640* *<.001*	*-0.0212* *<.001*	*1*		
SIZE	*0.1076* *<.001*	*-0.0840* *<.001*	*-0.0896* *<.001*	*0.4051* *<.001*	*-0.0142* *0.6888*	*1*	
VOLA	*-0.0608* *<.001*	*0.2012* *<.001*	*0.1805* *<.001*	*-0.0757* *<.001*	*-0.0094* *<.001*	*-0.3204* *<.001*	*1*

Table 4.5 Comparison of Private Earnings Guidance

This table presents the results of t-tests and z-tests for the difference in mean and median private earnings guidance (*PEG*) in the pre-FD versus post-FD period. Pre-FD period is from 2000 to 2001 and post-FD period is from 2003 to 2007. Z-test (Wilcoxon signed test) is used to measure whether the medians are statistically different from each other while t-test is used to measure whether the means between pre-FD period and post-FD period are statistically different from each other. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

	Pre-FD (n=571)	*Difference of PEG (Pre-FD=Post-FD)*		*Post-FD (n=1,740)*
		t-test	*z-test*	
Mean	*0.022*	*10.07****	*13.54****	*0.009*
(Median)	*(0.010)*			*(0.003)*

Table 4.6 Comparison of Cumulative Abnormal Returns

This table presents the difference in stock price effect to missing, meeting and beating analysts' forecasts around earnings announcement released in the pre-FD (2000-2001) versus post-FD period (2003-2007). The event date (D) is defined as the earnings announcement release date. *CAR* is the cumulative abnormal returns for three windows ([*day-1, day+1*], [*day-3, day+3*], [*day-5, day+5*]). Z-test (Wilcoxon signed test) is used to measure whether the medians are statistically different from each other while t-test is used to measure whether the means are statistically different from each other. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: All Period* >

	MISS (n=1,342)	*Difference of CAR (MISS=MEET)*		*MEET (n=526)*	*Difference of CAR (MEET=BEAT)*		*BEAT (n=443)*
		t-test	*z-test*		*t-test*	*z-test*	
CAR (D-1, D+1)	*-0.003*	*-0.20*	*-1.07*	*-0.002*	*-0.10*	*0.36*	*-0.002*
CAR (D-3, D+3)	*-0.010*	*-0.59*	*-1.70**	*-0.008*	*-1.42*	*-0.41*	*-0.001*
CAR (D-5, D+5)	*-0.009*	*-1.21*	*-1.63*	*-0.003*	*-2.07***	*-1.30*	*0.009*

< *Panel B: Pre-FD Period* >

	MISS (n=321)	*Difference of CAR (MISS=MEET)*		*MEET (n=124)*	*Difference of CAR (MEET=BEAT)*		*BEAT (n=126)*
		t-test	*z-test*		*t-test*	*z-test*	
CAR (D-1, D+1)	*-0.004*	*-0.03*	*-0.94*	*-0.004*	*-0.25*	*0.44*	*-0.002*
CAR (D-3, D+3)	*-0.022*	*-1.09*	*-1.80**	*-0.012*	*-0.02*	*0.65*	*-0.012*
CAR (D-5, D+5)	*-0.008*	*-1.01*	*-1.48*	*0.003*	*-0.29*	*-0.17*	*0.007*

< *Panel C: Post-FD Period* >

	MISS (n=1,021)	*Difference of CAR (MISS=MEET)*		*MEET (n=402)*	*Difference of CAR (MEET=BEAT)*		*BEAT (n=317)*
		t-test	*z-test*		*t-test*	*z-test*	
CAR (D-1, D+1)	*-0.002*	*-0.22*	*-0.65*	*-0.002*	*0.02*	*0.12*	*-0.002*
CAR (D-3, D+3)	*-0.006*	*0.01*	*-0.83*	*-0.006*	*-1.95**	*-1.08*	*0.037*
CAR (D-5, D+5)	*-0.009*	*-0.79*	*-1.01*	*-0.005*	*-2.31***	*-1.43*	*0.009*

Table 4.7 Comparison for Private Information in Analysts' Forecasts

This table presents the results of t-tests and z-tests for the difference in private information in analysts' forecasts in the pre-FD versus post-FD period. The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. Z-test (Wilcoxon signed test) is used to measure whether the medians are statistically different from each other while t-test is used to measure whether the means between the pre-FD period and the post-FD period are statistically different from each other. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

Pre-FD	*Difference (Pre-FD=Post-FD)*		*Post-FD*
(n=24,969)	*t-test*	*z-test*	*(n=136,374)*
0.5265	*15.85****	*13.91****	*0.4938*

Table 4.8 Regression of Regulation FD and Private Earnings Guidance

This table reports the results of regressions to examine the variation in private earnings guidance for 2,311 firm-year observations from 2000 to 2007 (excluding 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable (*PEG*) is defined as the private earnings guidance. The explanatory variables are post-FD period (*FD*), earnings increase firms (*INCREASE*), analysts following (*ANALY*), book to market (*BM*), firm size (*SIZE*) and standard deviation of past five year's EPS (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Model 1* > $PEG = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 BM + \beta_4 SIZE + \beta_5 VOLA + \varepsilon$

		Coef.		*t*	*P>|t|*
INTERCEPT	α	*0.0093*	***	*2.55*	*0.011*
FD	β_1	*-0.0089*	***	*-6.62*	*0.000*
ANALY	β_2	*0.0000*		*0.69*	*0.489*
BM	β_3	*0.0042*	***	*10.31*	*0.000*
SIZE	β_4	*0.0018*		*1.36*	*0.173*
VOLA	β_5	*-0.0000*	***	*-3.07*	*0.002*
		Number of obs = 2,311 *Adj R-squared = 0.1027*			

< *Model 2* > $PEG = \alpha + \beta_1 INCREASE + \beta_2 VOLA + \beta_3 ANALY + \beta_4 BM + \beta_5 SIZE + \beta_5 VOLA + \varepsilon$

	< Pre-FD period>					*< Post-FD period>*				
		Coef.		*t*	*P>|t|*		*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*-0.0097*		*-0.95*	*0.345*	α	*0.0095*	***	*3.25*	*0.001*
INCREASE	β_1	*0.0093*	***	*2.75*	*0.006*	β_1	*-0.0000*		*-0.06*	*0.955*
ANALY	β_2	*0.0062*		*1.62*	*0.106*	β_3	*-0.0006*		*-0.56*	*0.574*
BM	β_3	*0.0063*	***	*7.09*	*0.000*	β_4	*0.0020*	***	*5.05*	*0.000*
SIZE	β_4	*-0.0001*	***	*-2.66*	*0.008*	β_5	*- 0.0000*	*	*-1.66*	*0.098*
VOLA	β_5	*0.0000*		*0.93*	*0.354*	β_2	*0.0000*		*0.38*	*0.705*
	Number of obs = 571 *Adj R-squared = 0.1278*					*Number of obs = 1,740* *Adj R-squared = 0.0263*				

Table 4.9 Regression of Market Reaction to Meeting and Beating Analysts' Forecasts

This table reports the results of regressions to examine the market response to firm that meet or beat analysts' forecasts compared to the firms that miss analysts' forecasts for 2,311 firm-year observations from 2000 to 2007 (excluding 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable (*CAR*) is defined as the cumulative four windows [*CAR (D-1,D+1)*], [*CAR (D-3,D+3)*], [*CAR (D-5,D+5)*]. Independent variables are firms' meeting and beating to analysts' forecasts (*MEET* and *BEAT*), analysts following (*ANALY*), firm size (*SIZE*), leverage (*LEVE*) and standard deviation of daily stock returns (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$CAR = \alpha + \beta_1 MEET + \beta_2 BEAT + \beta_3 ANALY + \beta_4 SIZE + \beta_5 LEVER + \beta_6 VOLA + \varepsilon$$

< Panel A: All Period >

		CAR (D-1, D+1)				CAR (D-3, D+3)				CAR (D-5, D+5)			
		Coef.		t	Coef.	Coef.		t	Coef.	Coef.		t	Coef.
CON	α	-0.0139	**	-2.40	0.016	-0.0406	***	-4.18	0.000	-0.0200	*	-1.71	0.088
MEET	β_1	0.0004		0.18	0.857	0.0012		0.30	0.764	0.0061		1.29	0.198
BEAT	β_2	0.0006		0.23	0.816	0.0091	**	2.17	0.030	0.0171	***	3.4	0.001
ANALY	β_3	0.0000	*	-1.90	0.058	0.0000		-1.57	0.116	0.0000		-1.16	0.245
SIZE	β_4	0.0042	*	1.82	0.069	0.0114	***	2.96	0.003	0.0035		0.75	0.451
LEVER	β_5	0.0007		1.46	0.143	0.0006		0.71	0.476	0.0025	*	2.42	0.016
VOLA	β_6	0.0000		-0.44	0.657	0.0000		-0.69	0.490	0.0000		-0.26	0.794
		Number of obs = 2,311 Adj R-squared = 0.0031				Number of obs = 2,311 Adj R-squared = 0.0070				Number of obs = 2,311 Adj R-squared = 0.0086			

< Panel B: Pre-FD Period >

		CAR (D-1, D+1)				CAR (D-3, D+3)				CAR (D-5, D+5)			
		Coef.		t	Coef.	Coef.		t	Coef.	Coef.		t	Coef.
CON	α	-0.0187		-1.57	0.116	-0.0694	***	-3.55	0.000	-0.0170		-0.73	0.466
MEET	β_1	0.0065		1.08	0.280	0.0098		0.99	0.321	0.0180		1.53	0.127
BEAT	β_2	0.0026		0.47	0.639	0.0107		1.15	0.251	0.0157		1.42	0.155
ANALY	β_3	-0.0002	***	-4.23	0.000	-0.0002	**	-1.98	0.049	-0.0002	*	-1.93	0.054
SIZE	β_4	0.0041		0.82	0.414	0.0142	*	1.7	0.089	-0.0006		-0.06	0.950
LEVER	β_5	0.0024		1.48	0.140	0.0046	*	1.7	0.090	0.0054	*	1.68	0.094
VOLA	β_6	0.0000		1.09	0.278	0.0000		0.76	0.448	0.0000		0.77	0.443
		Number of obs = 571 Adj R-squared = 0.0418				Number of obs = 571 Adj R-squared = 0.0232				Number of obs = 571 Adj R-squared = 0.0183			

< Panel C: Post-FD Period >

		CAR (D-1, D+1)				CAR (D-3, D+3)				CAR (D-5, D+5)			
		Coef.		t	Coef.	Coef.		t	Coef.	Coef.		t	Coef.
CON	α	-0.0147	**	-2.21	0.028	-0.0234	**	-2.06	0.039	-0.0252	*	-1.83	0.067
MEET	β_1	0.0003		0.11	0.914	-0.0004		-0.09	0.927	0.0041		0.79	0.431
BEAT	β_2	0.0002		0.09	0.928	0.0096	**	2.07	0.039	0.0181	***	3.23	0.001
ANALY	β_3	0.0000		-0.77	0.440	0.0000		-0.67	0.500	0.0000		-0.72	0.471
SIZE	β_4	0.0050	*	1.91	0.056	0.0064		1.44	0.150	0.0061		1.13	0.257
LEVER	β_5	0.0005		0.89	0.376	0.0007		0.75	0.452	0.0018	*	1.69	0.090
VOLA	β_6	0.0000		-1.64	0.101	0.0000		-0.67	0.506	0.0000		-1.07	0.283
		Number of obs = 1,740 Adj R-squared = 0.0036				Number of obs = 1,740 Adj R-squared = 0.0047				Number of obs = 1,740 Adj R-squared = 0.0096			

Table 4.10 Regression of Private Information in Analysts' Forecasts

This table reports the results of regressions to examine the variation in private information in analysts' forecasts for 161,343 forecasts-year observations from 2000 to 2007 (excluding 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is absolute forecast errors (*AFE*) and forecast dispersion (*DISP*). The explanatory variables are post-FD period (*FD*), private information in analysts' forecasts (*PI*), analyst following (*ANALY*), forecast horizon (*HORI*), firms size (*SIZE*) and standard deviation of daily stock returns (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better

$$\textbf{(MODEL 1) } AFE = \alpha + \beta_1 FD + \beta_2 PI + \beta_3 PI*FD + \beta_4 ANALY + \beta_5 HORI + \beta_6 SIZE + \beta_7 VOLA + \varepsilon$$

$$\textbf{(MODEL 2) } DISP = \alpha + \beta_1 FD + \beta_2 PI + \beta_3 PI*FD + \beta_4 ANALY + \beta_5 HORI + \beta_6 SIZE + \beta_7 VOLA + \varepsilon$$

Model 1		*Coef*		*t*	*P>|t|*
INTERCEPT	α	*0.1035*	***	*68.67*	*0.0000*
FD	β_1	*-0.0789*	***	*-67.93*	*0.0000*
PI	β_2	*-0.1739*	***	*-104.64*	*0.0000*
*PI*FD*	β_3	*0.1047*	***	*59.13*	*0.0000*
ANALY	β_4	*-0.0008*	***	*-57.05*	*0.0000*
HORI	β_5	*0.0001*	***	*97.18*	*0.0000*
SIZE	β_6	*0.0000*	***	*25.22*	*0.0000*
VOLA	β_7	*0.0863*	***	*64.53*	*0.0000*
		Number of obs = 161,343			
		Adj R-squared = 0.2491			
Model 2		*Coef*		*t*	*P>|t|*
INTERCEPT	α	*0.0374*	***	*39.8*	*0.0000*
FD	β_1	*-0.0223*	***	*-30.79*	*0.0000*
PI	β_2	*-0.0166*	***	*-16.05*	*0.0000*
*PI*FD*	β_3	*0.0145*	***	*13.15*	*0.0000*
ANALY	β_4	*-0.0004*	***	*-43.58*	*0.0000*
HORI	β_5	*0.0000*	***	*3.94*	*0.0000*
SIZE	β_6	*0.0000*	***	*9.39*	*0.0000*
VOLA	β_7	*0.0512*	***	*61.52*	*0.0000*
		Number of obs = 161,343			
		Adj R-squared = 0.0800			

CHAPTER 5

HERDING BEHAVIOUR IN ANALYSTS' FORECASTS

5.1. Introduction

Access to managers is one of the most important determinants of analysts' quality (Johnson, 2005).[66] On the other hand, it puts analysts in a privileged position. In order to prohibit private access to managers, the Financial Supervisory Committee (FSC) in Korea adopted Regulation FD in November 2002. The regulation is intended to ensure equal access to material information by disseminating publicly the information privately shared with market participants.

In the previous chapter, consistent with the regulator's intention, we showed evidence of decrease in private information in analysts' forecasts and of an increase in the public dissemination of information. In this chapter, we examine the effect of Regulation FD on Korean analysts' herding behaviour. In the present context, herding is defined as 'excessive agreement' among analysts expectations' (De Bondt et al., 1999), or as 'a group of investors trading in the same direction over a period of time' (Olsen, 1996; Nofsinger et al., 1999; Oehler et al., 2000) and as 'deviating from one's true posterior belief on a subject and moving closer to the prevailing consensus' (Gleason et al., 2003). Herding, therefore, can decrease the information transmitted by individual analysts' forecasts or lead them to revise their forecasts simply to be closer to the mean

[66] Prendergast et al., (1996) suggest that if an analyst's ability relates to access to private information, high-ability analyst's forecast is further away from consensus than the consensus forecast.

forecast and not because of new private information (Clement et al., 2005). Obviously, herding implies that individual patterns are alike.[67]

Numerous approaches to testing herding behaviour in analysts' forecasts have been proposed in prior papers (Trueman, 1994; De Bondt et al., 1999; Kim et al., 1999; Clement et al., 2005; Chen et al., 2006; Bernhardt et al., [*hereafter* "BCK"], 2006). Trueman (1994) finds evidence that herding forecast is positively associated with forecast dispersion.[68] Chan et al., (2005) suggest that the informational cascade model and the reputational risk model[69] predict higher levels of herding behaviour for stock with high information uncertainty as there is little reliable information.

However, empirical evidence regarding the effect of the Regulation FD on herding behavior in analysts' forecasts is limited. For example, Arya et al., (2005) show that Regulation FD may cause analysts to mimic the firms' announcement or analysts' consensus forecasts and ignore their own private information. In light of herding concerns, they suggest that Regulation FD may act to stifle firm disclosure and lead firms to do away with voluntary disclosure. The results are consistent with the

67 See section 2.6 in Chapter 2.

68 Forecast dispersion is used as a proxy for information uncertainty on the future earnings.

69 Analysts' herding behaviour is based on the three theoretical models (See Chapter 2): the information cascade model (Bikhchandani et al., 1992), the reputational risk model (Scharfstein et al., 1990), and the investigative herding model (Hirshleifer et al., 1994). According to the information cascade model and reputational risk model, analysts are likely to herd toward other analysts, even if their colleagues might not obtain reliable information. For example, for firms with high information uncertainty, the two former models predict a high level of herding, as analysts do not have the reliable information about the future firms. On the other hand, investigative model predicts low level of herding as the firm has little reliable information. Thus, our hypotheses may follow two different routes. However, we suspect that herding behaviour is associated with low dispersion if analysts are not sure about their information. For the study in this chapter, we follow the two former models.

regulation's critics.[70] Arya et al., (2005) assume that the analyst who is privy to a firm's disclosure is willing to reflect his own information and be independent of the recommendation of other analysts when the firm selectively discloses material information. However, a consequence of widening the recipients of firm disclosures may be heightened herding behavior among recipients because Regulation FD limits selective disclosure. Arya et al., (2005) conclude that the Regulation FD could have the unintended consequence of increasing herding behaviour among analysts' forecasting. On the other hand, Mensah et al., (2008) contradict Arya et al., (2005), and report no evidence that Regulation FD results in increasing in analysts' herding behaviour. To the contrary, they find some weak evidence of a slight increase in anti-herding behaviour in the post-FD period. The results indicate that Regulation FD has not led to a negative influence on the analysts' individual forecasting ability.

Our study is motivated by this debate and the inconclusive evidence. Our research attempts to reconcile these conflicting results. We examine whether Regulation FD influences herding behaviour by comparing behaviour among analysts during the pre-FD and post-FD periods. We use two methods to proxy (i.e., measure) for herding referred to as herding propensity. Using the *S-statistic* approach by *BCK* (2006) and *Boldness* approach developed by Clement et al., (2005), we measure herding propensity in Korean analysts' forecasts. We show no evidence that there is significant increase in Korean analysts' herding behaviour in the post-FD period, which indicates that Regulation FD is not related to any discernible increase in analysts' herding behaviour.

[70] e.g. Association for Investment Management and Research [AIMR, 2000, now the CFA institute] and Securities Industry Association [SIA, 2000], which suggest that Regulation FD leads to decrease in information provided by firms, the so-called "chilling effect. See Chapter 3.

Second, we extend previous Korean evidence by using much more comprehensive data than in Ahn et al., (2006). Using 161,343 forecasts observations from 2000 to 2007, we find that that Korean analysts consistently exhibit anti-herding behaviour in all sub-samples ($P = 0.62$, $S = 0.52$), which indicates that on average 62% (or 52%) of analysts' forecasts are away from the consensus forecast. Our results, therefore, are not consistent with Ahn et al., (2006).

Third, following Jegadeesh et al., (2008), we examine whether the Korean securities market recognizes analysts' herding behaviour. In order to understand the broader implications of analysts herding behaviour, it is important that we examine whether analysts herd in earnings forecasting but also how the stock market responds to the herding forecasts. Jegadeesh et al., (2008) find that stock returns respond more strongly when forecast revisions deviate from the consensus forecast than when the revisions follow their colleagues' opinion. The results indicate that analysts' herding behaviour does not influence the stock price because the securities market recognizes analysts' herding behaviour. Our results are consistent with Jegadeesh et al., (2008). We find that the Korean stock market responses more strongly to anti-herding forecasts.

Our paper contributes to the research on the herding behaviour in the following ways. First, this paper reconciles the conflicting papers on the effect of Regulation FD on the herding behavior. Our empirical results offer a convincing interpretation of the mixed results on the effect of Regulation. Second, our paper provides evidence on anti-herding behaviour in Korean analysts' forecasts. Finally, our paper provides further evidence on

the Korean stock markets' response to herding behaviour among analysts after controlling for factors known to impact the market reaction.

This chapter proceeds as follows. Section 5.2 introduces and develops the hypotheses. Section 5.3 describes the sample selection procedure and provides some descriptive statistics. Section 5.4 discusses research design. Section 5.5 presents the main empirical results on the effect of Regulation FD. The final section provides a brief summary and presents conclusions.

5.2. Hypotheses Development

5.2.1. Analysts' Herding Behaviour in Korean Market

Herding behaviour occurs when analysts ignore their own private information and follow their colleagues' recommendations. A number of studies are offered to explain the herding behaviour among analysts. These studies largely focus on the following major questions: (1) Do analysts herd? (Welch, 2000; Hong et al., 2000; Zitzewitz, 2001; Kim et al., 2003; Clement et al., 2005; Bernhardt et al., 2006) (2) Do markets respond more strongly to anti-herding? (Gleason et al., 2003; Clement et al., 2005) (3) Why do analysts herd? (Chevalier et al., 1999; Hong et al., 2000; Clement et al., 2005) (4) Does anti-herding lead to better forecast accuracy? (Clement et al., 2005; Clarke et al., 2006)[71]

This chapter is related to the first and second questions. In order to study the effect of Regulation FD on herding behavior, we begin by examining whether Korean analysts

[71] See Chang et al., (2008) for detailed surveys of herding research.

herd in earnings forecasting and whether the Korean capital market recognizes analysts' herding behavior. Most research on analysts' herding behavior focuses on U.S. analysts. Hong et al., (2000), Kim et al., (2003) and Clement et al., (2005) provide evidence of herding in analysts' forecasts by examining the clustering of earnings around the prevailing consensus. Using a methodology that represents divergence in forecast, Zitzewitz (2001) and Bernhardt et al., (2006) report that anti-herding is pervasive in the U.S. securities market. Research on analysts' herding behaviour in other countries is rather limited. For example, using data for U.K. companies between 1986 and 1997, De Bondt et al., (1999) find strong evidence of over-optimism, overreaction, and herding in analysts' forecasts. Using *BCK* (2006), Naujoks et al., (2009) examine the herding behaviour of German analysts between 1994 and 2005. They find that German analysts tend to release biased forecasts, which reveal anti-herding behaviour.

Using 3,951 observations between 2001 and 2003, Ahn et al., (2006) find that 71% of Korean analysts herd toward their colleague's forecasts. In addition, they document that analysts employed by smaller brokerage firms and analysts covering companies with a higher ratio of institutional investors are likely to herd. They interpret the results, suggesting that analysts employed by small brokerage firms are more likely to have an incentive to reduce the danger of unemployment or loss of bonus caused by inaccuracy of forecasts than analysts employed by large brokerage firms. Consistent with Ahn et al., (2006), we first hypothesize that analysts' herding behaviour exists in the Korean stock market. Our first hypothesis is stated as follows:

H_1: Herding behaviour exists among analysts in the Korean stock market.

5.2.2. Regulation FD and Analysts' Herding Behaviour

Arya et al., (2005) show evidence that analysts' herding behaviour tends to increase with changes in internal and external factors surrounding their forecasts. Arya et al., (2005) also suggest that selective disclosure, prior to the adoption of Regulation FD, could have had a preventive effect on herding behaviour. Their results are consistent with Zitzewits (2002), who reports that herding may be more present in the post-FD period due to the reduction in the disclosure of private information to analysts. The consensus of the above research suggests that analysts who get private access to managers may more willing to use both their private information and other analysts' forecasts. Therefore, analysts are likely to follow previous analysts' forecasts in the post-FD period because the regulation inhibits selective disclosure and leads to the chilling effect to stifle firm disclosure.[72]

On the other hand, Mensah et al., (2008) find that Regulation FD is not related to increasing herding behaviour in the post-FD period. On the contrary, they find evidence of a slight decrease in anti-herding behaviour after the adoption of Regulation FD. The experimental evidence on the effect of Regulation FD on herding behavior among analysts, therefore, seems to be mixed. Our study is motivated by the current debate on the effect of Regulation FD on herding behaviour. By re-examining the relationship between Regulation FD and herding behavior, we reconcile these opposing results.

[72] The chilling effect would result in cutting off communication between companies and market participants.

5.2.3. Market Reaction to Analysts' Herding Behaviour

Previous literature examined the association of herding behaviour and investment recommendations (Graham, 1999; Jaffe et al., 1999; Desai et al., 2000), herding behaviour among fund managers (Lakonishok et al., 1992; Grinblatt et al., 1995; Wermers, 1999, Chevalier et al., 1999), and herding behaviour and earnings forecasts (Jegadeesh et al., 2008).

There is, however, a paucity of research on the markets' response to analysts' herding behaviour. Jegadeesh et al., (2008) examine whether stock price reactions following recommendations are stronger when the new recommendation is away from the consensus than when it is closer to it. Jegadeesh et al., (2008) find that stock returns to analysts' recommendations are unrelated to consensus forecast if they make recommendations based on their own information, without herding. These results are consistent with Gleason et al., (2003), who suggest that the stock price reaction to forecasts that herd toward consensus forecast is weaker than to forecasts that deviate from the consensus. Because the market efficiently reflects all available information such as consensus recommendations and analysts' recommendation revisions, the market should react more strongly to anti-herding forecasts than to herding forecasts. We, therefore, expect a stronger market reaction when analysts deviate from the consensus forecast. Our second hypothesis is stated as follows:

> *H_2: The market reaction will be more pronounced to anti-herding recommendations as opposed to herding recommendations.*

5.3. Sample Selection and Descriptive Statistics

In order to test for the effect of Regulation FD on the herding behaviour in analysts' forecasts, we use samples from FNguide and FSS database. FNguide, established in 2000, collects analysts' forecasts information such as forecasted earnings per share (EPS), level of investment recommendations, name of analyst and release date of recommendations from 46 financial professional institutions.[73] Thus, our data consist of forecasts released by analysts affiliated to most Korean domestic securities companies. Our sample includes observations for herding propensity (*P*, *S*), forecast dispersion, analysts following, forecast horizon, firms size, volatility of stock returns, actual earnings, book value to market value, leverage and cumulative abnormal returns (*CAR*). Consistent with other research (Sinha et al., 1997; Clement et al., 1999), we eliminate observations from the sample if (1) there are no earnings per share forecast (2) only one analyst covers the firm (3) forecasts reported in year 2002 (4) earnings forecast is in the top or bottom 3 percents of the forecast variable.

Table 5.2 shows the number of observations used in this study and their distribution over time. Our sample contains 161,343 observations and spans 7 years (from 2002 to 2007, excluding 2002). The number of observations in each year ranges from 5,014 in 2000 to 41,270 in 2005. We define the years from 2000 to 2001 as belonging to the pre-FD period and the years from 2003 to 2007 as the post-FD period. It is ambiguous whether analysts' yearly earnings forecasts released in 2002 were affected by the new regulation because Regulation FD in Korea was enacted in November. 2002. Therefore, we exclude analyst forecasts issued in 2002.

[73] Forty Korean domestic securities companies and six economic research institutes.

[Insert *Table 5.2* about here]

The descriptive statistics of the sample are shown in *Table 5.3*. *Table 5.3* presents the distribution of main variables used in this study. The mean value of herding propensity by Clement et al., (2005) and *BCK* (2006) is 0.621 (pre-FD; 0.612, post-FD; 0.623) and 0.518 (pre-FD: 0.522, post-FD: 0.517) respectively. On the other hand, *Table 5.3* shows a decrease in stock price volatility (*VOLA*) and number of broker's analysts (*SECU*) in the post-FD period relative to the pre-FD period. At the same time, the table shows an increase in firm size (*SIZE*) in the post-FD period. This may seem a significant change in Korean market value in the post-FD period. On the other hand, there is no significant change in analysts following (*ANALY*).

[Insert *Table 5.3* about here]

5.4. Research Design

5.4.1. Measurement of Analysts' Herding Behaviour

Numerous studies have documented that analysts have a tendency to herd toward their colleagues' consensus forecast, making recommendations that under-weight their own private information. Measures of analysts herding propensity are classified into two types: analysts' herding ratio in certain firms and analysts' herding ratio among analysts. The former measures overall analysts' herding propensity based on analysts' forecast dispersion (De Bondt et al., 1999, Kim et al., 2003). The latter method provides an

overall analysts' herding ratio (Olsen, 1996; Cote et al., 1997; Clement et al., 2005; *BCK*, 2006). We adopt the second method and explore Korean analysts' herding behaviour in earnings forecasting.

5.4.1.1. S-Statistic Test

In this paper, we employ the methodology of *BCK* (2006) to measure for herding propensity in Korean analysts' forecasts. This methodology is robust to signal correlation, arrival of new information unforecasted shocks to earnings and systematic optimism or pessimism. By perceiving all this information, analysts form posterior earnings when they issue forecasts if an analyst's forecast is unbiased. His forecast equals the median posterior earnings, which indicates that conditional probability is 0.5.

$$\Pr\left(F_\tau > A_\tau \text{ and } F_\tau > C_\tau : F_\tau \neq A_\tau\right) = 0.5 \qquad (5.1)$$

$$\Pr\left(F_\tau < A_\tau \text{ and } F_\tau < C_\tau : F_\tau \neq A_\tau\right) = 0.5 \qquad (5.2)$$

where;

F_τ: analyst's forecast; A_τ: actual earnings; C_τ: consensus forecast

If an analyst chooses to bias their forecast away from his best estimate of earnings in the direction of the consensus, the forecast should be considered as a herding forecast.

$$\Pr\left(F_\tau > A_\tau \text{ and } F_\tau < C_\tau : F_\tau \neq A_\tau\right) < 0.5 \qquad (5.3)$$

$$\Pr\left(F_\tau < A_\tau \text{ and } F_\tau > C_\tau : F_\tau \neq A_\tau\right) < 0.5 \qquad (5.4)$$

By contrast, if an analyst chooses to bias their forecast away from the consensus, the forecast should be considered as an anti-herding forecast.

$$\Pr (F_\tau > A_\tau \text{ and } F_\tau > C_\tau : F_\tau \neq A_\tau) > 0.5 \qquad (5.5)$$

$$\Pr (F_\tau < A_\tau \text{ and } F_\tau < C_\tau : F_\tau \neq A_\tau) > 0.5 \qquad (5.6)$$

BCK (2006) use the test *Statistic-S* to estimate for herding behaviour in analysts' forecasts. First condition events, τ_τ^+ means the analyst's forecast exceeds the consensus forecast ($F_\tau > C_\tau$) and τ_τ^- implies the forecast falls short of the consensus forecast ($F_\tau < C_\tau$) when analysts release the recommendations.

$$\begin{aligned} &\tau_\tau^+ = 1 \text{ if } F_\tau > C_\tau \text{ occurred, } \tau_\tau^+ = 0 \text{ otherwise and} \\ &\tau_\tau^- = 1 \text{ if } F_\tau < C_\tau \text{ occurred, } \tau_\tau^- = 0 \text{ otherwise} \end{aligned} \qquad (5.7)$$

BCK (2006) define the dummy variables, δ_τ^+ and δ_τ^-, which are the conditioning indicator functions. δ_τ^+ and δ_τ^- is above or below realised earnings (A_τ) given that it is also above or below the extant consensus (C_τ).

$$\begin{aligned} &\delta_\tau^+ = 1 \text{ if } F_\tau > A_\tau \text{ and } F_\tau > C_\tau \text{ occurred, } \delta_\tau^+ = 0 \text{ otherwise and} \\ &\delta_\tau^- = 1 \text{ if } F_\tau < A_\tau \text{ and } F_\tau < C_\tau \text{ occurred, } \delta_\tau^+ = 0 \text{ otherwise} \end{aligned} \qquad (5.8)$$

We can define the two conditional probabilities in *Equation* (*5.7*) and (*5.8*) as:

$$\frac{\sum_\tau \delta_\tau^+}{\sum_\tau \tau_\tau^+} \text{ and } \frac{\sum_\tau \delta_\tau^-}{\sum_\tau \tau_\tau^-}, \qquad (5.9)$$

Statistic-S, which is the degree of herding among analysts, is the average of the two conditional probability estimates: the conditional overshooting and the conditional undershooting probability. The average of these two conditional probabilities is the *Statistic S*. Therefore, *Statistic S* can be interpreted as the degree of herding among analysts.

$$S\,(z-,\, z+) = 0.5\,\left[\frac{\sum_{\tau}\delta_{\tau}^{+}}{\sum_{\tau}\tau_{\tau}^{+}} + \frac{\sum_{\tau}\delta_{\tau}^{-}}{\sum_{\tau}\tau_{\tau}^{-}}\right] \qquad (5.10)$$

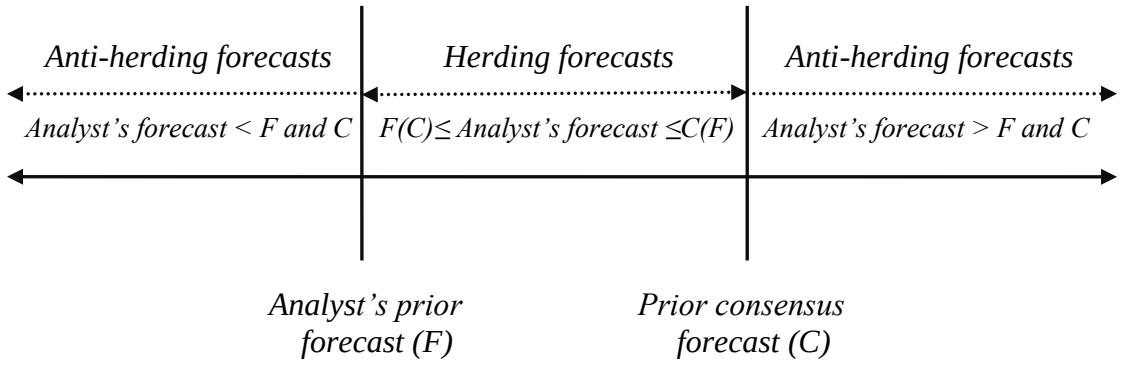
$\frac{\sum_{\tau}\delta_{\tau}^{+}}{\sum_{\tau}\tau_{\tau}^{+}}$ is estimate of the conditional probability of overshooting actual earnings given that the forecast exceeds the consensus; while $\frac{\sum_{\tau}\delta_{\tau}^{-}}{\sum_{\tau}\tau_{\tau}^{-}}$ is estimate of the conditional probability of falling short of true earnings given that the forecast falls short of the consensus. If analysts herd, the probability that their forecasts overshoot earnings in the direction away from the consensus is less than one-half (i.e., $S < 0.5$). Conversely, if analysts overstate their private information, S is more than one-half (i.e., $S > 0.5$).

5.4.1.2. Forecast Boldness Measure

In order to measure herding behaviour in Korean analysts' forecasts, we use the *Forecast Boldness Measure* (*P*) developed by Clement et al., (2005). Using a simple herding model, Clement et al., (2005) examine the relation of herding behaviour and analysts' characteristics. They show evidence that analysts who (1) are historically accurate (2) are employed by large brokerage (3) with more general experience (4)

frequently forecast, tend to issue bold (or anti-herding) forecasts.[74] As shown in *Figure 5.1*, they classify forecasts as herding forecasts and bold (or anti-herding) forecasts.

Figure 5-1 Forecast Boldness Measure (Clement et al., 2005)



Anti-herding forecasts are above both the analysts' own prior forecast and the consensus forecast immediately prior to the analyst's forecast, or else below both. All other forecasts between the analysts' own prior forecast and the consensus forecast are classified as herding forecasts. Univariate analysis assumes that other variables that influence the herding behaviour remain constant over the test periods. In order to control for other extraneous variables, the coefficients tested in the regression model will provide evidence regarding the effect of Regulation FD on herding behaviour.

We expect that binary β_1s, coefficients of *FD* in *Equation* (*5.11*) are to be significantly positive or insignificantly negative, which suggests that herding behaviour has not significantly increased in the post-FD period. For the study, we use herding propensity (*P* and *S*) by Clement et al., (2005) and *BCK* (2006). Following Mensah et al., (2008),

[74] Zitzewitz (2001) defines the bold forecast as a chance to release earnings forecasts that is further from the consensus than analysts' private information suggests.

in order to test the effect of Regulation FD on herding behavior in analysts' forecasts, using *P* and *S*, we estimate the following regression models.

$$HERD\ (P,S) = \alpha + \beta_1 FD + \beta_2\ ANALY + \beta_3 HORI + \beta_4 SIZE + \beta_5 SECU + \varepsilon \quad (5.11)$$

All variables are defined in *Table 5.1*. Previous research suggests that analyst characteristics could be related to herding behaviour (Graham, 1999; De Bondt et al., 1999; Chrishnan et al., 2005; Clement et al., 2005; Naujoks et al., 2007; Mensah et al., 2008). Four variables that earlier studies have been found to be important in explaing the herding behaviour. For instance, De Bondt et al., (1999) provide evidence that analyst disagreement tend to go up with the number of analysts (*ANALY*) and with the number of months that remain until earnings announcement (*HORI*). Naujoks et al., (2007) report a strong positive relation between firm size (*SIZE*) and anti-herding forecast, indicating that anti-herding behaviour seems to be less prevalent among forecasts for smaller firms. Clement et al., (2005) report that broker size (*SECU*) has the same sign with the anti-herding behaviour. This observation could be explained by the notion that analysts in large brokerage house tend to deviate from the other analysts' forecasts.

We control the variables influencing herding behavior described in the previous research: analysts following (*ANALY*), forecast horizon (*HORI*), firm size (*SIZE*) and broker size (*SECU*). We expect that an increase in the number of analysts following the firms, older forecasts, bigger firm size and broker size are associated with anti-herding behavior. One of the most interesting coefficients in the regression models is the β_1, *FD*

variable. Significant positive or insignificant negative β_1 is consistent with our hypothesis that herding behavior has not changed after the introduction of Regulation FD.

5.4.2. Markets' Reaction to Herding Behaviour

We begin the analysis by comparing changes in market response to herding forecasts and anti-herding forecasts. We then examine the market response to herding forecasts and anti-herding forecasts around release of recommendations using both univariate tests and regression analysis. For the research, as stated in the previous chapter, we compute cumulative abnormal returns ($CAR_{j,t}$) by subtracting the cumulative market portfolio returns as expressed in the following equation. The initial market reaction is measured for trading day [day+0, day+1] when day 0 is the recommendations release date, and longer term ([day+0, day+5] and [day+0, day+21]) stock returns are measured. In order to test the markets' reaction to analysts' herding behaviour for buy-recommendations and sell-recommendations, we compare the cumulative stock returns ($CAR_{j,t}$) to herding forecasts and anti-herding forecasts. We examine excess returns using a market adjusted returns model[75] which takes into account market wide movement.

$$CAR_{j,t} = R_{j,t} - R_{m,t} \qquad (5.12)$$

[75] Brown et al., (1980) suggest that market adjusted returns model performs no worse than the market and risk adjusted returns model for short event widows and Jegadeesh et al., (2008) use this model.

All the variables are defined in *Table 5.1*. For our test of H_2, we classify our observations as buy-side recommendations (2,310 observations) and sell-side recommendations (100,331 observations). We examine whether the market responds differently to analysts' herding or anti-herding behaviour in accordance with level of recommendations. We expect that stock returns would be higher for anti-herding buy-side recommendations than herding buy-side recommendations and be inversely lower for anti-herding sell-side recommendations than herding sell-side recommendations. We run our regressions separately for each sub-sample. We use the following regression specification to investigate whether the Korean stock markets recognize the analysts' herding behaviour.

$$CAR = \alpha + \beta_1 HERD\ (P,S) + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \varepsilon \qquad (5.13)$$

All variables are defined in *Table 5.1*. The independent variables, analysts following (*ANALY*), firm size (*SIZE*) broker size (*SECU*), and standard deviation of daily stock price (*VOLA*) serve as controls for market price reaction. Their inclusion is motivated by previous research (Jegadeesh et al., 2008; Barber et al., 2008; Barron et al., 2008; Fabiano, 2008). The coefficient binary β_1s, on *P and S* variables, represent the change in market price response for anti-herding forecasts compared to those for herding forecasts, which we predict to be more positive for buy-side recommendations and negative for sell-side recommendations.

In order to clarify the Korean stock market's reaction to herding forecasts, following Jegadeesh et al., (2008), we use the following two regression models. Jegadeesh et al.,

(2004) define *DEVI* (β_2, *NEWREC* - *CONLEVEL*) as analyst's new recommendation level less consensus recommendation level. *NEWREC* is the recommendation level after the forecast revision and *CONLEVEL* indicates the consensus recommendation the day before analysts forecast excluding the analysts' forecasting. Jegadeesh et al., (2008) define a forecast as an anti-herding forecast if the absolute value of deviation from the consensus is larger for the new recommendation than for the old recommendation, and a herding forecast vice versa.

We use a dummy variable taking the sign of expected abnormal returns conditional on buy-side recommendations or sell-side recommendations.[76] We expect that market reaction is stronger for recommendations that move away from the consensus than for those that move toward it. Coefficient β_2, therefore, is expected to be significantly positive. In addition, we re-estimate the models reported in *Equation 5.13* with six future cumulative abnormal stock returns (measured over days 1 to 180 after the analyst's recommendation release) as the dependent variable. We use the following regression models as the robust test on the Korean markets' reaction to herding forecasts. All variables are defined in Table *5.1*.

$$CAR = \alpha + \beta_1 BUY + \beta_2 DEVI + \beta_3 ANALY + \beta_4 SIZE + \beta_5 SECU + \beta_6 VOLA + \varepsilon \quad (5.14)$$

$$CAR = \alpha + \beta_1 BUY + \beta_2 HERD\ (P, S) + \beta_3 ANALY + \beta_4 SIZE + \beta_5 SECU + \beta_6 VOLA + \varepsilon \quad (5.15)$$

[76] On the other hand, Jegadeesh et al., (2004) adopt upgrade and downgrade recommendations.

5.5. Empirical Results

5.5.1. Analysts' Herding Behaviour in Earnings Forecasting

Our first set of tests examines whether Korean analysts herd toward their colleagues' forecasts. *Table 5.4* and *Table 5.5* summarize the results regarding Korean analysts' herding propensity**.** The results show evidence of anti-herding behaviour among Korean analysts. The first herding propensity (*P*) by Clement et al., (2005) in *Tables 5.4* shows mean value of $P = 0.612$. The second herding propensity (*S*) by *BCK* (2006) in *Table 5.5* presents mean value $S = 0.518$. *Table 5.4* and *Table 5.5* indicate that 38.8% (48.2%, *S*) of the Korean analysts' release earnings forecasts tend to herd. The results do not support our hypothesis H_1.

[Insert *Table 5.4* and *Table 5.5* about here]

The results are not also consistent with Ahn et al., (2006), who suggest that over 70% of Korean analysts tend to herd their colleagues' opinion. They employ Cote et al., (1997) and Clement et al., (2005), when they define a forecast as anti-herding forecast. However, their study is different from our study in several aspects. Ahn et al., (2006) only cover the last revision forecasts closing to the end of the fiscal year after the earnings forecasts while we adopt the whole analysts' annual earnings forecasts. Therefore, we can cover the analysts' forecasts without revision or revision forecasts issued several times after first earnings forecasts. Second, our study employs a more comprehensive sample size and a longer sample period.

5.5.2. Comparison of Herding Propensity

Table 5.4 and *Table 5.5* show the overall herding propensity. The reports in both Tables show evidence of mixed findings. For instance, two herding propensities for the pre-FD period in *Table 5.4* and *Table 5.5* have mean value of 0.612 (*P*), 0.522 (*S*) whereas the mean value of herding propensities for the post-FD period are 0.623 (*P*), 0.517 (*S*), respectively.

A comparison of *P* in *Table 5.4* shows a significant increase from the pre-FD (0.612) to the post-FD period (0.623). In order to test the difference of herding propensity between the two periods, we conduct a t-test and a Wilcoxon test (z-test). As shown in *Table 5.4*, the results indicate that herding behaviour has decreased after the adoption of Regulation FD.

On the other hand, *Table 5.5* shows that herding propensity (*S*) has insignificantly decreased in the post-FD period. The mean of the pre-FD period is not significantly higher than that of the post-FD period by 0.005 with a Satterthwaite t-value of 1.45. Both univariate results suggest that there is insignificant difference in herding propensity between the two periods.

In addition, our regression results also contradict Arya et al., (2005), who suggest that Regulation FD may lead to herding behaviour due to a lack of available information. *Table 5.10* reports the regression results of changes in herding behavior after the adoption of Regulation FD. The coefficient of β_1, on *FD* variable is negative and statistically insignificant. We interpret this result as evidence that herding behavior has not significantly changed after the adoption of Regulation FD. Therefore, we contradict

the notion that Regulation FD may suppress the firm's disclosure and private disclosure stave off herding behaviour.[77]

Table 5.6 and *Table 5.7* detail the distribution of forecasted year, forecast horizon, forecast order and broker size. The value of *P* varies from a low of 0.60 in 2006 to a high of 0.65 in 2007 while *S-Statistics* shows a generally balanced herding propensity. Our findings suggest a positive relation between the forecast horizon and anti-herding propensity. *Table 5.6* presents that analysts who issue more than 300 days prior to the earnings announcement move from their colleagues' forecasts more than 70% of the time while those who report within about 100 days prior to the announcement date anti-herd more than 55% of the time. *Table 5.6* and *Table 5.7* present that anti-herding behaviour is positively associated with release order. *P* and *S* of forecasts within 25% in forecast order show higher than average herding propensity.

In contrast, *P* and *S* of forecasts outside 75% in forecasts order are lower than the average. The finding is not consistent with *BCK* (2006), who suggest that herding behavior varies little with release order. *Table 5.6* also shows that *P* varies with broker size at the time of forecast in the pre-FD period, but not last in the post-FD period. In addition, we find no evidence of relation between *S* and broker size.

5.5.3. Korean Stock Markets' Reaction to Herding Behaviour

Our second hypothesis provides a potential explanation for the market response to the analysts' herding behaviour. H_2 predicts that market reaction will be stronger for anti-

[77] See chapter 3.

herding forecasts. *Table 5.8* documents the market reaction to analysts' forecasts classified by the level of herding forecasts. The results present the cumulative stock returns (*CAR*) for the three event windows ([*day+0, day+1*], [*day+0, day+5*], and [*day+0, day+21*]).

[Insert *Table 5.8* about here]

Similar to prior studies (Jegadeesh et al., 2008; Gleason et al., 2003), *Table 5.8, Panel A* and *Panel B* show that market reaction to buy-side recommendations is larger when analysts deviate from the consensus relative to herding forecasts. The result supports our hypothesis H_2. On the other hand, market reactions to sell-side recommendations are not significantly different between the two forecast groups. The results indicate that the Korean market recognizes buy-side herding behaviour. *Table 5.11* and *Table 5.12* report the results of a pooled regression of stock returns on these explanatory variables.

The pooled time-series cross-section regressions approach often ignores residual cross-correlation (i.e. assumes no correlation across firms). For example, the average slopes from equivalent year-by-year cross section regressions are essentially equivalent to the slopes from pooled time series cross section regressions that include annual dummies that allow the average values of the variables to change through time. Fama et al., (1973) show that standard errors of average regression slopes (from year by year cross section regressions) tend to be much larger than standard errors from pooled time series cross section regressions.

The dependent variable is cumulative stock returns over the 1 days [*day+0, day+1*], 5 days [*day+0, day+5*], and 21 days [*day+0, day+21*]. The results reported in *Table 5.11* and *Table 5.12* confirm the results of univariate analysis and our hypothesis H_2. However, we find heteroscedasticity in six regressions ([*day+0, day+1*], [*day+0, day+5*], [*day+0, day+21*], for sell-side recommendations and buy-side recommendations). We use the White (1980) correction for heteroskedasticity to explain this problem. *Table 5.11* and *Table 5.12* report that the market cannot generally recognize the differential impact of herding forecasts (*P*) for sell-side recommendations. We ascribe the results to the scarcity of sell-side recommendations.

[Insert *Table 5.11* and *Table 5.12* about here]

Sell-side recommendations have a valuable meaning relative to buy-side recommendations as analysts do not have a tendency to release sell-side recommendations. If analysts release unfavourable recommendation to firms, unfavourable analysts are pressured to drop coverage. Thus, in order to keep in good relations with management, analysts tend to positively bias their view of the firms (Kim, 2009). Actually, our data shows that sell-side recommendations decrease as the years pass.[78] Therefore, it is not easy for markets to make a sufficient distinction between herding sell recommendation and anti-herding sell recommendations.

[78] The number of sell-side recommendations in Korean stock markets decreases over time: 326 observations in 2000, 1,291 observations in 2001, 398 observations in 2002, 175 observations in 2003, 143 observations in 2004, 207 observations in 2005, 134 observations in 2006 and 34 observations in 2007.

If analysts release sell-side recommendations, the recommendations can cause a strong market reaction because the rarity of sell-side recommendations encourages investors to sell the stocks. Even if an analyst herds the previous sell-recommendation, investors are likely to consider the recommendation as a confirmation of colleagues' sell-side recommendations. However, as expected, the market fully appreciates the difference of buy-side herding recommendations and buy-side anti-herding recommendations. Our results suggest that other variables of interest (unexpected earnings, book to market and firm size) affect the market reaction.

In addition, following Jegadeesh et al., (2008), we examine the robustness of our results. *Table 5.9* represents cumulative abnormal returns over various six windows of horizon following analysts' forecasts. The *CAR*s for six windows ([*day+0, day+1*], [*day+0, day+3*], [*day+0, day+10*], [*day+0, day+21*], [*day+0, day+42*], and [*day, day+126*]) on the release date for anti-herding forecasts are significantly higher than those for herding forecasts at the 1% of significant level. Particularly, the results suggest that the Korean market price continues to reflect anti-herding information up to a half year (*d+126*, 180 business-days) after recommendations release.

The results of univariate analyses are consistent with our expectations and Jegadeesh et al., (2008). *Table 5.13* presents the estimates of *Equation 5.14* using the Fama-MacBeth (1973) approach. We estimate the regression using six different windows. The positive coefficients (β_2s) indicate that stock market reaction is stronger for moving from the consensus forecast. *Table 5.13* reports that the slope coefficients (β_2s) increase generally

over time, which reflect the delay in market reaction to analysts' recommendations. The results are also similar to the previous results.

[Insert *Table 5.13* and *Table 5.14* about here]

In addition, controlling for several variables influencing market reaction to analysts' forecasts, we plot dummy variables, *P, S* in the regression models instead of *DEVI*. *Table 5.14* also reports that all coefficients (β_2s) on the herding propensity (*S*) are significantly positive, indicating that the Korean stock market recognises the analysts' herding forecasts.[79] Therefore, market price sufficiently incorporates the information in the herding forecasts on the release date.

5.6. Summary and Conclusions

Regulation FD prohibits the practice of "selective disclosure," where a firm provides crucial information to favoured financial professionals. This regulation restricts private communications between a firm and a market participant. Advocated by the SEC chairman, Arthur Levitt, the new rule was intended to level the playing field for all investors.[80] In this chapter, we examine changes in herding behaviour after the adoption of Regulation FD. We analyze a large sample of 161,343 observations of individual analysts during a seven year period surrounding the adoption of Regulation FD in 2002. We calculate herding propensity (*P, S*) and the effect of Regulation FD on herding behaviour.

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[79] Our empirical results present that the market reaction is also stronger for anti-herding forecasts based on herding propensity (*P*) developed by Clement et al., (2005). For brevity, we omit drawing tables on the similar results.

[80] See Chapter 3 and http://www.sec.gov/news/speech/speecharchive/1998/spch202.txt.

We have three main sets of findings. First, we find that Korean analysts do not herd. About 61% (by Clement, 2005) or 51% (by *BCK*, 2006) of Korean analysts tend to deviate their forecasts away from their colleagues' forecast. The results are not consistent with Ahn et al., (2006), who suggest that only 30% of Korean analysts deviate their forecast away from their consensus forecast.

Second, we find no evidence that herding behaviour has significantly increased in the post-FD period. After controlling for other relevant variables, we find that Regulation FD has not led to analysts' herding behaviour. The results indicate that Regulation FD has not led to a deterioration of information quality and decrease in information released from firms. The findings are not consistent with Arya et al., (2005).

Third, we find that the Korean stock market recognizes buy-side herding recommendations. Market reaction to buy-side recommendations for anti-herding behaviour is stronger for than that of herding behaviour. On the other hand, there is no significant difference in market reaction to sell-side recommendations. In the results of robust testing, we also find that six *CAR*s ([*day+0, day+1*], [*day+0, day+3*], [*day+0, day+10*], [*day+0, day+21*], [*day+0, day+42*], [*day+0, day+126*]) for anti-herding forecasts are significantly higher than those for herding forecasts. This finding indicates that the Korean market reflects herding information for up to six months after analysts forecast.

Overall, our results counter the criticism of Regulation FD. We find no evidence that Regulation FD makes firms withhold voluntary disclosure of material information and results in chilling the flow of information to the market participants. To the contrary, we conclude that Regulation FD contributes to the increase in the quality and quantity of available public information for analysts' forecasts.

ANNEX 4

Table 5.1 Definition of Variables

This table outlines the definitions of variables used in our hypothesis testing

P	=	herding propensity (Clement et al., 2005)
S	=	herding propensity (*S-statistics, BCK*, 2006)
FD	=	dummy variable that equals 1 for firms take in the post-FD (year 2003-2007) period and 0 otherwise;
ANALY	=	the number of analysts providing earnings forecasts;
HORI	=	the number of days between the end of the following fiscal year and the date of the analysts' forecast;
SIZE	=	the natural log of the total asset at the end of the last year of forecast;
SECU	=	the number of broker's analysts;
VOLA	=	standard deviation of daily stock returns for year prior to recommendations release;
CAR	=	cumulative abnormal returns over three (or six) windows surrounding release day of analysts' forecasts
$R_{j,t}$	=	stock returns on stock j for day t;
$R_{m,t}$	=	stock returns on the market portfolio (KOSPI composite index or KOSDAQ composite index) for day t.
BUY	=	dummy variable that equals 1 for buy-side recommendations and 0 for sell-side recommendations;
DEVI	=	new recommendation level less consensus recommendation level.

Table 5.2 Sample Selection

Our sample consists of 161,343 analyst-year observations from 2000 to 2007 (excluding 2002).

2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*Total*
5,014	*19,955*	-	*21,772*	*21,424*	*41,270*	*33,543*	*18,365*	*161,343*

	Number of Observations
Initial observations (observations with forecasts on manufacturing firms without engaging in merging and acquisitions)	214,924
- Observations without forecasts	-2,401
- Observations with only 1 analyst	-3,234
- Observations forecasted in 2002	-18,948
- Observations with firms not year-end dates of December, etc	-18,700
- top and bottom 3 percents of of observations	-10,298
Final sample	161,343

Table 5.3 Descriptive Statistics for Variables

This table presents the descriptive statistics for 161,343 analyst-year observations from 2000 to 2007 (excluding year 2002). Pre-FD period is from 2000 to 2001 and post-FD period is from 2003 to 2007. Variables are herding propensity (*P, S*), analyst following (*ANALY*), forecast horizon (*HORI*), firm size (*SIZE*), broker size (*SECU*) and standard deviation of daily stock price (*VOLA*).

Variables	*Pre-FD period*				*Post-FD period*			
	Mean	*25th Percentile*	*Median*	*75th Percentile*	*Mean*	*25th Percentile*	*Median*	*75th Percentile*
ANTIHERD(P)	*0.612*	*0*	*1*	*1*	*0.623*	*0*	*1*	*1*
ANTIHERD(S)	*0.522*	*0*	*1*	*1*	*0.517*	*0*	*1*	*1*
ANALY	*23*	*15*	*23*	*33*	*24*	*14*	*24*	*33*
HORI	*206*	*107*	*198*	*299*	*214*	*115*	*216*	*313*
SIZE	*3,058*	*1,031*	*3,033*	*13,256*	*7,511*	*1,651*	*7,477*	*35,554*
SECU	*37*	*22*	*40*	*49*	*32*	*22*	*29*	*42*
VOLA	*0.71*	*0.60*	*0.70*	*0.80*	*0.47*	*0.37*	*0.45*	*0.55*

Table 5.4 Summary Statistics of Herding Propensity (P)

This table presents the results of t-tests and z-tests for the difference in mean herding propensity in analysts' forecast in the pre-FD versus post-FD period. The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. Z-test (Wilcoxon signed test) is used to measure whether the medians are statistically different from each other while t-test is used to measure whether the means between pre-FD period and post-FD period are statistically different from each other. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

Pre-FD	*Pre-FD (2000-2001)*	*Difference (Pre-FD=Post-FD)*		*Post-FD (2003-2007)*	*All*
		t-test	*z-test*		
Observations (A)	*24,969*	-	-	*136,374*	*161,343*
Anti-herding Forecasts (B)	*15,293*	-	-	*84,917*	*100,210*
Herding forecasts	*9,676*	-	-	*51,457*	*61,133*
Herding propensity (P) (B/A)	*0.612*	*-4.10****	*-4.10****	*0.623*	*0.621*

Table 5.5 Summary Statistics of Herding Propensity (S)

This table presents the results of *Satterthwaite test* for the difference in mean herding propensity (*S*) in analysts' forecasts in the pre-FD versus post-FD period. The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007.

Pre-FD (n= 24,969)			*P-value* ($S_{Pre\text{-}FD}$= $S_{Post\text{-}FD}$)	*Post-FD (n=136,374)*			*All (n=161,343)*
Overshooting probability	*Undershooting Probability*	*S*		*Overshooting probability*	*Undershooting Probability*	*S*	
0.719	*0.325*	*0.522*	*1.45*	*0.682*	*0.352*	*0.517*	*0.518*

< Row-wise mean comparison >

Satterthwaite t-value : 1.45

Probability : 0.146

Table 5.6 Distribution of Herding Propensity (P) in Analysts' Forecasts

Herding propensity (*P*) developed by Clement et al., (2005), is computed for different sub-samples: order is the order in the sequence of forecasts; broker size is the number of analysts hired by the broker.

< Panel A> Pre-FD period (n= 24,969)		
By Year		*Herding propensity (P)*
(n=5,014)	*2000*	*0.63*
(n=19,955)	*2001*	*0.61*
By Days to Earnings Announcement		
25%	*To-announce<=107*	*0.54*
50%	*107< To-announce<=198*	*0.59*
75%	*198< To-announce<=299*	*0.63*
100%	*299< To-announce*	*0.72*
By Forecast Order		
25%	*Order <=14*	*0.72*
50%	*15< Order<=39*	*0.61*
75%	*39<Order<=90*	*0.59*
100%	*90<Order*	*0.56*
By Broker Size		
25%	*Broker <=22*	*0.68*
50%	*22< Broker<=40*	*0.66*
75%	*40< Broker<=49*	*0.65*
100%	*49< Broker*	*0.49*

< Panel B> Post-FD period (n=136,374)		
By Year		*Herding propensity*
(n=21,773)	*2003*	*0.64*
(n=21,424)	*2004*	*0.63*
(n=41,270)	*2005*	*0.61*
(n=33,543)	*2006*	*0.60*
(n=18,365)	*2007*	*0.65*
By Days to Earnings Announcement		*Herding propensity*
25%	*To-announce<=115*	*0.55*
50%	*115< To-announce<=216*	*0.59*
75%	*216< To-announce<=313*	*0.64*
100%	*313< To-announce*	*0.70*
By Forecast Order		
25%	*Order <=30*	*0.65*
50%	*30< Order<=81*	*0.63*
75%	*81<Order<=169*	*0.61*
100%	*169<Order*	*0.59*
By Broker Size		
25%	*Broker size<=22*	*0.62*
50%	*22< Broker size <=29*	*0.61*
75%	*29< Broker size <=42*	*0.62*
100%	*42< Broker size*	*0.63*

Table 5.7 Distribution of Herding Propensity (S) in Analysts' Forecasts

Herding propensity (*S*) developed by *BCK* (2006) is computed for different sub-samples: order is the order in the sequence of forecasts; broker size is the number of analysts hired by the broker

< Panel A> Pre-FD period (n= 24,969)				
By Year		*Overshooting probability*	*Undershooting Probability*	*S-Statistics*
(n=5,014)	*2000*	*0.69*	*0.35*	*0.52*
(n=19,955)	*2001*	*0.73*	*0.32*	*0.52*
By Days to Earnings Announcement				
25%	*To-announce<=107*	*0.67*	*0.37*	*0.52*
50%	*107< To-announce<=198*	*0.69*	*0.34*	*0.52*
75%	*198< To-announce<=299*	*0.73*	*0.30*	*0.52*
100%	*299< To-announce*	*0.78*	*0.29*	*0.55*
By Forecast Order				
25%	*Order <=14*	*0.78*	*0.32*	*0.55*
50%	*15< Order<=39*	*0.74*	*0.32*	*0.53*
75%	*39<Order<=90*	*0.70*	*0.29*	*0.50*
100%	*90<Order*	*0.65*	*0.37*	*0.51*
By Broker Size				
25%	*Broker <=22*	*0.71*	*0.32*	*0.52*
50%	*22< Broker<=40*	*0.71*	*0.35*	*0.53*
75%	*40< Broker<=49*	*0.76*	*0.31*	*0.54*
100%	*49< Broker*	*0.69*	*0.32*	*0.51*

< Panel B> Post-FD period (n=136,374)				
By Year		*Overshooting probability*	*Undershooting Probability*	*S-Statistics*
(n=21,773)	*2003*	*0.67*	*0.37*	*0.52*
(n=21,424)	*2004*	*0.64*	*0.40*	*0.52*
(n=41,270)	*2005*	*0.67*	*0.36*	*0.52*
(n=33,543)	*2006*	*0.71*	*0.31*	*0.51*
(n=18,365)	*2007*	*0.71*	*0.32*	*0.52*
By Days to Earnings Announcement				
25%	*To-announce<=115*	*0.63*	*0.36*	*0.50*
50%	*115< To-announce<=216*	*0.66*	*0.34*	*0.40*
75%	*216< To-announce<=313*	*0.69*	*0.34*	*0.52*
100%	*313< To-announce*	*0.75*	*0.36*	*0.56*
By Forecast Order				
25%	*Order <=30*	*0.75*	*0.34*	*0.55*
50%	*30< Order<=81*	*0.71*	*0.32*	*0.52*
75%	*81<Order<=169*	*0.69*	*0.33*	*0.51*
100%	*169<Order*	*0.58*	*0.41*	*0.50*
By Broker Size				
25%	*Broker size<=22*	*0.66*	*0.37*	*0.52*
50%	*22< Broker size <=29*	*0.68*	*0.34*	*0.51*
75%	*29< Broker size <=42*	*0.68*	*0.35*	*0.52*
100%	*42< Broker size*	*0.71*	*0.34*	*0.53*

Table 5.8 Comparison of CARs for Herding Forecasts (P and S)

This table presents the difference in stock price effect to herding and anti-herding behaviour (based on the herding propensity by Clement et al., 2005 and *BCK*, 2006) around analysts' recommendations release in the pre-FD (2000-2001) versus post-FD period (2003-2007). The event date (D) is defined as the analysts' recommendations release date. *CAR* is the cumulative abnormal returns for three windows ([*day+0, day+1*], [*day+0, day+5*], [*day+0, day+21*]). Z-test (Wilcoxon signed test) is used to measure whether the medians are statistically different from each other while t-test is used to measure whether the means between herding forecasts and anti-herding forecasts are statistically different from each other. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Herding Propensity (P)* >

Herding			***Difference***					***Anti-Herding***		
Obs.	*Mean*	*Median*	*t-test*		*Variables*	*z-test*		*Obs.*	*Mean*	*Median*
Sell-side recommendations										
1,029	*-0.0056*	*-0.0072*		*-0.32*	*CAR (D+0, D+1)*		*-0.48*	*1,281*	*-0.0048*	*-0.0063*
1,029	*-0.0090*	*-0.0138*		*0.12*	*CAR (D+0, D+5)*		*0.48*	*1,281*	*-0.0096*	*-0.0147*
1,029	*-0.0366*	*-0.0578*		*-0.43*	*CAR (D+0, D+21)*		*-0.71*	*1,281*	*-0.0336*	*-0.0513*
Buy-side recommendations										
38,897	*0.0030*	*0.0003*	***	*-3.32*	*CAR (D+0, D+1)*	***	*-3.71*	*61,434*	*0.0039*	*0.0009*
38,897	*0.0035*	*0.0004*	***	*-2.61*	*CAR (D+0, D+5)*	**	*-2.35*	*61,434*	*0.0047*	*0.0015*
38,897	*0.0032*	*-0.0046*		*0.74*	*CAR (D+0, D+21)*		*-0.93*	*61,434*	*0.0026*	*-0.0032*

< *Panel B: Herding Propensity (S)* >

Herding			***Difference***					***Anti-Herding***		
Obs.	*Mean*	*Median*	*t-test*		*Variables*	*z-test*		*Obs.*	*Mean*	*Median*
Sell-side recommendations										
1,519	*-0.0062*	*-0.0074*		*-1.13*	*CAR (D+0, D+1)*		*-1.19*	*791*	*-0.0032*	*-0.0062*
1,519	*-0.0119*	*-0.0156*	*	*-1.81*	*CAR (D+0, D+5)*		*-1.47*	*781*	*-0.0041*	*-0.0111*
1,519	*-0.0421*	*-0.0673*	***	*-3.02*	*CAR (D+0, D+21)*	***	*-5.00*	*791*	*-0.0204*	*-0.0338*
Buy-side recommendations										
38,525	*0.0031*	*0.0001*	***	*-3.93*	*CAR (D+0, D+1)*	***	*-4.75*	*61,806*	*0.0041*	*0.0013*
38,525	*0.0036*	*0.0004*	***	*-3.75*	*CAR (D+0, D+5)*	***	*-4.01*	*61,806*	*0.0052*	*0.0017*
38,525	*0.0013*	*-0.0056*	***	*-4.35*	*CAR (D+0, D+21)*	***	*-5.11*	*61,806*	*0.0046*	*-0.0022*

Table 5.9 Comparison of CARs for Herding Forecasts (DEVI)

This table presents the difference in stock price effect to herding and anti-herding behaviour (based on Jegadeesh et al., 2008) around analysts' recommendations release in the pre-FD (2000-2001) versus post-FD period (2003-2007). The event date (D) is defined as the analysts' recommendations release date. *CAR* is the cumulative abnormal returns. Z-test (Wilcoxon signed test) is used to measure whether the medians are statistically different from each other while t-test is used to measure whether the means between herding forecasts and anti-herding forecasts are statistically different from each other. P-values for both tests are reported. For brebity, we omit the medians on the similar results. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

Herding (*N=69,707*)	***Difference***					*Anti-Herding* (*N= 91,636*)
	t-test		*Variables*	*z-test*		
0.0002	***	*-15.23*	*CAR (D+0, D+1)*	***	*-15.93*	*0.0035*
-0.0006	***	*-14.51*	*CAR (D+0, D+5)*	***	*-15.44*	*0.0037*
-0.0022	***	*-8.67*	*CAR (D+0, D+10)*	***	*-9.34*	*0.0016*
-0.0040	***	*-10.59*	*CAR (D+0, D+21)*	***	*-12.30*	*0.0029*
-0.0074	***	*-10.63*	*CAR (D+0, D+42)*	***	*-14.27*	*0.0027*
-0.0313	***	*-14.41*	*CAR (D+0, D+126)*	***	*-20.79*	*-0.0046*

Table 5.10 Regression of Herding Propensity (P and S)

This table reports the results of regressions to examine the variation in herding propensity for 161,343 observations from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is defined as herding propensity (*P*, *S*) by Clement et al., (2005) and *BCK* (2006). Independent variables are post-FD period (*FD*), analyst following (*ANALY*), forecast horizon (*HORI*), firm size (*SIZE*) and broker size (*SECU*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$\textit{Herding Propensity } (P,S)_{i,t} = \alpha + \beta_1 FD + \beta_2\, ANALY_{i,t} + \beta_3 HORI_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 SECU_{i,t} + \varepsilon_{i,j,t}$$

< *Panel A : Herding propensity (P)* >

		Coef.		*t*	*P>|t|*
CONSTANT	α	*0.4353*	***	*56.57*	*0.000*
FD	β_1	*-0.0045*		*-1.22*	*0.223*
ANALY	β_2	*0.0025*	***	*20.61*	*0.000*
HORI	β_3	*0.0004*	***	*40.13*	*0.000*
SIZE	β_4	*0.0119*	***	*5.66*	*0.000*
SECU	β_5	*-0.0002*	***	*-2.64*	*0.008*
		Number of obs =161,343			
		Adj R-squared = 0.00169			

< *Panel B : Herding propensity (S)* >

		Coef.		*t*	*P>|t|*
CONSTANT	α	*0.2858*	***	*36.17*	*0.000*
FD	β_1	*-0.0024*		*-0.62*	*0.534*
ANALY	β_2	*0.0010*	***	*7.98*	*0.000*
HORI	β_3	*0.0002*	***	*17.34*	*0.000*
SIZE	β_4	*0.0357*	***	*16.53*	*0.000*
SECU	β_5	*-0.0000*		*-0.32*	*0.751*
		Number of obs =161,343			
		Adj R-squared = 0.0072			

Table 5.11 Regression of CARs to Herding Forecasts (P)

This table reports the results of regressions to examine the variation in abnormal stock returns to herding behaviour and anti-herding behaviour (based on herding propensity by Clement et al., 2005) in accordance of the level of recommendations for 102,641 observations from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is defined as the cumulative abnormal returns (*CAR*) for three windows ([*day+0, day+1*], [*day+0, day+5*], [*day+0, day+21*]). Independent variables are herding forecasts (*P*), analyst following (*ANALY*), firm size (*SIZE*), broker size (*SECU*) and standard deviation of daily stock price (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$CAR_{i,t} = \alpha + \beta_1 P_{i,t} + \beta_2 ANALY_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 SECU_{i,t} + \beta_5 VOLA_{i,t} + \varepsilon_{i,j,t}$$

Sell-side recommendations		< Day+0, Day+1>			< Day+0, Day+5>			< Day+0, Day+21>		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
CONSTANT	α	*-0.0207*	*-1.35*	*0.177*	*-0.0212*	*-0.84*	*0.401*	*-0.0919*	*-2.10*	*0.036*
P	β_1	*-0.0045*	*-1.52*	*0.130*	*-0.0121* **	*-2.50*	*0.013*	*-0.0065*	*-0.78*	*0.437*
ANALY	β_2	*-0.0001*	*-0.78*	*0.437*	*-0.0003*	*-0.89*	*0.373*	*-0.0007*	*-1.52*	*0.128*
SIZE	β_3	*0.0032*	*0.94*	*0.345*	*0.0053*	*0.97*	*0.333*	*0.0212* **	*2.23*	*0.026*
SECU	β_4	*0.0000*	*0.32*	*0.750*	*-0.0001*	*-0.79*	*0.431*	*-0.0002*	*-0.81*	*0.421*
VOLA	β_5	*0.0143*	*1.42*	*0.155*	*0.0187*	*1.13*	*0.258*	*0.0325*	*1.14*	*0.256*
		Number of obs = 2,310 *Adj R-squared = 0.0048*			*Number of obs = 2,310* *Adj R-squared = 0.0069*			*Number of obs = 2,310* *Adj R-squared = 0.0051*		
Buy-side recommendations		< Day+0, Day+1>			< Day+0, Day+5>			< Day+0, Day+21>		
CONSTANT	α	*0.0050* ***	*4.41*	*0.000*	*0.0005*	*0.27*	*0.784*	*-0.0179* ***	*-5.33*	*0.000*
P	β_1	*0.0011* ***	*4.05*	*0.000*	*0.0012* ***	*2.74*	*0.006*	*-0.0010*	*-1.24*	*0.216*
ANALY	β_2	*-0.0000* *	*-1.86*	*0.063*	*0.0000*	*0.08*	*0.938*	*0.0001* **	*2.31*	*0.021*
SIZE	β_3	*-0.0015* ***	*-6.21*	*0.000*	*-0.0010* **	*-2.55*	*0.011*	*0.0020* ***	*2.78*	*0.005*
SECU	β_4	*0.0001* ***	*7.03*	*0.000*	*0.0001* ***	*6.52*	*0.000*	*0.0001* ***	*4.93*	*0.000*
VOLA	β_5	*0.0036* ***	*3.62*	*0.000*	*0.0067* ***	*4.15*	*0.000*	*0.0164* ***	*5.51*	*0.000*
		Number of obs = 100,331 *Adj R-squared = 0.0025*			*Number of obs = 100,331* *Adj R-squared = 0.0011*			*Number of obs = 100,331* *Adj R-squared = 0.0009*		

Table 5.12 Regression of CARs to Herding Forecasts (S)

This table reports the results of regressions to examine the variation in abnormal stock returns to herding behaviour and anti-herding behaviour (based on herding propensity by *BCK*, 2006) in accordance of the level of recommendations for 102,641 observations from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is defined as the cumulative abnormal returns (*CAR*) for three windows ([*day+0, day+1*], [*day+0, day+5*], [*day+0, day+21*]). Independent variables are herding forecasts (*S*), analyst following (*ANALY*), firm size (*SIZE*), broker size (*SECU*) and standard deviation of daily stock price (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$CAR_{i,t} = \alpha + \beta_1 S_{i,t} + \beta_2 ANALY_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 SECU_{i,t} + \beta_5 VOLA_{i,t} + \varepsilon_{i,j,t}$$

Sell-side recommendations		< Day+0, Day+1>				< Day+0, Day+5>				< Day+0, Day+21>			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
CONSTANT	α	*-0.0279*	*	*-1.84*	*0.066*	*-0.0272*		*-1.09*	*0.276*	*-0.1257*	***	*-2.89*	*0.004*
S	β_1	*0.0049*	*	*1.66*	*0.096*	*0.0064*		*1.32*	*0.187*	*0.0229*	***	*2.70*	*0.007*
ANALY	β_2	*-0.0002*		*-1.15*	*0.250*	*-0.0003*		*-1.11*	*0.267*	*-0.0009*	*	*-1.81*	*0.071*
SIZE	β_3	*0.0039*		*1.18*	*0.239*	*0.0046*		*0.85*	*0.394*	*0.0251*	***	*2.64*	*0.008*
SECU	β_4	*0.0000*		*0.33*	*0.740*	*-0.0001*		*-0.51*	*0.613*	*-0.0002*		*-0.74*	*0.461*
VOLA	β_5	*0.0161*		*1.61*	*0.107*	*0.0155*		*0.94*	*0.345*	*0.0473*	*	*1.65*	*0.099*
		Number of obs = 2,310 *Adj R-squared = 0.0053*				*Number of obs = 2,310* *Adj R-squared = 0.0026*				*Number of obs = 2,310* *Adj R-squared = 0.0106*			
Buy-side recommendations		< Day+0, Day+1>				< Day+0, Day+5>				< Day+0, Day+21>			
CONSTANT	α	*0.0053*	***	*4.68*	*0.000*	*0.0007*		*0.38*	*0.704*	*-0.0185*	***	*-5.55*	*0.000*
S	β_1	*0.0009*	***	*3.54*	*0.000*	*0.0013*	***	*3.17*	*0.002*	*0.0021*	***	*2.72*	*0.007*
ANALY	β_2	*-0.0000*	**	*-2.11*	*0.035*	*-0.0000*		*-0.09*	*0.930*	*0.0001*	**	*2.30*	*0.022*
SIZE	β_3	*-0.0015*	***	*-6.36*	*0.000*	*-0.0010*	***	*-2.69*	*0.007*	*0.0017*	**	*2.46*	*0.014*
SECU	β_4	*0.0001*	***	*6.92*	*0.000*	*0.0001*	***	*6.54*	*0.000*	*0.0001*	***	*4.93*	*0.000*
VOLA	β_5	*0.0041*	***	*4.13*	*0.000*	*0.0072*	***	*4.45*	*0.000*	*0.0164*	***	*5.53*	*0.000*
		Number of obs = 100,331 *Adj R-squared = 0.0027*				*Number of obs = 100,331* *Adj R-squared = 0.0012*				*Number of obs = 100,331* *Adj R-squared = 0.0009*			

Table 5.13 Regression of CARs to Herding Forecasts (DEVI)

This table reports the results of regressions to examine the variation in abnormal stock returns to herding behaviour and anti-herding behaviour (based on herding propensity by Jegadeesh et al., 2008) in accordance of the level of recommendations for 102,641 observations from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is defined as the cumulative abnormal returns (*CAR*) for six windows ([*day+0, day+1*], [*day+0, day+3*], [*day+0, day+10*], [*day+0, day+21*], [*day+0, day+42*], and [*day+0, day+126*]). Independent variables are buy-side recommendations (*BUY*, dummy variable), herding forecasts (*DEVI*), analyst following (*ANALY*), firm size (*SIZE*), broker size (*SECU*) and standard deviation of daily stock price (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$CAR_{i,t} = \alpha + \beta_1 BUY_{i,t} + \beta_2 DEVI_{i,t} + \beta_3 ANALY_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 SECU_{i,t} + \beta_6 VOLA_{i,t} + \varepsilon_{i,j,t}$$

		< Day+0, Day+1>				< Day+0, Day+3>				< Day+0, Day+10>			
		Coef.		t	P>|t|	Coef.		t	P>|t|	Coef.		t	P>|t|
CONSTANT	α	-0.0055	***	-3.21	0.001	-0.0118	***	-5.04	0.000	0.0156	***	6.42	0.000
BUY	β_1	0.0114	***	9.49	0.000	0.0165	***	10.11	0.000	0.0022	**	2.04	0.041
DEVI	β_2	0.0021	***	3.89	0.000	0.0022	***	3.10	0.002	0.0000	*	1.84	0.065
ANALY	β_3	0.0000	***	-2.69	0.007	0.0000	**	-1.98	0.048	0.0005		1.03	0.302
SIZE	β_4	-0.0015	***	-6.53	0.000	-0.0013	***	-4.13	0.000	0.0001	***	5.53	0.000
SECU	β_5	0.0001	***	6.58	0.000	0.0001	***	5.20	0.000	0.0060	***	2.98	0.003
VOLA	β_6	0.0040	***	4.04	0.000	0.0051	***	3.75	0.000	-0.0237	***	-6.78	0.000
		Number of obs = 102,641 Adj R-squared = 0.0034				Number of obs = 102,641 Adj R-squared = 0.0023				Number of obs = 102,641 Adj R-squared = 0.0009			
		< Day+0, Day+21>				< Day+0, Day+42>				< Day+0, Day+126>			
CONSTANT	α	-0.0508	***	-9.98	0.000	-0.1041	***	-13.98	0.000	-0.2530	***	-16.77	0.000
BUY	β_1	0.0329	***	9.29	0.000	0.0585	***	11.31	0.000	0.1365	***	13.02	0.000
DEVI	β_2	0.0038	**	2.41	0.016	0.0069	***	2.99	0.003	0.0140	***	3.02	0.003
ANALY	β_3	0.0001	***	2.67	0.008	0.0001		0.98	0.328	-0.0003	***	-2.83	0.005
SIZE	β_4	0.0017	**	2.47	0.014	0.0065	***	6.38	0.000	0.0261	***	12.58	0.000
SECU	β_5	0.0001	***	5.10	0.000	0.0002	***	5.37	0.000	0.0004	***	5.05	0.000
VOLA	β_6	0.0145	***	4.93	0.000	0.0337	***	7.86	0.000	0.0335	***	3.85	0.000
		Number of obs = 102,641 Adj R-squared = 0.0017				Number of obs = 102,641 Adj R-squared = 0.0027				Number of obs = 102,641 Adj R-squared = 0.0044			

Table 5.14 Regression of CARs to Herding Forecasts (S)

This table reports the results of regressions to examine the variation in abnormal stock returns to herding behaviour and anti-herding behaviour (based on herding propensity by *BCK*, 2006) in accordance of the level of recommendations for 102,641 observations from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is defined as the cumulative abnormal returns (*CAR*) for six windows ([*day+0, day+1*], [*day+0, day+3*], [*day+0, day+10*], [*day+0, day+21*], [*day+0, day+42*], and [*day+0, day+126*]). Independent variables are anti-herding forecasts (*ANTIHERD*), analyst following (*ANALY*), firm size (*SIZE*) and broker size (*SECU*) and standard deviation of daily stock price (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$CAR_{i,t} = \alpha + \beta_1 BUY_{i,t} + \beta_2 S_{i,t} + \beta_3 ANALY_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 SECU_{i,t} + \beta_6 VOLA_{i,t} + \varepsilon_{i,j,t}$$

		< Day+0, Day+1>				< Day+0, Day+3>				< Day+0, Day+10>			
		Coef.		t	P>|t|	Coef.		t	P>|t|	Coef.		t	P>|t|
CONSTANT	α	-0.0045	***	-2.75	0.006	-0.0104	***	-4.68	0.000	-0.0227	***	-6.84	0.000
BUY	β_1	0.0096	***	8.55	0.000	0.0144	***	9.46	0.000	0.0139	***	6.14	0.000
S	β_2	0.0010	***	3.73	0.000	0.0011	***	3.25	0.001	0.0015	***	2.84	0.004
ANALY	β_3	0.0000	**	-2.25	0.024	0.0000	*	-1.74	0.081	0.0000		1.41	0.160
SIZE	β_4	-0.0015	***	-6.16	0.000	-0.0012	***	-3.81	0.000	0.0006		1.27	0.203
SECU	β_5	0.0001	***	6.93	0.000	0.0001	***	5.19	0.000	0.0001	***	5.17	0.000
VOLA	β_6	0.0043	***	4.29	0.000	0.0053	***	3.93	0.000	0.0071	***	3.52	0.000
		Number of obs = 102,641 Adj R-squared = 0.0032				Number of obs = 102,641 Adj R-squared = 0.0022				Number of obs = 102,641 Adj R-squared = 0.0009			
		< Day+0, Day+21>				< Day+0, Day+42>				< Day+0, Day+126>			
CONSTANT	α	-0.0489	***	-10.12	0.000	-0.0993	***	-14.04	0.000	-0.2470	***	-17.24	0.000
BUY	β_1	0.0300	***	9.09	0.000	0.0519	***	10.75	0.000	0.1243	***	12.71	0.000
S	β_2	0.0023	***	3.05	0.002	0.0053	***	4.72	0.000	0.0155	***	6.84	0.000
ANALY	β_3	0.0001	**	2.10	0.036	0.0000		0.81	0.415	-0.0003	***	-2.87	0.004
SIZE	β_4	0.0019	***	2.71	0.007	0.0067	***	6.50	0.000	0.0262	***	12.65	0.000
SECU	β_5	0.0001	***	4.76	0.000	0.0002	***	5.05	0.000	0.0004	***	4.95	0.000
VOLA	β_6	0.0165	***	5.58	0.000	0.0354	***	8.22	0.000	0.0360	***	4.12	0.000
		Number of obs = 102,641 Adj R-squared = 0.0017				Number of obs = 102,641 Adj R-squared = 0.0028				Number of obs = 102,641 Adj R-squared = 0.0048			

CHAPTER 6

INFORMATION LEAKAGE AND INFORMED TRADING

6.1. Introduction

Market participants have various ways to gain information. They can acquire private information either under selective disclosure or under fair disclosure. The Securities and Exchange Commission (SEC) stated that selective disclosure has evils similar to informed trading in that both are not conducted openly or in public view.

> *Selective disclosure has an adverse impact on market integrity that is similar to the adverse impact from illegal insider trading: investors lose confidence in the fairness of the markets when they know that other participants may exploit "unerodable informational advantages" derived not from hard work or insights, but from their access to corporate insiders.*[81]

With the induction of Regulation FD, SEC imposed literally fairness on the disclosure practice of firms.[82] Regulation FD forces all market participants to have fair access to material information disclosed by firms. From the point of view of legislation, although Regulation FD seems to be the best remedy for information asymmetry, the effect of the regulation on the financial information environment remains controversial. Critics suggests that Regulation FD makes it more difficult for analysts to produce earnings forecasts since the regulation curtails the private channel to companies that they had

[81] See Securities and Exchange Commission (2000, Release Nos. 33-7881) Final Rule: Selective Disclosure and Insider Trading.

[82] Regulation FD requires that when firms release material information to the capital market, they should disclose it to the public simultaneously (form intentional disclosure) or promptly (for non-intentional disclosures).

formerly enjoyed (Association for Investment Management and Research [AIMR, 2000, now the CFA Institute] and Securities Industry Association [SIA, 2000]). At the same time, proponents report that there is no significant difference in quality of information and firms tend to release more public information (Bailey et al., 2003; Heflin et al., 2003).

In the previous chapter, we found that Regulation FD contributes to changes in analysts' information environments and ascribed the results to the decrease in private information following Regulation FD. If Regulation FD contributes to equal access to their material information, firms should stop the selective disclosure that reduced the average information quality prior to the regulation. There are, therefore, two important questions about the effect of Regulation FD on the quality of information released by firms and analysts: (1) Has Regulation FD influenced informed trading prior to unscheduled earnings announcements? (2) Has Regulation FD influenced informed trading prior to the release of analysts' recommendations?

First, we focus on the effect of Regulation FD on informed trading prior to the unscheduled earnings announcement. In order to examine the above issues, we test whether stock returns and trading volume increase prior to unscheduled earnings announcement. Informed trading allows informed traders to profit at the expense of the uninformed trader (Carter et al., 2003). In this paper, we consider two important benchmarks in measuring informed trading to the event day: earnings announcements and analysts' recommendations release. Prior literature reports evidence of an increase in a firm's trading volume when asymmetric information among investors increases due

to the different investors' information environment (e.g., Kim et al., 1991 and 1994; Atiase et al., 1994).[83] Specifically, following Liu et al., (1990), we measure the difference of stock returns and volume reactions around unscheduled earnings announcement and analysts' recommendations release. We use abnormal volumes (*AV*) and abnormal returns (*AR*) from nine trading days before event day to three trading days after event day [*Day-9, Day+3*]. The earnings announcement contains important information. Lundholm (1988), Stickel (1989) and Barron et al. (2002) suggest that the earnings announcement is a critical news event for analysts since the announcement helps analysts reduce errors in their earnings forecasts. Kim et al., (1997) find that the earnings announcement conveys private information and causes abnormal trading. If some investors access material information unrevealed in public, they can enjoy excess stock returns relative to normal investors. Information leaks through various ways, such as firms' insiders, financial professionals, and family members. As an information producer, insiders have an incentive to profit from their superior information about firm value.

On the other hand, as an information recipient, financial professionals such as institutional investors and analysts have significantly more resources and incentives to gain available information compared with general investors (Liu 2009). A typical example of an information source for analysts is conference calls. Frankel et al., (1999) find that conference calls provide better information to investors than the corresponding

[83] In the presence of cases such as scheduled announcements, this relationship can be inverted because uninformed traders delay trading to avoid adverse selection costs due to information asymmetry (e.g., Chae, 2005; Fabiano, 2008).

press release. Jorgensen et al., (2004) and Bowen et al., (2002) suggest that most firms used conference calls prior to the stock market opening to release earnings information.

Prior to Regulation FD, conference calls lead to selective disclosure while, after Regulation FD, managers may release the information simultaneously during the conference call. If firms disclose material information publicly instead of using selective disclosure, informed trading reduces after the adoption of Regulation FD.

Using 2,531 observations made for unscheduled earnings announcements, we hypothesize whether firms would leak earnings information before their earnings announcement in the post-FD period. We find that cumulative abnormal volumes (*CAV*) and cumulative abnormal returns (*CAR*) prior to earnings announcements in the post-FD period have significantly decreased in the post-FD period. These findings are supported by Mac (2002). Mac (2002) finds that there has been a significant decrease in unfair trading before event day subsequent to the Regulation FD. Ahmed et al., (2007) find evidence of reduction in the difference in information quality between investors in the post-FD period. The results indicate that Regulation FD curtails information leakage before earnings announcement.

Second, our study complements the above research by examining whether Regulation FD reduces informed trading prior to the release of analysts' recommendations. The Korean securities business mainly focuses on the brokerage service. On the basis of annual revenue, the income of brokerage service amounts to 62% in the 2007 fiscal

year.[84] In practice, conflicts of interest by Korean analysts are expected to centralize on the brokerage service, the largest source of securities' income. Therefore, the brokerage service is likely to create incentives for securities companies to secure brokerage commission. Using 113,164 observations made for buy-side and sell-side recommendations, we examine whether analysts leak their recommendations information to favoured clients prior to their recommendations release after the adoption of Regulation FD. We find that there is a significant decrease in cumulative trading volume and stock returns in the post-FD period, compared to the pre-FD period. The findings are supported by Heflin et al., (2003) and Cornett et al., (2007). They find that cumulative stock returns to analysts' recommendations release have significantly decreased in the post-FD period. The results indicate that Regulation FD encourages firms to offer material information to investors publicly instead of using selective disclosure.

We contribute to the study of both Regulation FD and information leakage, by examining the impact of Regulation FD on the information environment of analysts and firms. First, we contribute to the existing literature by providing additional insights on whether Regulation FD influences managers' information leakage. Second, we examine the changes in stock returns and trading volumes prior to analysts' recommendations release as a way of providing more convincing evidence on the effect of Regulation FD on the analysts' information leakage. Third, we provide evidence based on more comprehensive samples than prior research concerning the effect of Regulation FD.

[84] The main source of securities companies' income of three countries (Korea, U.S., Japan) in the 2007 fiscal year by press release from Korea Financial Investment Association Korea is as follows:
−Korea(brokerage 62%, proprietary trading 13%, fund sales 10%, underwriting service 3%)
−U.S. (brokerage service 27%, wrap account service 16%, fund sales 13%, underwriting service 13%)
−Japan (brokerage service 24%, proprietary trading 16%, fund sales 10%, underwriting service 3%)

This chapter proceeds as follows. Section 6.2 introduces and develops the hypotheses. Section 6.3 describes the sample selection procedure. Section 6.4 discusses research design. Section 6.5 presents the main empirical results on the effect of Regulation FD. The final section provides a brief summary and presents conclusions.

6.2. Hypotheses Development

6.2.1. Informed Trading around Earnings Announcements

Prior empirical studies indicate that information leakage is positively related to the length of the interval between informed trading and the unscheduled earnings announcement. Previous literature uses trading volumes as a proxy for an indicator for information leakage (Beaver, 1968; Kim et al., 1994, 1997; Straser, 2002). For example, Beaver (1968) finds that trading volume reflects a lack of consensus regarding price, in that change in trading volume is induced by the inflow of the new information. Kim et al., (1994) attribute abnormal volume trading around the earnings announcement date to private information around pre-announcement, and superior public information post-announcement. Kim et al., **(**1997) suggest that trading arises when investors have pre-disclosure earnings information because the information may lead market participants to disagree about firm prospects. Straser (2002) finds that informed trading is caused by only private information.

Previous literature shows evidence that individual investors cannot generally have excess stock returns based on private information (Lin et al., 1995; Carter et al., 2003). On the other hand, financial professionals are viewed as informed investors because

they tend to have superior access to private information from firms. Gaved (1997) argues that large institutional shareholders normally have the opportunity to gain private information from managers. Ali et al., (2004) suggest that institutional investors trade on superior information about forthcoming earnings. Grinblatt et al., (1989) argue that the excess returns that fund managers may earn is based on superior information. Ke et al., (2006) suggest that analysts have an incentive to use optimistically biased earnings forecasts to please management so that they can gain better access to management's private information.

Before the adoption of Regulation FD, this scenario would happen. If a firm's earnings were exceeding the analysts' forecasts, the manager would tell the favoured analysts that he/she expected outstanding earnings performance. The analysts would pass on the information to their important customers and the customers would buy stock. The clients have already realized profits when the earnings announcement is released to the public. Therefore, for firms with earnings increases, stock volumes would increase and stock returns would go up prior to earnings announcement in the pre-FD period. However, after Regulation FD took effect, a lower trading volume is expected due to there being less informed trading prior to the earnings announcement. This expectation is consistent with Ahmed (2007), who supports the view that informed trading declines after the implementation of Regulation FD.

In addition, if Regulation FD leads firms to replace selective disclosure with public disclosure, general investors reduce their uncertainty about forthcoming earnings. Heflin et al., (2003) report that flow of information to market participants has improved and returns volatility surrounding earnings announcements has been lower since

Regulation FD. Therefore, there will be significant differences in trading volume and stock returns after the adoption of Regulation FD. We expect that Regulation FD will make trading volume and stock returns decrease prior to the earnings announcement. Based on this expectation, we hypothesize that there is a decrease in informed trading before earnings announcement. Our first and second empirical hypotheses (H_1 and H_2) are as follows:

H_1: Abnormal trading volume to earnings announcements decreases after the adoption of Regulation FD.

H_2: Abnormal stock returns to earnings announcements decreases after the adoption of Regulation FD.

6.2.2. Informed Trading around Analysts' Recommendations

Investment banks may create conflicts of interest with their clients since they have three main sources of income: (1) underwriting service (i.e., corporate financing and the issuing of securities) (2) brokerage services and (3) proprietary trading. In recent years, numerous studies have attempted to explore the conflicts of interest between analysts' recommendations and banks' corporate finance business. (Lin et al., 1998; Michaely et al., 1999; Bradley, et al., 2003; Kim et al., 1997; Cowen et al., 2006).

For example, Lin et al. (1998) find that underwriter analysts' recommendations are significantly more favourable than those of unaffiliated analysts. Michaely et al., (1999) show that stocks that underwriter analysts recommend underperform more poorly than buy-side recommendations by unaffiliated brokers at the time of recommendation release. The results are consistent with Bradley et al., (2003). These findings reflect the

fact that affiliated analysts have incentives to issue favourable recommendations to maintain client relations.

On the other hand, Kim et al., (1997) suggest that there is a conflict of interest in the brokerage business and analysts' recommendations. They find that important clients of investment banks possess private information on the analysts' forecasts during the period between the pre-release of information and the public announcement. Cowen et al., (2006) suggest that both institutional investors and retail investors are expected to trade on the basis of analysts' recommendations.[85] It is possible that analysts are mainly motivated to maximize their brokerage commissions by providing their clients with high-quality information in advance.

Some of the most compelling studies focus on the relation of stock returns and analysts' recommendations (Womack, 1996; Barber et al., 1993; Kim et al., 1997; Kim et al., 2006). For example, Womack (1996) and Barber et al., (1993) suggest that investors earn abnormal returns of approximately 3% and -4% following buy and sell recommendations, respectively. Kim et al., (1997) suggests that first buy recommendations have an average excess stock returns of 4% for NYSE/AMEX stocks and 7% for NASDAQ stocks. They find that private information is incorporated in stock prices within 15 minutes of the opening trade for each market. Kim et al., (2006) find that abnormal returns start to rise from 20 days prior to announcement date when Korean analysts revise their stock recommendations upward. The results imply that the information has been reflected in the stock prices prior to the public announcement.

[85] Cowen et al., (2006) suggest that institutional investors generally pay commission or soft dollars to specific research and this payment allows institutional investors to track analysts' performance, while retail investors pay the cost of research though brokerage commission.

Prior to Regulation FD, it was possible that important clients of the securities companies were the first to receive information about an analyst's recommendations, and subsequently general investors had access the information. Thus, informed traders trade stocks more before the release of analysts' recommendations, if they get recommendation information from this private channel. However, as Regulation FD leads to improvement of the information inflow to market participants and eliminates private access to selective disclosure, earnings-related news make stock returns less volatile. Similar to the previous section, our third and fourth empirical hypotheses (H_3 and H_4) are as follows:

H_3: Abnormal trading volume to the analysts' recommendations decreases after the adoption of Regulation FD.

H_4: Abnormal stock returns to the analysts' recommendations decrease after the adoption of Regulation FD.

6.3. Sample Selection

In order to test for the effect of Regulation FD on the amount of private information in analysts' forecasts and informed trading prior to unscheduled earnings announcements and analysts' recommendations, we use samples from FSS and FNguide. Financial information is retrieved from FSS and analysts' forecasts observations, stock returns and trading volume are obtained from the FNguide. The release date of each unscheduled earnings announcement is also obtained from FNguide. Our sample consists of two sub-samples: Sample A (2,531 observations), and Sample B (113,164 observations).

[Insert *Table 4.2* about here]

These sub-samples consider all releases made during the sample period extending from 2000, when FNguide was established, to 2007. However, for Sample A (2,531 observations), annual actual earnings exclude the data for 2002 in both periods, because Regulation FD was enacted in November. 2002. On the other hand, unlike previous chapters, we include the observations forecasted in 2002 in Sample B because we do not use variables based on annual reported earnings such as forecast accuracy and forecast dispersion in measuring informed trading around analysts' recommendations. Therefore, the pre-FD period is from 2000 to October 2002 while the post-FD period is from November 2002 to December 2007 in Sample B.

First, for the research on informed trading prior to unscheduled earnings announcements, we use Sample A (2,531 observations). This sample constitutes unscheduled earnings announcement. The sample is split into two categories based on the firms' earnings performance: *earnings increase firms* and *earnings decrease firms*. As we described in the previous chapter, we define *earnings increase firms* (*earnings decrease firms*) as when a firm reports profit (loss) and an increase (decrease) in earnings from last year's earnings. Sample B constitutes 113,164 analysts' recommendations. The sample is divided into two groups: sell-side recommendations (strong sell and sell) and buy-side recommendations (strong buy and buy). Hold recommendations and no-rating recommendations are excluded. Similar to Sample A, the informed trading to be examined includes both stock returns and abnormal trading volumes around the public release of analysts' recommendations.

6.4. Research Design

6.4.1. Measurement of Informed Trading

The aim of this chapter is to test for changes in information leakage and informed trading prior to event day in the Korean stock market. Since we cannot directly measure information leakage in the market, we investigate the stock returns and trading volume prior to the earnings announcement and analysts' recommendations release. Following Collet (2004)'s event study methodology, we calculate daily abnormal stock returns and abnormal trading volumes around the release of analysts' recommendations and unscheduled earnings announcement.

There are two methods to measure information leakage, consisting of volume effect and valuation effect. First, measuring unexpected trading volume requires a benchmark for expected trading volume. There are two benchmarks generally used in research on information leakage: (1) unadjusted percentage of firms' outstanding shares and (2) abnormal trading volumes. Collet (2004) identifies the percentage of outstanding shares on the day of announcement. In order to measure the volume effect of information leakage, we calculate the unadjusted percentage of firms' outstanding ($VOL_{j,t}$) as follows:

$$VOL_{j,t} = \frac{SHRTRD_{j,t}}{SHROUT_{j,t}} \times 100 \qquad (6.1)$$

where:

$VOL_{j,t}$ = volume for firm j for day t:
$SHRTRD_{j,t}$ = number of firms j's shares traded on Korean exchange for day t.
$SHROUT_{j,t}$ = number of firms j's shares outstanding for day t.

Abnormal trading volumes (*AV*) are calculated as the daily volume less mean daily volume during the various event windows. We choose six different event windows to capture the effect of Regulation FD on the informed trading.

$$AV_{j,t} = VOL_{j,t} - \overline{VOL_t} \qquad (6.2)$$

where:

$AV_{j,t}$ = abnormal volume for firm j for day t:
$\overline{VOL_t}$ = mean daily volume of firm j's during the estimation period.

Second, in order to measure the valuation effect, for each forecast recommendation and unscheduled earnings announcement, we report abnormal stock returns based on market-adjusted returns around event day. Abnormal returns (AR_{ji}) is defined as the difference between the actual return and the market return on the day.

$$AR_{j,t} = R_{j,t} - R_{m,t} \qquad (6.3)$$

where:

$R_{j,t}$ = returns on stock j for day t.
$R_{m,t}$ = returns on the market portfolio (*KOSPI* or *KOSDAQ* composite index) for day t.

In addition, cumulative abnormal returns ($CAR_{j,tA}$) is calculated as:

$$CAR_{j,tA} = \sum_{t}^{t+A} AR_{j,t} \qquad (6.4)$$

6.4.2. Regression Models of Information Leakage

In order to further test for prior-announcement information leakage, following Heggen et al., (2008) and Jackson et al., (2003), we examine the six windows *CAV*s and *CAR*s around unscheduled earnings announcement and analysts' recommendations. *CAV*s and *CAR*s are computed over six windows (i.e., [*Day-9*, *Day-1*], [*Day-7*, *Day-1*], [*Day-5*, *Day-1*], [*Day-3*, *Day-1*], [*Day+0*, *Day+1*], [*Day+0*, *Day+3*]) ranging in length from nine days prior to public release to three days after the release. The primary regression models, *Equation* (*6.5*) and *Equation* (*6.6*), are constructed for information leakage prior to unscheduled earnings announcement. We partition our sample into two subsets: earnings increase firms (1,301 observations) and earnings decrease firms (1,230 observations).

$$CAV = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 UE + \beta_4 SIZE + \beta_5 LEVER + \varepsilon \qquad (6.5)$$

$$CAR = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 UE + \beta_4 SIZE + \beta_5 LEVER + \beta_6 CAV + \varepsilon \qquad (6.6)$$

Next regression models, *Equation* (*6.7*) and *Equation* (*6.8*), are applied to information leakage prior to analysts' recommendations release. Similar to the above regression models, we also divide our sample into two subsets: buy-side recommendations (100,673 observations) and sell-side recommendations (2,491 observations).

$$CAV = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \varepsilon \qquad (6.7)$$

$$CAR = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \beta_6 CAV + \varepsilon \qquad (6.8)$$

All variables are defined in *Table 6.1*. The coefficients tested in the regression models will provide evidence on the information leakage after the adoption of Regulation FD. β_1s of *FD*, represent the change in market reaction (*CAV* or *CAR*) in the post-FD period compared to those in the pre-FD period. Therefore, we expect that β_1s, coefficients of *FD* in *Equation* (*6.5*), (*6.6*), (*6.7*) and (*6.8*), are to be significant and negative,[86] which suggests that informed trading prior to unscheduled earnings announcement and analysts' recommendations release has decreased after the adoption of Regulation FD.

The control variables in *Equation* (*6.5*), (*6.6*), (*6.6*), and (*6.7*) are used in the previous chapter: analysts following (*ANALY*), firms size (*SIZE*), broker size (*SECU*), volatility of daily stock returns (*VOLA*) and cumulative abnormal volumes (*CAV*). Prior research suggests that these variables are important determinants in market reaction (Jackson et al., 2003; Hegen et al., 2008).

6.5. Empirical Results

6.5.1. Informed Trading and Earnings Announcements

6.5.1.1. Univariate Results

The crux of this analysis is on trading volume and stock returns prior to earnings announcement before and after the adoption of Regulation FD. We examine whether the market was previously aware of information prior to the final unscheduled earnings announcements. According to our hypotheses H_1 and H_2, managers holding the information do not leak the earnings information after the adoption of Regulation FD.

[86] However, we expect that for sell-side recommendations and earnings decreases firms, β_1s of *FD* in *CAR* are significantly positive.

Table 6.3, *6.4*, *6.5*, and *6.6* present abnormal returns (*AR*) and abnormal volumes (*AV*), as well as cumulative abnormal returns (*CAR*) and cumulative abnormal volumes (*CAV*) for *earnings decrease firms* and *earnings increase firms* before and after Regulation FD. *Table 6.3* describes the daily abnormal volumes (*AV*) and their corresponding t-statistics and z-statistics from [*Day-9*] to [*Day+3*]. For *earnings decrease firms*, *AV*s for six trading days [*Day-9*, *Day-4*] prior to the earnings announcement are significantly positive in the pre-FD period.

After the adoption of Regulation FD, there is no significantly positive *AV* prior to the event day. *Table 6.4* and *Panel A* of *Figure 6-1* show the significant differences in *CAV*s for *earnings decrease firms*. *CAV*s for [*Day-9, Day-1*], [*Day-7, Day-1*], and [*Day-5, Day-1*] in the pre-FD period are significantly higher than those of the post-FD period while *CAV*s for [*Day+0, Day+1*] and [*Day+0, Day+3*] in the pre-FD period show the contrary results, compared to the post-FD period.

[Insert *Table 6.3, 6.4, 6.5* and *6.6* and *Figure 6.1* about here]

Similarly, for *earnings increase firms*, *AV*s for six trading days [*Day-9*, *Day-4*] prior to earnings announcement, each significant positive *AV* is observed in the pre-FD period. On the other hand, after the adoption of Regulation FD, significant positive *AV* prior to earnings announcement is not observed while *AV*s for event day [*Day+0*] and following day after event day [*Day+1*] are 0.32% and 0.18% respectively, significant at the level of 1%. *AV*s in these windows are also significantly different, when comparing the pre-FD period and post-FD period.

In the pre-FD period, *CAV*s for [*Day-9, Day-1*], [*Day-7, Day-1*] and [*Day-5, Day-1*] increase while the *CAV* for [*Day+0, Day+1*] decreases substantially. Moving to the post-FD period, conversely, all *CAV*s prior to earnings announcements are not significant while *CAV*s for [*Day+0, Day+1*] and [*Day+0, Day+3*] following event day increase. As shown in *Table 6.4*, there are significant changes in *CAV*s for [*Day-9, Day-1*], [*Day-7, Day-1*] [*Day-5, Day-1*] and [*Day+0, Day+1*] from the pre-FD to the post-FD period. The results of *Table 6.4* are also presented in *Panel B* of *Figure 6.1*, which shows the plot of both *CAV*s from [*Day-9*] to [*Day-3*]. We find that there is a decrease in informed trading, a difference in the quality of information after the adoption of Regulation FD. The results seem to indicate that Regulation FD curtails information leakage and that firms limit selective disclosure.

Further, *Table 6.5* and *Table 6.6* provide the results on the abnormal returns (*AR*) and cumulative abnormal returns (*CAR*) for H_2. For *earnings decrease firms*, *AR*s for [*Day-5*], [*Day-3*] and [*Day-2*] are significantly negative in the pre-FD period while *AR*s for [*Day-9*] and [*Day-2*] are significantly negative in the post-FD period. On the other hand, for *earnings increase firms*, *AR*s for [*Day-9*], [*Day-6*] [*Day-4*], and [*Day-1*] are significantly positive in the pre-FD period while *AR*s for [*Day-8*] and [*Day-1*] are significantly negative in the post-FD period. For earnings decrease firms, *CAR*s for [*Day-7, Day-1*], [*Day-5, Day-1*] and [*Day-3, Day-1*] in the pre-FD period are -0.69%, -1.18% and -1.10% while, *CAR* for [*Day-9, Day-1*] and [*Day-5, Day-1*] in the post-FD period are -0.46% and -0.33%.

On the other hand, for earnings increase firms, *CAR*s for [*Day-9, Day-1*], and [*Day-7, Day-1*] in the pre-FD period are 2.26% and 0.71% while, *CAR*s for [*Day-7, Day-1*], [*Day-5, Day-1*] and [*Day-3, Day-1*] in the post-FD period are 0.36%, 0.33%, and 0.28%.

[Insert *Table 6.5* and *Table 6.6* and *Figure 6.2* about here]

As shown in *Table 6.6* and *Panel A* of *Figure 6.2*, among the *earnings decrease firms*, there are significant changes in cumulative abnormal returns (*CAR*s) for [*Day-5, Day-1*] and [*Day-3, Day-1*] from the pre-FD to the post-FD period. For *earnings increase firms*, there are also significant differences in *AR*s for [*Day-9*], [*Day-6*], [*Day-4*] and [*Day-1*] are significantly positive in the pre-FD period while there is no significantly positive *AR* in the post-FD period. Similar results that are consistent with our hypotheses H_1 and H_2 are obtained when comparing the pre-FD and post-FD periods. *Table 6.6* and *Panel B* of *Figure 6.2* show the path of *CARs* starting from 9 days before the earnings announcement. We find that the *CAR* for [*Day-9, Day-1*] in the pre-FD (2.26%) is significantly positive compared to the post-FD period (0.22%). The results are consistent with Gadarowski et al., (2002) who find lower stock returns prior to earnings announcement in the post-FD period compared to pre-FD period.

6.5.1.2. Multivariate Results

Table 6.7 and *6.8* reports the results for the primary two regression models in *Equation* (*6.5*) and (*6.6*), which include the control variables representing analysts following (*ANALY*), unexpected earnings (*UE*), firm size (*SIZE*), leverage (*LEVER*) and cumulative abnormal volumes (*CAV*). *Table 6.7* presents that β_1s of *FD* in *CAV*

earnings decrease firms and *earnings increase firms* are significantly negative over the three event windows ([*Day-9, Day-1*], [*Day-9, Day-1*] and [*Day-5, Day-1*]) prior to the unscheduled announcement day. The results are consistent with our hypotheses (H_1 and H_2) and previous literature. Mac (2002) finds that there is a significant decrease in unfair trading before event day subsequent to Regulation FD.

On the other hand, β_1s of *FD* in *CAV* for *earnings increase firms* are significantly positive over [*Day+0, Day+1*] and [*Day+0, Day+3*]. The results are consistent with Bailey et al., (2003), who report a significant increase in abnormal trading volume after earnings announcement in the post-FD period and ascribe it to increased differences in opinion resulting from an improvement in analysts' information gathering. *Table 6.8* presents that β_1s of *FD* in *CAR* for *earnings decrease firms* show generally insignificant results. However, β_1s of *FD* in *CAR* for *earnings increase firms* are significantly negative over the four event windows ([*Day-9, Day-1*], [*Day-7, Day-1*], [*Day-3, Day-1*], and [*Day+0, Day+1*]) around unscheduled announcement date. The results are consistent with our expectation and previous literature. Ahmed et al., (2007) suggest that stock reaction to earnings announcement would be weak if Regulation FD increases the quality of information voluntarily released by firms. Again, these results support H_1 and H_2 that Regulation FD influences a change in firms' disclosure practice by restricting the selective disclosure available exclusively to favoured investors.

On the other hand, a brief explanation of the results from *Table 6.7* and *Table 6.8* indicate the relationship between four firm characteristics (*ANALY, UE, SIZE, LEVER)* and two market reaction indicators (*CAR, CAV*) is insignificant across the six event windows. However, *Table 6.8* presents that *CAR* appears to have a consistent

relationship with the *CAV*, indicating that abnormal returns are correlated with informed trading volume.

Taken together, our findings indicate that managers' information leakage prior to unscheduled earnings release has decreased after the adoption of Regulation FD.

6.5.2. Informed trading and Analysts Recommendations

6.5.2.1. Univariate Results

In this section, H_3 and H_4 are tested. If Regulation FD is effective, it should help to reduce information asymmetry. Our hypotheses (H_3 and H_4) state that abnormal trading volume and stock returns have decreased after the adoption of Regulation FD. We begin the analysis by comparing trading volume and stock returns to sell-side recommendations and buy-side recommendations before and after Regulation FD.

Table 6.9 reports the average magnitude of abnormal volumes (*AV*) for sell-side recommendations and buy-side recommendations both before and after the adoption of Regulation FD. The table lists the two sided p-values of *t-test* and *z-test* for the significant of the difference between the two periods. We first look at the difference in *AV*s (i.e., *AV*=0) between both periods. For sell-side recommendations, the *AV*s prior to event day are small and not generally significant so there is no evidence of informed trading during both periods. In *Table 6.10*, we report cumulative abnormal volumes (*CAV*s) around the day of the release of recommendations before and after the Regulation FD. These abnormal volumes (*AV*) are graphed in *Panel A* of *Figure 6.3*.

For sell-side recommendations, there is no significant positive *CAV* prior to event day during both periods.

[Insert *Table 6.9* and *Table 6.10* and *Figure 6.3* about here]

For buy-side recommendations, most *AV*s before event day are significantly different from zero during the both periods in *Table 6.10* (i.e., *AV*s≠0). The results indicate that there is information disparity among market participants. However, *Table 6.10* and *Panel B* of *Figure 6.3* show that there is significant difference in the *CAV*s before and after Regulation FD. *CAV*s for [*Day-9, Day-1*], [*Day-7, Day-1*], [*Day-5, Day-1*] and [*Day-3, Day-1*] before Regulation FD are 0.40%, 0.38%, 0.32% and 0.23% while *CAV*s for [*Day-9, Day-1*], [*Day-7, Day-1*], [*Day-5, Day-1*] and [*Day-3, Day-1*] after Regulation FD are 0.17%, 0.13, 0.12% and 0.10% respectively. The differences in *CAV*s are highly significant. The results are also consistent with our hypotheses and the assertion in the previous section that Regulation FD improves information flow to investors.

Table 6.11 presents the abnormal stock returns (*AR*) for both recommendations around Regulation FD. For sell-side recommendations, *AR*s for [*Day-7*], [*Day-6*] [*Day-5*] and [*Day-1*] in the pre-FD period are significantly negative while *AR*s for [*Day-9*], [*Day-8*] [*Day-1*] in the post-FD period are significantly negative (i.e., *AR*≠0). For buy-side recommendations, most *AR*s prior to event day show the significant positive during both periods.

[Insert *Table 6.11* and *Table 6.12* and *Figure 6.4* about here]

As shown in *Table 6.12* and *Panel A* of *Figure 6.4*., for sell-side recommendations, *CAR*s for [*Day-9, Day-1*], [*Day-7, Day-1*] and [*Day-5, Day-1*] in the pre-FD period are -1.36%, -0.57% and -0.71% while, *CAR* for [*Day-9, Day-1*] in the post-FD period it is -1.01%, significant at the level of 1%. On the other hand, for buy-side recommendations, *CAR*s for [*Day-9, Day-1*], [*Day-7, Day-1*], [*Day-5, Day-1*] and for sell-side recommendations, all β_1s of *FD* are insignificant while those for buy-side recommendations in the pre-FD period are 1.39%, 1.23%, 0.86% and 0.59% while, *CAR*s for [*Day-9, Day-1*], [*Day-7, Day-1*], [*Day-5, Day-1*] and [*Day-3, Day-1*] in the post-FD period are 0.35%, 0.47%, 0.40% and 0.30%.

As shown in *Table 6.12* and *Figure 6.4*, however, there are significant differences in the all *CAR*s prior to event day in the post-FD period, compared to the pre-FD period. Similar to the previous section, the results are generally consistent with our hypotheses (H_3 and H_4) and previous research. Cornett et al., (2007) find that stock returns to analysts' recommendations change has significantly decreased in the post-FD period. Our results indicate that it seems to reduce uncertainty on future earnings in the post-FD period.

6.5.2.2. Multivariate Results

The results of cross-sectional analysis of *CAV* and *CAR* in each of six windows are displayed in *Table 6.13* and *Table 6.14*. *Table 6.13* presents the regression results of *CAV* for sell-side recommendations and buy-side recommendations. The coefficient, β_1

of *FD*, captures the difference in *CAV* between the pre-FD and the post-FD period. In all event windows, for sell-side recommendations, all β_1s of *FD* are insignificant. The results indicate that securities companies (or analysts) tend to keep the information regarding forthcoming their analysts' sell-side recommendations from important clients prior to the open.

On the other hand, for buy-side recommendations, all β_1s are negatively significant. The results are consistent with our hypotheses (H_3 and H_4) and univariate results, indicating that Regulation FD contributes to the elimination of selective disclosure of private information. *Table 6.14* presents the regression results of *CAR* for six windows around analysts' recommendations release. For sell-side recommendations, except for [*Day-7, Day-1*], other β_1s of *FD* are insignificant. However, as expected, the all coefficients (β_1s) of FD for buy-side recommendations are significantly negative, which is consistent with our expectations (H_4).

In order to corroborate our results, we additionally examine the *CAV* and *CAR* for first two buy-side recommendations. *Table 6.16* presents that all β_1s of *CAV* for first two recommendations prior to recommendations release date are significantly negative. On the other hand, *Table 6.17* presents the β_1s of *CAR* for [*Day-9, Day-1*] and [*Day-7, Day-1*], prior to event day are significantly negative.

The results in *Table 6.16* and *Table 6.17* confirm the prior findings and our hypotheses (H_3 and H_4) of decreased in informed trading prior to the analysts' recommendations

release in the post-FD period.[87] Taking these results together, Regulation FD may level the playing field by giving individual investors the same information as other market participants.

6.6. Summary and Conclusions

We provide an empirical study of the effect of Regulation FD on the informed trading prior to the earnings announcement and release of analysts' recommendations. With Regulation FD's aim of levelling the playing field, we expect a decrease in information asymmetry. If selective disclosure had been prevalent prior to Regulation FD, there would be information leakage before earnings announcement or analysts' recommendations release. However, we would not expect to see evidence of such selective disclosure after the adoption of Regulation FD.

After the adoption of Regulation FD, trading volume and market response prior to event day may be smaller, if informed trading decreases and available public information increase. For the study, we examine the cumulative abnormal volumes (*CAV*) and cumulative abnormal returns (*CAR*) prior to the earnings announcement both in the pre-FD and in the post-FD period. We find evidence that a general sharp increase in *CAV*s prior to event day does not persist in the post-FD period, which indicates that Regulation FD influences a decrease in informed trading. The results are consistent with Mac (2002), who finds that informed trading does not exist in the post-FD due to the elimination of selective disclosure. We also find that there is a significant difference in

[87] To further our investigation, we measure the informed trading prior to first buy-side recommendations and first three buy-side recommendations. The results are similar to the above results.

*CAR*s in the post-FD period, which indicates that average information quality has increased in the post-FD period. The results are consistent with Gadarowski et al., (2002) who find lower stock returns prior to earnings announcement in the post-FD period compared to the pre-FD period.

Next, we examine the changes in informed trading prior to analysts' recommendations. For buy-side recommendations, there is informed trading prior to analysts' recommendations during the pre-FD and post-FD periods. However, we find that information disparity among market participants decreases after the adoption of Regulation FD. We also find evidence that there is a significant decrease in market response prior to the recommendations release after the adoption of Regulation FD. These results are consistent with Cornett et al., (2007), who suggest that market reaction to analysts' recommendations has significantly decreased in the post-FD period. Our results indicate that it seems to eliminate the private information that was selectively disclosed prior to Regulation FD or provide public information on future earnings. In other words, these results suggest that Regulation FD reduces differences in information quality and informed trading between investors and disseminates material information to the public instead of promoting selective disclosure.

ANNEX 5

Table 6.1 Definition of Variables

This table outlines the definitions of variables used in our hypothesis testing.

CAV	=	cumulative abnormal volumes;
CAR	=	cumulative abnormal returns;
ANALY	=	the number of analysts providing earnings forecasts;
UE	=	reported earnings less consensus forecasts earnings;
SIZE	=	the natural log of the total asset at the end of the last year of forecast;
LEVER	=	leverage ratio;
VOLA	=	standard deviation of daily stock returns for one year prior to analysts' recommendations;
SECU	=	the number of broker's analysts;
FD	=	dummy variable that equals 1 for firms take in the post-FD (year 2003-2007) period and 0 otherwise.

Table 6.2 Sample Selection

Sample A is based on the firms-year observations while Sample B is based on the forecasts-year observations. Sample A and Sample B consist of 2,531 observations and 113,164 observations from 2000 to 2007. Sample A excludes the observations reported in year 2002).

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*Total*
Sample A	*274*	*300*	*-*	*264*	*208*	*426*	*520*	*539*	*2,531*
Sample B	*2,770*	*10,782*	*12,155*	*13,655*	*26,486*	*22,923*	*13,870*	*102,641*	*113,164*

Table 6.3 AVs around Earnings Announcement

This table presents the volume effect around unscheduled earnings announcement made by Korean Exchange-listed firms, over the sample period of 2000 to 2007 (excluding 2002). The event date (D) is defined as the unscheduled earnings announcement release date. A t-test is used to measure whether the mean is statistically different from zero and z-test (Wilcoxon signed test) is used to measure whether the median is statistically different from zero. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Earnings Decrease Firms* >

	Pre-FD periods (n=308)						*Post-FD periods (n=922)*					
	AV	*Difference* (*AV=0*)				*CAV*	*AV*	*Difference* (*AV=0*)				*CAV*
		t-test		*z-test*				*t-test*		*z-test*		
Day-9	*0.0045*	***	*3.12*	***	*3.23*	*0.0045*	*-0.0004*		*-1.21*	**	*-1.99*	*-0.0004*
Day-8	*0.0060*	***	*3.98*	***	*3.72*	*0.0106*	*0.0001*		*0.18*		*-1.48*	*-0.0003*
Day-7	*0.0076*	***	*5.12*	***	*4.96*	*0.0181*	*0.0004*		*0.77*	**	*-2.05*	*0.0001*
Day-6	*0.0031*	**	*2.24*		*0.91*	*0.0212*	*0.0006*		*1.03*		*-1.26*	*0.0006*
Day-5	*0.0038*	***	*2.80*	*	*1.93*	*0.0250*	*-0.0001*		*-0.14*	**	*-2.38*	*0.0005*
Day-4	*0.0048*	***	*3.42*	***	*3.74*	*0.0298*	*-0.0005*		*-1.19*	**	*-2.45*	*-0.0000*
Day-3	*0.0019*		*1.21*		*-1.07*	*0.0317*	*-0.0002*		*-0.38*	***	*-3.74*	*-0.0002*
Day-2	*0.0020*		*1.29*		*-1.23*	*0.0337*	*-0.0004*		*-0.86*	***	*-4.00*	*-0.0006*
Day-1	*0.0004*		*0.37*		*-0.99*	*0.0341*	*-0.0003*		*-0.64*	**	*-2.01*	*-0.0009*
Day+0	*0.0003*		*0.18*	***	*2.61*	*0.0344*	*0.0012*	*	*1.74*		*0.02*	*0.0003*
Day+1	*-0.0001*		*-0.11*	***	*-3.00*	*0.0342*	*0.0014*	**	*2.34*	**	*2.45*	*0.0016*
Day+2	*-0.0008*		*-0.64*	***	*-3.45*	*0.0334*	*0.0013*	*	*1.67*		*0.24*	*0.0029*
Day+3	*-0.0011*		*-0.72*	***	*-4.31*	*0.0323*	*0.0010*		*1.62*		*-0.45*	*0.0039*

< *Panel B: Earnings Increase Firms* >

	Pre-FD periods (n=266)						*Post-FD periods (n=1,035)*					
	AV	*Difference* (*AV=0*)				*CAV*	*AV*	*Difference* (*AV=0*)				*CAV*
		t-test		*z-test*				*t-test*		*z-test*		
Day-9	*0.0033*	**	*2.53*	***	*2.75*	*0.0033*	*0.0001*		*0.30*		*-0.36*	*0.0001*
Day-8	*0.0065*	***	*3.45*	***	*4.12*	*0.0098*	*0.0002*		*0.67*		*-0.62*	*0.0003*
Day-7	*0.0060*	***	*3.80*	***	*3.35*	*0.0158*	*0.0005*		*1.42*		*1.22*	*0.0008*
Day-6	*0.0038*	***	*2.65*	**	*2.00*	*0.0196*	*0.0004*		*0.90*		*-0.78*	*0.0012*
Day-5	*0.0028*	*	*1.86*	***	*2.70*	*0.0224*	*0.0003*		*0.69*		*-1.42*	*0.0014*
Day-4	*0.0022*		*1.55*	*	*1.88*	*0.0246*	*-0.0000*		*-0.08*	**	*-2.34*	*0.0014*
Day-3	*0.0011*		*0.78*		*-0.23*	*0.0257*	*-0.0003*		*-0.90*		*-0.99*	*0.0011*
Day-2	*0.0004*		*0.25*		*-1.08*	*0.0261*	*-0.0003*		*-0.79*		*-0.84*	*0.0008*
Day-1	*-0.0007*		*-0.52*		*-1.48*	*0.0254*	*-0.0004*		*-1.47*		*-1.02*	*0.0004*
Day+0	*-0.0008*		*-0.65*	**	*-2.23*	*0.0246*	*0.0032*	***	*4.70*	***	*5.54*	*0.0037*
Day+1	*-0.0013*		*-1.00*	***	*-2.47*	*0.0233*	*0.0018*	***	*4.16*	***	*6.31*	*0.0055*
Day+2	*0.0004*		*0.24*	***	*-2.72*	*0.0238*	*0.0007*		*1.59*		*1.50*	*0.0062*
Day+3	*0.0039*		*1.48*	*	*-1.74*	*0.0277*	*0.0005*		*1.48*	***	*2.67*	*0.0067*

Table 6.4 Comparison of CAVs around Earnings Announcement

This table presents the volume effect around unscheduled earnings announcement made by Korean Exchange-listed firms, over the sample period of 2000 to 2007 (excluding 2002). The event date (D) is defined as the unscheduled earnings announcement release date. Z-test is used to measure whether the median is statistically different from each other while t-test is used to measure whether the mean between pre-FD period and post-FD period is statistically different each other (2) or the mean is statistically different form the zero (1). P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Earnings Decrease Firms* >

Variables	*Pre-FD periods (n=308)*		*Difference* ($CAV_{pre\text{-}FD} = CAV_{post\text{-}FD}$)		*Post-FD periods(n=922)*	
		t-test (CAV=0)(1)	*t-test (2)*	*z-test*		*t-test (CAV=0)*
CAV(D-9, D-1)	*0.0341*	*3.83* ***	*4.96* ***	*5.02* ***	*-0.0009*	*-0.31*
CAV(D-7, D-1)	*0.0235*	*3.19* ***	*4.02* ***	*4.18* ***	*-0.0005*	*-0.22*
CAV(D-5, D-1)	*0.0129*	*2.22* **	*3.15* ***	*2.84* ***	*-0.0015*	*-0.84*
CAV(D-3, D-1)	*0.0043*	*1.14*	*1.71* *	*0.40*	*-0.0009*	*-0.73*
CAV(D+0, D+1)	*0.0001*	*0.05*	*-1.00*	*-4.36* ***	*0.0025*	*2.35* **
CAV(D+0, D+3)	*-0.0018*	*-0.38*	*-1.46*	*-4.70* ***	*0.0047*	*2.32* **

< *Panel B: Earnings Increase Firms* >

Variables	*Pre-FD periods (n=266)*		*Difference* ($CAV_{pre\text{-}FD} = CAV_{post\text{-}FD}$)		*Post-FD periods(n=1,035)*	
		t-test (CAV=0)(1)	*t-test (2)*	*z-test*		*t-test (CAV=0)*
CAV(D-9, D-1)	*0.0254*	*2.84* ***	*4.03* ***	*4.41* ***	*0.0004*	*0.20*
CAV(D-7, D-1)	*0.0156*	*2.14* **	*3.05* ***	*3.24* ***	*0.0001*	*0.07*
CAV(D-5, D-1)	*0.0058*	*1.01*	*1.68* *	*1.93* *	*-0.0007*	*-0.56*
CAV(D-3, D-1)	*0.0008*	*0.23*	*0.74*	*-0.47*	*-0.0010*	*-1.21*
CAV(D+0, D+1)	*-0.0020*	*-0.83*	*-3.05* ***	*-4.77* ***	*0.0050*	*5.06* ***
CAV(D+0, D+3)	*0.0023*	*0.43*	*-0.98*	*-3.56* ***	*0.0063*	*4.02* ***

Table 6.5 ARs around Earnings Announcement

This table presents the valuation effect around unscheduled earnings announcement made by Korean Exchange-listed firms, over the sample period of 2000 to 2007 (excluding 2002). The event date (D) is defined as the unscheduled earnings announcement release date. A t-test is used to measure whether the mean is statistically different from zero and z-test (Wilcoxon signed test) is used to measure whether the median is statistically different from zero. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Earnings Decrease Firms* >

	Pre-FD periods (n=308)						*Post-FD periods (n=922)*					
	AR	*Difference (AR=0)*				*CAR*	*AR*	*Difference (AR=0)*				*CAR*
		t-test		*z-test*				*t-test*		*z-test*		
Day-9	*0.0051*	**	*2.13*	**	*2.00*	*0.0051*	*-0.0030*	***	*-2.62*	***	*-4.11*	*-0.0030*
Day-8	*-0.0005*		*-0.28*		*-1.34*	*0.0046*	*0.0009*		*-0.26*	**	*-2.00*	*-0.0021*
Day-7	*0.0019*		*0.97*		*-0.40*	*0.0065*	*0.0026*	***	*3.17*	**	*2.00*	*0.0005*
Day-6	*0.0030*		*1.61*		*0.62*	*0.0095*	*-0.0003*		*-0.85*	***	*-3.10*	*0.0002*
Day-5	*-0.0088*	***	*-4.42*	***	*-7.05*	*0.0007*	*-0.0011*		*-0.91*	**	*-2.30*	*-0.0009*
Day-4	*0.0080*	***	*3.41*		*1.53*	*0.0087*	*-0.0004*		*-0.57*	**	*-1.65*	*-0.0013*
Day-3	*-0.0037*	**	*-2.00*	**	*-2.11*	*0.0050*	*0.0008*		*0.85*		*0.31*	*-0.0005*
Day-2	*-0.0087*	***	*-5.09*	***	*-6.93*	*-0.0037*	*-0.0011*	**	*-2.41*	***	*-3.59*	*-0.0016*
Day-1	*0.0014*		*0.81*		*0.07*	*-0.0023*	*-0.0006*		*-0.99*	**	*-2.20*	*-0.0022*
Day+0	*0.0079*	***	*2.74*	***	*5.92*	*0.0056*	*0.0025*	***	*3.03*	***	*4.25*	*0.0002*
Day+1	*0.0001*		*0.04*		*0.27*	*0.0057*	*-0.0024*	**	*-2.10*	***	*-3.65*	*-0.0022*
Day+2	*-0.0100*	***	*-4.70*	***	*-5.37*	*-0.0044*	*-0.0002*		*0.31*	*	*-1.61*	*-0.0024*
Day+3	*-0.0092*	***	*-4.46*	***	*-5.13*	*-0.0136*	*0.0009*		*1.64*		*-0.10*	*-0.0015*

< *Panel B: Earnings Increase Firms* >

	Pre-FD periods (n=266)					*Post-FD periods (n=1,035)*				
	AR	*Difference* (*AR=0*) *t-test*		*Difference* (*AR=0*) *z-test*		*CAR*	*AR*	*Difference* (*AR=0*) *t-test*		*Difference* (*AR=0*) *z-test*		*CAR*
Day-9	*0.0140*	***	*5.78*	***	*4.68*	*0.0140*	*-0.0015*	**	*-2.42*	***	*-2.74*	*-0.0015*
Day-8	*0.0016*		*0.75*		*-0.41*	*0.0156*	*0.0008*		*1.40*		*0.12*	*-0.0007*
Day-7	*0.0012*		*0.64*		*-0.23*	*0.0168*	*0.0011*	*	*1.85*		*0.52*	*0.0004*
Day-6	*0.0071*	***	*3.62*	***	*3.18*	*0.0238*	*-0.0009*		*-1.54*	***	*-2.95*	*-0.0005*
Day-5	*-0.0089*	***	*-4.55*	***	*-6.82*	*0.0149*	*0.0007*		*1.38*		*-0.28*	*0.0002*
Day-4	*0.0047*	**	*2.36*		*0.95*	*0.0196*	*-0.0004*		*-0.82*	*	*-1.86*	*-0.0002*
Day-3	*0.0018*		*0.83*		*0.16*	*0.0214*	*0.0003*		*0.83*		*0.10*	*0.0002*
Day-2	*-0.0064*	***	*-4.01*	***	*-5.28*	*0.0149*	*-0.0003*		*0.07*		*-0.92*	*-0.0001*
Day-1	*0.0077*	***	*5.40*	***	*5.10*	*0.0226*	*0.0014*	***	*2.74*	**	*2.05*	*0.0012*
Day+0	*0.0026*		*1.51*	***	*2.87*	*0.0253*	*-0.0025*	***	*-2.77*		*-1.42*	*-0.0013*
Day+1	*0.0053*	**	*2.26*	*	*1.74*	*0.0306*	*0.0006*		*1.59*		*0.14*	*-0.0007*
Day+2	*-0.0095*	***	*-4.65*	***	*-5.31*	*0.0210*	*-0.0002*		*0.41*		*-1.09*	*-0.0008*
Day+3	*0.0011*		*0.48*		*0.16*	*0.0221*	*-0.0005*		*0.07*	*	*-1.88*	*-0.0013*

Table 6.6 CARs around Earnings Announcement

This table presents the valuation effect around unscheduled earnings announcement made by Korean Exchange-listed firms, over the sample period of 2000 to 2007 (excluding 2002). The event date (D) is defined as the unscheduled earnings announcement release date. Z-test is used to measure whether the median is statistically different each other while t-test is used to measure whether the mean between pre-FD period and post-FD period is statistically different from each other (2) or the mean is statistically different from the zero (1). P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Earnings Decrease Firms* >

Variables	*Pre-FD periods (n=308)*		*Difference* ($CAR_{pre\text{-}FD} = CAR_{post\text{-}FD}$)		*Post-FD periods(n=922)*	
		t-test (CAR=0)(1)	*t-test (2)*	*z-test*		*t-test (CAR=0)(1)*
CAR(D-9, D-1)	*-0.0023*	*-0.47*	*0.48*	*0.18*	*-0.0046*	*-2.02* **
CAR(D-7, D-1)	*-0.0069*	*-1.67* *	*-1.29*	*-2.08* **	*-0.0014*	*-0.69*
CAR(D-5, D-1)	*-0.0118*	*-3.00* ***	*-2.22* **	*-3.30* ***	*-0.0033*	*-1.87* *
CAR(D-3, D-1)	*-0.0110*	*-3.60* ***	*-2.94* ***	*-3.05* ***	*-0.0021*	*-1.44*
CAR(D+0,D+1)	*0.0080*	*2.83* ***	*2.55* **	*3.66* ***	*0.0007*	*0.53*
CAR(D+0,D+3)	*-0.0113*	*-2.53* **	*-3.32* ***	*-2.77* ***	*0.0024*	*1.36*

< *Panel B: Earnings Increase Firms* >

Variables	*Pre-FD periods (n=266)*		*Difference* ($CAR_{pre\text{-}FD} = CAR_{post\text{-}FD}$)		*Post-FD periods(n=1,035)*	
		t-test (CAR=0)(1)	*t-test (2)*	*z-test*		*t-test (CAR=0)(1)*
CAR(D-9, D-1)	*0.0226*	*5.16* ***	*4.46* ***	*3.65* ***	*0.0022*	*1.06*
CAR(D-7, D-1)	*0.0071*	*1.92* *	*-0.87*	*0.43*	*0.0036*	*2.05* **
CAR(D-5, D-1)	*-0.0012*	*-0.34*	*-1.28*	*-2.25* **	*0.0033*	*2.14* **
CAR(D-3, D-1)	*0.0030*	*1.02*	*0.07*	*-0.81*	*0.0028*	*2.21* **
CAR(D+0,D+1)	*0.0079*	*2.76* ***	*3.05* ***	*3.02* ***	*-0.0010*	*-0.78*
CAR(D+0,D+3)	*-0.0006*	*-0.15*	*-0.66*	*0.30*	*-0.0006*	*-0.37*

Table 6.7 Regression of CAVs around Earnings Announcement

This table presents the volume effect around earnings announcement for 2,531 observations from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to 2001 and the post-FD period is from 2003 to 2007. The dependent variable is cumulative abnormal volumes (*CAV*) for each event window. The explanatory variables are post-FD period (*FD*), analyst following (*ANALY*), unexpected earnings (*UE*), firms size (*SIZE*), and leverage (*LEVER*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Earnings Decrease Firms* >

$$CAV = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 UE + \beta_4 SIZE + \beta_5 LEVER + \varepsilon$$

		CAV(D-9, D-1)			***CAV(D-7, D-1)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0494* **	*2.02*	*0.044*	*0.0259*	*1.25*	*0.213*
FD	β_1	*-0.0310* ***	*-3.60*	*0.000*	*-0.0218* ***	*-2.98*	*0.003*
ANALY	β_2	*0.0001*	*1.16*	*0.247*	*0.0000*	*0.32*	*0.748*
UE	β_3	*0.0144*	*0.57*	*0.571*	*0.0146*	*0.68*	*0.497*
SIZE	β_4	*-0.0099*	*-1.21*	*0.225*	*-0.0035*	*-0.51*	*0.611*
LEVER	β_5	*0.0233*	*0.65*	*0.513*	*0.0141*	*0.46*	*0.642*
		Number of obs = 1,230			*Number of obs = 1,230*		
		Adj R-squared = 0.0200			*Adj R-squared = 0.0130*		
		CAV(D-5, D-1)			***CAV(D-3, D-1)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0133*	*0.83*	*0.409*	*0.0005*	*0.05*	*0.962*
FD	β_1	*-0.0135* **	*-2.39*	*0.017*	*-0.0040*	*-1.09*	*0.277*
ANALY	β_2	*0.0000*	*0.09*	*0.930*	*0.0000*	*-0.30*	*0.764*
UE	β_3	*0.0224*	*1.35*	*0.178*	*0.0171*	*1.59*	*0.112*
SIZE	β_4	*-0.0013*	*-0.24*	*0.814*	*0.0004*	*0.12*	*0.903*
LEVER	β_5	*0.0096*	*0.41*	*0.683*	*0.0123*	*0.81*	*0.416*
		Number of obs = 1,230			*Number of obs = 1,230*		
		Adj R-squared = 0.0095			*Adj R-squared = 0.0053*		
		CAV(D+0, D+1)			***CAV(D+0, D+3)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*-0.0005*	*-0.06*	*0.950*	*0.0022*	*0.15*	*0.878*
FD	β_1	*0.0038*	*1.44*	*0.150*	*0.0080*	*1.59*	*0.112*
ANALY	β_2	*0.0000*	*-0.32*	*0.751*	*0.0000*	*0.26*	*0.796*
UE	β_3	*0.0011*	*0.14*	*0.888*	*-0.0051*	*-0.35*	*0.729*
SIZE	β_4	*-0.0005*	*-0.21*	*0.833*	*-0.0027*	*-0.57*	*0.565*
LEVER	β_5	*-0.0062*	*-0.58*	*0.565*	*-0.0141*	*-0.68*	*0.499*
		Number of obs = 1,230			*N Number of obs = 1,230*		
		Adj R-squared = 0.0033			*Adj R-squared = 0.0042*		

< Panel B: Earnings Increase Firms >

$$CAV = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 UE + \beta_4 SIZE + \beta_5 LEVER + \varepsilon$$

		CAV(D-9, D-1)			CAV(D-7, D-1)		
		Coef.	t	P>|t|	Coef.	t	P>|t|
INTERCEPT	α	0.0550 ***	3.01	0.003	0.0321 **	2.14	0.032
FD	β_1	-0.0249 ***	-3.56	0.000	-0.0165 ***	-2.88	0.004
ANALY	β_2	0.0001	1.43	0.154	0.0000	0.95	0.342
UE	β_3	-0.0798 *	-1.87	0.062	-0.0594 *	-1.69	0.091
SIZE	β_4	-0.0114 *	-1.87	0.061	-0.0064	-1.28	0.201
LEVER	β_5	0.0099	0.38	0.704	0.0120	0.56	0.575
		Number of obs = 1,301			Number of obs = 1,301		
		Adj R-squared = 0.0247			Adj R-squared = 0.0168		
		CAV(D-5, D-1)			CAV(D-3, D-1)		
		Coef.	t	P>|t|	Coef.	t	P>|t|
INTERCEPT	α	0.0160	1.40	0.161	0.0044	0.63	0.532
FD	β_1	-0.0097 **	-2.22	0.026	-0.0041	-1.54	0.125
ANALY	β_2	0.0000	0.80	0.425	0.0000	0.52	0.602
UE	β_3	-0.0118	-0.44	0.658	-0.0049	-0.30	0.765
SIZE	β_4	-0.0033	-0.86	0.392	-0.0009	-0.36	0.716
LEVER	β_5	0.0076	0.47	0.641	-0.0003	-0.03	0.978
		Number of obs = 1,301			Number of obs = 1,301		
		Adj R-squared = 0.0079			Adj R-squared = 0.0030		
		CAV(D+0, D+1)			CAV(D+0, D+3)		
		Coef.	t	P>|t|	Coef.	t	P>|t|
INTERCEPT	α	-0.0100 *	-1.75	0.080	-0.0154	-1.42	0.155
FD	β_1	0.0064 ***	2.92	0.004	0.0079 *	1.91	0.056
ANALY	β_2	0.0000	-1.48	0.139	0.0000	-0.98	0.327
UE	β_3	-0.0095	-0.71	0.478	-0.0228	-0.90	0.368
SIZE	β_4	0.0024	1.27	0.203	0.0040	1.12	0.263
LEVER	β_5	0.0048	0.59	0.552	0.0061	0.40	0.691
		Number of obs = 1,301			Number of obs = 1,301		
		Adj R-squared = 0.0123			Adj R-squared = 0.0066		

Table 6.8 Regression of CARs around Earnings Announcement

This table presents the valuation effect around earnings announcement for 2,531 observations from 2000 to 2007 (excluding year 2002). The dependent variable is cumulative abnormal returns (*CAR*) for each event window. The explanatory variables are post-FD period (*FD*), analyst following (*ANALY*), unexpected earnings (*UE*), firms size (*SIZE*), leverage (*LEVER*) and cumulative abnormal volumes (*CAV*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Earnings Decrease Firms* >

$$CAR = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 UE + \beta_4 SIZE + \beta_5 LEVER + \beta_6 CAV + \varepsilon$$

		CAR(D-9, D-1)				***CAR(D-7, D-1)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*-0.0123*		*-0.74*	*0.458*	*-0.0037*		*-0.26*	*0.795*
FD	β_1	*-0.0063*		*-1.08*	*0.282*	*0.0017*		*0.33*	*0.741*
ANALY	β_2	*0.0000*		*-0.95*	*0.341*	*0.0000*		*0.20*	*0.844*
UE	β_3	*0.0332*	*	*1.94*	*0.052*	*0.0202*		*1.37*	*0.171*
SIZE	β_4	*0.0044*		*0.80*	*0.427*	*-0.0003*		*-0.06*	*0.952*
LEVER	β_5	*0.0142*		*0.59*	*0.554*	*-0.0049*		*-0.24*	*0.812*
CAV	β_6	*0.1838*	***	*7.83*	*0.000*	*0.2084*	***	*8.74*	*0.000*
		Number of obs = 1,230				*Number of obs = 1,230*			
		Adj R-squared = 0.0793				*Adj R-squared = 0.0879*			
		CAR(D-5, D-1)				***CAR(D-3, D-1)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*-0.0081*		*-0.64*	*0.523*	*-0.0126*		*-1.23*	*0.219*
FD	β_1	*0.0041*		*0.93*	*0.353*	*0.0069*	*	*1.92*	*0.055*
ANALY	β_2	*0.0000*		*0.61*	*0.541*	*0.0000*		*-0.93*	*0.355*
UE	β_3	*0.0214*		*1.64*	*0.101*	*0.0039*		*0.37*	*0.710*
SIZE	β_4	*-0.0001*		*-0.01*	*0.900*	*0.0018*		*0.54*	*0.588*
LEVER	β_5	*-0.0041*		*-0.22*	*0.825*	*-0.0091*		*-0.61*	*0.543*
CAV	β_6	*0.2460*	***	*9.01*	*0.000*	*0.0954*	***	*2.77*	*0.006*
		Number of obs = 1,230				*Number of obs = 1,230*			
		Adj R-squared = 0.0957				*Adj R-squared = 0.0153*			
		CAR(D+0, D+1)				***CAR(D+0, D+3)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.0029*		*0.31*	*0.756*	*-0.0387*	***	*-2.78*	*0.006*
FD	β_1	*-0.0057*	*	*-1.72*	*0.086*	*0.0090*	*	*1.84*	*0.066*
ANALY	β_2	*0.0000*		*-1.17*	*0.242*	*-0.0001*	*	*-1.96*	*0.051*
UE	β_3	*-0.0036*		*-0.37*	*0.711*	*-0.0010*		*-0.07*	*0.947*
SIZE	β_4	*0.0023*		*0.73*	*0.466*	*0.0124*	***	*2.67*	*0.008*
LEVER	β_5	*-0.0131*		*-0.96*	*0.337*	*-0.0125*		*-0.61*	*0.539*
CAV	β_6	*-0.0874*	**	*-1.99*	*0.047*	*0.0044*		*0.13*	*0.896*
		Number of obs = 1,230				*N Number of obs = 1,230*			
		Adj R-squared = 0.0120				*Adj R-squared = 0.0156*			

< Panel B: Earnings Increase Firms >

$$CAR = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 UE + \beta_4 SIZE + \beta_5 LEVER + \beta_6 CAV + \varepsilon$$

		CAR(D-9, D-1)				***CAR(D-7, D-1)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.0211*		*1.51*	*0.132*	*-0.0113*		*-0.95*	*0.343*
FD	β_1	*-0.0257*	***	*-4.77*	*0.000*	*-0.0078*	*	*-1.70*	*0.090*
ANALY	β_2	*0.0000*		*0.69*	*0.489*	*0.0000*		*-0.44*	*0.658*
UE	β_3	*0.0569*	*	*1.74*	*0.083*	*0.0665*	**	*2.37*	*0.018*
SIZE	β_4	*0.0008*		*0.16*	*0.871*	*0.0064*		*1.59*	*0.112*
LEVER	β_5	*0.0119*		*0.60*	*0.549*	*0.0181*		*1.06*	*0.288*
CAV	β_6	*0.1478*	***	*5.85*	*0.000*	*0.1440*	***	*5.48*	*0.000*
		Number of obs = 1,301				*Number of obs = 1,301*			
		Adj R-squared = 0.0701				*Adj R-squared = 0.0442*			
		CAR(D-5, D-1)				***CAR(D-3, D-1)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*-0.0087*		*-0.85*	*0.397*	*-0.0083*		*-0.94*	*0.346*
FD	β_1	*-0.0007*		*-0.18*	*0.854*	*-0.0063*	*	*-1.87*	*0.062*
ANALY	β_2	*0.0000*		*-0.74*	*0.458*	*0.0000*	*	*-1.81*	*0.070*
UE	β_3	*0.0255*		*1.06*	*0.289*	*-0.0076*		*-0.37*	*0.712*
SIZE	β_4	*0.0043*		*1.25*	*0.212*	*0.0063*	**	*2.15*	*0.032*
LEVER	β_5	*-0.0067*		*-0.46*	*0.646*	*-0.0155*		*-1.24*	*0.216*
CAV	β_6	*0.1491*	***	*5.02*	*0.000*	*0.1487*	***	*3.61*	*0.000*
		Number of obs = 1,301				*Number of obs = 1,301*			
		Adj R-squared = 0.0297				*Adj R-squared = 0.0245*			
		CAR(D+0, D+1)				***CAR(D+0, D+3)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.0067*		*0.78*	*0.434*	*0.0007*		*0.06*	*0.953*
FD	β_1	*-0.0055*	*	*-1.67*	*0.095*	*-0.0009*		*-0.19*	*0.848*
ANALY	β_2	*0.0000*		*-0.67*	*0.503*	*0.0000*		*-0.91*	*0.365*
UE	β_3	*0.0086*		*0.43*	*0.667*	*0.0150*		*0.55*	*0.584*
SIZE	β_4	*0.0001*		*0.04*	*0.971*	*0.0014*		*0.36*	*0.722*
LEVER	β_5	*-0.0150*		*-1.23*	*0.218*	*-0.0294*	*	*-1.76*	*0.078*
CAV	β_6	*-0.1441*	***	*-2.92*	*0.004*	*0.0369*		*1.03*	*0.302*
		Number of obs = 1,301				*N Number of obs = 1,301*			
		Adj R-squared = 0.0057				*Adj R-squared = 0.0059*			

Table 6.9 AVs around Analysts' Recommendations

This table presents the volume effect around analysts' sell-side and buy-side recommendations made by Korean analysts, over the sample period of 2000 to 2007. The pre-FD period is from 2000 to October 2002 and the post-FD period is from November 2002 to 2007.The event date (D) is defined as the release of analysts' recommendations. A t-test is used to measure whether the mean is statistically different from zero and z-test (Wilcoxon signed test) is used to measure whether the median is statistically different from zero. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Sell-Side Recommendations* >

	Pre-FD periods (n=1,722)					*Post-FD periods (n=769)*				
	AV	*Difference* (*AV=0*)			*CAV*	*AV*	*Difference* (*AV=0*)			*CAV*
		t-test		*z-test*			*t-test*		*z-test*	
Day-9	*-0.0001*		*-0.20*		*-0.92*	*-0.0001*	*0.0002*		*0.30*		*0.43*	*0.0002*
Day-8	*-0.0009*		*-1.23*		*-1.02*	*-0.0010*	*0.0003*		*0.52*		*0.91*	*0.0005*
Day-7	*0.0011*		*1.40*		*0.35*	*0.0001*	*-0.0008*		*-1.21*		*-1.59*	*-0.0002*
Day-6	*-0.0015*	**	*-2.01*	***	*-2.94*	*-0.0015*	*-0.0011*	*	*-1.67*	**	*-2.05*	*-0.0014*
Day-5	*-0.0019*	**	*-2.42*	***	*-4.77*	*-0.0033*	*-0.0011*		*-1.55*	**	*-2.23*	*-0.0024*
Day-4	*-0.0001*		*-0.06*		*-0.44*	*-0.0034*	*0.0008*		*0.97*		*0.27*	*-0.0017*
Day-3	*0.0017*	*	*1.85*	*	*1.86*	*-0.0017*	*0.0003*		*0.40*		*0.70*	*-0.0013*
Day-2	*0.0008*		*0.88*		*-1.04*	*-0.0009*	*0.0005*		*0.63*		*1.42*	*-0.0008*
Day-1	*-0.0004*		*-0.48*		*-1.32*	*-0.0013*	*0.0007*		*0.81*		*1.34*	*-0.0001*
Day+0	*0.0003*		*0.31*	*	*1.92*	*-0.0011*	*0.0022*	**	*2.29*	**	*1.82*	*0.0021*
Day+1	*0.0001*		*0.10*		*1.01*	*-0.0010*	*0.0009*		*1.05*		*0.38*	*0.0030*
Day+2	*0.0004*		*0.37*		*1.05*	*-0.0006*	*0.0008*		*1.03*		*0.58*	*0.0039*
Day+3	*0.0001*		*0.17*		*0.24*	*-0.0004*	*0.0012*		*1.37*		*0.14*	*0.0051*

< ***Panel B: Buy-Side Recommendations*** >

	Pre-FD periods (n=19,162)					*Post-FD periods (n=91,511)*				
	AV	*Difference (AV=0)*			*CAV*	*AV*	*Difference (AV=0)*			*CAV*
		t-test		*z-test*			*t-test*		*z-test*	
Day-9	*0.0001*		*1.08*		*1.41*	*0.0001*	*0.0002*	***	*4.81*	***	*2.79*	*0.0002*
Day-8	*0.0001*		*0.32*		*1.03*	*0.0002*	*0.0001*	***	*3.60*	***	*2.99*	*0.0003*
Day-7	*0.0004*	***	*3.03*	***	*2.83*	*0.0006*	*0.0001*	**	*2.40*	*	*1.85*	*0.0004*
Day-6	*0.0002*		*1.27*		*0.24*	*0.0008*	*0.0000*		*0.20*		*-1.12*	*0.0004*
Day-5	*0.0004*	***	*2.74*	*	*1.87*	*0.0012*	*-0.0000*		*-0.82*	*	*-1.81*	*0.0004*
Day-4	*0.0006*	***	*3.81*	***	*3.45*	*0.0018*	*0.0003*	***	*6.02*	**	*2.28*	*0.0007*
Day-3	*0.0006*	***	*4.59*	***	*3.78*	*0.0024*	*0.0002*	***	*4.49*	***	*3.12*	*0.0009*
Day-2	*0.0009*	***	*5.67*	***	*3.36*	*0.0033*	*0.0002*	***	*5.47*	***	*2.92*	*0.0011*
Day-1	*0.0007*	***	*4.93*	***	*2.78*	*0.0040*	*0.0006*	***	*11.51*	***	*4.80*	*0.0017*
Day+0	*0.0016*	***	*9.79*	***	*8.26*	*0.0056*	*0.0012*	***	*24.11*	***	*20.05*	*0.0029*
Day+1	*0.0014*	***	*9.07*	***	*6.95*	*0.0070*	*0.0008*	***	*15.17*	***	*13.18*	*0.0037*
Day+2	*0.0010*	***	*6.43*	***	*3.56*	*0.0080*	*0.0003*	***	*7.67*	***	*7.61*	*0.0040*
Day+3	*0.0009*	***	*5.33*	***	*2.72*	*0.0089*	*0.0002*	***	*3.11*	*	*1.90*	*0.0042*

Table 6.10 Comparison of CAVs around Analysts' Recommendations

The pre-FD period is from 2000 to October 2002 and the post-FD period is from November 2002 to 2007. The event date (D) is defined as the release of analysts' recommendations. Z-test is used to measure whether the median is statistically different each other while t-test is used to measure whether the mean between pre-FD period and post-FD period is statistically different from each other (2) or the mean is statistically different from zero (1). P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Sell-Side Recommendations* >

Variables	*Pre-FD periods (n=1,722)*		*Difference ($CAV_{pre\text{-}FD}$ = $CAV_{post\text{-}FD}$)*		*Post-FD periods (n=769)*	
		t-test (CAV=0)(1)	*t-test (2)*	*z-test*		*t-test (CAV=0)(1)*
CAV(D-9, D-1)	*-0.0013*	*-0.27*	*-0.15*	*0.30*	*-0.0001*	*-0.03*
CAV(D-7, D-1)	*-0.0003*	*-0.08*	*0.05*	*0.36*	*-0.0007*	*-0.17*
CAV(D-5, D-1)	*0.0001*	*0.04*	*-0.21*	*-0.30*	*0.0012*	*0.39*
CAV(D-3, D-1)	*0.0020*	*0.90*	*0.14*	*-0.63*	*0.0015*	*0.74*
CAV(D+0,D+1)	*0.0004*	*0.22*	*-0.99*	*-1.16*	*0.0031*	*1.90* *
CAV(D+0,D+3)	*0.0009*	*0.28*	*-0.84*	*-0.36*	*0.0052*	*1.72* *

< *Panel B: Buy-Side Recommendations* >

Variables	*Pre-FD periods (n=19,162)*		*Difference ($CAV_{pre\text{-}FD}$ = $CAV_{post\text{-}FD}$)*		*Post-FD periods (n=91,511)*	
		t-test (CAV=0)(1)	*t-test (2)*	*z-test*		*t-test (CAV=0) (1)*
CAV(D-9, D-1)	*0.0040*	*4.26* ***	*3.05* ***	*8.18* ***	*0.0017*	*5.74* ***
CAV(D-7, D-1)	*0.0038*	*4.83* ***	*3.90* ***	*8.26* ***	*0.0013*	*5.57* ***
CAV(D-5, D-1)	*0.0032*	*5.28* ***	*4.13* ***	*6.26* ***	*0.0012*	*6.75* ***
CAV(D-3, D-1)	*0.0023*	*5.76* ***	*4.05* ***	*4.84* ***	*0.0010*	*8.39* ***
CAV(D+0,D+1)	*0.0030*	*10.27* ***	*4.08* ***	*2.90* ***	*0.0020*	*21.76* ***
CAV(D+0,D+3)	*0.0048*	*8.92* ***	*5.29* ***	*5.95* ***	*0.0025*	*15.18* ***

Table 6.11 ARs around Analysts' Recommendations

This table presents the valuation effect around analysts' sell-side and buy-side recommendations made by Korean analysts, over the sample period of 2000 to 2007. The pre-FD period is from 2000 to October 2002 and the post-FD period is from November 2002 to 2007. The event date (D) is defined as the release of analysts' recommendations. A t-test is used to measure whether the mean is statistically different from zero and z-test (Wilcoxon signed test) is used to measure whether the median is statistically different from zero. P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Sell-Side Recommendations* >

	Pre-FD periods (n=1,722)					*Post-FD periods (n=769)*				
	AR	*Difference* (*AR=0*)			*CAR*	*AR*	*Difference* (*AR=0*)			*CAR*
		t-test		*z-test*			*t-test*		*z-test*	
Day-9	*0.0002*		*0.27*	*0.81*	*0.0002*	*-0.0032*	***	*-3.84*	*** *-4.70*	*-0.0032*
Day-8	*0.0019*	*	*1.95*	*1.22*	*0.0021*	*-0.0027*	**	*-2.34*	*** *-3.75*	*-0.0058*
Day-7	*-0.0020*	**	*-2.07*	*** *-5.46*	*0.0001*	*-0.0010*		*-1.00*	*-0.98*	*-0.0069*
Day-6	*-0.0067*	***	*-7.13*	*** *-9.17*	*-0.0066*	*-0.0008*		*-0.74*	*-1.05*	*-0.0077*
Day-5	*-0.0044*	***	*-4.71*	*** *-7.22*	*-0.0110*	*0.0005*		*0.42*	*0.70*	*-0.0073*
Day-4	*0.0001*		*0.10*	*0.92*	*-0.0109*	*-0.0005*		*-0.42*	*-1.32*	*-0.0078*
Day-3	*0.0010*		*1.02*	** *2.02*	*-0.0100*	*0.0008*		*0.74*	*-0.63*	*-0.0069*
Day-2	*-0.0014*		*-1.47*	*-0.88*	*-0.0114*	*-0.0011*		*-1.03*	*1.07*	*-0.0081*
Day-1	*-0.0023*	**	*-2.34*	*** *-4.79*	*-0.0136*	*-0.0020*	*	*-1.77*	** *-2.15*	*-0.0101*
Day+0	*-0.0016*		*-1.63*	*-1.61*	*-0.0152*	*-0.0055*	***	*-4.30*	*** *-5.32*	*-0.0156*
Day+1	*-0.0022*	**	*-2.16*	*** *-3.91*	*-0.0174*	*-0.0009*		*-0.68*	*-0.98*	*-0.0165*
Day+2	*-0.0033*	***	*-3.41*	*** *-7.85*	*-0.0207*	*-0.0007*		*-0.56*	*-1.11*	*-0.0171*
Day+3	*-0.0047*	***	*-4.69*	*** *-8.29*	*-0.0254*	*-0.0029*	**	*-2.49*	*** *-4.22*	*-0.0200*

< ***Panel B: Buy-Side Recommendations*** >

	Pre-FD periods (n=19,162)					*Post-FD periods (n=91,511)*				
	AR	*Difference (AR=0)*			*CAR*	*AR*	*Difference (AR=0)*			*CAR*
		t-test		*z-test*			*t-test*		*z-test*	
Day-9	*-0.0001*		*-0.36*		*-1.38*	*-0.0001*	*-0.0018*	***	*-26.25*	***	*-41.60*	*-0.0018*
Day-8	*0.0017*	***	*7.08*	***	*3.75*	*0.0016*	*0.0006*	***	*6.53*	***	*7.40*	*-0.0012*
Day-7	*0.0023*	***	*9.68*	***	*3.12*	*0.0039*	*0.0005*	***	*5.54*	***	*9.93*	*-0.0007*
Day-6	*0.0014*	***	*5.69*	***	*2.98*	*0.0053*	*0.0002*	*	*1.79*	**	*2.13*	*-0.0006*
Day-5	*0.0010*	***	*4.10*	***	*3.31*	*0.0063*	*0.0005*	***	*5.78*	***	*8.04*	*-0.0001*
Day-4	*0.0017*	***	*6.77*	***	*2.95*	*0.0080*	*0.0006*	***	*6.60*	***	*7.08*	*0.0005*
Day-3	*0.0012*	***	*4.80*	***	*3.31*	*0.0092*	*0.0009*	***	*10.41*	***	*4.75*	*0.0013*
Day-2	*0.0018*	***	*7.35*	***	*2.95*	*0.0110*	*0.0007*	***	*8.24*	***	*5.85*	*0.0020*
Day-1	*0.0029*	***	*11.91*	***	*3.52*	*0.0139*	*0.0014*	***	*15.68*	***	*10.52*	*0.0035*
Day+0	*0.0044*	***	*17.39*	***	*3.65*	*0.0183*	*0.0027*	***	*28.95*	***	*15.15*	*0.0061*
Day+1	*0.0019*	***	*7.63*	***	*4.64*	*0.0202*	*0.0010*	***	*11.17*	***	*10.42*	*0.0071*
Day+2	*0.0012*	***	*4.98*	***	*8.92*	*0.0213*	*0.0004*	***	*4.31*	***	*3.56*	*0.0074*
Day+3	*0.0004*	*	*1.77*	**	*2.56*	*0.0218*	*-0.0001*		*-1.49*	**	*-2.21*	*0.0073*

Table 6.12 Comparison of CARs around Analysts' Recommendations

The pre-FD period is from 2000 to October 2002 and the post-FD period is from November 2002 to 2007. The event date (D) is defined as the release of analysts' recommendations. Z-test is used to measure whether the median is statistically different each other while t-test is used to measure whether the mean between pre-FD period and post-FD period is statistically different from each other (2) or the mean is statistically different from zero (1). P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Sell-Side Recommendations* >

Variables	*Pre-FD periods (n=1,722)*		*Difference* ($CAR_{pre\text{-}FD} = CAR_{post\text{-}FD}$)				*Post-FD periods (n=769)*	
		t-test (CAV=0)(1)	*t-test (2)*		*z-test*			*t-test (CAV=0)(1)*
CAR(D-9, D-1)	*-0.0136*	*-4.76* ***	*-0.72*		*-1.52*		*-0.0101*	*-2.83* ***
CAR(D-7, D-1)	*-0.0157*	*-6.17* ***	*-2.60*	***	*-3.02*	***	*-0.0043*	*-1.30*
CAR(D-5, D-1)	*-0.0071*	*-3.41* ***	*-1.31*		*-2.34*	**	*-0.0024*	*-0.87*
CAR(D-3, D-1)	*-0.0027*	*-1.64*	*-0.13*		*-1.56*		*-0.0023*	*-1.13*
CAR(D+0,D+1)	*-0.0037*	*-2.47* **	*1.08*		*0.20*		*-0.0065*	*-3.48* ***
CAR(D+0,D+3)	*-0.0117*	*-3.88* ***	*-0.56*		*-1.23*		*-0.0098*	*-3.88* ***

< *Panel B: Buy-Side Recommendations* >

Variables	*Pre-FD periods (n=19,162)*		*Difference* ($CAR_{pre\text{-}FD} = CAR_{post\text{-}FD}$)				*Post-FD periods (n=91,511)*	
		t-test (CAV=0)(1)	*t-test (2)*		*z-test*			*t-test (CAV=0)(1)*
CAR(D-9, D-1)	*0.0139*	*19.03* ***	*16.52*	***	*13.95*	***	*0.0035*	*14.06* ***
CAR(D-7, D-1)	*0.0123*	*18.50* ***	*13.19*	***	*11.86*	***	*0.0047*	*20.71* ***
CAR(D-5, D-1)	*0.0086*	*15.14* ***	*9.10*	***	*6.95*	***	*0.0040*	*20.80* ***
CAR(D-3, D-1)	*0.0059*	*13.33* ***	*7.26*	***	*4.38*	***	*0.0030*	*19.21* ***
CAR(D+0,D+1)	*0.0063*	*17.11* ***	*8.08*	***	*3.15*	***	*0.0036*	*27.86* ***
CAR(D+0,D+3)	*0.0079*	*15.82* ***	*8.97*	***	*5.15*	***	*0.0039*	*21.82* ***

Table 6.13 Regression of CAVs around Analysts' Recommendations

This table presents the volume effect around analysts' recommendations release from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to October 2002 and the post-FD period is from November 2002 to 2007. The dependent variable is cumulative abnormal volumes (*CAV*) for each event window. The explanatory variables are post-FD period (*FD*), analyst following (*ANALY*), firms size (*SIZE*), broker size (*SECU*) and standard deviation of daily stock price (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Sell-side Recommendations* >

$$CAV = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \varepsilon$$

		CAV(D-9, D-1)				***CAV(D-7, D-1)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*-0.2812*	***	*-8.10*	*0.000*	*-0.2411*	***	*-8.46*	*0.000*
FD	β_1	*-0.0044*		*-0.40*	*0.687*	*-0.0005*		*-0.05*	*0.957*
ANALY	β_2	*0.0007*		*1.60*	*0.109*	*0.0006*		*1.52*	*0.128*
SIZE	β_3	*-0.0323*	***	*-2.67*	*0.008*	*-0.0220*	**	*-2.22*	*0.027*
SECU	β_4	*0.0004*		*1.34*	*0.179*	*0.0003*		*1.31*	*0.191*
VOLA	β_5	*0.0463*		*0.53*	*0.593*	*0.0344*		*0.48*	*0.629*
		Number of obs = 2,491				*Number of obs = 2,491*			
		Adj R-squared = 0.0054				*Adj R-squared = 0.0038*			
		CAV(D-5, D-1)				***CAV(D-3, D-1)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*-0.1860*	***	*-8.51*	*0.000*	*-0.1091*	***	*-7.71*	*0.000*
FD	β_1	*0.0013*		*0.19*	*0.853*	*0.0005*		*0.10*	*0.919*
ANALY	β_2	*0.0004*		*1.34*	*0.182*	*0.0002*		*1.17*	*0.244*
SIZE	β_3	*-0.0129*	*	*-1.69*	*0.090*	*-0.0100*	**	*-2.02*	*0.043*
SECU	β_4	*0.0002*		*0.89*	*0.376*	*0.0001*		*0.92*	*0.355*
VOLA	β_5	*0.0426*		*0.78*	*0.435*	*0.0440*		*1.25*	*0.213*
		Number of obs = 2,491				*Number of obs = 2,491*			
		Adj R-squared = 0.0022				*Adj R-squared = 0.0032*			
		CAV(D+0, D+1)				***CAV(D+0, D+3)***			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*-0.0970*	***	*-9.88*	*0.000*	*-0.2335*	***	*-13.89*	*0.000*
FD	β_1	*0.0035*		*1.14*	*0.256*	*0.0113*	**	*2.16*	*0.031*
ANALY	β_2	*0.0000*		*0.28*	*0.776*	*0.0002*		*0.75*	*0.451*
SIZE	β_3	*-0.0012*		*-0.34*	*0.731*	*0.0055*		*0.93*	*0.350*
SECU	β_4	*0.0002*	**	*1.96*	*0.050*	*0.0002*		*1.10*	*0.271*
VOLA	β_5	*0.0151*		*0.62*	*0.538*	*0.0610*		*1.45*	*0.146*
		Number of obs = 2,491				*Number of obs = 2,491*			
		Adj R-squared = 0.0022				*Adj R-squared = 0.0048*			

< *Panel A: Buy-side Recommendations* >

$$CAV = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \varepsilon$$

		CAV(D-9, D-1)			***CAV(D-7, D-1)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0486* ***	*35.98*	*0.000*	*0.0407* ***	*35.51*	*0.000*
FD	β_1	*-0.0070* ***	*-10.98*	*0.000*	*-0.0063* ***	*-11.8*	*0.000*
ANALY	β_2	*0.0000*	*1.61*	*0.107*	*0.0000*	*1.35*	*0.175*
SIZE	β_3	*-0.0087* ***	*-23.77*	*0.000*	*-0.0072* ***	*-23.00*	*0.000*
SECU	β_4	*0.0000* ***	*-2.61*	*0.009*	*0.0000* ***	*-2.92*	*0.004*
VOLA	β_5	*-0.0045*	*-0.81*	*0.416*	*-0.0054*	*-1.16*	*0.248*
		Number of obs = 100,673			*Number of obs = 100,673*		
		Adj R-squared = 0.0109			*Adj R-squared = 0.0106*		
		CAV(D-5, D-1)			***CAV(D-3, D-1)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0311* ***	*34.8*	*0.000*	*0.0195* ***	*32.79*	*0.000*
FD	β_1	*-0.0048* ***	*-11.54*	*0.000*	*-0.0031* ***	*-11.11*	*0.000*
ANALY	β_2	*0.0000*	*0.93*	*0.352*	*0.0000*	*0.30*	*0.764*
SIZE	β_3	*-0.0054* ***	*-22.29*	*0.000*	*-0.0033* ***	*-20.57*	*0.000*
SECU	β_4	*0.0000* ***	*-3.02*	*0.003*	*0.0000* ***	*-2.67*	*0.008*
VOLA	β_5	*-0.0035*	*-0.98*	*0.329*	*-0.0006*	*-0.27*	*0.789*
		Number of obs = 100,673			*Number of obs = 100,673*		
		Adj R-squared = 0.0102			*Adj R-squared = 0.0091*		
		CAV(D+0, D+1)			***CAV(D+0, D+3)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0195* ***	*41.71*	*0.000*	*0.0344* ***	*42.75*	*0.000*
FD	β_1	*-0.0020* ***	*-9.23*	*0.000*	*-0.0051* ***	*-13.60*	*0.000*
ANALY	β_2	*0.0000* ***	*-4.63*	*0.000*	*-0.0001* ***	*-4.58*	*0.000*
SIZE	β_3	*-0.0034* ***	*-26.83*	*0.000*	*-0.0058* ***	*-26.65*	*0.000*
SECU	β_4	*0.0000*	*-0.96*	*0.338*	*0.0000*	*-0.24*	*0.811*
VOLA	β_5	*0.0001*	*0.06*	*0.951*	*0.0059* *	*1.81*	*0.070*
		Number of obs = 100,673			*Number of obs = 100,673*		
		Adj R-squared = 0.0161			*Adj R-squared = 0.0180*		

Table 6.14 Regression of CARs around Analysts' Recommendations

This table presents the valuation effect around analysts' recommendations release from 2000 to 2007 (excluding year 2002). The pre-FD period is from 2000 to October 2002 and the post-FD period is from November 2002 to 2007. The dependent variable is cumulative abnormal returns (*CAR*) for each event window. The explanatory variables are post-FD period (*FD*), analyst following (*ANALY*), firms size (*SIZE*), broker size (*SECU*), standard deviation of daily stock price (*VOLA*) and cumulative abnormal volumes (*CAV*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Sell-side Recommendations* >

$$CAR = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \beta_6 CAV + \varepsilon$$

		CAR(D-9, D-1)			***CAR(D-7, D-1)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*-0.0248*	*-1.58*	*0.115*	*0.0073*	*0.51*	*0.607*
FD	β_1	*0.0046*	*0.94*	*0.345*	*0.0080* *	*1.83*	*0.067*
ANALY	β_2	*0.0007* ***	*3.50*	*0.000*	*0.0007* ***	*3.89*	*0.000*
SIZE	β_3	*0.0082*	*1.51*	*0.130*	*-0.0013*	*-0.27*	*0.789*
SECU	β_4	*-0.0002*	*-1.20*	*0.230*	*-0.0002*	*-1.36*	*0.174*
VOLA	β_5	*-0.0499*	*-1.29*	*0.197*	*-0.0171*	*-0.49*	*0.626*
CAV	β_6	*0.0659* ***	*6.83*	*0.000*	*0.0806* ***	*7.59*	*0.000*
		Number of obs = 2,491			*Number of obs = 2,491*		
		Adj R-squared = 0.0351			*Adj R-squared = 0.0371*		
		CAR(D-5, D-1)			***CAR(D-3, D-1)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0179*	*1.42*	*0.155*	*0.0212* **	*2.21*	*0.027*
FD	β_1	*0.0063*	*1.64*	*0.101*	*0.0010*	*0.32*	*0.747*
ANALY	β_2	*0.0003* **	*2.00*	*0.045*	*0.0001*	*0.47*	*0.640*
SIZE	β_3	*-0.0016*	*-0.36*	*0.716*	*0.0000*	*-0.01*	*0.995*
SECU	β_4	*-0.0002*	*-1.59*	*0.111*	*-0.0002* ***	*-2.72*	*0.007*
VOLA	β_5	*0.0115*	*0.37*	*0.710*	*-0.0182*	*-0.77*	*0.443*
CAV	β_6	*0.1085* ***	*8.90*	*0.000*	*0.1432* ***	*9.87*	*0.000*
		Number of obs = 2,491			*Number of obs = 2,491*		
		Adj R-squared = 0.0401			*Adj R-squared = 0.0468*		
		CAR(D, D+1)			***CAR(D, D+3)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0261* ***	*3.41*	*0.001*	*-0.0057*	*-0.57*	*0.568*
FD	β_1	*0.0007*	*0.30*	*0.761*	*0.0072* **	*2.42*	*0.016*
ANALY	β_2	*0.0001*	*1.39*	*0.165*	*0.0003* **	*2.40*	*0.017*
SIZE	β_3	*-0.0036*	*-1.40*	*0.162*	*0.0012*	*0.37*	*0.713*
SECU	β_4	*0.0000*	*0.52*	*0.603*	*-0.0001*	*-0.73*	*0.466*
VOLA	β_5	*0.0118*	*0.63*	*0.528*	*0.0208*	*0.88*	*0.381*
CAV	β_6	*0.2008* ***	*12.21*	*0.000*	*0.0788* ***	*6.45*	*0.000*
		Number of obs = 2,491			*Number of obs = 2,491*		
		Adj R-squared = 0.0669			*Adj R-squared = 0.0277*		

< Panel B: Buy-side Recommendations >

$$CAR = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \beta_6 CAV + \varepsilon$$

		CAR(D-9, D-1)			***CAR(D-7, D-1)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0169* ***	*11.88*	*0.000*	*0.0128* ***	*9.87*	*0.000*
FD	β_1	*-0.0087* ***	*-13.09*	*0.000*	*-0.0050* ***	*-8.32*	*0.000*
ANALY	β_2	*0.0000*	*0.36*	*0.717*	*0.0000* **	*2.10*	*0.035*
SIZE	β_3	*-0.0005*	*-1.21*	*0.225*	*-0.0008* **	*-2.22*	*0.026*
SECU	β_4	*-0.0001* ***	*-5.23*	*0.000*	*0.0000*	*-1.55*	*0.122*
VOLA	β_5	*-0.0621* ***	*-10.83*	*0.000*	*-0.0639* ***	*-12.2*	*0.000*
CAV	β_6	*0.2097* ***	*65.32*	*0.000*	*0.2428* ***	*70.41*	*0.000*
		Number of obs = 100,673			*Number of obs = 100,673*		
		Adj R-squared = 0.0421			*Adj R-squared = 0.0472*		
		CAR(D-5, D-1)			***CAR(D-3, D-1)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0081* ***	*7.22*	*0.000*	*0.0065* ***	*7.25*	*0.000*
FD	β_1	*-0.0028* ***	*-5.44*	*0.000*	*-0.0017* ***	*-4.12*	*0.000*
ANALY	β_2	*0.0000*	*0.54*	*0.589*	*0.0000*	*0.73*	*0.468*
SIZE	β_3	*-0.0003*	*-1.12*	*0.263*	*-0.0004* *	*-1.70*	*0.089*
SECU	β_4	*0.0000*	*-0.07*	*0.947*	*0.0000*	*-1.64*	*0.102*
VOLA	β_5	*-0.0441* ***	*-9.78*	*0.000*	*-0.0266* ***	*-7.38*	*0.000*
CAV	β_6	*0.2578* ***	*67.68*	*0.000*	*0.2903* ***	*63.43*	*0.000*
		Number of obs = 100,673			*Number of obs = 100,673*		
		Adj R-squared = 0.0429			*Adj R-squared = 0.0376*		
		CAR(D+0, D+1)			***CAR(D+0, D+3)***		
		Coef.	*t*	*P>|t|*	*Coef.*	*t*	*P>|t|*
INTERCEPT	α	*0.0050* ***	*6.78*	*0.000*	*0.0049* ***	*4.82*	*0.000*
FD	β_1	*0.0004*	*1.20*	*0.232*	*-0.0001*	*-0.26*	*0.797*
ANALY	β_2	*0.0000*	*0.42*	*0.676*	*0.0000* *	*1.88*	*0.060*
SIZE	β_3	*-0.0012* ***	*-6.12*	*0.000*	*-0.0012* ***	*-4.39*	*0.000*
SECU	β_4	*0.0000* ***	*5.55*	*0.000*	*0.0001* ***	*4.63*	*0.000*
VOLA	β_5	*-0.0017*	*-0.57*	*0.572*	*-0.0036*	*-0.89*	*0.373*
CAV	β_6	*0.3590* ***	*74.36*	*0.000*	*0.2501* ***	*65.05*	*0.000*
		Number of obs = 100,673			*Number of obs = 100,673*		
		Adj R-squared = 0.0520			*Adj R-squared = 0.0399*		

Table 6.15 CARs and CAVs around First Buy-side Recommendations

The pre-FD period is from 2000 to October 2002 and the post-FD period is from November 2002 to 2007. The event date (D) is defined as the release of analysts' initial two buy-side recommendations. Z-test is used to measure whether the median is statistically different from each other while t-test is used to measure whether the mean between pre-FD period and post-FD period is statistically different from each other (2) or the mean is statistically different from zero (1). P-values for both tests are reported. * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

< *Panel A: Cumulative Abnormal Volume* >

Variables	*Pre-FD periods (n=501)*	*Difference* ($CAV_{pre\text{-}FD} = CAV_{post\text{-}FD}$)		*Post-FD periods (n=1,926)*	
		t-test (CAV=0)(1)	*t-test (2)*	*z-test*	*t-test (CAV=0) (1)*
CAR(D-9, D-1)	*0.0280*	*3.47* ***	*2.87* ***	*3.04* ***	*0.0004* *0.08*
CAR(D-7, D-1)	*0.0249*	*3.61* ***	*3.03* ***	*3.26* ***	*0.0004* *0.12*
CAR(D-5, D-1)	*0.0223*	*3.95* ***	*3.45* ***	*3.66* ***	*0.0009* *0.31*
CAR(D-3, D-1)	*0.0129*	*3.49* ***	*2.85* ***	*3.12* ***	*0.0016* *0.89*
CAR(D+0,D+1)	*0.0164*	*5.08* ***	*1.18*	*0.37*	*0.0124* *8.08* ***
CAR(D+0,D+3)	*0.0316*	*5.58* ***	*1.93* *	*2.24* **	*0.0195* *7.00* ***

< *Panel B: Cumulative Abnormal Returns* >

Variables	*Pre-FD periods (n=501)*	*Difference* ($CAR_{pre\text{-}FD} = CAR_{post\text{-}FD}$)		*Post-FD periods (n=1,926)*	
		t-test (CAV=0)(1)	*t-test (2)*	*z-test*	*t-test (CAV=0)(1)*
CAR(D-9, D-1)	*0.0391*	*4.88* ***	*4.16* ***	*2.20* **	*0.0151* *7.34* ***
CAR(D-7, D-1)	*0.0299*	*3.99* ***	*3.02* ***	*1.15*	*0.0138* *7.24* ***
CAR(D-5, D-1)	*0.0224*	*3.62* ***	*1.77* *	*0.04*	*0.0144* *8.74* ***
CAR(D-3, D-1)	*0.0166*	*3.62* ***	*1.31*	*-1.53*	*0.0119* *8.98* ***
CAR(D+0,D+1)	*0.0160*	*4.62* ***	*-0.01*	*-0.64*	*0.0160* *12.47* ***
CAR(D+0,D+3)	*0.0212*	*4.38* ***	*0.68*	*0.52*	*0.0182* *10.20* ***

Table 6.16 Regression of CAVs around First Buy-side Recommendations

This table presents the volume effect around analysts' first two buy-side recommendations release from 2000 to 2007. The pre-FD period is from 2000 to October 2002 and the post-FD period is from November. 2002 to 2007. The dependent variable is cumulative abnormal volumes (*CAV*) for each event window. The explanatory variables are post-FD period (*FD*), analyst following (*ANALY*), firms size (*SIZE*), broker size (*SECU*) and standard deviation of daily stock price (*VOLA*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$CAV = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \varepsilon$$

		CAV(D-9, D-1)				**CAV(D-7, D-1)**			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.0646*	***	*3.19*	*0.001*	*0.0546*	***	*3.27*	*0.001*
FD	β_1	*-0.0248*	***	*-2.75*	*0.006*	*-0.0212*	***	*-2.86*	*0.004*
ANALY	β_2	*0.0001*		*0.34*	*0.736*	*0.0001*		*0.17*	*0.862*
SIZE	β_3	*-0.0119*	*	*-1.70*	*0.088*	*-0.0100*	**	*-1.73*	*0.083*
SECU	β_4	*-0.0001*		*-0.22*	*0.829*	*0.0000*		*-0.12*	*0.908*
VOLA	β_5	*-0.0818*		*-1.01*	*0.314*	*-0.0603*		*-0.90*	*0.368*
		Number of obs = 2,427				*Number of obs = 2,427*			
		Adj R-squared = 0.0065				*Adj R-squared = 0.0071*			
		CAV(D-5, D-1)				**CAV(D-3, D-1)**			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.0517*	***	*4.06*	*0.000*	*0.0306*	***	*3.88*	*0.000*
FD	β_1	*-0.0173*	***	*-3.06*	*0.002*	*-0.0076*	**	*-2.15*	*0.032*
ANALY	β_2	*0.0001*		*0.28*	*0.783*	*0.0001*		*0.37*	*0.715*
SIZE	β_3	*-0.0099*	**	*-2.25*	*0.024*	*-0.0064*	**	*-2.35*	*0.019*
SECU	β_4	*-0.0001*		*-0.33*	*0.741*	*0.0000*		*-0.44*	*0.660*
VOLA	β_5	*-0.0573*		*-1.12*	*0.262*	*-0.0350*		*-1.10*	*0.271*
		Number of obs = 2,427				*Number of obs = 2,427*			
		Adj R-squared = 0.0096				*Adj R-squared = 0.0073*			
		CAV(D+0, D+1)				**CAV(D+0, D+3)**			
		Coef.		*t*	*P>|t|*	*Coef.*		*t*	*P>|t|*
INTERCEPT	α	*0.0623*	***	*9.00*	*0.000*	*0.1080*	***	*8.46*	*0.000*
FD	β_1	*0.0002*		*0.08*	*0.939*	*-0.0052*		*-0.92*	*0.357*
ANALY	β_2	*0.0002*		*1.54*	*0.124*	*0.0005*	*	*1.95*	*0.051*
SIZE	β_3	*-0.0166*	***	*-6.94*	*0.000*	*-0.0276*	***	*-6.27*	*0.000*
SECU	β_4	*0.0000*		*0.14*	*0.888*	*0.0000*		*-0.15*	*0.882*
VOLA	β_5	*-0.0434*		*-1.56*	*0.118*	*-0.0438*		*-0.85*	*0.394*
		Number of obs = 2,427				*Number of obs = 2,427*			
		Adj R-squared = 0.0315				*Adj R-squared = 0.0251*			

Table 6.17 Regression of CARs around First Buy-side Recommendations

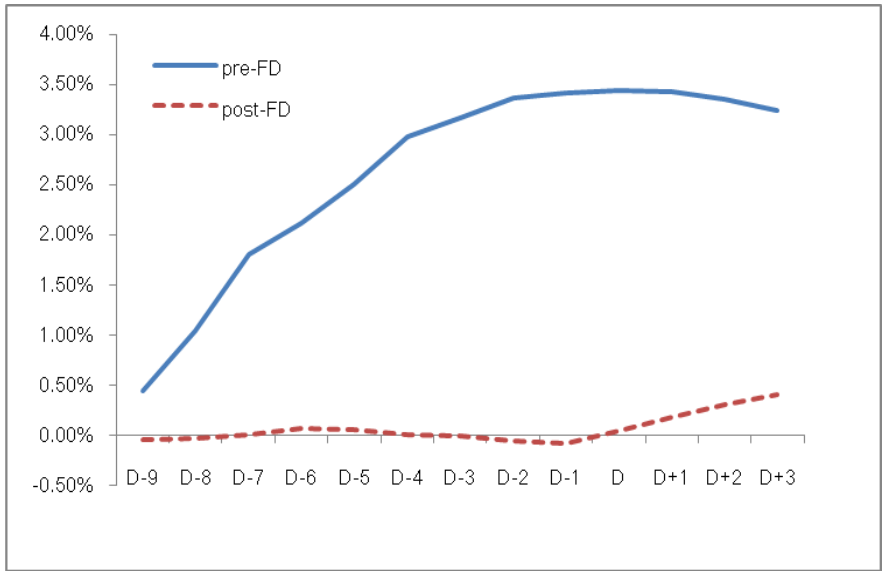
This table presents the valuation effect around analysts' first two buy-side recommendations release from 2000 to 2007. The pre-FD period is from 2000 to October 2002 and the post-FD period is from November 2002 to 2007. The dependent variable is cumulative abnormal returns (*CAR*) for each event window. The explanatory variables are post-FD period (*FD*), analyst following (*ANALY*), firms size (*SIZE*), broker size (*SECU*), standard deviation of daily stock price (*VOLA*) and cumulative abnormal volumes (*CAV*). * Significant at the 10% level or better; ** Significant at the 5% level or better; *** Significant at the 1% level or better.

$$CAR = \alpha + \beta_1 FD + \beta_2 ANALY + \beta_3 SIZE + \beta_4 SECU + \beta_5 VOLA + \beta_6 CAV + \varepsilon$$

		CAR(D-9, D-1)				CAR(D-7, D-1)			
		Coef.		t	P>|t|	Coef.		t	P>|t|
INTERCEPT	α	0.0790	***	5.85	0.000	0.0657	***	5.25	0.000
FD	β_1	-0.0218	***	-3.64	0.000	-0.0110	**	-1.97	0.048
ANALY	β_2	-0.0002		-0.70	0.486	-0.0002		-0.76	0.448
SIZE	β_3	-0.0112	**	-2.40	0.016	-0.0100	**	-2.33	0.020
SECU	β_4	-0.0001		-0.39	0.699	-0.0001		-0.91	0.365
VOLA	β_5	-0.1588	***	-2.94	0.003	-0.1401	***	-2.80	0.005
CAV	β_6	0.1384	***	9.76	0.000	0.1593	***	9.98	0.000
		Number of obs = 2,427 Adj R-squared = 0.0608				Number of obs = 2,427 Adj R-squared = 0.0581			
		CAR(D-5, D-1)				CAR(D-3, D-1)			
		Coef.		t	P>|t|	Coef.		t	P>|t|
INTERCEPT	α	0.0453	***	4.24	0.000	0.0285	***	3.41	0.001
FD	β_1	-0.0026		-0.56	0.578	-0.0019		-0.51	0.607
ANALY	β_2	-0.0001		-0.36	0.719	0.0001		0.39	0.694
SIZE	β_3	-0.0077	**	-2.1	0.036	-0.0058	**	-2.02	0.044
SECU	β_4	0.0000		-0.08	0.932	0.0001		1.38	0.168
VOLA	β_5	-0.1188	***	-2.78	0.005	-0.0874	***	-2.61	0.009
CAV	β_6	0.1592	***	8.92	0.000	0.1523	***	6.77	0.000
		Number of obs = 2,427 Adj R-squared = 0.0446				Number of obs = 2,427 Adj R-squared = 0.0273			
		CAR(D+0, D+1)				CAR(D+0, D+3)			
		Coef.		t	P>|t|	Coef.		t	P>|t|
INTERCEPT	α	0.0398	***	5.61	0.000	0.0426	***	4.33	0.000
FD	β_1	0.0020		0.65	0.515	-0.0001		-0.02	0.982
ANALY	β_2	-0.0002		-1.34	0.180	-0.0001		-0.32	0.748
SIZE	β_3	-0.0091	***	-3.72	0.000	-0.0115	***	-3.40	0.001
SECU	β_4	0.0000		-0.07	0.947	0.0002		1.46	0.143
VOLA	β_5	0.0135		0.48	0.628	0.0034		0.09	0.931
CAV	β_6	0.3162	***	14.72	0.000	0.2593	***	16.00	0.000
		Number of obs = 2,427 Adj R-squared = 0.1211				Number of obs = 2,427 Adj R-squared = 0.1250			

Figure 6-1 CAVs around Unscheduled Earnings Announcement

< Panel A: Earnings Decrease Firms >



< Panel B: Earnings Increase Firms >

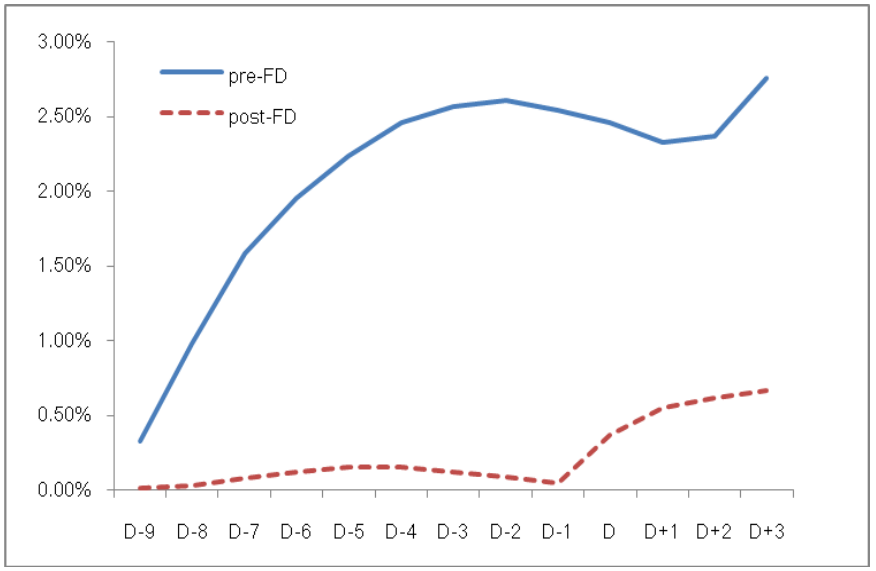
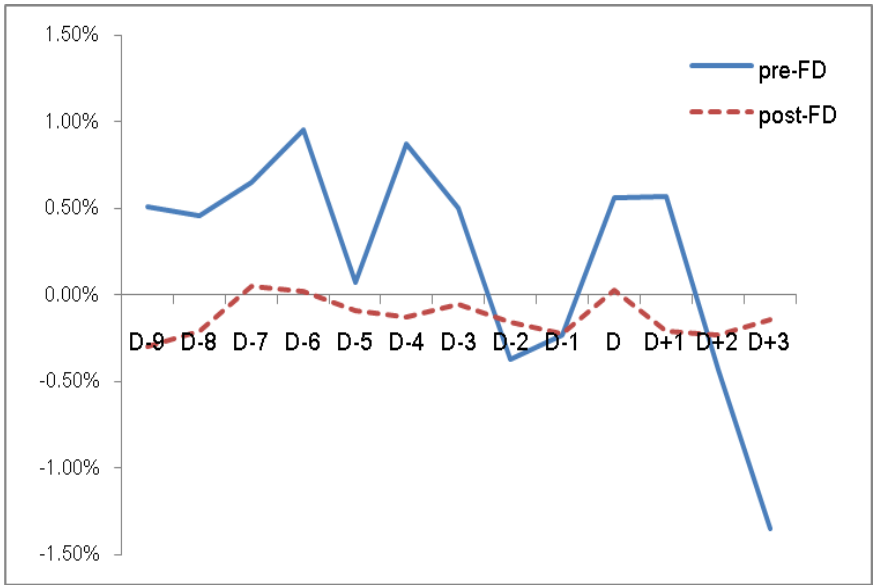


Figure 6-2 CARs around Unscheduled Earnings Announcement

< Panel A: Earnings Decrease Firms >



< Panel B: Earnings Increase Firms >

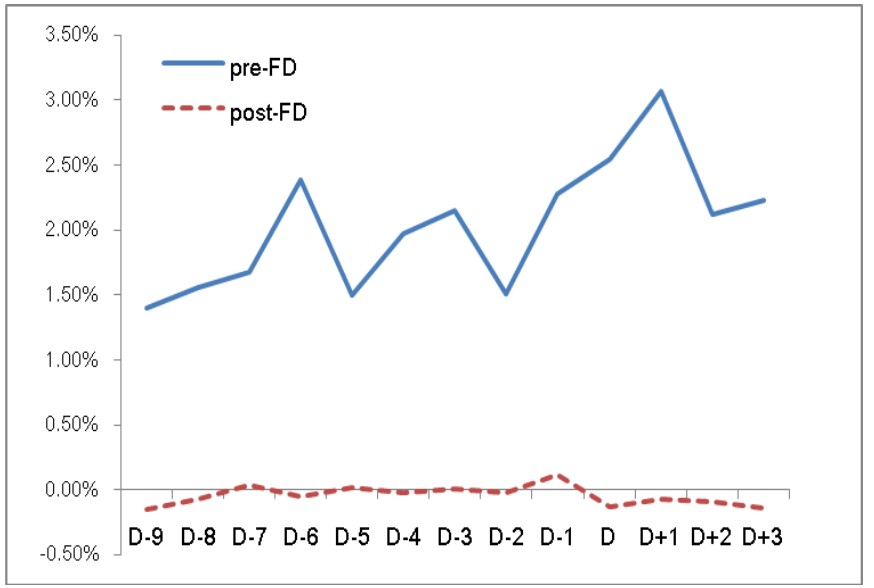
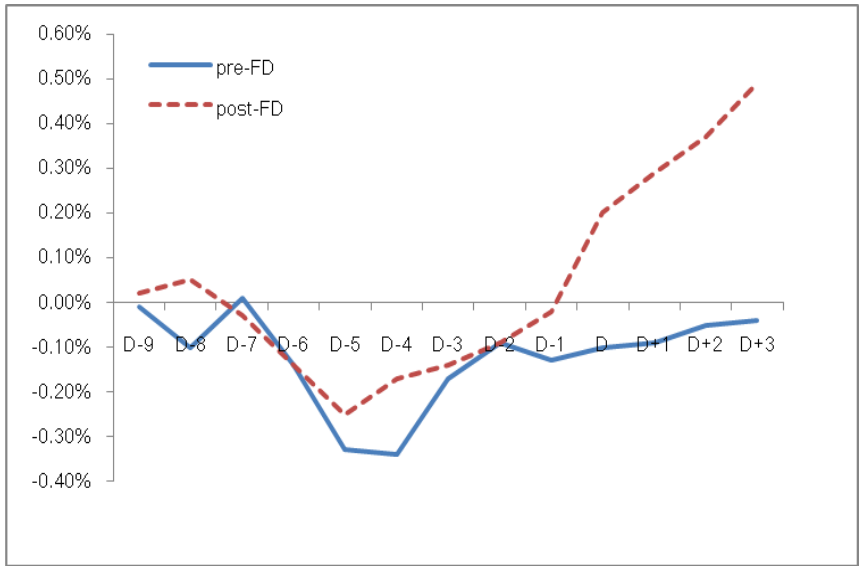


Figure 6.3 CAVs around Analysts' Recommendations

< Panel A: Sell-Side Recommendations >



< Panel B: Buy-Side Recommendations >

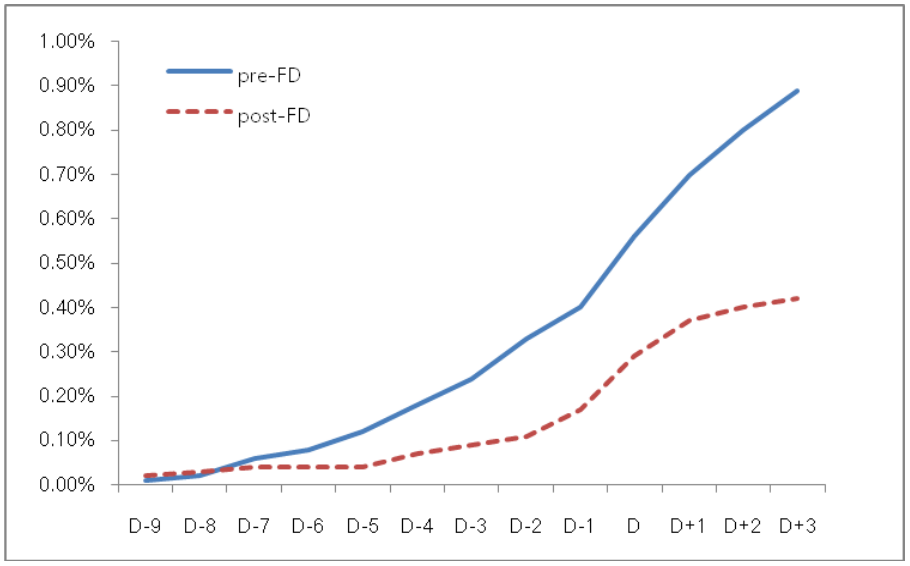
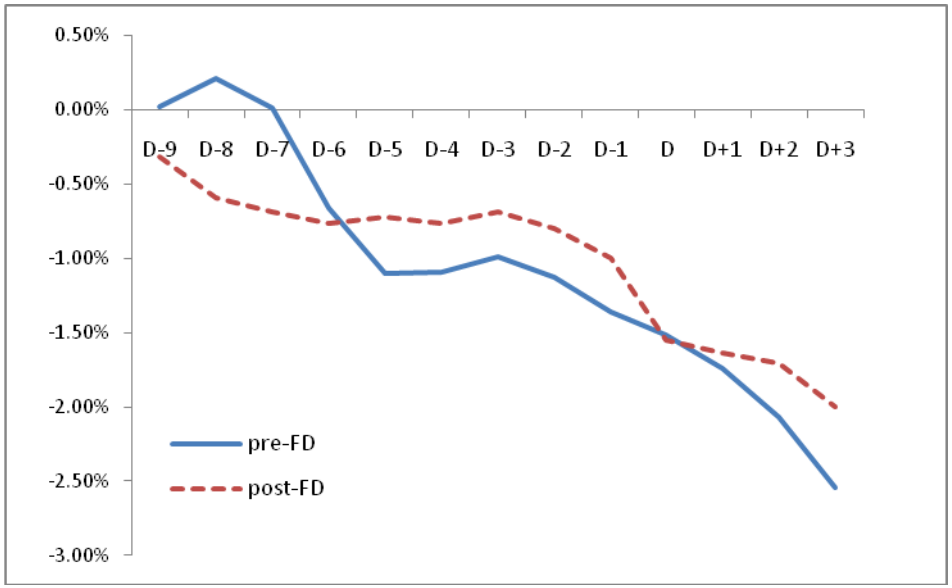


Figure 6.4 CARs around Analysts' Recommendations

< Panel A: Sell-Side Recommendations >



< Panel B: Buy-Side Recommendations >

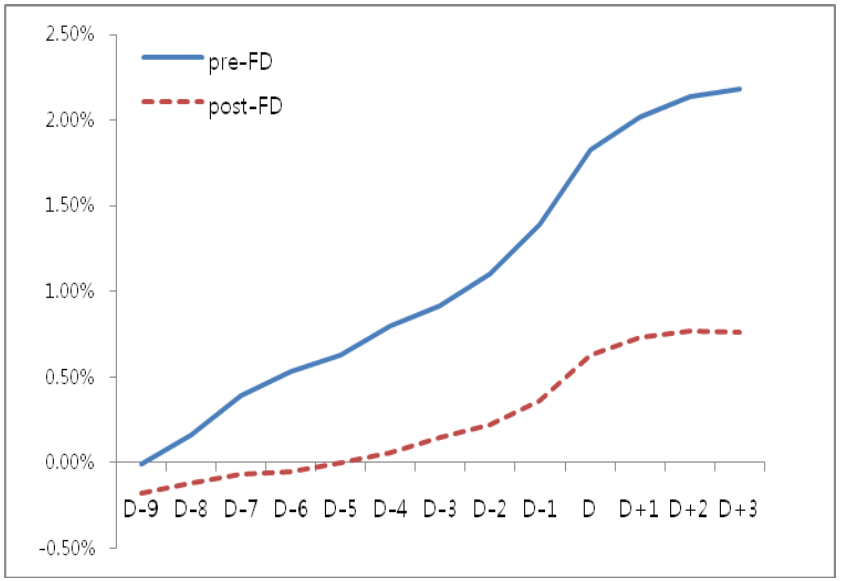
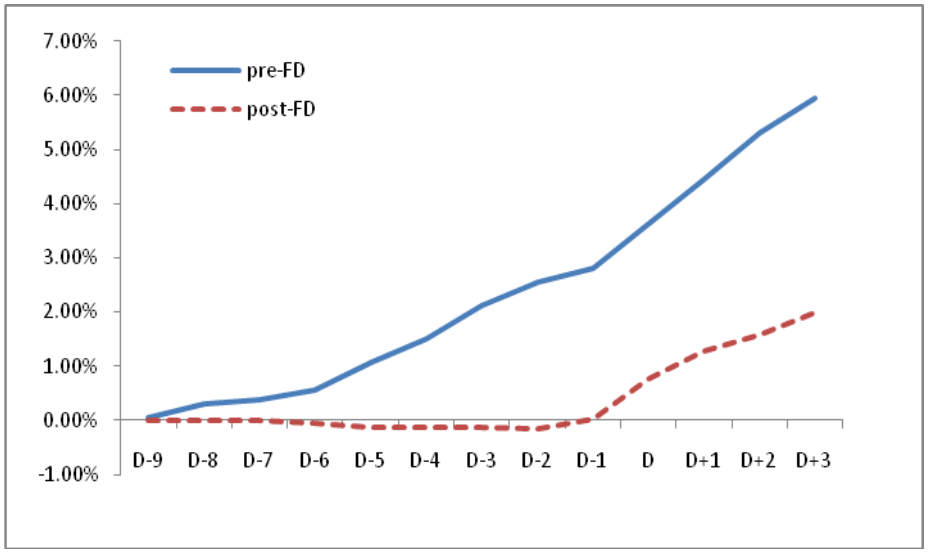
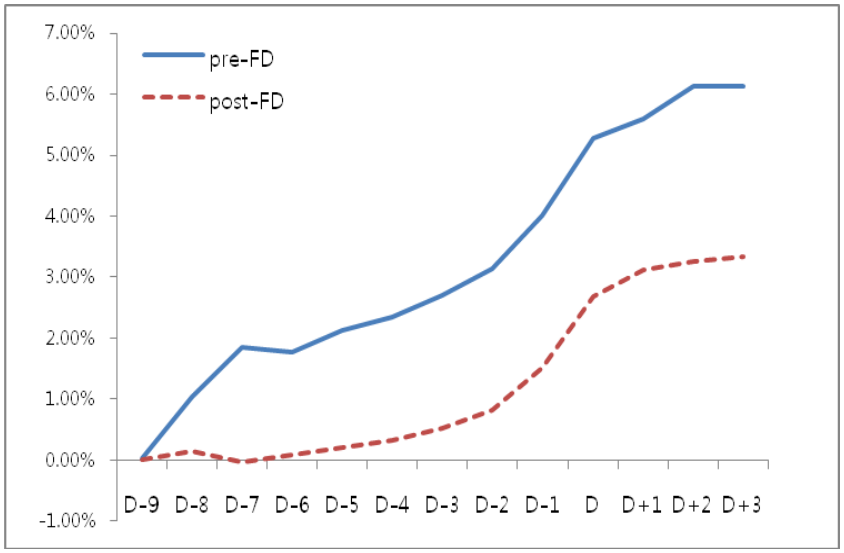


Figure 6.5 CAVs and CARs around First Two Buy-side Recommendations

< Panel A: Cumulative Abnormal Volume >



< Panel B: Cumulative Abnormal Returns >



CHAPTER 7

SUMMARY AND CONCLUSIONS

7.1. Introduction

Proponents of Regulation FD have argued that selective disclosure should be prohibited as it has three negative effects: (1) optimistically biased forecasts (2) unfair informed trading (i.e., information asymmetry) (3) increased cost of capital for firms. On the other hand, opponents claim that the regulation could have a "chilling effect" on the flow of information to financial markets (Zitzewitz, 2002).

The purpose of this thesis is to examine empirically whether Regulation FD influences the Korean securities market. Using a sample of 161,343 observations made of analysts' forecasts covering 2,311 firms from 2000 to 2007, we provide empirical evidence for the following questions: (1) Has Regulation FD changed analysts' forecasting ability? (2) Has Regulation FD decreased selective disclosure among market participants? (3) Has Regulation FD reduced the quality and quantity of public disclosure? We empirically test[88] the hypotheses for the above three questions by employing six different approaches. Specifically, this study examines the effect of Regulation FD on (1) forecast accuracy and forecast dispersion (2) private earnings guidance (3) private information in analysts' forecasts (4) herding behaviour among analysts (5) informed trading prior to unscheduled earnings announcement (6) information leakage prior to analysts' recommendations.

[88] All the estimates and tests for the economic models in this study are conducted using the statistical software package STATA (version 9.2) and SPSS (PASW statistics 18).

7.2. Summary and Conclusions for Empirical Results

In Chapter 3, controlling for variables that affect analysts' forecasts, we analyse changes in analysts' forecasting ability after the adoption of Regulation FD. Interestingly, we find that analysts' forecast accuracy has increased after the adoption of Regulation FD. These findings are of interest to finance researchers for two reasons. First, prior research finds mixed results on changes in forecasting ability in the post-FD period. For instance, Agrawal et al., (2006) and Findlay et al., (2006) find evidence that Regulation FD leads to increases in forecast errors and forecast dispersion since managers supply less private information to analysts in the post-FD period. On the other hand, Heflin et al., (2003) have shown that analysts have not seen a worsening in their performance in the post-FD period. Second, we view this result to be a consequence of the fact that an increase in the quality and quantity of public information positively influences analysts' forecasting ability in the post-FD period, indicating that firms have effectively substituted public communication for private channels to analysts in the Korean market after the adoption of Regulation FD.

This interpretation is opposed to the views of some of the previous literature. For instance, Gomez et al., (2004) suggest that public communication does not seem to be a good substitute for private communication, indicating that analysts' information advantage came from management's selective disclosure. However, we support the view of the proponents (i.e., Heflin et al., 2001), who find that the amount of public communication from firms has increased in the post-FD period. Furthermore, the decrease in forecast dispersion provides a justification for our explanations. Our study provides insights into how Regulation FD influences analysts' forecasting ability and

firms' disclosure practice. Our study does not contradict previous studies showing a decrease in forecasting ability in the post-FD period, but it does shed additional light on the issue. Regulation FD contributes to prohibiting firms from disclosing selectively and disseminating nonpublic information to the public.

In Chapter 4, we examine whether Regulation FD influences the private information in analysts' forecasts and private earnings guidance. Although recent research shows that Regulation FD has decreased private contact between firms and analysts, it remains unclear whether the private channels have been completely cut off. For example, at least some analysts can still enjoy an information advantage by virtue of their private communications with managers after the adoption of Regulation FD. We provide evidence on this issue by measuring whether the amount of private information in analysts' forecasts and private earning guidance decreases as a result of the elimination of selective disclosure after the adoption of Regulation FD.

We have two main sets of findings. First, we find that private earnings guidance has diminished after the adoption of Regulation FD. In our second set of findings, the precision of private information in analysts' forecasts has decreased after the adoption of Regulation FD. The above results indicate that Regulation FD prevents private access to management and public information remains the most important communication channel between a firm and analysts. Our explanation for these results supports proponents of Regulation FD, Mohanram et al., (2006) and Heflin et al., (2006), reporting that analysts have not faced a significant deterioration in the quality of public information acquired from firms after the adoption of the regulation. Our study

contributes to the understanding of the effect of Regulation FD on private communications between managers and analysts. Our results suggest that the regulation has forced managers to communicate more effectively through public channels instead of using private contacts.

In Chapter 5, we study changes in analysts' herding behaviour after the adoption of the regulation. Previous literature shows two interpretations of the impact of Regulation FD on herding behaviour. First, Regulation FD's opponents argue that Regulation FD leads to increasing herding behaviour among analysts since the regulation leads firms to do away with voluntary disclosure in the capital market (Zitzwitz, 2002; Arya et al., 2005). On the other hand, Mensah et al., (2008) find no evidence that Regulation FD results in an increase in analysts' herding behaviour.

Our results refute suggestions that Regulation FD has led to increasing herding behaviour among analysts. Our findings contradict Regulation FD's opponents (e.g., Association for Investment Management and Research (AIMR), and Security Industry Association (SIA). The survey by AIMR and SIA showed that many respondents answered that the quantity and quality of information has declined after the adoption of Regulation FD.[89] Bailey et al., (2003) also cautiously put forward the results of a survey conducted by the opponents of Regulation FD in question. Bailey et al., (2003) suggest that the survey results may more reflect analysts' fears that Regulation FD removes their information advantage than their concerns for fairness. Our study adds to the growing body of literature that shows that Regulation FD has not reduced the

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quantity of information. Our evidence on the herding behaviour indicates that Regulation FD has not caused the quality of these forecasts to deteriorate.

In Chapter 6, we examine two specific issues. First, has there been a change in informed trading prior to the unscheduled earnings announcement after the adoption of Regulation FD? Second, has there been a change in information leakage prior to the analysts' recommendations? Like prior studies of the effect of Regulation FD, we find evidence of a decrease in abnormal volumes and abnormal returns prior to unscheduled earnings announcement in the post-FD period, indicating that differences in information quality between investors decreased. We also find strong evidence of a reduction in the information leakage of analysts in (first two) buy-side recommendations prior to the release of analysts' recommendations. This results are driven by *earnings increase firms* and *buy-side recommendations.* There is no evidence that informed trading patterns existed in *earnings decrease firms* and *sell-side recommendations* before Regulation FD became effective. The results indicate that managers and analysts are reluctant to leak bad news prior to public announcement.

Overall, therefore, our findings lend support to the idea that Regulation FD has achieved the provision of a more level playing field to all investors. This study also contributes to understanding how Regulation FD influences informed trading and information leakage. It is widely documented in the previous literature that the significant drop in the abnormal volumes prior to unscheduled public announcement indicates that Regulation FD succeeded in eliminating selective disclosure.

In conclusion, these results suggest that Regulation FD contributes to curtailing information leakage and levelling the playing field by giving individual investors the same information simultaneously.

7.3. Limitations of Research

Our results are subject to some limitations. First, we used annual analysts' forecast observations because there were no quarterly forecasts observations before Korea adopted Regulation FD in 2002. Annual forecast observations may have a limitation in assessing analysts' forecasting ability and herding behaviour compared to quarterly forecast observations because some forecast observations have a longer forecast horizon. Therefore, our conclusions may not be generalized to the effect of Regulation FD on the analysts' forecasts.

Second, even if our study includes various control variables that are identified by previous literature, it is always possible that other variables are not controlled for. Future research can further refine the methodology developed in our study.

Third, our research depends on various models developed by Dechow et al., (1995), Barren et al., (1998), BCK (2006), Clement et al., (2005), Matsumoto (2002) and Wang (2007). However, some models are potentially plagued by problems. Therefore, our conclusions are constrained by the limitations of the models.

Lastly, our sample consists of the pre-FD period (2 years) and post-FD period (5 years). Campbell and Stanley (1966) suggest that the ideal analysis should have both periods of

approximately equal size for ideal analysis.[90] Our periods are unevenly sized, so our results may obtain different findings.

7.4. Further Research

There are several ways to extend our research from the research topics. First, in Chapter 3, we employ the two groups of information uncertainty in order to assess the effect of Regulation FD on forecasting ability. This methodology can be easily extended to the cases of the effects of Regulation FD on the competitiveness of best-analysts (similar to the U.S. All-American Research Team) chosen by votes of institutional investors or on changes in the level of recommendations (i.e., upgrade or downgrade). We would expect that the performance of best-analysts and analysts issuing upgrade recommendations to be less dependent on private communication with managers after the adoption of Regulation FD.

Second, we can employ other methods to examine the effect of the regulation on management disclosure policy. For example, in Chapter 4, we use Matsumoto (2002) and Wang (2005), in order to measure the degree of private earnings guidance. Researchers might be interested to use text mining or interviewing survey data. Feldmann et al., (2003) examine earnings guidance disclosures based on identification of these announcements using text mining techniques. Hutton (2005) uses survey data from the National Investor Relations Institute (NIRI) to identify firms conducting reviews guided analysts' earnings forecasts.

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[90] Campbell and Stanley (1966) suggest that the ideal experiment has the following characteristics: (1) approximately equal number of pre-test and post-test periods; (2) an experimental group and a control group with observations randomly assigned to both; (3) ability of the researcher to control when the intervention occurs; and (4) ability to determine whether there is an intercept shift and a slope shift.

Third, in Chapter 6, we do not examine the effect of Regulation FD on the trading behaviour of institutional investors. Previous literature addresses the effect of the regulation on the trading behaviour of institutional investors (Ke et al., 2008). We expect there to be abnormal trading of stocks immediately preceding bad or good news in the pre-FD period, but the institutions to not display similar abnormal trading of stocks in the post-FD period.

Finally, Gomes et al., (2007) and Duarte et al., (2008) examine the effect of Regulation FD on firms' costs of capital. Their results indicate that Regulation FD generally leads to a higher cost of capital. It would be interesting to examine the role of cost of capital in the Korean market. We leave to future research questions related to the regulator's goals for the regulation.

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