

Did Small Investors  
Benefit from the Global Settlement?

by

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A Dissertation Presented in Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Philosophy

Approved April 2011 by the  
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ARIZONA STATE UNIVERSITY

May 2011

## ABSTRACT

Responding to the allegedly biased research reports issued by large investment banks, the Global Research Analyst Settlement and related regulations went to great lengths to weaken the conflicts of interest faced by investment bank analysts. In this paper, I investigate the effects of these changes on small and large investor confidence and on trading profitability. Specifically, I examine abnormal trading volumes generated by small and large investors in response to security analyst recommendations and the resulting abnormal market returns generated. I find an overall increase in investor confidence in the post-regulation period relative to the pre-regulation period consistent with a reduction in existing conflicts of interest. The change in confidence observed is particularly striking for small traders. I also find that small trader profitability has increased in the post-regulation period relative to the pre-regulation period whereas that for large traders has decreased. These results are consistent with the Securities and Exchange Commission's primary mission to protect small investors and maintain the integrity of the securities markets.

## ACKNOWLEDGMENTS

I would like to gratefully and sincerely thank Dr. Michael Mikhail, Dr. Yuchang Hwang and Dr. Artur, J., Hugon for their guidance, understanding and patience. Mike volunteered to supervise my dissertation and has squeezed time for me out of his busy schedule; Artur has given me the most timely and helpful feedbacks without which I may not have finished the paper by now; Yuhchang has always been a mentor and father figure to me throughout the program.

I would also like to thank Dr. James Boatsman and Dr. James Ohlson for their guidance in getting my research started on the right foot and providing me the foundation for becoming an accounting researcher.

I would also like to thank everybody else in the Department of Accounting at Arizona State University. Specifically, I thank Dr. Steve Kaplan who brought me into this program, Dr. Melissa Martin who gave me the minimum workload so that I had time to focus on my research, my officemate Vanessa Makridis who helped me improve my English. I also thank the rest of the people whose names I did not mention for their comments on the paper in the workshop.

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## Chapter 1

### INTRODUCTION

Since the late 1990's, regulators have had a strong interest in the quality of research reports issued by sell-side analysts working for investment banks.

Several factors exist that create a conflict of interest for a typical analyst and may impair his or her objectivity. First, an analyst's employer may be involved in underwriting the covered companies' stock or in assisting it in the issuance of debt. Unfavorable analyst reports may hurt an investment bank's efforts to maintain a lucrative relationship with a company's management. Second, positive analyst reports and recommendations can help firms make money by generating more brokerage commissions – "Buy" recommendations generate relatively more trading through an analyst's brokerage firm (Irvine, 2004). Finally, conflicts can arise from an analyst or an analyst's employer owning a significant position in the companies the analyst covers. An analyst is unlikely to issue pessimistic reports that may negatively impact the stock positions held by their employers.

As a consequence of the incentives surrounding investment banking business, the volume of brokerage commissions, and potential ownership positions they hold, investment banks have adopted compensation plans that explicitly reward security analysts more for issuing "Buys" than "Sells," regardless of their profitability, and link an analyst's salary and bonus to

quantifiable measures such as his firm's underwriting fees (see, e.g., Dorfman, 1991). Compensation is only one benefit that a positive outlook provides. Hong and Kubik (2003) also find that analysts are much more likely to be promoted if their recommendations are optimistic. Given all of these issues, it came as no surprise when congressional hearings and other regulatory investigations revealed that Wall Street investment banks provided misleading information to investors over the period April 1999 to July 2002. As a result of these findings, several new regulations were imposed by NYSE, NASD and a Research Analyst Settlement negotiated by New York's Attorney General.<sup>1</sup> The reforms imposed included several measures to mitigate or eliminate conflicts of interest. These include, among other things, limitation on communication between personnel from the two departments, prohibition of investment banking-based compensation to analysts and disclosure of potential conflicts of interest. Regulators claim that the main objectives of the Global Settlement and related regulations are to "restore investor confidence" and "protect small investors". As no evidence exists regarding whether these objectives have been achieved. This paper provides

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<sup>1</sup> The original ten investment firms included in the Global Settlement are Bear Sterns; Credit Suisse First Boston; Goldman Sachs; Lehman Brothers; J. P. Morgan; Merrill Lynch; Pierce, Fenner&smith; Morgan Stanley; Citigroup Global Markets; UBS Warburg; and U.S. Bancorp Piper Jefferay. In August 2004, Deutsche Bank and Thomas Weisel joined the settlement, bringing the total number of participants to twelve.



answers to these questions so that regulators could objectively evaluate the success of related regulations.

In this paper, I examine changes in small and large investors' trading confidence and profitability in response to security analyst recommendation revisions surrounding the introduction of regulatory changes associated with the above discussion. Specifically, I first examine abnormal trading volumes generated by large and small investors in response to security analyst recommendation revisions before and after changes are introduced into the regulatory environment. Next, I examine changes in relative profitability between large and small traders over the same time period by quantifying the abnormal market returns generated. I'm particularly interested in whether or not the regulatory changes have eliminated or curtailed previously identified wealth transfers between large sophisticated traders and small investors (Franco, Lu and Vasvari, 2007).

To investigate the questions posed above, I divide the full sample period which extends from 2000 to 2006 into three sub-periods: the Pre-regulation period (the period before the investigations take place)<sup>2</sup>, the investigation period (the period when formal investigations began until the Global Settlement)<sup>3</sup> and the

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2 This period starts from Jan 1<sup>st</sup> of year 2000 till June 30<sup>th</sup> of year 2001.

3 This period starts from July 1<sup>st</sup> of year 2001 till April 23<sup>th</sup> of year 2003.

Post-regulation period (the period after the Global Settlement)<sup>4</sup>. I first examine whether the regulations have altered small traders' confidence in investment bank recommendations, by comparing abnormal trading volumes surrounding recommendation revisions in the post-regulation period to that observed in the other two periods. As a benchmark, I use the change in large- trader abnormal trading volume surrounding investment bank recommendation revisions. Using a seemingly unrelated regression model, I find that both types of traders react less to investment bank recommendation revisions in the investigation period relative to the pre-regulation period; the relative change is more prominent for small traders. This is consistent with analyst scandals brought to light during the regulation period undermining the confidence of all investor groups. I also find that both types of traders react more to investment bank recommendation revisions after the introduction of the settlement and related regulations; the relative change observed is also more prominent for small traders. This evidence is consistent with regulators' expectation that investors, especially small investors, find investment bank recommendation revisions more reliable after the regulatory changes took effect. The results remain significant after controlling for firm and analyst characteristics.

To identify the direction of each trade, I obtain trade and quote prices from the TAQ database and calculate a trading imbalance measure surrounding analyst

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<sup>4</sup> This period starts from April 24<sup>th</sup> of year 2003 till December 31<sup>th</sup> of year 2006.

recommendation revisions. Following Lee and Ready (1991), I classify a trade as buyer (seller)-initiated if the trade price is higher (lower) than the mid-point of prevailing quote prices. Trading imbalance is then calculated as the difference between buyer-initiated trades and seller-initiated trades, scaled by total trades. For small traders, I find that average trading imbalance surrounding recommendation revisions is negatively correlated with up to 12-months post-recommendation abnormal stock returns prior to the introduction of the regulations but is positively correlated with the abnormal stock returns after the regulations took place. This suggests that small traders have been more capable of exploiting trading profits from recommendations revisions after the regulations took place. In contrast, large traders' average trading imbalance surrounding investment bank recommendation revisions predict positive post-recommendation abnormal stock returns both before and after the introduction of regulatory change. However, in the post-regulation period the correlation coefficient is significantly less positive, suggesting that large traders are less able to exploit profits from recommendations revisions.

Following prior literature, I estimate trading profit for each type of trader as a function of trading imbalance and future abnormal stock returns. Comparing large and small investor differential trading profits, I find that prior to the introduction of the Global Settlement and related regulations, large traders (small traders) generated positive (negative) trading profits – consistent with the wealth

transfer effect documented in both De Franco et al. (2007) and Mikhail et al. (2007). In contrast, in the post-regulation era, average small trader profit has increased to a positive level, whereas average large trader profit has decreased. The wealth transfer effect has been largely eliminated. Together, these results suggest that the Settlement and related regulations benefited small traders.

In the additional tests, I consider the differential effects of the Global Settlement and related regulations on recommendation revisions issued by affiliated banks (banks with underwriting relationship with the covered firm) and those issued by unaffiliated banks. Consistent with prior literature documenting a larger effect on reaction to affiliated banks recommendations, I find that the change in investor confidence is more prominent for favorable recommendation revisions from affiliated banks relative to those from unaffiliated banks, suggesting that the improvement of investor confidence is partially attributed to severed investment banking ties.

I also test the differential effects of the Global Settlement and related regulations on recommendation revisions issued by sanctioned banks versus those issued by non-sanctioned banks. Test result shows increased confidence in non-sanctioned banks, but not sanctioned banks. This is possibly due to the reputation damage occurred to sanctioned banks.

The rest of the paper proceeds as follows. In Chapter 2, I review the Global Settlement and related regulations. In Chapter 3, I summarize prior

literature and develop hypotheses about possible outcomes of the Global Settlement-related regulations on large and small investor differential trading behavior. Methodological considerations and my sample are discussed in Chapter 4. I present my empirical results in Chapter 5 and results of additional tests in Chapter 6.

## Chapter 2

### BACKGROUND

As a result of multiple scandals related to investment bank analyst conflicts of interest, Congress held an “Analyzing the Analysts” hearing during the summer of 2001. Several pieces of closely related regulations followed: (1) a revision of NYSE Rule 472 regarding communication with the public, (2) NASD Rule 2711 regarding research analysts and research reports, and (3) a Global Settlement orchestrated by New York Attorney General Elliott Spitzer. The first two changes applied to a broad spectrum of banks while the third was targeted to a few large investment banks (sanctioned banks). The following section provides a brief summary of these new regulatory requirements. Please see also Kadan et al. (2009).

In response to the actual and perceived conflicts rampant throughout the securities industry, the exchanges adopted mechanisms to curtail the abuses observed. In July 2002, new rules for sell-side analysts became effective through NYSE (amended Rule 472 “Communication with the Public”) and NASD (Rule 2711 “Research Analysts and Research Reports”). Among other requirements, the rules limited the communications between investment banking departments and

research departments, and banned subject companies from reviewing research reports before publication. The new rules require more stringent disclosure regarding research analysts' ownership of securities, receipt of compensation and a bank's affiliation with the companies being analyzed. These requirements are meant to provide better information so that investors can properly interpret research analysts' research outputs, and more easily identify potential conflicts of interest. Finally, to make research output more meaningful and easily comparable across different analysts and firms, the rules prescribed that every research report must explain the meaning of its rating system and disclose the percentage of recommendations in the "buy", "hold" and "sell" categories, as well as the valuation models they use to arrive at the recommendations.

In June 2001, the New York Attorney General began investigating Merrill Lynch after a *Wall Street Journal* article alleged misconduct by the firm's security analysts. Contrary to favorable public reports by analysts about certain stocks, internal e-mails by those same analysts showed a clear dissatisfaction with the attractiveness of the stocks. Results of the investigation prompted the Attorney General to instigate reviews at other investment banks for similar issues. The investigations revealed that from approximately mid-1999 to mid-2001, investment bankers engaged in practices that created or maintained inappropriate influence over research analysts. For example, a security analyst's salary and bonus were often linked to quantifiable measures such as underwriting or other

fees generated by non-research divisions of the bank. In many cases, the likelihood of a bank winning these lucrative contracts was potentially influenced by the issuance of favorable reports.

The investigations led to the Global Settlement between the SEC, the NYSE, the NASD, the New York Attorney General, and ten (later twelve) U.S. investment firms. The Global Settlement's objectives closely mirrored the SRO's new regulations, most importantly with respect to severing the ties between investment bank and research departments. In a few cases, the Global Settlement goes beyond the SRO's new rules. For example, it requires that investment bank and research departments be physically separated, and that the research department has a dedicated legal department. Besides the regulatory measures on sell-side research, the Global Settlement required the sanctioned banks to pay fines and penalties totaling roughly \$1.4 billion.

The terms of the regulations and settlement above are designed to "ensure that stock recommendations are not tainted by efforts to obtain investment banking fees, ..... individual investors get access to objective investment advice.... and investors can evaluate and compare the performance of analysts....". The objectives of the Global Settlement are to "restore investor confidence and protect small investors"<sup>5</sup>. As of now, no evidence exists regarding

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<sup>5</sup>All quotes are from The SEC, State of New York Attorney General, NASAA, NASD, NYSE joint release, April 23, 2008.



whether the Settlement and related regulations have achieved their objectives.

This paper is the first to address this question.

## Chapter 3

### PRIOR LITERATURE AND HYPOTHESES

#### **ANALYST CONFLICTS OF INTEREST AND BIASED RESEARCH PRIOR TO THE INTRODUCTION OF THE REGULATIONS**

An extensive literature has examined the conflicts of interest faced by security analysts employed at investment banks. Although the issuance of reliable recommendations can enhance an analyst's reputation, many countervailing incentives exist to motivate analysts to be "optimistic". For example, an often-cited rationale for the lack of pessimistic ratings is that an analyst's salary and bonus are linked to quantifiable measures such as underwriting fees or commissions generated by his or her recommendations, outcomes that might be facilitated by the issuance of favorable reports. In addition, analysts rely on company management for information and thus have a reason to maintain good relationships with them. In this chapter, I summarize extant studies pertaining to different sources of analyst conflicts of interest and their consequences.

#### **Underwriting Relationships**

An underwriting relationship refers to the relationship between an investment bank who raises investment capital from investors on behalf of corporations that are issuing securities. The underwriting relationship may cause conflicts of interest and thus biased recommendations as unfavorable

recommendations hurts an investment's effort to maintain lucrative underwriting relationships with the firms they cover.

For stock recommendations and long-term growth forecasts, almost all studies find that banks with underwriting relationships are more optimistic than those without underwriting relationships. Dugar and Nathan (1995) and Lin and McNichols (1998) both find that recommendations by investment banker analysts are more favorable than those by unaffiliated analysts. In addition, Lin and McNichols (1998) finds that investors respond similarly to lead underwriter and unaffiliated "Strong buy" and "Buy" recommendations, but three-day returns to lead underwriter "Hold" recommendations are significantly more negative than those to unaffiliated "Hold" recommendations. These findings suggest that investors expect lead analysts to be more likely to recommend "Hold" when "Sell" is warranted.

Michaely and Womack (1998) examine the "buy" recommendations disseminated by brokerage analysts in the period after the end of the quiet period. Their findings indicate that 1) lead underwriter analysts issue significantly more "buy" recommendations than analysts from other banks, 2) lead underwriter analysts tend to follow firms with falling pre-recommendation stock prices while other analysts tend to follow firms with rising pre-recommendation stock prices and 3) recommendation day stock returns and long-term stock returns are

significantly higher for non-underwriting analyst recommendations than for underwriting analyst recommendations.

Recent advance in the literature build on this prior work by directly comparing investment banks and independent research firms (banks that do not generate revenues from investment banking business). Barber et al (2007) find that investment banks issue significantly more “buy” and “strong buy” recommendations and less “hold” and “sell” recommendations than research organizations that don’t have auxiliary businesses.. In addition, the market reaction to optimistic recommendations tends to support the lack of credibility in investment banking reports. The average daily abnormal return to independent research firm “buy” recommendations exceeds that of investment bank “buy” recommendations; in contrast, investment bank hold and sell recommendations outperform those of independent research firms. All these findings support the idea that underwriting relationship is a major source of biased analyst recommendations.

### **Trading Commissions**

Trading commission is another major source of conflicts of interest as analyst compensation is usually tied to the trading volume analysts generate and favorable recommendations can generate more trades. Konrad (1989, 118) reports that a sell-side analyst at Morgan Keegan earned 2.5 percent of the brokerage's trading commissions in the 19 stocks the analyst covered. Dorfman (1991) also

reports that some brokerage firms include similar trading incentives in analysts' contracts. However, more often brokerage firms conduct a formal poll asking the institutional sales force to rate analysts on how much trade they generate, and the results affect analysts' bonuses.

Irvine (2004) finds that, as a result of the short-selling constraint imposed on most investors, buy recommendations generate relatively more trading through the brokerage firm than sell recommendations. Given this finding, it is not surprising that analysts driven by trading commissions tend to issue optimistic recommendations as the long-term growth forecasts are a major input to generate analyst recommendations.

Dechow et al (2000) directly test the effect of analyst compensation on their level of optimism. They find a positive relation between the fees paid to the affiliated analysts' employers and the level of the affiliated analysts' growth forecasts. They also document that the post-offering underperformance is most pronounced for firms with the highest growth forecasts made by affiliated analysts. As analyst compensation affects the level of optimism in growth forecasts, it may affect the level of optimism in analyst recommendations as well.

### **Other sources of conflicts of interest**

Conflicts of interest could also arise from other sources. According to Boni and Womack (2002), a much less emphasized but equally important issue concerning the credibility of the analysts' recommendations is the personal

investments of the analysts in the stocks they cover. Schack (2001, p. 60) also emphasizes that “Wall Street research analysts increasingly are accused of ditching their objectivity to please underwriting clients. But largely overlooked in all of the complaints has been perhaps the most fundamental conflict of interest for all Wall Street analysts—owning the stock of companies they cover.” Other than direct financial reasons, investment bank analysts may also issue favorable recommendations in response to indirect financial stimuli such as promotion opportunities (Hong and Kubik, 2003).

Given all these sources of conflicts of interest, it came as no surprise that investment bank analysts issued biased recommendations prior to the introduction of the Global Settlement. One result of the misleading recommendations is that large and small investors reacted differentially to these recommendations, resulting in a wealth transfer effect. The next subsection summarizes studies that documented this phenomenon.

### **LARGE AND SMALL INVESTORS DIFFERENTIAL TRADING BEHAVIOR**

A large body of research studies the differential investment behavior of small and large traders. Most of these studies assume that large traders possess sophisticated knowledge and research resources, which distinguishes their behavior from that of small and naïve traders. In general, large traders are found

to be rational when processing news and trade profitably, while small traders very often fail to distinguish the nature of news and lose to large traders.

For example, Lee (1992) examines large and small investor directional reaction to earnings announcement. In good (bad) news cases, he finds brief and intense buyer-initiated (seller-initiated) activities for large trades. He also observes a persistent period of unusually high buying activities for small trades regardless of the nature of news. One of the suggested explanations of this anomalous buying activity for small traders is that small traders rely heavily on security analysts and financial analysts are much more likely to suggest buying than selling.

Mikhail, Walther and Willis (MWW, 2007) directly test large and small investor differential response to analyst recommendations by comparing abnormal trading volumes surrounding analyst recommendations across investor types. They find that small investors don't fully account for the effect of analyst incentives on the credibility of analyst reports and trade more heavily on favorable recommendations than large traders; they also trade more on favorable recommendations than on unfavorable recommendations.

Using directional trades (trade imbalance) instead of abnormal trading volumes to examine large and small investor differential reaction to analyst recommendations, Malmendier and Shanthikumar (2007) reached similar conclusions. Specifically, they find that large traders adjust their trading response

downward: they exert buy pressure following strong buy recommendations, no reaction to buy recommendations, and selling pressure following hold recommendations. Small traders, instead, follow recommendations literally. They exert positive pressure following both buy and strong buy recommendations and zero pressure following hold recommendations.

De Franco, Lu and Vasvari (DLV ,2007) complement above studies by examining individual and institutional investor differential trading behavior during a very special period– the Settlement period. This research setting is interesting because it focuses on a particular set of firms who engaged in misleading behavior where analyst biases are objective and identifiable. They show that during this period daily small-size trades are dominated by buy orders while daily large-size trades are dominated by sell orders. Their estimates of investors' trading losses show that individual traders lost money to institutions. The authors discuss three possible reasons for this wealth transfer effect. First, institutions place less weight on signals from investment bank analysts so that analysts have a relatively smaller effect on institutional trading. Second, institutions anticipate that individuals will follow analysts' recommendations to a greater extent and take advantage of any temporary trading-related pressure on prices caused by misinformed individuals. Finally, institutions could receive less-biased information and hence trade based on analysts' true view of the stock.



The above three papers all show, using data prior to the regulatory changes, that small traders suffer losses from literally following investment bank recommendations. None of these papers made an effort to disentangle which of the above three reasons is the main cause of this wealth transfer effect. The event of the regulatory change provides an opportunity to indirectly test these alternative explanations: if the wealth transfer effect is only a result of large investor sophistication (reason 1 and reason 2), then we shouldn't expect to see any change in large investor profitability, as their sophistication level hasn't changed. If, instead, the wealth transfer effect is primarily a result of large investors receiving true opinions from analysts through private channels in the pre-regulation period (reason 3), more likely we will observe a reduction in large investor trading profit in the post-regulation period as large investors were less likely to communicate with analysts through private channels after the regulations took place.

### **THE EFFECT OF THE GLOBAL SETTLEMENT ON INVESTMENT BANK RECOMMENDATION CREDIBILITY**

Several papers have documented the effect of the Global Settlement on improving the credibility of investment bank recommendations. Kadan et al. (2009) investigate the aftermath of the Global Settlement and document that optimistic recommendations are issued less frequently and tend to be more informative. In contrast, neutral and negative recommendations have become

more frequent and less informative. Moreover, the likelihood of issuing optimistic recommendations no longer depends on affiliation with the covered firm.

Similarly, Clarke et al. (2009) examine the impact of NASD Rule 2711, NYSE Rule 472, and the Global Research Settlement on the recommendation performance of independent, affiliated, and unaffiliated analysts. They find that analysts from all three types of institutions issued fewer strong buys following these regulations designed to separate investment banking and equity research. Affiliated analysts were less likely to issue innovative recommendations. While downgrades became more prevalent following the regulations, they were significantly less informative.

Examining stock returns, Kadan et al (2009) finds that investment bank strong buy and buy recommendations have become more informative while their sell and strong sell recommendations have become less informative since the regulations. Similarly, Casey (2009) finds that investment bank analyst upgrades have become more informative and their downgrades have become less informative. These results are consistent with the expectation that investment banks issue more credible recommendations after conflicts of interest has been curtailed or removed. As large and small investors may have different reactions toward the change of the regulatory environment, their trading behavior would not be affected by the regulations in the same fashion. In the next subsection I discuss the possible consequences of these regulations.

## **EXPECTED EFFECTS ON LARGE AND SMALL INVESTOR DIFFERENTIAL TRADING BEHAVIOR**

Prior literature summarized above suggests that 1) conflicts of interest caused biased recommendations 2) biased recommendations affected investor confidence and profitability (in different ways for large and small investors) and 3) the regulations removed or weakened conflicts of interest within investment bank analysts and have improved the quality of investment bank recommendations. These findings suggest that investor confidence and profitability may have changed as a result of the regulations. As large and small investors do not rely on investment bank recommendations to the same extent, it is reasonable to expect that the change of regulatory environment would have differential effects on large and small investors. In this subsection, I discuss the expected changes in large and small investor trading behavior separately for each of the three periods: the pre-regulation period, the investigation period and the post-regulation period.

### **The Pre-Regulation Period**

The pre-regulation period was featured by severe conflicts of interest within investment bank analysts and overall optimistic recommendations issued by investment banks. Instead of the bias in investment bank recommendations, prior studies find that both large and small investors react strongly to analyst recommendations as intense trading volumes (for both types of traders) were observed during a short window surrounding the recommendations. As small

investors lack the sophistication to extract information from analyst forecasts, they were expected to rely more heavily on analyst recommendations. For example, Mikhail et al. (2007) using sample from year 1993 to year 1999 show that small investors react more strongly than large investors to upgrades.

Regarding large and small investor differential trading profits in the pre-regulation period, several papers (Mikhail et al. 2007, Malmendier and Shanthikumar 2007, Defranco et al. 2007) find that large investors made positive trading profits during this period whereas small investors made negative trading profits using different samples. I expect to find the same wealth-transfer effect from small investors to large investors.

### **The Investigation Period**

The investigation period was featured by multiple corporate scandals as well as a series of regulatory investigations and congressional hearings. The revealed conflicts of interest within investment bank analysts and the low credibility of their recommendations may have negative impact on investor confidence to trade on these recommendations. In addition, the impact could be more severe for small investor confidence, as small investors relied more heavily on analyst recommendations and their confidence was more sensitive to the change of analyst recommendation credibility.

The expected change in investor trading profits is not as clear. On one hand, the credibility of investment bank recommendations may or may not have

improved during this period depending on how quickly investment banks react to the corporate scandals and regulatory investigations; on the other hand, even if the quality of investment bank research has improved during this time, investors might not have taken advantage of the improved informativeness of analyst recommendations as a result of the low investor confidence.

### **The Post-Regulation Period**

The post-regulation period starts from the completion of the regulatory investigation, during which numerous actions were taken (including the self-regulation rules and the Global Settlement) to remove conflicts of interest within investment banks. According to Kadan et al. (2009) and Casey (2009), the post-regulation period saw tremendous improvement in the credibility of investment bank analyst recommendations.

Regarding investor confidence level, as long as investors perceive the improvement in the credibility of analyst recommendations, I expect both types of investors to react more strongly to analyst recommendations in the post-regulation period. In addition, as small investors generally rely more heavily on analyst recommendations, I expect that the change in small investor reaction should be even stronger than that of large investors.

Regarding trading profit, small investors are most likely to have benefited from the Global Settlement, given that small investors were more likely deceived into losses by misleading recommendations in the pre-regulation period and given

that the regulations had reduced the frequency of misleading recommendations. As for large investor, their trading profit is expected to have decreased, given that large investors are less likely to receive analyst opinions through private channels in the post-regulation period than in the pre-regulation period.

The expected effects on investor confidence and trading profit discussed above are summarized in the following table.  $C_{ij}$  and  $P_{ij}$  ( $i=1,2,3$  and  $j=l,s$ ) indicate trading confidence and trading profit, respectively; the first subscript indicates one of the three periods: the pre-regulation period ( $=1$ ), the investigation period ( $=2$ ) and the post-regulation period ( $=3$ ); the second subscript denotes large ( $l$ ) or small ( $s$ ) investor group.

**Table 1. Expected Effects on Investor Confidence and Profit**

	Pre-Regulation	Investigation	Post-Regulation
Investor Confidence (relative)	$C_{1l} < C_{1s}$	$C_{2l} - C_{1l} < 0$ $C_{2s} - C_{1s} < 0$ $C_{2l} - C_{1l} < C_{2s} - C_{1s}$	$C_{3l} - C_{2l} > 0$ $C_{3s} - C_{2s} > 0$ $C_{3l} - C_{2l} < C_{3s} - C_{2s}$
Trading Profit (relative)	$P_{1l} > 0$ $P_{1s} < 0$		$P_{3l} - P_{1l} > 0$ $P_{3s} - P_{1s} < 0$ $P_{3l} - P_{1l} < P_{3s} - P_{1s}$

## Chapter 4

### EMPIRICAL TESTS

#### DATA

I obtain dates and levels of recommendations issued by individual analysts from the Institutional Broker's Estimate System (I/B/E/S) database. The I/B/E/S database records each analyst recommendation as a rating between 1 and 5. I reverse the order of this rating system so that a rating of 1 represents a strong sell and a 5 represents a strong buy. I also require that a previous recommendation by the same analyst for the same firm be available, because recommendation changes are additionally informative (for example, upgrades and downgrades are usually more informative than reiterations). An upgrade represents a change to a more positive recommendation category, a downgrade is a change to a more negative category and a reiteration is a recommendation rating that equals the prior rating. Observations are dropped if the prior recommendation is more than a year old. I also eliminate a recommendation if it is made by an anonymous analyst since I am unable to identify the affiliation.

In supplementary analyses, I distinguish between brokers who have underwriting relationships with the firms they cover and those who do not. Underwriting data is obtained from the Securities Data Corporation (SDC) database. I label as "affiliated" those recommendations issued during the five years following an IPO or two years following the SEO by analysts who are

employed by either its lead underwriters or the co-managers. I also consider as “affiliated” those recommendations issued by a future lead underwriter or co-managers, but this inclusion does not affect the results. The remaining recommendations are considered “unaffiliated.” Finally, I also distinguish between brokers who were implicated under the Global Settlement (“sanctioned banks”) and those who were not (“non-sanctioned banks”).<sup>6</sup>

To conduct my tests, I also require transaction-level data from the NYSE Trade and Quote (TAQ) database. This database contains intraday trades and quotes for all securities listed in NYSE, AMEX and the NASDAQ market. Following prior research, I use dollar value of shares traded to identify large and small trades. Lee and Radhakrishna (2000) find that the dollar value of the trade is better than number of shares traded in discriminating between large and small traders because it is less sensitive to stock price changes.

A crucial assumption is that small trades are initiated by less sophisticated traders (small traders), while large trades are initiated by more sophisticated traders (large traders). However, information about the other side of the trade is not identifiable. A buyer-initiated large trade, for example, could be filled with a large non-initiated sell order, with several small trades that are pulled together, or by the market maker. Thus, theoretically a trade may or may not lead to ownership changes between different investor groups. However, MS (2007)

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<sup>6</sup> See footnote 1.



provide evidence with institutional holding data that, in general, these trades are associated with ownership changes. This implies that in a single trade, one type of investors' (large or a small) gain is usually accompanied by the other type of investors' loss.

Following Lee (1992) and MWW (2007), I use \$7,000 and \$30,000 cutoffs to identify small and large trades, i.e. If the dollar value of a trade (number of shares traded multiplies the price at which a trade occurs) is smaller than \$7,000 (larger than \$30,000), I presume it is a small (large) trade. All middle size trades (between \$7,000 and \$30,000) are removed to reduce noise. As a robustness test, I also define trading size above (below) \$10,000 as a large (small) trade; results are similar under the alternative cutoffs.

### **SUMMARY STATISTICS**

Table 2 summarizes the distribution of recommendation revisions by year. The sample is comprised of 89,101 recommendation revisions made by 5,341 analysts representing 381 banks. Strong buy, buy and hold recommendations account for about 90% of all recommendations; the rest are sell or strong sell. Upgrades, downgrades and reiterations comprise 35%, 36% and 29% of the sample observations, respectively. Interestingly, the distribution of recommendations has shifted since the introduction of the regulatory changes examined in my study. During the investigation period and the post-regulation periods, the frequency of strong buy, buy and hold recommendations decreased

substantially, relative to the pre-regulation period while the frequency of sell and strong sell recommendations increased. Upgrades are less frequent during the investigation and post-regulation periods, while downgrades and reiterations are more common. This shift is consistent with the finding in Kadan et al (2009). The improved credibility of investment bank recommendations is also reflected in the five-day stock returns surrounding recommendation revisions. For upgrades, the average five-day stock returns surrounding recommendation revisions have become more positive from the Pre-regulation period to the investigation, and the Post-regulation periods, suggesting that upgrades are perceived as more credible; for downgrades and reiterations, the average five-day stock returns surrounding the recommendation revision have become less negative from the Pre-regulation period to the investigation and Post-regulation periods, suggesting that downgrades are perceived as less credible. These changes reflect that 1) before the new regulations took place, investors understood the tendency of investment banks to issue optimistic recommendations and correspondingly “discounted” favorable recommendations and 2) during and after the introduction of the regulations, investors also understood the change in investment bank recommendation credibility and no longer “discounted” investment bank recommendation revisions.

**Table 2**  
**Descriptive Statistics**

Year	2000	2001	2002	2003	2004	2005	2006	Pre-Reg.	Investi- gation.	Post-Reg.
<b>Total No. of brokers</b>	178	161	167	216	248	257	247	211	217	279
<b>Total No. of recommendations</b>	7028	8612	14185	13932	12273	10418	11319	11334	18491	59276
<b>Total No. of distinct analysts</b>	1871	1966	2134	2321	2423	2388	2445	2281	2599	4105
<b>Total No. of covered firms</b>	1396	1638	1440	1978	2077	2144	2238	1755	2019	3304
<b>Pct. of Strong Buy</b>	25.68%	24.34%	20.26%	13.97%	16.78%	19.87%	16.61%	24.80%	21.42%	16.60%
<b>Pct. of Buys</b>	37.21%	36.62%	27.98%	24.77%	25.52%	24.02%	25.08%	37.68%	29.92%	24.87%
<b>Pct. of Holds</b>	34.65%	35.56%	42.81%	47.67%	45.88%	45.61%	46.84%	34.87%	41.03%	46.57%
<b>Pct. of Sells</b>	1.56%	2.37%	6.53%	10.46%	8.14%	7.32%	7.86%	1.69%	5.54%	8.57%
<b>Pct. of Strong Sells</b>	0.87%	1.09%	2.37%	3.10%	3.65%	3.15%	3.59%	0.94%	2.06%	3.37%
	43.89%	40.80%	30.29%	33.57%	35.69%	37.21%	33.32%	42.67%	32.94%	34.85%
<b>Pct. of Upgrades</b>										
<b>Pct. of Downgrades</b>	29.64%	34.18%	37.85%	38.73%	38.05%	35.41%	36.23%	30.67%	37.23%	37.23%
<b>Pct. of Reiterations</b>	26.45%	25.01%	31.85%	27.69%	26.25%	27.38%	30.44%	26.65%	29.82%	27.91%
<b>RET (-2, +2)</b>										
<b>Upgrades</b>	1.40%	1.60%	1.80%	2.41%	2.52%	2.76%	2.50%	1.47%	1.75%	2.60%
<b>Downgrades</b>	-4.73%	-4.12%	-4.38%	-3.11%	-3.82%	-2.64%	-2.58%	-4.49%	-4.27%	-3.03%
<b>Reiterations</b>	-2.03%	-1.42%	-1.07%	0.00%	-0.60%	0.13%	-0.17%	-1.69%	-1.19%	-0.20%
<b>FIRM_SIZE</b>	14.90	14.89	15.07	14.51	14.69	14.60	14.69	14.90	14.92	14.66
<b>BROK_SIZE</b>	72.57	81.67	88.01	81.33	65.11	66.62	77.57	75.57	85.56	71.24
<b>COVERAGE</b>	11.23	11.44	16.36	13.35	11.72	9.71	9.51	11.32	14.35	11.27
<b>SPREAD</b>	0.005	0.004	0.003	0.002	0.001	0.001	0.001	0.005	0.004	0.001

This table summarizes, by year, the number of brokers, the number (and percentage) of recommendations, and number of each type of recommendations. An upgrade represents a recommendation change to a more positive level; a downgrade represents a recommendation change to a more pessimistic level; a reiteration represents no change in recommendation level. RET (-2, +2) is the average 5-day stock return surrounding an analyst recommendation; FIRM\_SIZE is the market capitalization (in millions) of the covered firm, measured as of the beginning of the year. BROK\_SIZE is the size of a broker, measured by the number of analysts employed by that broker during the year; COVERAGE is the number of analysts covering the firm during a particular year; ABMKTVOL is the abnormal market trading volume, measured as the average daily market-level trading volume during the 5-day window surrounding an analyst recommendation minus the average market-level trading volume during the five days before the recommendation window, then scaled on the latter. SPREAD is the average daily bid-ask spread for a stock during the 5-day window surrounding an analyst recommendation.

The Pre-Reg. period is a period of time before formal investigation on investment banks (Jan/2000 – Jun/2001); the Investigation period is until the finalization of these investigations – the Global Settlement took place (Jul/2001-Dec/2002); the Post-Reg. period is from after the Global Settlement (Jan/2003 – Dec/2006).

Chapter 5

EMPIRICAL ANALYSES

**Test 1: Change in Abnormal Trading Volume**

In this subsection I test differential reactions of small and large traders to analyst recommendation revisions before and after the introduction of new regulations. Womack (1996) finds positive abnormal trading volume surrounding analyst recommendations. Mikhail et al. (2007) calculate abnormal trading volume for large and small traders, respectively, to capture their differential reactions to recommendation revisions. I calculate abnormal trading volume as

$$AVOLUME_{i,x,t} =$$

$$\left[ \frac{\begin{array}{l} \text{average daily trading volume for firm } i \\ \text{in investor group } x \text{ during } (t = -2,+2) \\ \text{window surrounding an analyst} \\ \text{recommendation revision at } t \end{array} - \begin{array}{l} \text{average daily trading volume for firm } i \\ \text{in investor group } x \text{ during } (t = -7,-3) \\ \text{window before an analyst} \\ \text{recommendation revision at } t \end{array}}{\begin{array}{l} \text{Average daily trading volume for firm } i \text{ in investor group } x \text{ during } (t = -7,-3) \\ \text{window before an analyst recommendation revision at } t \end{array}} \right] \cdot 100\% \quad (1)$$

i.e. I calculate i) average trading volume in the 5-day window centered on the recommendation day, labeled as *event trading volume* and ii) average daily trading volume in the 5 days prior to the 5-day recommendation window labeled as *normal trading volume*. *Abnormal trading volume* is defined as the percentage

change of event trading volume from normal trading volume, for each type of trader. A positive  $AVOLUME_{i,x,t}$  suggests that analyst recommendations trigger intense trading activity during the event window. It is worth noting that this measure does not have any directional implications, i.e. positive abnormal trading volume might be due to intensive buy-initiated trades or sell-initiated trades in the event period.

Table 3 reports descriptive statistics of  $AVOLUME_{i,x,t}$ , by investor type and recommendation revision category, for the pre-regulation, investigation and post-regulation periods. T-statistics and Wilcoxon Z-statistics are provided; the latter is a ranked test and is useful when the population can not be assumed to be normally distributed. Overall, all recommendation revisions appear to trigger excess trading volumes suggesting that a recommendation revision generally conveys information to the market. For large trades, a recommendation revision results, on average, in an increase of 74.95% in abnormal trading volume in the pre-regulation period. In contrast, in the investigation period, this number drops to 67.37%. This difference is statistically significant ( $t = -7.58$  and  $Z = -9.21\%$ ) and is consistent with investors losing confidence as the various analyst scandals are uncovered and brought to light as a result of congressional hearings and other investigations. In the post-regulation period, the abnormal volume measure is 100.73%, significantly higher than the values in the previous two periods. This increased reaction is consistent with regulators' hopes that the new regulatory

environment will result in more credible recommendations and increased investor confidence in these recommendations.

I observe similar patterns within each recommendation revision category (upgrades, reiterations and downgrades). Abnormal trading volume for large investors drops from the pre-regulation period to the investigation period as analyst impropriety is revealed and increases after the introduction of new regulations meant to enhance the quality of analyst disclosures. Focusing on the changes in abnormal trading volume from the pre-regulation period to the post-regulation period, I find that the changes are greater for the strong buy, buy and hold categories than for the sell and strong sell categories; they are also greater for upgrades than for downgrades. This is consistent with the belief that the regulations should be most effective in restoring the credibility of favorable recommendations.

The changes in small trader abnormal trading volume closely mirror those for large traders, i.e. the average abnormal trading volume decreases during the investigation period and increases to an even higher level in the post-regulation period.

To our surprise, the level of small investor abnormal trading volume in the pre-regulation period appears to be lower than that of large investor abnormal trading volume, despite the expectation that small investors relied on analyst recommendations to a greater extent than large investors. One possible

**Table 3**  
**Abnormal trading volume, by trader type and recommendation type**

<i>AVOLUME<sub>L</sub></i>	(1) <i>Pre-Reg.</i>			(2) <i>Investigation</i>			(3) <i>Post-Reg.</i>			(2)-(1)	(3)-(2)	(3)-(1)
	Mean	Median	Medians	Mean	Medians	Medians	Mean	Medians	Medians			
<b>Overall</b>	74.95%	25.50%	67.37%	16.29%	100.73%	29.39%	-7.58%	***	33.36%	***	25.78%	***
<b>Strong Buy</b>	79.78%	22.48%	70.91%	19.58%	117.01%	43.54%	-8.87%	***	46.10%	***	37.23%	***
<b>Buy</b>	72.88%	23.05%	63.45%	16.49%	106.02%	31.97%	-9.43%	***	42.57%	***	33.14%	***
<b>Hold</b>	62.57%	17.38%	60.00%	15.32%	96.11%	25.56%	-2.57%	***	36.11%	***	33.54%	***
<b>Sell</b>	95.91%	24.42%	78.53%	15.49%	106.38%	31.57%	-17.38%	***	27.85%	***	10.47%	***
<b>Strong Sell</b>	101.69%	33.50%	65.64%	20.01%	107.92%	31.01%	-36.05%	***	42.28%	***	6.23%	***
<b>Upgrades</b>	75.77%	27.05%	68.88%	20.56%	105.96%	33.68%	-6.89%	***	37.08%	***	30.19%	***
<b>Downgrades</b>	78.85%	27.77%	74.11%	17.45%	107.05%	32.62%	-4.74%	***	32.94%	***	28.20%	***
<b>Reiterations</b>	69.19%	20.40%	57.31%	9.41%	85.81%	19.74%	-11.88%	***	28.50%	***	16.62%	***
<i>AVOLUME<sub>S</sub></i>												
<b>Overall</b>	24.82%	10.31%	19.34%	7.38%	32.49%	16.15%	-5.48%	***	13.14%	***	7.66%	***
<b>Strong Buy</b>	24.48%	7.32%	13.94%	6.50%	33.70%	19.07%	-10.54%	***	19.76%	***	9.22%	***
<b>Buy</b>	24.64%	8.48%	19.80%	6.89%	30.51%	14.68%	-4.84%	***	10.71%	***	5.87%	***
<b>Hold</b>	19.98%	4.63%	12.95%	4.14%	31.39%	15.39%	-7.03%	***	18.44%	***	11.41%	***
<b>Sell</b>	29.47%	13.34%	21.17%	7.19%	33.51%	16.68%	-8.30%	***	12.34%	***	4.04%	***
<b>Strong Sell</b>	21.16%	12.43%	15.81%	6.77%	41.13%	22.80%	-5.35%	***	25.32%	***	19.97%	***
<b>Upgrades</b>	25.13%	10.27%	19.74%	7.44%	32.72%	18.33%	-5.39%	***	12.98%	***	7.59%	***
<b>Downgrades</b>	26.64%	10.76%	20.56%	8.71%	36.05%	19.02%	-6.08%	***	15.49%	***	9.41%	***
<b>Reiterations</b>	22.25%	9.87%	17.39%	5.65%	27.60%	9.59%	-4.86%	***	10.21%	***	5.35%	***



This table presents comparisons of abnormal trading volumes across different time periods.  $AVOLUME_{i,t}$  is abnormal trading volume for large (small) trades within 5-day recommendation window, defined as the percentage change of the (-2, +2) day recommendation window trading volume from the (-7,-3) day non-recommendation window trading volume. The Pre.-Reg. period is a period of time before formal investigation on investment banks (Jan/2000 – Jun/2001); the Investigation. period is until the finalization of these investigations – the Global Settlement took place (Jul/2001-Dec/2002); the Post-Reg. period is from after the Global Settlement (Jan/2003 – Dec/2006). T-test and Wilcoxon Z-test results are provided. \*, \*\*, and \*\*\* indicate significance at 10%, 5% and 1%, respectively

explanation is that, prior to the introduction of the regulations, large investors relied on the true opinions from investment banks privately communicated to them when public recommendations were made. As these opinions were more credibility than those received by small investors, large investors on average traded more surrounding the recommendations.

To make the change in investor confidence comparable across investor groups, I first calculate two separate standardized abnormal trading volumes, one for each type of trader by subtracting the sample-means from the abnormal trading volumes, and then dividing the demeaned abnormal trading volumes by their standard deviations, respectively.

Next, I examine how trading reactions to analyst recommendations have changed, controlling for bank characteristics, analyst characteristics and firm characteristics, by estimating the following seemingly unrelated regression model (SUR). Large and small traders' reactions to a recommendation event very likely are correlated. The SUR model adjusts for such correlations and provides more efficient estimates than separate OLS regressions.

$$\begin{aligned}
AVOLUME_{i,k,t}^j - STARNDARD &= \alpha_0^j + \alpha_1^j PREREG + \alpha_2^j UP_{i,k,t} \\
&+ \alpha_3^j UP_{i,k,t} * PREREG + \alpha_4^j DOWN_{i,k,t} + \alpha_5^j DOWN_{i,k,t} * PREREG \\
&+ \alpha_6^j POSTREG_{i,k,t} + \alpha_7^j UP_{i,k,t} * POSTREG + \alpha_8^j DOWN_{i,k,t} * POSTREG \\
&+ \alpha_9^j FIRM\_SIZE + \alpha_{10}^j BROK\_SIZE_{k,t} + \alpha_{11}^j COVERAGE_t \\
&+ \alpha_{12}^j ABMKTVOL + \alpha_{13}^j SPREAD + \varepsilon_{i,k,t}^j \quad (2)
\end{aligned}$$

Where each variable is defined as following:

$AVOLUME_{i,k,t}^j$  \_\_\_  $STARNDARD$ : Standardized abnormal trading volume for firm  $i$  by investor group  $j$  ( $j =$  small or large) associated with analyst  $k$ 's recommendation revision for firm  $i$  at time  $t$ , where abnormal trading volume is the percentage change of average trading volume from the event trading period (day (-2,+2)) to the normal trading period (day (-7,-3)).

$UP_{i,k,t}$ : Dummy variable equal to 1 if the recommendation revision is an upgrade.

$DOWN_{i,k,t}$ : Dummy variable equal to 1 if the recommendation revision is a downgrade.

$BROK\_SIZE_t$ : Brokerage size, measured as the number of analysts (in logarithm) employed by analyst  $k$ 's brokerage house in the year the recommendation is made.

$COVERAGER_{i,t}$ : the number of analyst covering the firm during a particular year.

$FIRM\_SIZE_{i,t}$ : Firm size, measured as the natural logarithm of the market value of equity for firm  $i$  at the beginning of year the recommendation is made.

$AMKTVOL_t$ : Abnormal market volume at time  $t$ , calculated as total market volume surrounding recommendation revision during  $t = -2$  to  $t = +2$  less the average total market volume during  $t = -22$  to  $t = -3$  window.

$SPREAD_{it}$ : the average daily bid-ask spread for the stock during the 5-day recommendation window.

$PREREG$ : Dummy variable equal to 1 if the recommendation is made in the *Post-reg.* period, i.e. before the formal investigation on investment banks (June of 2001).

$POSTREG$ : Dummy variable equal to 1 if the recommendation is made in the post-regulation period, i.e. after the Global Settlement took place (January of 2003).

$\varepsilon_{i,k,t}^j$  : Error term.

The control variables in Equation (2) are drawn from prior research. I include firm size and analyst coverage since the increased availability of information for these firms is likely to result in less abnormal trading volume in response to analyst recommendations and revisions (Stickel, 1995). I predict that the coefficient estimates on  $FIRM\_SIZE$  and  $COVERAGE$  will be negative. In contrast, I predict the coefficient on  $BROK\_SIZE$  will be positive. Larger brokerages will generate greater trading volume given their enhanced ability to disseminate information to the capital markets through their retail brokers and broader client base (Stickel, 1995). Likewise, I predict the coefficient on abnormal market volume ( $AMKVOL$ ) to be positive. Firm abnormal trading volume will be positively affected by general market liquidity (Bhattacharya, 2001). The coefficient on bid-ask spread ( $SPREAD$ ) is expected to be negative as

a high bid-ask spread set by the market maker discourages trading activities (Copeland and Galai, 1983).

The coefficients of primary interest are:  $-PREREG$ ,  $-(PREREG+PREREG*UP)$ ,  $-(PREREG+PREREG*DOWN)$ ,  $POSTREG$ ,  $POSTREG+POSTREG*UP$  and  $POSTREG*DOWN$ .  $-PREREG$  reflects how  $AVOLUME_{i,k,t}^j$  conditional on reiterations has changed from the pre-regulation period to the investigation period;  $-(PREREG+PREREG*UP)$  and  $-(PREREG+PREREG*DOWN)$  reflect how  $AVOLUME_{i,k,t}^j$  conditional on upgrades and downgrades has changed, respectively. Similarly,  $POSTREG$ ,  $POSTREG+POSTREG*UP$  and  $POSTREG*DOWN$  reflect how  $AVOLUME_{i,k,t}^j$  conditional on reiterations, upgrades, or downgrades has changed from the Reg. period to the post-regulation period, respectively.

Table 4 panel A presents the regression results. Column (1) and (2) present the results without and with control variables, respectively. From the pre-regulation period to the investigation period, there are decreased reactions to investment bank reiterations, as the sign on  $-PREREG$  is negative and significant, for both types of traders. Moreover, changes in reactions to upgrades and downgrades are even more negative, as the signs on  $-PREREG*UP$  and  $-PREREG*DOWN$  are negative. From the investigation period to the post-regulation period, I observe increased reactions to investment bank reiterations, as

**Table 4A**  
**Abnormal Trading Volume in response to investment bank recommendation revisions**

Variable	w/o control			w/ control		
	Small	Large		Small	Large	
Intercept	a <sub>0</sub> -0.185 (-12.83)	b <sub>0</sub> -0.142 (-9.99)	c <sub>0</sub> ***	d <sub>0</sub> -0.246 (-5.90)	e <sub>0</sub> -0.196 (-4.71)	f <sub>0</sub> ***
PREREG	a <sub>1</sub> 0.048 (4.24)	b <sub>1</sub> 0.043 (3.77)	c <sub>1</sub> ***	d <sub>1</sub> 0.054 (4.39)	e <sub>1</sub> 0.044 (3.76)	f <sub>1</sub> ***
UP	a <sub>2</sub> 0.093 (4.62)	b <sub>2</sub> 0.053 (5.28)	c <sub>2</sub> ***	d <sub>2</sub> 0.096 (4.54)	e <sub>2</sub> 0.057 (5.37)	f <sub>2</sub> ***
UP*PREREG	a <sub>3</sub> 0.033 (2.18)	b <sub>3</sub> 0.024 (1.56)	c <sub>3</sub> ***	d <sub>3</sub> 0.035 (2.71)	e <sub>3</sub> 0.029 (1.82)	f <sub>3</sub> **
DOWN	a <sub>4</sub> 0.112 (5.81)	b <sub>4</sub> 0.13 (6.79)	c <sub>4</sub> ***	d <sub>4</sub> 0.111 (5.49)	e <sub>4</sub> 0.140 (6.42)	f <sub>4</sub> ***
DOWN*PREREG	a <sub>5</sub> 0.043 (2.80)	b <sub>5</sub> 0.044 (2.83)	c <sub>5</sub> ***	d <sub>5</sub> 0.043 (2.73)	e <sub>5</sub> 0.048 (3.10)	f <sub>5</sub> ***
POSTREG	a <sub>6</sub> 0.105 (6.37)	b <sub>6</sub> 0.058 (2.33)	c <sub>6</sub> ***	d <sub>6</sub> 0.111 (6.40)	e <sub>6</sub> 0.056 (2.08)	f <sub>6</sub> ***
UP*POSTREG	a <sub>7</sub> 0.061 (2.63)	b <sub>7</sub> 0.045 (1.97)	c <sub>7</sub> **	d <sub>7</sub> 0.059 (2.46)	e <sub>7</sub> 0.040 (1.70)	f <sub>7</sub> *
DOWN*POSTREG	a <sub>8</sub> 0.080 (3.79)	b <sub>8</sub> 0.065 (2.91)	c <sub>8</sub> ***	d <sub>8</sub> 0.085 (3.69)	e <sub>8</sub> 0.056 (2.42)	f <sub>8</sub> ***
System weighted R-sqr	0.006			0.021		

This table represents the regression result of large- and small-trader abnormal trading volume (standardized) on explanatory variables, using the seemingly unrelated regression method. Column (1) and (2) presents regression results with and without control variables, respectively. PREREG is a dummy variable equal to 1 if the recommendation is made during the pre-reg. period; POSTREG is a dummy variable equal to 1 if the recommendation is made during the post-reg. period; UP is a dummy variable equal to 1 if the recommendation revision is an upgrade; DOWN is a dummy variable equal to 1 if the recommendation revision is a downgrade; FIRM\_SIZE is the market capitalization (in millions) of the covered firm, measured as of the beginning of the year. BROK\_SIZE is the size of a broker, measured by the number of analysts employed by that broker during the year; COVERAGE is the number of analysts covering the firm during a particular year; ABMKTVOL is the abnormal market trading volume, measured as the average daily market-level trading volume during the 5-day window surrounding an analyst recommendation minus the average market-level trading volume during the five days before the recommendation window, then scaled on the latter. SPREAD is the average daily bid-ask spread for a stock during the 5-day window surrounding an analyst recommendation.

**Table 4B**  
**Change in Investor Confidence**

Test	aggregation	Value	P-value	aggregation	Value	P-value
<b>From Pre-Reg to Investigation.</b>						
Change in small trader Confidence	Reiterations	-a <sub>1</sub>	-0.048	-c <sub>1</sub>	-0.054	<0.001
	Upgrades	-(a <sub>1</sub> +a <sub>3</sub> )	-0.081	-(c <sub>1</sub> +c <sub>3</sub> )	-0.089	<0.001
	Downgrades	-(a <sub>1</sub> +a <sub>5</sub> )	-0.091	-(c <sub>1</sub> +c <sub>5</sub> )	-0.097	<0.001
change in large trader Confidence	Reiterations	-b <sub>1</sub>	-0.043	-d <sub>1</sub>	-0.044	<0.001
	Upgrades	-(b <sub>1</sub> +b <sub>3</sub> )	-0.067	-(d <sub>1</sub> +d <sub>3</sub> )	-0.073	<0.001
	Downgrades	-(b <sub>1</sub> +b <sub>5</sub> )	-0.087	-(d <sub>1</sub> +d <sub>5</sub> )	-0.092	<0.001
Relative change in small v.s Large trader confidence	Reiterations	-a <sub>1</sub> +b <sub>1</sub>	-0.005	-c <sub>1</sub> +d <sub>1</sub>	0.009	0.021
	Upgrades	-(a <sub>1</sub> +a <sub>3</sub> )+(b <sub>1</sub> +b <sub>3</sub> )	-0.014	-(c <sub>1</sub> +c <sub>3</sub> )+(d <sub>1</sub> +d <sub>3</sub> )	-0.016	<0.001
	Downgrades	-(a <sub>1</sub> +a <sub>5</sub> )+(b <sub>1</sub> +b <sub>5</sub> )	0.006	-(c <sub>1</sub> +c <sub>5</sub> )+(d <sub>1</sub> +d <sub>5</sub> )	-0.005	0.815
<b>From Investigation. to Post-Reg.</b>						
Change in Small trader Confidence	Reiterations	a <sub>6</sub>	0.105	c <sub>6</sub>	0.111	<0.001
	Upgrades	a <sub>6</sub> +a <sub>7</sub>	0.166	c <sub>6</sub> +c <sub>7</sub>	0.170	<0.001
	Downgrades	a <sub>6</sub> +a <sub>8</sub>	0.185	c <sub>6</sub> +c <sub>8</sub>	0.196	<0.001
change in large trader Confidence	Reiterations	b <sub>6</sub>	0.058	d <sub>6</sub>	0.056	<0.001
	Upgrades	b <sub>6</sub> +b <sub>7</sub>	0.103	d <sub>6</sub> +d <sub>7</sub>	0.096	<0.001
	Downgrades	b <sub>6</sub> +b <sub>8</sub>	0.123	d <sub>6</sub> +d <sub>8</sub>	0.112	<0.001



Relative change in small v.s. large trader confidence	Reiterations	$a_6 - b_6$	0.047	<0.001	$c_6 - d_6$	0.055	<0.001
	Upgrades	$(a_6 + a_7) - (b_6 + b_7)$	0.063	<0.001	$(c_6 + c_7) - (d_6 + d_7)$	0.074	<0.001
	Downgrades	$(a_6 + a_8) - (b_6 + b_8)$	0.062	<0.001	$(c_6 + c_8) - (d_6 + d_8)$	0.084	<0.001
<b>From Pre-Reg. to Post-Reg.</b>	Reiterations	$-a_1 + a_6$	0.057	<0.001	$-c_1 + c_6$	0.058	<0.001
Change in small trader Confidence	Upgrades	$-(a_1 + a_3) + (a_6 + a_7)$	0.085	<0.001	$-(c_1 + c_3) + (c_6 + c_7)$	0.081	<0.001
	Downgrades	$-(a_1 + a_5) + (a_6 + a_8)$	0.094	<0.001	$-(c_1 + c_5) + (c_6 + c_8)$	0.099	<0.001
Change in large trader Confidence	Reiterations	$-b_1 + b_6$	0.015	<0.001	$-d_1 + d_6$	0.012	<0.001
	Upgrades	$-(b_1 + b_3) + (b_6 + b_7)$	0.036	<0.001	$-(d_1 + d_3) + (d_6 + d_7)$	0.023	<0.001
	Downgrades	$-(b_1 + b_5) + (b_6 + b_8)$	0.036	<0.001	$-(d_1 + d_5) + (d_6 + d_8)$	0.020	<0.001
Relative change in small v.s. large trader confidence	Reiterations	$(-a_1 + b_1) + (a_6 - b_6)$	0.042	<0.001	$(-c_1 + d_1) + (c_6 - d_6)$	0.046	<0.001
	Upgrades	$-(a_1 + a_3) + (b_1 + b_3) - (a_6 + a_7) + (b_6 + b_7)$	0.049	<0.001	$-(c_1 + c_3) + (d_1 + d_3) - (c_6 + c_7) + (d_6 + d_7)$	0.058	<0.001
	Downgrades	$-(a_1 + a_5) + (b_1 + b_5) - (a_6 + a_8) + (b_6 + b_8)$	0.068	<0.001	$-(c_1 + c_5) + (d_1 + d_5) - (c_6 + c_8) + (d_6 + d_8)$	0.079	<0.001

This table aggregates the coefficients in Table 4A. F-statistics and P-values are provided. \*, \*\*, and \*\*\* represents significance at 10%, 5% and 1%, respectively.

the sign on *POSTREG* is positive and significant, for both types of traders. Moreover, changes in reactions to upgrades and downgrades are even more positive, as the signs on *POSTREG\*UP* and *POSTREG\*DOWN* are positive. The estimated coefficients on my control variables are as expected. Abnormal trading volume is positively related to abnormal market trading volume (*ABMKTVOL*) and brokerage size (*BROK\_SIZE*) and negatively correlated with firm size (*FIRM\_SIZE*), coverage (*COVERAGE*) and bid-ask spread (*SPREAD*). These results are consistent with the univariate results presented previously. Trading activities are negatively affected as investors lost confidence due to various analyst scandals coming to light and then recovered as the new regulations came into effect.

In Table 4 panel B, I aggregate the regression coefficients in panel A and present the aggregated values only in order to highlight the differences between the changes in small- and large- investor confidence. The “aggregation” columns correspond to the coefficients in panel A. From the pre-regulation period to the investigation period, changes in large- and small- trader confidence are negative; in addition, F-tests show that the relative change is larger for small traders. In contrast, changes in large- and small- trader confidence are positive moving from the investigation to the post-regulation period; F-tests show that the relative change is also larger for small traders. Overall, moving from the pre-regulation to the post-regulation period, there are positive changes in investor confidence, for

both types of investors; the relative change in confidence is larger for small traders. The fact that small-trader confidence is more sensitive to investment bank reputation is consistent with small traders relying on investment bank recommendations to a greater extent relative to large traders. Large traders may have the ability to extract information from analyst reports regardless of existing conflicts and may have alternative sources of information unavailable to small investors.

## **TEST 2: TRADING DIRECTION AND PROFITABILITY**

In this section, I use an algorithm developed by Lee and Ready (1991) to classify each trade as buyer- or seller- initiated, and further use that to calculate investor profitability. This algorithm compares the price at which the trade occurs with the prevailing<sup>7</sup> bid and ask prices; trades occurring at or closer to the prevailing quoted ask (bid) are classified as buyer- (seller- ) initiated trades and imply that the buyer (seller) is the active party to trade.

Following prior literature, I first calculate trading imbalance

(  $NETBUY_{i,k,t}^j$  ) as:

$$NETBUY_{i,k,t}^j = \frac{BI_{i,k,t}^j - SI_{i,k,t}^j}{BI_{i,k,t}^j + SI_{i,k,t}^j} \quad (j = 1,s) \quad (3)$$

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<sup>7</sup>According to prior literature, the TAQ database sometimes has a delay in recording market quotes. Following the most common practice, I avoid such an issue using the ask/bid prices occurred 5 seconds before each trade as the prevailing prices.

where  $BI^j$  is daily buyer-initiated trades (in dollars) in investor type  $j$  ( $j = l, s$ );  $SI^j$  is seller-initiated trades (in dollars) in investor type  $j$ .  $NETBUY_{i,k,t}^j$  represents the percentage of total trading volume caused by net buying activities.

Unlike *AVOLUME*, *NETBUY* can take negative values, especially when responding to negative recommendations. I observe that on average, upgrades are associated with net buying activities for both small and large traders while downgrades are associated with net selling activities for both types of traders; small (large)-trader trading imbalance is slightly positive (negative) surrounding reiterations indicating that small (large) traders are net buyers in response to reiterations.

Table 5 shows the correlation between the recommendation revision level and large- and small- trader net buying activities. To save space, I only list the correlation tables separately for the pre-regulation period and the post-regulation period (in the investigation period, the correlation coefficients are similar to those in the Post-reg. period). In the pre-regulation period, *REV* is positively correlated with both  $NETBUY_l$  and  $NETBUY_s$ , suggesting that more optimistic recommendations trigger higher net buying activities. Moreover, judging from the magnitude of these correlations, small investors seem to be more trustful to recommendation revisions, as the correlation coefficient between  $NETBUY_s$  and *REV* is larger. Nevertheless, small investors do not seem to profit from these recommendations. The correlations between  $NETBUY_s$  and the subsequent abnormal returns (1-month and 3-month) are negative (-0.027 and

**Table 5**  
**Spearman Correlation**

<b>Pre-Reg.</b>					
	NETBUY <sub>s</sub>	NETBUY <sub>l</sub>	REV	RET(+3,+20)	RET(+3,+60)
NETBUY <sub>s</sub>	1.000	0.239***	0.074***	-0.027***	-0.038***
NETBUY <sub>l</sub>		1.000	0.036***	0.075***	0.064***
REV			1.000	0.063***	0.053***
RET(+3,+20)				1.000	0.814***
RET(+3,+60)					1.000

  

<b>Post-Reg.</b>					
	NETBUY <sub>s</sub>	NETBUY <sub>l</sub>	REV	RET(+3,+20)	RET(+3,+60)
NETBUY <sub>s</sub>	1.000	0.253***	0.084***	0.042***	0.045***
NETBUY <sub>l</sub>		1.000	0.041***	0.044***	0.052***
REV			1.000	0.074***	0.058***
RET(+3,+20)				1.000	0.735***
RET(+3,+60)					1.000

NETBUY<sub>l(s)</sub> is trading imbalance calculated using Lee and Ready quote method, i.e.

$$NETBUY_{i,k,t}^j = \frac{BI_{i,k,t}^j - SI_{i,k,t}^j}{BI_{i,k,t}^j + SI_{i,k,t}^j}$$

where  $BI^j$  is daily buyer-initiated trades (in dollars) in investor type  $j$

( $j = l, s$ );  $SI^j$  is buyer-initiated trades (in dollars) in investor type  $j$ .  $NETBUY_{i,k,t}^j$  represents the percentage of total trading volume caused by net buying activities. REV is the recommendation revision level; RET(+3, +20) and RET(+3,+60) are 1-month and 3-month post-recommendation abnormal stock returns (four-factor adjusted). \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% level, respectively.

-0.038); whereas that between  $NETBUY_t$  and subsequent returns are positive (0.075 and 0.064, respectively) and significant. In the post-regulation period,  $NETBUY_s$  is positively correlated with both one-month and three-month stock returns (with correlation coefficients 0.042 and 0.045, respectively). On the other hand, the correlation between  $NETBUY_t$  and post-recommendation stock returns are lower relative to the pre-regulation period. These correlation results suggest that small (large) investors became more (less) capable of profiting from Investment bank recommendations after the regulations.

Following MWW (2007), I multiply the daily amount of abnormal volume (abnormal buying volume minus abnormal selling volume, based on dollars of shares traded) deflated by the absolute value of total abnormal trading volume (abnormal buying volume plus abnormal selling volume) for each investor group during the event window, by the firm's abnormal return over the next trading month ( $RET (+3, +20)$ )<sup>8</sup>. To minimize the effect of outliers, I winsorize the observations in the top and bottom percentile of the distribution<sup>9</sup>.

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<sup>8</sup> The stock returns are adjusted for market return, size, book-to-market and momentum. If a stock is delisted from CRSP within the return-calculation period, I use delisting return equal to market return.

<sup>9</sup> The result is not sensitive to the winsorization.

**Table 6**  
**Trading Profit Analysis**

	(1) Pre-Reg.	(2) Investigation.	(3) Post-Reg.	(2)-(1)	(3)-(2)	(3)-(1)
Small trade	Overall	***	0.007	***	0.002	***
	Upgrades	-0.011	0.007	***	0.000	***
	Downgrades	-0.006	0.001	***	0.007	***
	Reiterations	-0.004	0.001	***	0.005	***
large trade	Overall	0.019	0.009	***	0.003	***
	Upgrades	0.021	0.011	***	0.000	***
	Downgrades	0.016	0.006	***	0.006	*
	Reiterations	0.019	0.008	***	0.005	*
Large-Small	Overall	0.026	0.004	**	0.000	***
	Upgrades	0.030	0.004	**	-0.001	***
	Downgrades	0.022	0.000	0.004	0.004	***
	Reiterations	0.025	0.007	0.006	-0.001	***

This table presents the trading profits for large and small traders, respectively. Trading profits are calculated as the trading imbalances (large and small) during the 5-day window surrounding an analyst recommendation multiplies abnormal stock returns (four-factor adjusted) in the following month

(RET(+3,+20)). The Pre-Reg. period is a period of time before formal investigation on investment banks (Jan/2000 – Jun/2001); the Investigation. period is until the finalization of these investigations – the Global Settlement took place (Jul/2001-Dec/2002); the Post-Reg. period is from after the Global Settlement (Jan/2003 – Dec/2006). \*, \*\*, and \*\*\* indicates significance at 1%, 5% and 10%, respectively.

Table 6 presents the results using 1-month abnormal stock returns ( $RET(+3, +20)$ )<sup>10</sup>. For small traders, the average abnormal trading profit is significantly negative (-0.6%) in the pre-regulation period; the abnormal returns are more negative for upgrades and less for downgrades and reiterations. After the scandals come to light, the average trading profits for small investors increase to positive levels. In contrast, large traders experience a reduction in profitability; the overall change in profitability from the Pre-reg. period to the Post-reg. period is negative (-0.9%). On relative terms, large trader average trading profit was about 2.6% higher than that of small traders before the regulations, consistent with prior findings of a wealth-transfer effect from small traders to large traders. In the post regulation time period this differential is decreased to 0.4%. Although the difference is still significant, the wealth transfer effect has been reduced by 5/6. Moreover, the reduction in relative profitability is greater for upgrades (2.7%) than for downgrades (1.8%) or reiterations (1.9%). When I calculate trading profits using 3-month, 6-month or 12-month stock returns, the conclusions are similar. The results from the trading profitability analysis are consistent with the conclusions from the correlation analysis: small traders are more profitable when following investment bank recommendations after the regulations are introduced while large-trader profitability has been greatly impaired. The wealth-transfer effect has been largely

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<sup>10</sup> The stock returns are adjusted for market return, size, book-to-market and momentum.



removed. In other words, small traders did benefit from the Settlement-related regulations.

## Chapter 6

### ADDITIONAL ANALYSIS

#### **ELIMINATING OTHER INFORMATION EVENTS**

Analysts tend to release recommendations in close proximity to information events such as earnings announcements, dividend announcements and management guidance. My test results, especially those related to abnormal trading volume may potentially be driven by these other relevant events, i.e. investors react to earnings events instead of to analyst recommendations. To solve this issue, I eliminate analyst recommendations that have an earnings announcement, dividend announcement or management guidance issued within (-7, 2) days surrounding the recommendation window.<sup>11</sup>

After this elimination, 45,102 observations remain in the sample. I perform tests using these recommendations that are not centered around any earnings events. I find similar results in both the abnormal trading volume test and the profitability test. This suggests that changes in trading volume and profitability are due to perceived changes in the quality of analyst recommendations, instead of changes in the quality of earnings or dividend-related information.

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<sup>11</sup> This is to guarantee that these information events are not in the normal-trading period (-7,-3) or event trading period (-2, +2).

## **AFFILIATED BANKS V.S. UNAFFILIATED BANKS**

The goal of the Global Settlement and related regulations is to eliminate conflict of interest problems in investment recommendations. As discussed in chapter 3, one type of conflict of interest is the underwriting relationship between investment banks and the firms they cover. In this part, I examine whether the changes in confidence and profitability occur to recommendations issued by both affiliated banks and unaffiliated banks and whether the changes are more prominent for recommendation issued by affiliated banks.

Affiliated banks are those who served as underwriters or co-managers for a firm during the five years following its IPO or two years following its SEO. Based on this criterion, about 8% of all recommendations revisions are issued by affiliated banks. To differentiate the reactions to recommendations from affiliated banks and unaffiliated banks, I interact a dummy variable indicating the affiliation status (AFFIL) with variables in equation (2).

I find that the coefficients on PREREG, POSTREG and their interactions with upgrade and downgrade dummy variables remain significant. This indicates that, the observed pattern in the changes of investor confidence applies to recommendations issued by unaffiliated banks as well as to those issued by affiliated banks. In other words, although investment banking tie was a major source of the conflicts of interest, it is not perceived by investors as the only

**Table 7**  
**Differential reactions to affiliated v.s. unaffiliated recommendations**

	Small		Large	
Intercept	-0.215 (-4.76)	***	-0.176 (-3.17)	***
PREREG	0.044 (4.29)	***	0.042 (3.19)	***
UP	0.086 (3.94)	***	0.055 (4.67)	***
UP*PREREG	0.033 (2.43)	***	0.026 (1.97)	**
DOWN	0.091 (4.31)	***	0.128 (4.42)	***
DOWN*PREREG	0.042 (1.97)	***	0.042 (2.30)	***
POSTREG	0.111 (6.24)	***	0.056 (2.18)	***
UP*POSTREG	0.055 (2.46)	***	0.039 (1.79)	*
DOWN*POSTREG	0.085 (2.69)	***	0.054 (2.24)	***
AFFIL	0.021 (1.11)		0.019 (1.18)	
PREREG*AFFIL	0.018 (2.11)	***	0.011 (1.78)	**
PREREG*UP*AFFIL	0.002 (1.38)		0.003 (1.12)	
DOWN*PREREG*AFFIL	0.001 (0.89)		0.001 (0.76)	
POSTREG*AFFIL	-0.002 (-1.05)		-0.005 (-1.34)	
UP*POSTREG*AFFIL	0.002 (1.33)		0.002 (1.78)	**
DOWN*POSTREG*AFFIL	0.002 (1.23)		0.000 (0.14)	
System Rsq	0.7%			

This table represents the regression result of large- and small-trader abnormal trading volume (standardized) on explanatory variables, using the seemingly unrelated regression method. Column (1) and (2) presents regression results with and without control variables, respectively. PREREG is a dummy variable equal to 1 if the recommendation is made during the pre-reg. period; POSTREG is a dummy variable equal to 1 if the recommendation is made during the post-reg. period; UP is a dummy variable equal to 1 if the recommendation revision is an upgrade; DOWN is a dummy variable equal to 1 if the recommendation revision is a downgrade. AFFIL is a dummy variable equal to 1 if the recommendation is issued by a bank who serves as underwriters or co-managers for a firm during the five years following the IPO or two years following the SEO of the covered firm.

source of conflicts of interest that was severed by the Settlement-related regulations.

The table also shows that the interactions on  $POSTREG * AFFIL * UP$  is positive for both large and small traders but only weakly significant for large traders ( $p < 0.05$ ). This suggests that the improvement of investor confidence is partially attributed to severed investment banking ties, and that large traders appear to be better at discerning the weakened tie than small traders. The interactions on  $POSTREG * AFFIL$  and  $POSTREG * AFFIL$  are insignificant. This is not surprising as the improved quality occurred within only favorable recommendations.

#### **SANCTIONED BANKS v.s. NON-SANCTIONED BANKS**

I also test whether the Global Settlement and related regulations have affected reactions to recommendations issued by sanctioned banks differently from those issued by non-sanctioned banks. I interact a dummy variable indicating sanctioned bank status (*SANC*) with the variables in equation (2) and show the results in table 8.

I find that the coefficients on  $PREREG * SANC$  are positive and significant for both large and small traders, indicating that during the investigation period confidence in reiterations issued by sanctioned banks are even lower. Similarly,

**Table 8**  
**Differential reactions to sanctioned v.s. non-sanctioned recommendations**

	Small		Large	
Intercept	-0.215	***	-0.176	***
	(-4.76)		(-3.17)	
PREREG	0.044	***	0.042	***
	(4.29)		(3.19)	
UP	0.086	***	0.055	***
	(3.94)		(4.67)	
UP*PREREG	0.033	***	0.026	**
	(2.43)		(1.97)	
DOWN	0.091	***	0.128	***
	(4.31)		(4.42)	
DOWN*PREREG	0.042	***	0.042	***
	(1.97)		(2.30)	
POSTREG	0.111	***	0.056	***
	(6.24)		(2.18)	
UP*POSTREG	0.055	***	0.039	*
	(2.46)		(1.79)	
DOWN*POSTREG	0.085	***	0.054	***
	(2.69)		(2.24)	
SANC	0.021		0.019	
	(1.11)		(1.18)	
PREREG*SANC	0.003	*	0.006	**
	(1.75)		(1.97)	
PREREG*UP*SANC	0.001	*	0.001	**
	(1.78)		(1.92)	
DOWN*PREREG*SANC	0.001		0.002	
	(1.79)		(0.46)	
POSTREG*SANC	-0.002		-0.001	
	(-1.05)		(-1.34)	
UP*POSTREG*SANC	-0.002		-0.001	**
	(-1.05)		(-1.34)	
DOWN*POSTREG*SANC	0.002		0.000	
	(1.23)		(0.14)	
System Rsq	0.8%			

This table represents the regression result of large- and small-trader abnormal trading volume (standardized) on explanatory variables, using the seemingly unrelated regression method. Column (1) and (2) presents regression results with and without control variables, respectively. PREREG is a dummy variable equal to 1 if the recommendation is made during the pre-reg. period; POSTREG is a dummy variable equal to 1 if the recommendation is made during the post-reg. period; UP is a dummy variable equal to 1 if the recommendation revision is an upgrade; DOWN is a dummy variable equal to 1 if the recommendation revision is a downgrade. SANC is a dummy variable equal to 1 if the recommendation is issued by a bank who was sanctioned during the Global Settlement; otherwise it is equal to 0.

the confidence level in upgrades issued by sanctioned banks are also lower than those issued by non-sanctioned banks, as the coefficient on *PREREG\*SANC\*UP* is positive and significant for both types of investors. After the new regulations are introduced, the changes in investor confidence were no different for sanctioned banks from that for non-sanctioned banks: the coefficients on *POSTREG\*SANCT*, *POSTREG\*SANCT\*UP* and *POSTREG\*SANCT\*DOWN* are all negative but insignificant. This result might indicate that the investigations and the Global Settlement have caused severe reputation damage to the sanctioned banks; in the post-regulation period, this effect did not vanish.

## Chapter 7

### CONCLUSION

In this paper, I investigate large and small traders' differential reactions to security analyst recommendations and the relative profitability of their trading activities before and after the Global Settlement and related regulations. These regulations aimed to eliminate conflicts of interest among investor bank analysts. Regulators' primary objectives were to "restore investor confidence" and "protect small investors". To evaluate these two objectives, I first investigate whether the regulations have altered large and small investors' confidence in investment bank recommendations. I also examine the differential effects of the regulations on large and small investors' trading profitability, with an eye on whether the previously documented wealth-transfer from small traders to large traders has been eliminated or curtailed.

Comparing abnormal trading volumes across three time periods (pre-regulation period, investigation period and post-regulation), I find that both types of traders lost confidence in recommendations as multiple corporate scandals revealed the low quality of analyst research. This situation changed after the regulations took place. Both investor groups regained confidence in the post-



regulation period, and more so for small investors as they rely more on analyst recommendations.

Examining trading profits, I find that before the regulations, large traders (small traders) made positive (negative) trading profits; in the post-regulation period, average small trader profit has increased to a positive level, whereas average large trader profit has decreased. These results suggest that the Settlement and related regulations benefited small traders.

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