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## Essays on institutional trading behavior with conflicts of interest and information sharing

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ESSAYS ON INSTITUTIONAL TRADING BEHAVIOR WITH CONFLICTS OF  
INTEREST AND INFORMATION SHARING

A Dissertation

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

in

The Interdepartmental Program in Business Administration  
(Finance)

by

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## **ABSTRACT**

This dissertation explores a controversial issue of institutional trading behavior with conflicts of interest and information sharing. Using firms sued for alleged financial misreporting, the first essay examines whether analyst-affiliated institutions reduce the portfolio weights of sued firms prior to their analysts releasing the information through downgrade revisions – trading huddles. Empirical evidence is consistent with this behavior, particularly among the institutions with investment banking operations but without underwriting relationships with sued firms. Institutions with underwriting relationships only reduce portfolio weights significantly when their analysts are the first to provide downgrades during the class period, which is a proxy for the private information production period during which the public has no knowledge of firms’ wrongdoings. The evidence of post-trading stock performance suggests that analyst-affiliated institutions with investment banking operations have superior information. Overall, the evidence implies that the allegation of pre-release activities by trading huddle is not without merit.

The second essay investigates whether the trading behavior is affected by tension between the asset management division and the investment banking business. Investment banks may coerce their affiliated funds to support clients of underwriting business, which creates costs borne by the funds’ shareholders – conflicts of interest hypothesis. Empirical evidence supports the conflict of interest hypothesis. Affiliated asset management firms tend to hold or even increase their stockholdings of the underwritten, sued firms significantly in the class period, while underwriters hold or sell the firms. Overall, underwriters’ support for the clients comes at the fund shareholders’ expense.



# **CHAPTER 1: DO INSTITUTIONS SIDELINE RETAIL CLIENTS' INTERESTS? EVIDENCE FROM INSTITUTIONAL TRADING SURROUNDING SECURITIES CLASS ACTION LAWSUITS**

## **1.1 Introduction**

Financial institutions play roles in a broad range of activities through their divisions, such as underwriting, lending, and stock research. Bundling these activities enables them to retain and expand their business relationships with clients. For example, Duarte-Silva (2010) shows that underwriters having lending relationships with clients can better certify their equity issuance. Ljungqvist, Marston, and Wilhelm (2006) document aggressive stock recommendations among underwriters to compete for underwriting mandates. Massa and Rehman (2008) provide evidence of information sharing between divisions for the purpose of equity trading. However, the cooperation among divisions also potentially exposes them to conflicts of interest. Particularly, buy-side traders and sell-side analysts face pressures to help out the other divisions of a bank to maximize profits for the institution as a whole. For example, a bank's traders may buy shares of a firm to support investment banking, while analysts may report optimistically biased recommendations to support investment banking (Michaely and Womack, 1999).

Besides the above mentioned conflicts of interest, *The New York Times* recently published an article written by a former Goldman Sachs executive regarding the investment bank's business operation and environment stating that the interests of the client are sidelined in the way the firm operates and thinks about making money.<sup>1</sup> Investment banks trying to maximize their own profits thus may exploit their customers by trading securities with private information, which is, for example, obtained from other divisions or pre-released by analysts – the so called “tipping” (Irvine, Lipson, and Puckett, 2007). Another recent allegation of Goldman Sachs involved short-term stock

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<sup>1</sup> “Why I am Leaving Goldman Sachs” by Greg Smith, published by *The New York Times*

tipping to its biggest trading clients.<sup>2</sup> These tips were the product of meetings known as trading huddles between Goldman's stock analysts and traders. At these gatherings, research analysts would identify stocks that were likely to rise or fall because of coming earnings announcements, the direction of the overall market or other short-term developments. Some of their recommendations differed from ratings printed in Goldman's widely circulated long-term reports. In this study, we examine the extent to which institutions benefit themselves by trading on pre-release information and provide evidence on trading huddles.

Financial institutions with their own analysts have two major channels through which information collected among divisions is released. The investment arms (asset managements or client accounts) reveal information through their trades, and in-house analysts release theirs with recommendations. Our primary interest is to examine the trading activities of institutional investors along with their recommendations on firms sued for alleged financial fraud. Therefore, if an institution has affiliated analysts following a firm and the institution also invests in the firm's stocks, we classify it as an analyst-affiliated institution.

To understand the effect of different types of relationships, analyst-affiliation institutions are further classified into four groups. First, *underwriter analysts* are financial institutions which have served as lead underwriter in the past 3 years for a firm covered by their analysts. Michaely and Womack (1999) document a potential conflict of interest inherent in underwriter analysts. The lead underwriter is responsible for the due diligence process, for "building the book" of committed investors, for the debut price of IPOs or SEOs, and for the aftermarket price support. The recommendations from underwriter analysts and their trading behavior would not be the same as other analysts without such an intensive duty.

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2 "Goldman Fined \$22 Million Over Trading Huddles" by Susanne Craig, published by *The New York Times*

Second, *lender analysts* are banks which have had in the past 3 years a lending relationship with firms covered by their analysts. Corporate lending is another important activity of banks through which the banks may be able to collect information about their borrowers such as the firms' financial condition, creditworthiness, and even future performance. Massa and Rehman (2008) study how information flows within financial conglomerates by investigating loan market deals, providing evidence that affiliated asset management companies trade on shared inside information not available to the market.

The rest of analysts are considered as *independent analysts*. They are financial institutions without any relationship with their covered firms. Among independent analysts, investment banks may have different levels of information and trading activities relative to pure independent analysts such as brokerage houses as well as banks without investment banking. Jacob, Rock, and Weber (2008) compares the earnings forecasts of analysts employed by investment banks with those employed by firms not involved in investment banking, and finds a relation between forecast accuracy and investment banking and also its informational advantages. We, thus, separately analyze independent investment bank analysts (*independent IB analysts*) from independent analysts without investment banking operation (*independent non-IB analysts*).

Our sample consists of firms with alleged financial fraud during the class period, which marks the beginning and the end of wrongdoings. It provides a unique private information production period that allows us to look at divisional activities of affiliated institutions and address questions regarding how they trade and report stock value during the period. Another reason we use financial lawsuit firms is because analysts have an incentive to produce information and pre-release them due to the nature of potential large losses. Christophe, Ferri, and Hsieh (2010) study short-selling prior to the release of analyst downgrades, and show that pre-announcement abnormal short-selling

is significantly related to the subsequent share price reaction to the downgrade. Clearly, the potential negative impact of a downward revision on stock price provides investors with a strong incentive to profit from pre-release trades.

We use this setting to investigate whether affiliated institutional investors trade on a firm covered by their own analysts to benefit themselves from subsequent retail client trades. Although we do not have retail client trades directly, the fact that these institutions act before releasing recommendations to retail clients is enough for us to infer whether they sideline these clients' interests. We find that analyst-affiliated institutions tend to decrease their holdings in the recommended firms before their own analysts issue downgrades, particularly among institutions with independent IB analysts who do not serve recommended firms in underwriting business. Lender affiliated analysts appear to drop the firms and do not provide many revisions during the class periods. Underwriter affiliated analysts, on average, do not sell prior to any downgrades unless they are the ones to provide the first downgrade. In such a case, they sell significantly during the information pre-release period. Evidence of front-running is robust to controls for firms' characteristics including size and book-to-market, investment bank reputation, firms' past performance, institutional ownership, and analyst consensus and coverage. Furthermore, we provide empirical results with the finer classification for post-recommendation stock performance, showing that stocks sold by underwriter analyst institutions and independent IB analyst perform poorly in the long run, suggesting their informational advantage and accuracy.

This paper contributes to the literature on institutional trading and analyst recommendations. Chan, Chang, and Wang (2009) explore how US financial firms trade relative to their own equity analyst recommendations, showing that the firm trades are consistent with their analysts' research and recommendations. However, they investigate institutional trading in the quarter of- and after

a recommendation. As they discuss, strategic trading or trading aimed at benefiting from subsequent retail client trades might occur before the recommendation release. Jordan, Liu, and Wu (2012) and Haushalter and Lowry (2011) also look at the quarter of recommendation and the quarter after release to investigate institutional trading with analyst recommendations. We fill this gap by showing an empirical test of the same issue, but for the pre-release period.

Secondly, our study differs from the literature focusing on market making activity of investment banks. Juergens and Lindsey (2009) examine NASDAQ market makers' trading volume around analyst recommendation changes issued by an analyst at the same firm and find evidence of elevated sell volume at the recommending analyst's firm in the 2 days preceding a downgrade. However, we examine quarterly holding changes during the quarter prior to downgrade issuance. It is much earlier than the 2-day window and helps us to identify whether the trades occur way before other clients' trading activities.

Thirdly, we add clarity to the question on institutional trading along with information sharing and conflicts of interest. According to Mehran and Stulz (2007), information plays a critical role in transactions involving financial institutions, whose main business is related to reducing asymmetric information for their customers, for example, by certifying new security issuance or reporting analysts' opinions on a firm's investment value. Therefore, consideration of the reputation capital of financial institutions may eliminate our concerns of credibility (Chemmanur and Fulghieri, 1994). Our findings, however, suggest that institutions have a tendency to emphasize their own profits, not those of their retail investing customers, by trading with pre-release or privately obtained information and misleading their customers with optimistically biased recommendations in some cases. Therefore, we offer empirical evidence showing that the accusation of trade huddles is not without merit.

The remainder of the paper is organized as follows. Section 2 discusses related literature. We describe the data and variables in section 3. Section 4 and 5 report the empirical results. We present robustness tests in section 6. Section 7 concludes the paper.

## **1.2 Literature Review and Hypothesis Development**

By our definition, affiliated institutions have their own analysts covering a firm, while they have a positive position in the firm. Previous studies on institutional trading with analyst recommendations document that institutions may trade before the release of analysts' recommendations. Irvine, Lipson, and Puckett (2007) find abnormally high institutional trading volume, especially buying, is because of tips received regarding the contents of forthcoming analysts' reports. Christophe, Ferri, and Hsieh (2010) provide evidence of front-running by short-sellers, who are informed before downgrades. These are consistent with the tipping hypothesis, suggesting that analysts give their asset managers or clients a tip with respect to future recommendation revisions so that they can exploit the profitable opportunity.

Recently, Goldman Sachs was fined \$22 million for short-term stock tipping to its biggest trading clients, called "a dishonest and unethical violation" of the Massachusetts state securities act by Massachusetts regulators. Known as trading huddles between Goldman's stock analysts and traders, research analysts would identify stocks that were likely to rise or fall because of coming earnings announcements, the direction of the overall market or other short-term developments. More interestingly, according to an article from *The New York Times*, the trading huddles grew out of a 2003 settlement with regulators in which several Wall Street firms, including Goldman, agreed to pay a \$1.4 billion settlement to resolve accusations that they had been issuing overly optimistic stock research to win more lucrative investment banking business. The settlement requires the financial firms to put up firewalls between research and investment banking and also stop the use

of banking revenue to subsidize research. Consequently, Goldman management, seeking new ways to make money from research, introduced the idea of trading huddles and increased trading commissions in exchange for the trading ideas. Although this case indicates potential pre-release trading, little research has studied the overall magnitude and significance of institutional trading prior to analyst recommendations and its impact on other trading clients. According to the literature and news, we thus propose the first hypothesis as follows:

**H1:** Affiliated institutions decrease their holdings in the stocks of sued firms covered by their own analysts before the release of recommendations during the class period, relative to non-affiliated institutions.

No relation between trading activities and analyst affiliation provides the alternative hypothesis. The reputation of investment banks may help prevent the affiliated institutions from trading on the pre-release information.

We further investigate the extent to which different types of analysts have different levels of information in terms of accuracy, or access to management, which, in turn, determines how each type of analysts trades based on their possessions of private information. Haushalter and Lowry (2011) find evidence that information from investment banking flows to other divisions of the bank. When investment banks advise acquirers in mergers, the banks' stockholdings of the acquirer are positively related to changes in recommendations by their analysts. Jacob, Rock, and Weber (2008) document that despite the possible conflicts of interest faced by investment banks, their analysts nevertheless provide superior forecasts. Also, among investment bank analysts, affiliated analysts issue more accurate forecasts than non-affiliated analysts, conferring the informational advantages of investment banking affiliations. Accordingly, we also propose the following hypothesis:

**H2:** Among the analyst-affiliated institutions, investment banks are more likely to decrease stockholdings in the recommended firms, relative to non-investment banks.

However, possession of information does not necessarily lead to the execution of trading based on that information. For example, investment banking may pressure asset management to buy or not to sell the underwritten firm because of future potential business. Therefore, the alternative hypothesis is that the trading activities of the affiliated investment banks are indistinguishable from those of other affiliated institutions. We did not focus on lending relationships, which could also provide superior private information, in the above hypothesis because very few lender-affiliated analysts provide recommendations during the class periods. This silence itself may indicate a certain level of conflicts of interests in releasing negative information. However, for our purposes, we require an analyst's action to be sure the information production occurs surrounding the start of a class period.

The next step is to examine the performance of the stocks traded by each type of analyst-affiliated institution. The affiliated institutions may trade with an information advantage or simply follow market trends. If the financial institutions have more accurate and superior information, we would expect that the stocks sold by the institutions produce more negative abnormal returns than the stocks purchased by the same institutions. Furthermore, since different types of affiliated institutions may have a different level of information and willingness to trade, we investigate post-recommendation stock performance, traded by each type of affiliation. We, therefore, posit our third hypothesis as follows:

**H3:** The financial lawsuit stocks in which affiliated investment banks decrease their positions prior to analyst recommendations under-perform stocks sold by non-affiliated investment banks.



Portfolio rebalancing without private information would not generate abnormal stock performance.

## **1.3 Data**

### **1.3.1 Data Construction**

We examine institutional trading on firms sued in federal securities fraud class action lawsuits. The Stanford Clearing house offers detailed information on federal securities fraud class litigation. There are 1,977 unique firms (2,286 filings), securities of which are traded on New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and NASDAQ during our sample period, from 1996 to 2006. In order to identify the affiliated institutions and their holdings, we use Thomson Financial/Spectrum 13F data, providing aggregate holdings at the institution level, and I/B/E/S for brokerage house information.<sup>3</sup> Employers of analysts and their equity ownership on filing firms are collected with the I/B/E/S Broker Translation file, and also through a hand-matching process.<sup>4</sup>

I/B/E/S also provides analysts' recommendations. We obtain variables including the announcement dates of recommendations, reporting analysts, number of analyst following, brokerage houses employing the analysts, the level of the consensus recommendation as well as each analyst's recommendation. To identify lending relationships between financial institutions and recommended firms, we use the Loan Pricing Corporation's DealScan database, which contains identification of a lead arranger of each borrower's package loan deal.

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<sup>3</sup> Under the SEC Act of 1934, all institutional investors with security assets of \$100 million or more under discretionary management are required to report their holdings each quarter on Form 13f.

<sup>4</sup> The I/B/E/S Broker Translation file only covers up to 2006.

For stock performance information, Center for Research in Security (CRSP) is used for the stock price, return, and shares outstanding. We obtain accounting figures in financial statements from COMPUSTAT to see firms' financial characteristics such as total assets, book value, and leverage.

### 1.3.2 Sample Selection

To look at whether affiliated institutional investors change their holdings on financial lawsuit firms, we first identify the lawsuit firms that are recommended by analysts during an event window, e.g. the class period. Filings for the lawsuit firms contain three important dates, the class period starting date (CPS), the class period ending date (CPE), and the filing date (FD). CPS shows when the wrongdoing starts, and CPE is the date at which that particular wrongdoing ends and is also uncovered. Figure 1 shows the time line of the dates. The period between CPS and the release of the first downgrade (upgrade) provides us with an important event window during which informed investors possibly make a profit by trading early based on pre-release information, and it allows us to examine whether affiliated institutions change their holdings during the event period. Thus, firms that receive at least one recommendation during the class period are selected. The class period recommendation is also confined to accompany a previous recommendation issued by the same analyst at least within 2 years, which affirms that the covered firms are still under the analyst's watch, and enables us to see a revision of recommendations issued in a relatively reasonable window.

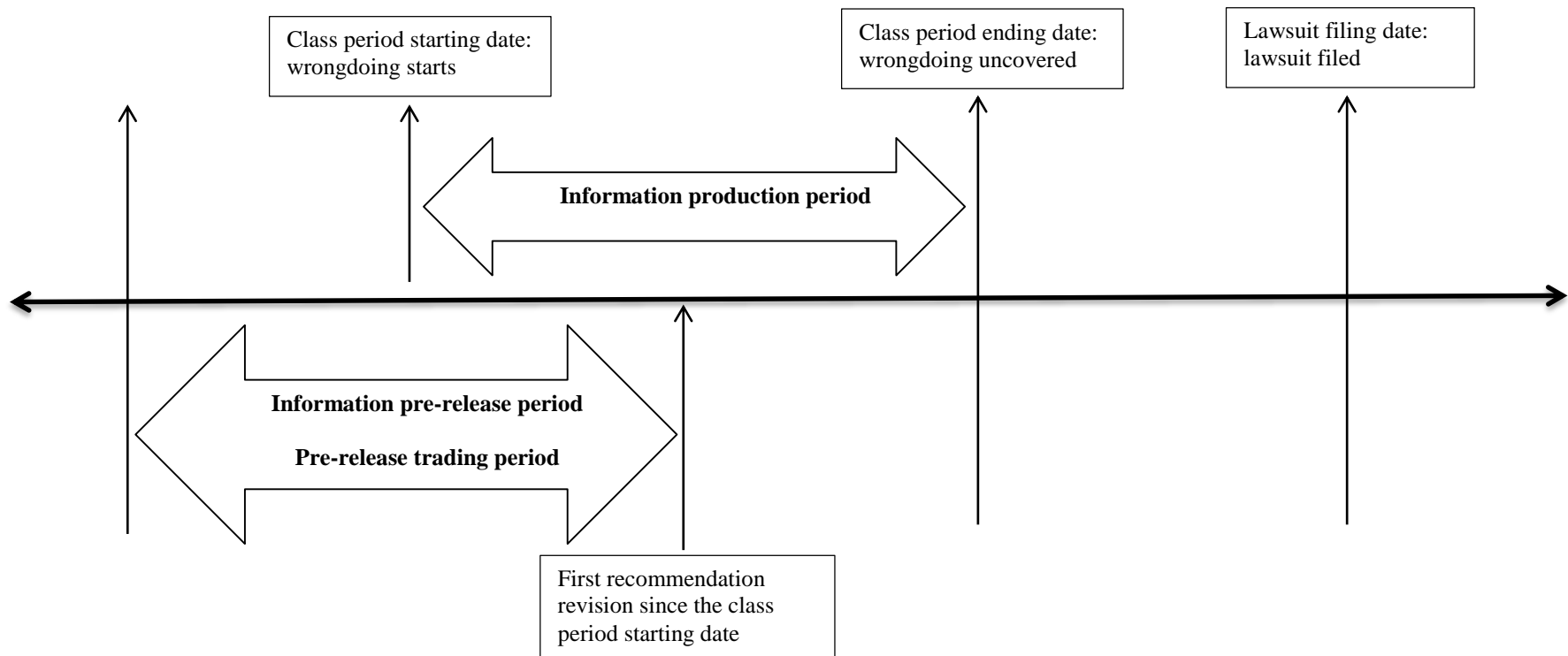


Figure 1.1 Time Line of Events associated with Lawsuits, Analyst Recommendations, and Changes in Stockholdings

We began with a sample of 1,977 publicly traded firms. Our samples are filtered through three criteria. First, we exclude lawsuit firms that CRSP, COMPUSTAT, I/B/E/S, and Thomson Financial/Spectrum 13F databases do not contain. Second, we delete stocks with a price less than \$1. Third, we focus on first financial lawsuits for each firm that could contain significant negative information and avoid firms that have already had lawsuits before. i.e., we keep firms with only one lawsuit. Finally, 660 unique firms (associated with 831 lawsuits) meet our criteria.

Table 1 shows the sample firm distribution and the reasons for filing securities class action lawsuits from 1996 to 2006. Our sample (660 firms with one lawsuit) contains the majority of sued

Table 1.1 Financial Lawsuits and Sample Firms

Sample firms	Number of lawsuits	Number of firms
All sued firms	2,286	1,977
Filtered firms	831	740
Firms with 1 lawsuit		660
2 lawsuits		71
3 lawsuits		7
4 lawsuits		2
5 or more lawsuits		0

Reasons for filing lawsuits	Number of firms	%
General financial misreporting	616	74.13
Artificially inflate securities prices	576	69.31
Inadequate internal control	151	18.17
Bond issuance related	55	6.62
Equity issuance related	125	15.04
Mergers and acquisitions related	86	10.35
Insider trading and conflict of interest	349	42.00
SEC 1934 Sections 10(b) and rule 10b-5	584	70.28
SEC 1933 Section 11	149	17.93
GAAP violation/improper accounting	300	36.10
Investment banks also sued in the same filing	36	4.33
Total number of lawsuits	831	

Notes: This table reports the number of financial lawsuits and sample firms and the distribution of the reasons for filing securities class action lawsuits during 1996 to 2006.

firms. For the total number of 831 lawsuit filings, general financial misreporting and artificially inflating securities prices, both violating SEC 1934 section 10(b) and rule, are the most popular reasons.

We classify recommendation revisions into two groups: downgrades and upgrades. A downgrade is a recommendation revised by an analyst from a higher level (e.g. strong buy or buy) to lower level (e.g. underperform or sell) and vice versa for an upgrade. Sometimes analysts do not change their recommendations, which is also classified as upgrade. Analysts usually issue more than one recommendation on a stock during the class period. We keep all recommendations until the first downgrade is issued. Also, we only consider the very first downgrade (upgrade) for each firm among analyst recommendations, as it contains the most significant impact on a stock and triggers subsequent downgrades (upgrades).

Table 2 presents summary statistics of the sample firms from 1996 to 2006. Panel A shows the summary of observations satisfying the sample selection criteria for downgrade (upgrade). Although we focus on financial lawsuit firms, some of them get upgrades only. In Panel A, the sample size of downgraded firms is around 7.5 times larger than upgraded firms due to the nature of the population. There are 582 (78) downgraded (upgraded only) firms, and the total number of institutional investors' holding changes on each group of firms during the quarter before the downgrades (upgrades) is 126,644 (13,010).

Average (median) class periods for all sample firms are about 434 (311) days during which analysts can discover a covered firm's wrongdoing and inform investors of uncovered bad news. Analysts, in particular, have an incentive to find out negative information early, raising their reputation, attracting clients, and compensating their efforts with trading commissions (Irvine, 2004).

Table 1.2 Descriptive Statistics for Sample Firms

Panel A. Summary of observations

	All	Firms with downgrades during the class period	Firms with only upgrades during the class period
Number of unique firms in the sample	660	582	78
Total number of institutional holding changes	139,654	126,644	13,010
Average (median) number of days during the class period	434 (311)	459 (323)	243 (207)
Average (median) number of days from the class period starting date to the date of the first revision	161 (97)	170 (105)	91 (52)

Panel B. Sample firm distribution by revisions

Recommendation revisions	# of downgraded firms	# of upgraded firms
Firms without upgrade (downgrade) prior to downgrade (upgrade)	474	73
with one upgrade (no revision) prior to downgrade (upgrade)	94	5
with two upgrades (no revision) prior to downgrade	12	
with three upgrades (no revision) prior to downgrade	2	
Total	582	78

Panel C. Financial characteristics and control variables

Variables	All	Firms with downgrades during the class period	Firms with only upgrades during the class period
Total assets (million)	7,793	8,502	2,454
Market value (million)	6,861	6,553	9,179
Book-to-market	0.39	0.40	0.29
Long-term debt-to-total Assets	0.16	0.17	0.14
Trading volume (millions)	21.16	21.96	15.17
Market-adjusted return	0.13	0.11	0.25
Average number of analyst following	9.09	9.40	6.79

Notes: This table provides summary statistics for the firms with class-action lawsuits in our sample from 1996 to 2006. The group of firms with downgrades includes all the sample firms that receive at least one downgrade during the class period over which sued firms allegedly commit wrongdoing. The firms in the group may or may not have upgrades. The other group of the sample firms includes firms that receive only upgrades during the class period. Panel A presents the summary of observations, including the number of unique firms, the total number of institutional holding changes, average (median) number of days during the class period, and average (median) number of days from the class period starting date to the date of the first downgrade (first upgrade). Panel B shows the distribution of sample firms by revisions. Panel C reports financial characteristics and control variables for the sample firms. All the variables are reported as mean values and computed using the relevant Compustat and CRSP data items. Total assets and market value are reported in millions. Market value is calculated as the price multiplied by shares outstanding. Book-to-Market equals the book value, which is common equity, divided by market capitalization. Leverage is a ratio of long term debts to total assets. Trading volume, market-adjusted return (past 6 month (t-7 to t-1) cumulated returns minus

CRSP value-weighted index return), where  $t$  is the month of the first recommendation revision, and the average number of analysts following a sample firm are also reported.

It takes on average 170 (91) days for analysts to issue the first downgrade (upgrade) about the covered firms, implying that downgrades need more time in part because of a reluctance of analyst's to issue downward revision (Mao and Song, 2012).

Panel B presents the sample firm distribution by revisions. Among 582 downgraded firms, 474 firms receive first downgrades without prior upgrades since the CPS. The number of firms which receive one upgrade before finally getting downgraded is 94. More than 97% of downgraded firms have 0 or 1 upgrade prior to the first downgrade. The upgraded only firms are the firms which do not receive any downgrade during the class period. Panel C reports financial characteristics of firms and control variables of our analysis, including accounting variables such as total assets, book value of equity, and long-term debt to total asset ratio, which are measured at the fiscal year-end preceding the first downgrade (upgrade) on each firm during the class period. All others including trading volume, market-adjusted return calculated as past 6 month ( $t-7$  to  $t-1$ ) cumulated returns minus CRSP value-weighted index return, and analyst coverage are measured at the end of the quarter prior to the first revision. The downgraded firms are relatively larger than the upgraded firms in terms of total assets. However, average market values of the upgraded firms are higher than that of the downgraded firms. The higher book-to-market ratio indicates that value firms tend to get downgraded. On average, the downgraded firms tend to have a lower prior market-adjusted return than the upgraded firms. More than 9 analysts, on average, follow the downgraded firms during the class period.

Table 3 provides summary statistics for the first recommendation revision issued by analysts during the class period. Panel A and Panel B report about the first downgrade (upgrade) revision,

respectively. Among 584 first downgrades, 84 (14.21%) downgrades are issued by underwriter analysts who wait 237 days for revision since the CPS. The scaled number of days is calculated as the number of days until issuing the downgrades (upgrades) since the CPS divided by the number of days during the class period multiplied by 100, which provides a timeliness on updating information regarding the firms by analysts (Mao and Song, 2012). Underwriter analysts tend to issue downgrades slowly relative to the other analysts, which is consistent with Mao and Song that underwriters are discouraged to disclose negative news on firms with an underwriting relationship. In contrast to underwriter analysts, since independent analysts (both independent IB analysts and independent non-IB analysts) and independent research firms which are pure research institutions without trading arms are not associated with the firms for other business activities, they tend to release information promptly. Lenders issue the first downgrades very infrequently relative to others, indicating that they are reluctant to reveal negative information because of the possibility of ruining potential profits. The percentage of non-first revision suggests their reluctance as well. For Panel B, most interestingly, underwriters are more likely to issue upgrades promptly relative to downgrades, which have a higher percentage of first revision and a lower scaled number of days, showing their support for the underwritten firm even though they were sued later.

Panel C provides buy and hold returns on the firms during each holding period. Both downgraded firms and upgraded firms have positive buy and hold returns until analysts issue downgrades or upgrades since the CPS. However, investors finally react negatively to the first downgrade according to buy and hold returns up to the CPE from the CPS. Since the public realizes sued firms' wrongdoing on the CPE, returns would turn negative, resulting in a negative buy and hold stock return for the period from the CPE to the FD. Overall, buy and hold returns for the



entire period from the CPS to the FD are -0.2218 for downgraded firms and -0.2976 for upgraded firms.

Table 1.3 Descriptive Statistics for First Recommendation Revisions

Panel A. First downgrade revision					
Issuer	No.	%	# of days until issuing the downgrade since the class period start	Scaled # days	% of non-first revision
Underwriter analyst	83	14.21	237 (183)	56.16	96.93
Lender analyst	4	0.68	140 (148)	33.17	98.98
Independent analyst	196	33.56	148 (86)	31.82	93.65
Independent research firm	301	51.54	166 (101)	35.69	91.66
Total	584	100			

Panel B. First upgrade revision					
Issuer	No.	%	# of days until issuing the upgrade since the class period start	Scaled # days	% of non-first revision
Underwriter analyst	16	20.51	102 (66)	35.29	98.62
Lender analyst	2	2.82	230 (230)	68.24	99.25
Independent analyst	19	24.35	64 (35)	29.62	98.74
Independent research firm	41	52.56	93 (53)	39.91	96.85
Total	78	100			

Panel C. Buy and hold stock return				
Holding period	Downgraded firms		Upgraded firms	
	Mean	Median	Mean	Median
Class period starting date to first recommendation revision date	0.1350	-0.0199	0.1304	0.0795
Class period starting date to class period ending date	-0.0686	-0.2820	0.0049	-0.0797
Class period ending date to lawsuit filing date	-0.2483	-0.2409	-0.2935	-0.3070
Class period starting date to lawsuit filing date	-0.2218	-0.4517	-0.2976	-0.3553

Notes: This table provides summary statistics for the first recommendation revision issued by analysts during the class period from 1996 to 2006. The class period is the period during which sued firms allegedly commit wrongdoing. Panel A (Panel B) reports about first downgrades (first upgrades), showing the number of firms, the number of days until issuing the downgrades since the class period starting date (CPS), the scaled number of days calculated as the number of days until issuing the downgrades since the class period starting date divided by the number of days during the class period multiplied by 100, and the percentage of non-first revision issuance, based on the type of analyst institutions. Underwriter analysts are financial institutions with analysts covering the sample firms, which also have an underwriting relationship with the firms. Lender analysts have a lending relationship with covered firms. Independent analysts have neither underwriting nor lending relationship with covered firms. Independent research firms are pure research firms without trading arms. Panel C reports buy and hold returns of the sample firms over different holding periods.

## 1.4 Empirical Results

Our primary interest is to examine the extent to which institutions with the channels for private information trade before other trading clients. We start by providing how to measure institutional trading. Four different measures of changes in institutional holdings are constructed as follows:

- (1) Raw holding change (*RHC*), measured simply by changes in stockholdings from  $t-2$  to  $t-1$ , where quarter  $t$  is the quarter of analysts issuing the first downgrade (upgrade).
- (2) Percentage holding change (*PHC*), measured by changes in the proportion of institutional ownership from  $t-2$  to  $t-1$
- (3) Portfolio weight change (*PWC*), calculated as changes in each institution's portfolio weight from  $t-2$  to  $t-1$ , where the portfolio weight is shares held by an institution on a stock divided by shares held by the institution on all firms from  $t-2$  to  $t-1$ .
- (4) Abnormal portfolio weight change (*APWC*), which is the change in an institution's portfolio weight of a stock (*PWC*), net of the change in the all 13F institutions' portfolio weight of the stock, where the 13F institutions' portfolio weight is shares held by the all 13F managers on a stock divided by shares held by all institutions on all firms from  $t-2$  to  $t-1$ .<sup>5</sup>

Investment bank size may have an impact on the degree of *RHC* and *PHC* because a bigger institution tends to have more assets under management. *PWC* is perhaps affected not only by holding changes, but also by price changes. Therefore, we calculate *APWC* to offset the impact on

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<sup>5</sup> We do not exclude affiliated investment banks for calculating the 13F institutions' portfolio weight of a stock.

portfolio weight change caused by price changes as well. We keep all the quarterly institutional holding positions reported in 13F.<sup>6</sup>

#### 1.4.1 Univariate Analysis of Institutional Holding Changes

For our purpose of examining pre-release trading, we calculate changes in holdings a quarter before the quarter during which analysts revise their recommendations released to the public. Juergens and Lindsey (2009) show that selling activities increase two days prior to a downgrade. By examining the quarterly trading changes prior to recommendation releases, we are likely to capture the trading activities of affiliated institutions prior to tipping their clients. Chan, Chang, and Wang (2009) and Jordan, Liu, and Wu (2012) examine whether investment banks follow their own recommendation by looking at the holding changes in the quarter of analyst recommendation. It is, however, hard to identify whether investment banks react to recommendation revisions, trade beforehand, or react to the same public events at the same time, if quarterly stockholdings are investigated in the same quarter as an analyst reporting. Therefore, we avoid the endogeneity issue in the previous literature and use more conservative measures for institutional trading.<sup>7</sup>

Table 4 provides average values of four different measures of changes in the stockholdings of institutional investors one quarter before the quarter during which the sell-side analysts report first recommendation revisions on the sample firms. We examine whether different types of analyst-affiliation between a financial institution and a firm produce differences in holding changes. We categorize the sample firms in three ways: (1) firms without upgrades prior to the first downgrade (474 firms); (2) firms with one upgrade prior to the first downgrade (94 firms); and (3) firms with

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<sup>6</sup> Under the SEC Act of 1934, all institutional investors with security assets of \$100 million or more under discretionary management are required to report their holdings each quarter on Form 13f.

<sup>7</sup> Our measures are conservative in the sense that we use quarterly holding changes from q-2 to q-1, where q stands for the quarter of recommendations, long before the releases. Informed trading may occur right before (2 or 3 days before (Guergens and Lindsey (2009)), or even hours before (Heidle and Li (2003)) the recommendation releases.

only upgrades (78 firms). Panel A presents results for the firms without upgrades prior to first downgrade since the CPS, showing that both analysts and non-analysts affiliated institutions tend to increase their holdings in the firms. The affiliated institutional investors, on average, increase their holdings (*RHC*) by 288,506, which is significantly different from zero at the 1% level. Similarly, the percentage holding changes (*PHC*) and the portfolio weight change (*PWC*) are significantly positive. Because of the size effect, portfolio weight change (*PWC*) and abnormal portfolio weight change (*APWC*) show more reliable estimates. *PWC* (*APWC*) is 0.0703% (0.0556%), significant at the 1% level. Non-affiliated institutions also increase their positions, making no statistical and economical differences in holding changes between affiliated and non-affiliated institutions, except *RHC* indicating a significant increase in a position. However, underwriter analysts and lender analysts change their holdings significantly different from non-underwriter analysts and non-lender analysts according to differences on *PWC* and *APWC*, suggesting different trading behaviors by those institutions.

Panel B and Panel C present results for the firms with one upgrade prior to first downgrade since the CPS and the firms with only upgrades since the CPS. Looking at all analyst in Panel B, the means of *RHC*, *PHC*, *PWC*, and *APWC* are 56,713 shares, 0.0998 %, -0.0056%, and -0.0071 %, respectively, which are all statistically insignificant, suggesting that the analyst affiliated institutions, on average, do not change their holdings prior to the analyst recommendation release. In contrast to the trading behavior of the affiliated institutions, the non-affiliated institutions do increase their holdings significantly prior to recommendations, showing that all measures are positive and significantly different from zero at the 1% level for *RHC* and *PHC* and at the 10% level for *PWC* and *APWC*.

Table 1.4 Holding Changes of Affiliated and Non-Affiliated Institutional Investors

	No. of holding changes	RHC	PHC	PWC	APWC
Panel A: Firm without upgrade prior to first downgrade since the class period starting date (No. of firms: 474)					
All analyst	5,322	288,506*** (5.61)	0.0224*** (3.48)	0.0703*** (6.90)	0.0556*** (5.55)
Non-analyst	109,213	74,514*** (14.8)	0.0169*** (10.5)	0.0715*** (22.81)	0.0517*** (16.77)
Difference	114,535	-213,991*** (-4.14)	-0.0054 (-0.81)	0.0011 (0.10)	-0.0039 (-0.37)
Underwriter analyst	746	90,168** (2.01)	0.0256 (1.22)	0.0307*** (2.59)	0.0274** (2.36)
Difference	114,535	-5,747 (-0.12)	-0.0084 (-0.40)	0.0410*** (-3.35)	0.0246** (2.05)
Lender analyst	114	738,542* (1.66)	0.1006* (1.75)	0.0136 (1.52)	0.012 (1.54)
Difference	114,535	-654,736 (-1.47)	-0.0835 (-1.45)	0.0578*** (6.11)	0.0399*** (4.77)
Independent analyst	4,497	309,240*** (5.21)	0.0203*** (3.04)	0.0779*** (6.54)	0.0611*** (5.22)
Difference	114,535	-233,968*** (-3.93)	-0.0032 (-0.47)	-0.0067 (-0.54)	-0.0095 (-0.78)
Panel B: Firm with upgrade prior to first downgrade since the class period starting date (No. of firms:94)					
All analyst	505	56,713 (1.37)	0.0998 (1.28)	-0.0056 (-0.42)	-0.0071 (-0.52)
Non-analyst	10,205	12,427*** (2.75)	0.0288*** (3.74)	0.0237* (1.94)	0.0223* (1.82)
Difference	10,710	-44,286 (-1.06)	-0.071 (-0.90)	0.0294 (1.61)	0.0294 (1.60)
Underwriter analyst	174	119,671 (1.09)	0.2894 (1.48)	0.0216 (1.10)	0.0188 (0.97)
Difference	10,710	-106,892 (-0.97)	-0.2615 (-1.34)	0.0007 (0.03)	0.002 (0.09)
Lender analyst	6	-17,964 (-1.21)	-0.0454 (-0.82)	-0.0033** (-2.47)	-0.0179 (-1.28)
Difference	10,710	32,498** (2.08)	0.0776 (1.38)	0.0257** (2.18)	0.0388** (2.13)
Independent analyst	327	24,278 (0.92)	0.0013 (0.02)	-0.0202 (-1.12)	-0.021 (-1.15)
Difference	10,710	-10,070 (-0.37)	0.0317 (0.51)	0.0440** (2.02)	0.0432** (1.97)

(Table 1.4 continued)

Panel C: Firm with only upgrade since the class period starting date (No. of firms: 78)

All analyst	456	-5,292 (-0.06)	0.0207 (0.59)	0.0149 (0.66)	0.0029 (0.13)
Non-analyst	12,554	24,160*** (3.13)	0.0315* (1.72)	0.0526*** (4.61)	0.0389*** (3.41)
Difference	13,010	29,452 (0.38)	0.0107 (0.27)	0.0377 (1.49)	0.0359 (1.42)
Underwriter analyst	119	-49,885 (-0.33)	0.0454 (1.03)	0.026 (0.89)	0.0253 (0.89)
Difference	13,010	73,687 (0.49)	-0.0144 (-0.30)	0.0254 (0.81)	0.0124 (0.39)
Lender analyst	13	538,622 (1.16)	0.1348 (0.66)	0.0355** (2.00)	0.0214 (1.23)
Difference	13,010	-516,009 (-1.11)	-0.1037 (-0.51)	0.0157 (0.75)	0.0162 (0.79)
Independent analyst	329	15,173 (0.16)	0.0147 (0.32)	0.0109 (0.37)	-0.0047 (-0.16)
Difference	13,010	8,161 (0.08)	0.0167 (0.33)	0.0413 (1.31)	0.0435 (1.38)

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a one-tailed test.

Notes: This table reports the trading activities of institutional investors during the quarter prior to a recommendation revision by the type of revision and institution. The sample consists of the firms with class-action lawsuits from 1996 to 2006. Affiliated institutional investors are classified as analyst institutions, underwriter analyst institutions, lender analyst institutions, and independent analyst institutions. Analyst institutions report recommendations on covered firms. Underwriter analysts are financial institutions with analysts covering the sample firms, which also have an underwriting relationship with the firms. Lender analysts have a lending relationship with covered firms. Independent analysts have neither underwriting nor lending relationship with covered firms. The trading activities are measured with holding changes, which are calculated as follows; (1) *RHC*, raw changes in shares held by an institutional investor, (2) *PHC*, percentage changes in shares held, (3) *PWC*, portfolio weight change, (4) *APWC*, abnormal weight change which is difference between portfolio weight change by an institutional holding and by overall institutional investors. Appendix A provides more detailed explanation. Panel A presents trading activities for the firms without upgrade prior to first downgrade since the class period starting date. All analyst shows all the analyst affiliated institutions' trading, and non-analyst reports holding changes of institutional investors without analyst affiliation. Underwriter analyst, lender analyst, and independent analyst also present their changes in holdings of the sample firms. Test of differences for each analyst type is compared to all institutions without such type of analyst affiliated institutions. Panel B and Panel C present trading activities for the firms with upgrades prior to first downgrades and firms with only upgrades since the class period starting date, respectively. *T-statistics* are reported in parentheses.

However, there are no significant differences in all the measures between analyst and non-analyst institutions. Panel C shows a similar pattern to Panel B. For upgraded firms, all the measures of differences between affiliated and non-affiliated institutions show as insignificantly different, indicating that all institutional investors trade in the same direction. The univariate analysis shows somewhat mixed results on holding changes. Next we further investigate sources of the difference in a regression analysis setting.

#### 1.4.2 Multivariate Regression Analysis of Institutional Holding Changes before Analyst Recommendations

Whether analyst-affiliated institutions trade prior to recommendation revisions is our primary interest. We conduct multivariate regression analyses in which control variables studied in the previous literature are taken into consideration. Appendix A contains detailed definitions of the variables.

Two key variables are of interest in our regressions, including analyst holding (*AH*) and first revision issuer (*FRI*). *AH* and *FRI* are dummy variables to designate identification of institutional investors whose analysts covers the sued firms and whose analysts issue the first revisions, respectively. A negative coefficient on *AH* indicates that an affiliated institution decreases its holdings more than non-affiliated institutions. As for a negative coefficient on *FRI*, a first revision issuer reduces its holdings more than non-first revision issuers including non-affiliated institutions. In order to investigate detailed sources for shared information and potential conflicts of interest that also play a role in trading, we employ a finer classification for analyst-affiliation as discussed in previous section, such as underwriter analysts, lender analysts, independent IB analysts, and independent non-IB analysts.

We also control other variables that may affect institutional trading. First, investment bank's reputation is based on the bank's market share in equity (debt) underwriting (%), calculated as a bank's aggregated total dollar amount in lead underwriting divided by all deal amounts in equity (bond) markets in a given year. It may play a role in the investment banks' pre-release trading in a way that high reputation banks possess more research resources and information advantage, and thereby tend to front-run before the market realizes. A star analyst (Allstar analyst), published in Institutional Investor "All-American Research Team" is more likely to have superior information and may be hired by a high reputation institution. For a sample of downgraded firms, a negative coefficient on Allstar analyst indicates that institutional investors weigh in their star analysts' opinions, leading them to decrease their portfolio positions. We also report an interaction term between all-star analysts and first revision issuers, meaning that a first downgrade (upgrade) is issued by a star analyst.

We consider initial portfolio weight ( $PW$ ) that may lead to a different trading standpoint, especially when an investor has negative information because the potential reaction by investors may depend on the size of the initial position. Total institutional ownership ( $TIO$ ) may have a different effect on trading because of transaction costs and monitoring by institutional investors (Ljungqvist et al., 2007). Brockman, Chung, and Yan (2009) also suggest that block ownership is detrimental to the firm's market liquidity because of its adverse impact on trading activity. The level of recommendation consensus among analysts (*analyst consensus*) and the number of analyst following (*analyst coverage*) are included to control any effect from previous recommendations and information asymmetry, measured at the end of the quarter prior to the first recommendation revision.



Firms' past performance and financial characteristics are also important pieces of information which are taken into consideration with market adjusted return, size, and book-to-market ratio. The market adjusted return (*Market-adj return*) is calculated as past 6 month ( $t-7$  to  $t-1$ ) cumulated returns minus CRSP value-weighted index return. The market capitalization (*SIZE*) is measured as price per share multiplied by the number of shares outstanding, and book-to-market ratio is calculated as the book value of equity over the market capitalization.

Table 5 reports the determinants of changes in portfolio weights during the pre-release quarter for each group of sample firms, all downgraded firms, firms without upgrades prior to downgrades, firms with upgrades prior to downgrades, and firms with only upgrades. Each panel of Table 5 groups two similar patterns of recommendations. The dependent variable is the portfolio weight change (*PWC*), and robustness tests with abnormal portfolio weight change (*APWC*) will be discussed in Section 5. The regression results are reported both with and without investment bank and year fixed effects.

Panel A shows regression results for firms with upgrades prior to the first downgrades and firms with only upgrades. We start by investigating the overall effect of analyst-affiliation on institutional trading, reported with the coefficients on *AH* from column 2, 3, 6, and 7. Interestingly, the coefficients on *AH*, -0.0379 with fixed effect (-0.0335 without fixed effect), are negative and significant, indicating that after controlling for other variables, affiliated investors decrease their portfolio weight 0.0379 (0.0335) % more than non-affiliated investors. Even for the firms with only upgrades for which analysts never downgrade during the class period, the coefficients on *AH*, -0.0568 (-0.0641), remain negative and significant.

Table 1.5 Determinants of Change in Institutional Holdings prior to First Recommendation Revisions

Panel A. Firms with upgrade prior to first downgrades since the class period starting date Vs. Firms with only upgrades

Variables	Dependent variable: PWC							
	Firms with upgrades prior to first downgrades since the class period starting date				Firms with only upgrades			
Analyst holding (AH)	-0.0335*	-0.0379*			-0.0568*	-0.0641*		
	(-1.74)	(-1.80)			(-1.66)	(-1.87)		
Underwriter AH			0.0025	0.0012			-0.0370	-0.0245
			(0.10)	(0.04)			(-0.86)	(-0.53)
Lender AH			-0.0017	-0.0209			-0.0588**	-0.0653*
			(-0.05)	(-0.53)			(-2.06)	(-1.88)
Independent IB AH			-0.0418**	-0.0480**			-0.0737	-0.0894*
			(-2.21)	(-2.33)			(-1.61)	(-1.94)
Independent non-IB AH			-0.0807	-0.0823*			-0.0153	-0.0172
			(-1.65)	(-1.70)			(-0.31)	(-0.36)
Reputation	-0.0150***	-0.0102*	-0.0154***	-0.0113**	-0.0105**	-0.0098*	-0.0097*	-0.0085
	(-2.84)	(-1.83)	(-2.91)	(-2.02)	(-2.01)	(-1.70)	(1.82)	(-1.46)
Allstar analyst	-0.0059	0.0088	-0.0151	-0.0007	0.0347	0.0429	0.0366	0.0436
	(-0.38)	(0.54)	(-0.81)	(-0.04)	(1.11)	(1.35)	(1.15)	(1.35)
First revision issuer (FRI)	-0.0080	-0.0098	-0.0086	-0.0109	0.0299	0.0247	0.0320	0.0259
	(-0.43)	(-0.51)	(-0.45)	(-0.55)	(0.68)	(0.54)	(0.71)	(0.54)
First revision from allstar analyst	0.0671	0.0726	0.0674	0.0728	-0.1084***	-0.0448***	-0.1087	-0.0450***
	(1.28)	(1.40)	(1.29)	(1.41)	(-4.39)	(-2.58)	(-4.39)	(-2.60)
Initial portfolio weight	-0.1970	-0.1974	-0.1970	-0.1974	-0.1598***	-0.1625***	-0.1598***	-0.1625***
	(-1.47)	(-1.47)	(-1.47)	(-1.47)	(-2.73)	(-2.75)	(-2.73)	(-2.74)
Total institutional ownership	0.0008**	0.0004	0.0008**	0.0004	0.0010*	0.0004	0.0010	0.0004
	(2.09)	(1.07)	(2.10)	(1.08)	(1.74)	(1.10)	(1.74)	(1.10)
Analyst consensus	0.0040	0.0064	0.0038	0.0063	-0.0066	0.0244	-0.0066	0.0245
	(0.20)	(0.22)	(0.19)	(0.22)	(-0.39)	(0.49)	(-0.39)	(0.49)

(Table 1.5 continued)

Analyst coverage	-0.0045*	-0.0067*	-0.0045*	-0.0067*	-0.0023	-0.0005	-0.0023	-0.0005
	(-1.70)	(-1.73)	(-1.69)	(-1.72)	(-1.45)	(-0.31)	(-1.44)	(-0.30)
Size	0.0000	0.0000	0.0000	0.0000	0.0000***	0.0000***	0.0000**	0.0000***
	(0.03)	(0.24)	(0.03)	(0.25)	(4.42)	(3.49)	(4.42)	(3.49)
Book-to-market	0.0316	0.0423	0.0318	0.0425	0.0756**	-0.0285	0.0761**	-0.0276
	(0.71)	(0.84)	(0.71)	(0.85)	(2.32)	(-0.56)	(2.33)	(-0.54)
Market-adj return	0.0002	0.0047	0.0005	0.0051	0.0140	-0.0505**	0.0141	-0.0505**
	(0.01)	(0.20)	(0.03)	(0.22)	(0.68)	(-2.51)	(0.69)	(-2.50)
Intercept	0.0062	-0.0592	0.0060	-0.0592	0.0233	-0.1243	0.0230	-0.1250
	(0.06)	(-0.44)	(0.06)	(-0.44)	(0.25)	(-0.70)	(0.25)	(-0.71)
Fixed effect	No	Yes	No	Yes	No	Yes	No	Yes
Number of obs.	10,710	10,710	10,710	10,710	13,010	13,010	13,010	13,010
R-squared	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04

Panel B. All downgraded firms Vs. Firms without upgrades prior to downgrades since the class period starting date

Variables	Dependent variable: PWC							
	All downgraded firms				Firms without upgrades prior to downgrades			
Analyst holding (AH)	-0.0075	-0.0072			-0.0032	-0.0031		
	(-0.46)	(-0.44)			(-0.18)	(-0.17)		
Underwriter AH			-0.0188	-0.0126			-0.0198	-0.0141
			(-1.21)	(-0.81)			(-1.13)	(-0.80)
Lender AH			-0.0359*	-0.0374**			-0.0382**	-0.0396**
			(-1.94)	(-2.33)			(-2.01)	(-2.21)
Independent IB AH			-0.0371***	-0.0390***			-0.0359***	-0.0397***
			(-3.15)	(-3.25)			(-2.82)	(-2.92)
Independent non-IB AH			0.1044**	0.1058**			0.1183**	0.1200**
			(2.03)	(2.04)			(2.14)	(2.17)

(Table 1.5 continued)

Reputation	-0.0136***	-0.0129***	-0.0096***	-0.0081**	-0.0123***	-0.0119***	-0.0077***	-0.0062
	(5.58)	(-3.15)	(-4.46)	(2.18)	(-4.72)	(-2.84)	(-3.25)	(-1.64)
Allstar analyst	-0.0298**	-0.0266*	-0.0224*	-0.0190	-0.0339**	-0.0313*	-0.0249*	-0.0221
	(-1.98)	(-1.74)	(-1.68)	(-1.43)	(-2.01)	(-1.83)	(-1.70)	(-1.50)
First revision issuer (FRI)	-0.0317**	-0.0314**	-0.0344**	-0.0346**	-0.0327**	-0.0311*	-0.0345**	-0.0332*
	(-2.17)	(-2.12)	(-2.27)	(-2.26)	(-1.98)	(-1.84)	(-2.03)	(-1.93)
First revision from allstar analyst	-0.0048	0.0110	-0.0047	0.0111	-0.0128*	0.0057	-0.0127*	0.0057
	(-0.62)	(1.34)	(-0.61)	(1.34)	(-1.76)	(0.71)	(-1.75)	(0.72)
Initial portfolio weight	-0.2106***	-0.2104***	-0.2106***	-0.2104***	-0.2036***	-0.2032***	-0.2036***	-0.2032***
	(-6.46)	(-6.45)	(-6.46)	(6.45)	(-6.25)	(-6.23)	(-6.25)	(-6.23)
Total institutional ownership	-0.0015***	-0.0019***	-0.0015***	-0.0019***	-0.0018***	-0.0022***	-0.0018***	-0.0022***
	(-8.18)	(-10.00)	(-8.16)	(-9.99)	(-9.08)	(-10.60)	(-9.08)	(-10.59)
Analyst consensus	0.0153***	0.0288***	0.0152***	0.0288***	0.0206***	0.0331***	0.0206***	0.0331***
	(3.02)	(5.58)	(3.01)	(5.57)	(3.82)	(6.04)	(3.81)	(6.04)
Analyst coverage	-0.0011*	-0.0005	-0.0011*	-0.0005	-0.0011*	-0.0004	-0.0011*	-0.0004
	(-1.69)	(-0.82)	(-1.67)	(-0.81)	(-1.66)	(-0.69)	(-1.65)	(-0.68)
Size	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	(27.50)	(27.32)	(27.48)	(27.28)	(27.25)	(26.97)	(27.22)	(26.93)
Book-to-market	0.0292*	0.0268	0.0292*	0.0267	0.0474**	0.0434**	0.0474**	0.0433**
	(1.77)	(1.49)	(1.77)	(1.49)	(2.52)	(2.08)	(2.52)	(2.08)
Market-adj return	-0.0294***	-0.0299***	-0.0294***	-0.0299***	-0.0337***	-0.0329***	-0.0337***	-0.0329***
	(-4.89)	(-4.93)	(-4.89)	(-4.93)	(-5.28)	(-5.06)	(-5.28)	(-5.06)
Intercept	0.0815***	0.0767*	0.0813***	0.0770*	0.0747***	0.0841*	0.0745***	0.0842*
	(2.93)	(1.80)	(2.92)	(1.80)	(2.57)	(1.77)	(2.56)	(1.77)
Fixed effect	No	Yes	No	Yes	No	Yes	No	Yes
Number of obs.	126,644	126,644	126,644	126,644	114,535	114,535	114,535	114,535
R-squared	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports regression results of portfolio weight change (*PWC*) for affiliated analysts' recommendations. *PWC* is the dependent variable calculated as the change in portfolio weight of a stock in an institutional investor's portfolio from at the beginning of quarter, which is quarter preceding recommendation quarter, to at the end of quarter. Independent variables include dummy variables that represent whether a recommendation is issued by an analyst affiliated with a financial institution holding the covered firm (*AH*), an analyst issuing a recommendation on a firm is employed by an underwriter of the firm (*Underwriter AH*), an analyst issuing a recommendation on a firm is employed by a bank lending the firm (*Lender AH*), and an analyst issuing a recommendation on a firm is independent of the firm. The independent analyst institutions are separated into institutions with (*Independent investment banking AH*) and without investment banking (*Independent AH*). Control variables include investment bank reputation (*Reputation*), recommendation issued by an *Institutional Investor* "All-American" analyst (*Allstar Analyst*), dummy for first revision issuer, first recommendation issued by an "All-American" analyst (*First revision from Allstar Analyst*), portfolio weight at the beginning of the quarter (*Initial portfolio weight*), total institutional ownership, median level of recommendation consensus (*Analyst consensus*), analyst coverage, market capitalization (*SIZE*), book-to-market ratio, market adjusted past 6-month returns (*Market-adj return*) calculated as past 6 month (t-7 to t-1) cumulated returns minus market return (CRSP value-weighted index return). More detailed information is in Appendix A. Panel A reports regression coefficients for all downgraded firms and firms without upgrades prior to downgrades. Panel B reports regression coefficients for firms with upgrades prior to first downgrades and firms with only upgrades. *T-statistics* are reported in parentheses.

The negative coefficients are driven by a different type of analysts between the two samples as we investigate further with a finer classification, shown in column 4, 5, 8, and 9. According to the detailed regressions, we find that independent IB analysts are the major sources for the firms with downgrades, and lender analysts are for the firms with upgrades. Looking at each type of analysts for the firms with downgrades, after controlling for other variables, the coefficients on underwriter analyst holding (*underwriter AH*) are positive and insignificant. Underwriter analysts did not trade differently from non-affiliated institutions. It is possible that they possess pre-release information, but do not want to exploit them by selling because of their support for the firms with an underwriting relationship. As a recent case of an IPO, Facebook, on May 18, 2012, went to public at its debut price of \$38 per share, which fell to \$27.72 on June 1. As the price fell, the lead underwriter of Facebook, Morgan Stanley, reportedly stepped in to keep the stock from breaking through its offer price while Reuters revealed that the bank's analysts downgraded their estimates about the future earnings of the company. Schultz and Zaman (1994) and Aggarwal (2000) document that underwriters repurchase large quantities of stock in the aftermarket. Lender analyst holding and independent non-IB analyst holding are insignificant. However, independent IB analysts, -0.0480 (-0.0418) are negative and highly significant, indicating more reduction of portfolio position on the firms than non-affiliation institutions. One possible explanation is that independent IB analysts have no underwriting relationship with the firms, and thereby are not under pressure like underwriters so that they can sell those firms which end up having downgrades.

Another key variable is the first revision issuer, whose coefficients are not significant, suggesting no change in shareholdings. This indicates that those issuers do not decrease portfolio position because of upgrade coming up. A number of the controls are significant. Investment bank reputation (*Reputation*) matters in a way that high reputational institutions decrease shareholdings

more than low reputational institutions. *PWC decreases more when the level of institutional ownership is higher.* Firms with more analyst coverage incurred more selling.

As for the firms with only upgrades, only 78 firms did not receive downgrades during the entire class period. Lender analysts are the sellers on the firms while other analysts are not. For the firms with only upgrades, the lender analysts may notice negative information related to, in particular, the firms' debts.<sup>8</sup> One possibility is that affiliated institutions do not view the analysts' recommendations as informative. Thus, the institutions decrease their holdings based on their own research, regardless of the analysts' report. Another possibility is that analysts simply give the traders pre-release tips that differ from their reporting. Recently *The Wall Street Journal* (WSJ) reports that analysts at Goldman Sachs sometimes shared with traders and key clients short-term trading tips that sometimes differed from the firm's long-term research.<sup>9</sup> According to our findings, the allegation is not without merit. Reputation, First revision from all-star analyst, and initial portfolio weight are negative and significant.

Panel B of Table 5 reports the same regression analysis for all firms with downgrades and firms without upgrades prior to downgrades. The results are similar between the two groups. In contrast to previous results, coefficients on *AH* are negative but insignificant. Looking at regression analysis with the finer classification, we find that lender analysts and independent IB analysts are negative and statistically significant, while independent non-IB analysts are positive and significant, offsetting each other's effect on trading, and thereby making *AH* insignificant.

Lender analysts and independent IB analysts significantly reduce their positions in both groups of firms, suggesting that they are able to execute transactions without pressure as

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<sup>8</sup> Investigating the detailed reason is beyond our scope in this study.

<sup>9</sup> Goldman's Trading Tips Reward Its Biggest Clients, *The Wall Street Journal*, August 24, 2009

underwriters have. In contrast to other analysts, independent non-IB analysts which do not have investment banking operations trade in the opposite direction, meaning that they tend to increase their holdings prior to downgrades. There are two potential explanations in which a different type of the analyst affiliation may result in differences in the pre-release trading. First, a pure independent analyst institution does not obtain more accurate and superior information from their research divisions simply because the analysts themselves do not have an ability to gather information and produce quality research. Jacob, Rock, and Weber (2008) compares IB analysts with non-IB analysts, suggesting that the IB analysts' forecasts are on average more accurate than forecasts made by other analysts. The possible resource advantages for the IB analysts include the employment of higher-quality analysts and investment banking affiliations. Second, investment banks may be less strict to the "Chinese wall", and thereby share information more frequently, making them execute transactions in a timely fashion, which is consistent with the "tipping hypothesis".

*FRI* identifies whether the first revision is issued by an affiliated institution's own analyst. Across the different samples and different specifications, the coefficients of the variable are negative and statistically significant, indicating that the first revision issuers tend to decrease shareholdings in the covered firms. We explore this issue in greater depth later in this section by employing interaction terms in which each type of analysts is multiplied by the first revision issuer dummy and find supportive evidence for this explanation. Whether the first revision analyst is an all-star does not affect institutional trading significantly beyond the overall effect of first revision analysts.

Reputation is negative and highly significant, indicating more selling for higher reputation. For the initial position, it is negatively related to the holding institution's later position, implying



that when a financial institution has a higher position, it is more likely to sell its shares in a firm for which its analyst has negative information. There is more selling for firms with higher degree of institutional ownership and higher past performance. Analyst coverage is highly significant. Institutional investors increase their position when the consensus is high.

Table 6 reports the regression results with those interaction terms for all downgraded firms, where each type of analyst is multiplied by FRI. The coefficient on  $AH \cdot FRI$  is -0.0314 (-0.0317) in column 2 (column 3), indicating that after controlling for other factors, affiliated institutional investors decreases their portfolio weight 0.0314% more when they issue first downgrades among others. Looking at the detailed regression analysis, we find that underwriter analysts and independent non-IB analysts also sell more only when they are the first revision issuers. The first downgrade is important because it signals firms' overall quality to the public, triggering multiple downgrades afterward. And it is likely that the issuer collects information about a covered firm and dissipates it to the market in a timely fashion. Therefore, affiliated institutions would benefit from subsequent retail trading, if they are able to sell before the first downgrade, and the first revision issuers do so. Lender analysts are, on average, sellers although they increase their portfolio position when they issue first downgrades. The coefficients on independent IB analysts are negative and significant, suggesting that independent IB analysts are strong front-runners, even if they are not the first revision issuers. Other control variables remain similar to the regression analysis for downgraded firms in Panel B of Table 5.

Table 1.6 Changes in Institutional Holdings prior to First Recommendation Revisions issued by Their Own Analysts vs. Others

Variables	Dependent Variable: PWC			
Analyst holding (AH)	-0.0075 (-0.46)	-0.0072 (-0.44)		
AH*First revision issuer (FRI)	-0.0317** (-2.17)	-0.0314** (-2.12)		
Underwriter AH			-0.0191 (-1.20)	-0.0123 (-0.78)
Underwriter AH*FRI			-0.0289** (-2.01)	-0.0363** (-2.39)
Lender AH			-0.0390** (-2.05)	-0.0397** (-2.39)
Lender AH*FRI			0.0570** (2.42)	0.0346* (1.97)
Independent IB AH			-0.0384*** (-3.29)	-0.0404*** (-3.40)
Independent IB AH*FRI			-0.0090 (-0.64)	-0.0063 (-0.43)
Independent non-IB AH			0.1113** (2.05)	0.1128** (2.07)
Independent non-IB AH*FRI			-0.1489** (-2.22)	-0.1497** (-2.25)
Reputation	-0.0136*** (-5.58)	-0.0129*** (-3.15)	-0.0097*** (-4.48)	-0.0081** (-2.20)
Allstar analyst	-0.0298** (-1.98)	-0.0266* (-1.74)	-0.0226* (-1.69)	-0.0192 (-1.44)
First revision from allstar analyst	-0.0048 (-0.62)	0.0110 (1.34)	-0.0048 (-0.61)	0.0110 (1.34)
Initial portfolio weight	-0.2106*** (-6.46)	-0.2104*** (-6.45)	-0.2106*** (-6.46)	-0.2104*** (-6.45)
Total institutional ownership	-0.0015*** (-8.18)	-0.0019*** (-10.00)	-0.0015*** (-8.17)	-0.0019*** (-9.99)
Analyst consensus	0.0153*** (3.02)	0.0288*** (5.58)	0.0152*** (3.00)	0.0288*** (5.57)
Analyst coverage	-0.0011* (-1.69)	-0.0005 (-0.82)	-0.0011* (-1.68)	-0.0005 (-0.81)
Size	0.0000*** (27.50)	0.0000*** (27.32)	0.0000*** (27.47)	0.0000*** (27.28)
Book-to-market	0.0292* (1.77)	0.0268 (1.49)	0.0292* (1.77)	0.0267 (1.48)

(Table 1.6 continued)

Market-adj return	-0.0294*** (-4.89)	-0.0299*** (-4.93)	-0.0294*** (-4.89)	-0.0299*** (-4.93)
Intercept	0.0815*** (2.93)	0.0767* (1.80)	0.0815*** (2.93)	0.0770* (1.80)
Fixed effect	No	Yes	No	Yes
Number of obs.	126,644	126,644	126,644	126,644
R-squared	0.09	0.09	0.09	0.09

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports regression coefficients on portfolio weight change (*PWC*) for recommendation revisions issued by own analysts and others. *PWC* is the dependent variable calculated as the change in portfolio weight of a stock in an institutional investor's portfolio from at the beginning of quarter, which is quarter preceding recommendation quarter, to at the end of quarter. Independent variables include dummy variables that represent whether a recommendation is issued by an analyst affiliated with a financial institution holding the covered firm (*AH*), an analyst issuing a recommendation on a firm is employed by an underwriter of the firm (*Underwriter AH*), an analyst issuing a recommendation on a firm is employed by a bank lending the firm (*Lender AH*), and an analyst issuing a recommendation on a firm is independent of the firm. The independent analyst institutions are separated into institutions with (*Independent investment banking AH*) and without investment banking (*Independent AH*). First revision issuer dummy is multiplied with each type of analyst affiliation. Control variables include investment bank reputation (*Reputation*), recommendation issued by an *Institutional Investor* "All-American" analyst (*Allstar Analyst*), dummy for first revision issuer, first recommendation issued by an "All-American" analyst (*First revision from Allstar Analyst*), portfolio weight at the beginning of the quarter (*Initial portfolio weight*), total institutional ownership, median level of recommendation consensus (*Analyst consensus*), analyst coverage, market capitalization (*SIZE*), book-to-market ratio, market adjusted past 6-month returns (*Market-adj return*) calculated as past 6 month (t-7 to t-1) cumulated returns minus market return (CRSP value-weighted index return). More detailed information is in Appendix A. *T-statistics* are reported in parentheses.

### 1.4.3 Regression Analysis of Pre- and Post-Recommendation Period

So far the empirical results support our hypotheses that affiliated institutions decrease their portfolio weights more than non-affiliated institutions before analysts' revisions that potentially impact firms' investment value badly. Once analysts reveal their opinion through recommendations, however, non-affiliated institutions may take on buying or selling that depends on the level of recommendation (e.g. buy or sell) as well. Therefore, we examine how changes in portfolio weights for the post-recommendation period are different from those for the pre-recommendation period.

Table 7 reports the regression results for portfolio weight change during the pre- and post-recommendation period. We include interaction terms in which all the primary interest dummy variables such as *AH*, *Underwriter AH*, *Lender AH*, *Independent IB AH*, and *Independent non-IB AH* are multiplied by the post-recommendation period dummy variable (*Post-Rec*). We analyze two different groups of sample firms, all downgraded firms and firms without upgrades prior to downgrades. The results are very similar. In column 2 and 4, the negative and insignificant coefficient on both *AH* and *AH\*Post-Rec* shows no difference in holding changes between affiliated and non-affiliated institutions. The post-recommendation period dummy (*Post-Rec dummy*) shows a statistically significant and negative coefficient, implying that non-affiliated institutions on average decrease stockholdings in the lawsuit firms after the release of recommendations. The results suggest that after pre-release trading of the affiliated institutions, the non-affiliated institutional investors realize the lawsuit firms' quality through the first downgrades, and follow the direction set by the affiliated institutions. It provides the affiliated institutions with incentives to trade early and benefit themselves at the expense of retail clients.

Column 3 and 5 show consistent evidence that affiliated institutions decrease stockholdings significantly during the pre-recommendation period, except the independent non-IB analysts. Underwriter analysts, lender analysts, and independent IB analysts lower 0.0337%, 0.0502%, and 0.0494% for all downgraded firms (0.0349%, 0.0487%, and 0.0462% for firms without upgrades prior to downgrades) of portfolio weights significant at about the 1% level during the quarter before recommendations, while lender analysts and independent IB analysts increase those positions during the post-recommendation period relative to non-affiliated institutions. It seems that those institutional investors sell stocks at a higher price before negative news comes out, and then buy them at a lower price after downgrades when everyone else sells. The results support this

Table 1.7 Regression Results for Portfolio Weight Change during the Pre- and Post-Recommendation Period

Variables	Dependent variable: PWC			
	All downgraded firms		Firms without upgrades prior to downgrades	
Analyst holding (AH)	-0.0194 (-1.42)		-0.0139 (-0.94)	
AH *Post-Rec	-0.0134 (-0.81)		-0.0183 (-1.02)	
Underwriter AH		-0.0337** (-2.55)		-0.0349** (-2.36)
Underwriter AH*Post-Rec		0.0094 (0.56)		0.0224 (1.45)
Lender AH		-0.0502*** (-3.96)		-0.0487*** (-3.44)
Lender AH*Post-Rec		0.0654*** (5.47)		0.0625*** (5.02)
Independent IB AH		-0.0494*** (-5.08)		-0.0462*** (-4.64)
Independent IB AH*Post-Rec		0.0255** (2.13)		0.0200* (1.81)
Independent non-IB AH		0.1203** (2.24)		0.1374** (2.40)
Independent non-IB AH*Post-Rec		-0.2082*** (-2.66)		-0.2349*** (-2.81)
First revision issuer (FRI)	-0.0435*** (-2.80)	-0.0458*** (-2.86)	-0.0466*** (-2.65)	-0.0478*** (-2.66)
FRI*Post-Rec	0.0819*** (3.35)	0.0843*** (3.35)	0.0892*** (3.25)	0.0901*** (3.21)
First revision from allstar analyst	-0.0165** (-2.05)	-0.0164** (-2.04)	-0.0228*** (-3.04)	-0.0226*** (-3.03)
First revision from allstar analyst*Post-Rec	0.0869*** (5.85)	0.0867*** (5.84)	0.1144*** (8.21)	0.1142*** (8.20)
Post-Rec dummy	-0.0804*** (-14.48)	-0.0804*** (-14.48)	-0.0874*** (-15.06)	-0.0874*** (-15.06)
Reputation	-0.0087*** (-3.24)	-0.0069*** (-2.60)	-0.0077*** (-2.78)	-0.0057** (-2.05)
Allstar analyst	-0.0055 (-0.73)	-0.0028 (-0.40)	-0.0073 (-0.89)	-0.0041 (-0.55)
Initial portfolio weight	-0.1716***	-0.1716***	-0.1486***	-0.1486***

(Table 1.7 continued)

	(-7.10)	(-7.10)	(-7.39)	(-7.39)
Total institutional ownership	-0.0010***	-0.0010***	-0.0013***	-0.0013***
	(-8.33)	(-8.33)	(-10.78)	(-10.77)
Analyst consensus	0.0304***	0.0304***	0.0329***	0.0329***
	(9.78)	(9.77)	(10.09)	(10.08)
Analyst coverage	0.0015***	0.0015***	0.0013***	0.0013***
	(4.09)	(4.09)	(3.68)	(3.69)
Size	0.0000***	0.0000***	0.0000***	0.0000***
	(26.10)	(26.07)	(26.61)	(26.57)
Book-to-market	0.0039	0.0038	0.0002	0.0002
	(0.54)	(0.53)	(0.04)	(0.03)
Market-adj return	-0.0208***	-0.0208***	-0.0275***	-0.0275***
	(-6.65)	(-6.65)	(-8.36)	(-8.36)
Intercept	0.0060	0.0061	0.0178	0.0178
	(0.32)	(0.32)	(0.92)	(0.92)
Fixed effect	Yes	Yes	Yes	Yes
Number of obs.	253,288	253,288	229,070	229,070
R-squared	0.05	0.05	0.05	0.05

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports regression coefficients on portfolio weight change (*PWC*) for recommendation revisions. *PWC* is the dependent variable calculated as the change in portfolio weight of a stock in an institutional investor's portfolio from at the beginning of quarter, which is quarter preceding recommendation quarter, to at the end of quarter. Independent variables include dummy variables that represent whether a recommendation is issued by an analyst affiliated with a financial institution holding the covered firm (*AH*), an analyst issuing a recommendation on a firm is employed by an underwriter of the firm (*Underwriter AH*), an analyst issuing a recommendation on a firm is employed by a bank lending the firm (*Lender AH*), and an analyst issuing a recommendation on a firm is independent of the firm. The independent analyst institutions are separated into institutions with (*Independent investment banking AH*) and without investment banking (*Independent AH*). A post recommendation period dummy (*Post-Rec*) is multiplied with each type of analyst affiliation. Control variables include investment bank reputation (*Reputation*), recommendation issued by an *Institutional Investor* "All-American" analyst (*Allstar analyst*), dummy for first revision issuer, first recommendation issued by an "All-American" analyst (*First revision from allstar analyst*), portfolio weight at the beginning of the quarter (*Initial portfolio weight*), total institutional ownership, median level of recommendation consensus (*Analyst consensus*), analyst coverage, market capitalization (*SIZE*), book-to-market ratio, market adjusted past 6-month returns (*Market-adj return*) calculated as past 6 month (t-7 to t-1) cumulated returns minus market return (CRSP value-weighted index return). More detailed information is in Appendix A. *T-statistics* are reported in parentheses.

strategic trading behavior of affiliated institutional investors. Independent non-IB analyst, however, trade in the direction indicated by first revisions. We will investigate post-recommendation stock performance traded by each type of analysts in the next section.

#### 1.4.4 Stock Price Performance around Recommendation Revisions

Prior results show that affiliated institutions decrease their holdings before the release of recommendations. In order to say that the trades by affiliated institutions are information-driven and designed to benefit themselves from retail client trades, we explore stock price performance around recommendation revisions. If underwriter analysts and independent IB analysts have more accurate and superior information, then the stocks purchased (sold) by the investment banks outperform (underperform) stocks purchased (sold) by the other analysts. Table 8 shows abnormal returns to first recommendation revisions. We calculate abnormal returns using a four-factor model (Carhart, 1997).

$$R_t = \alpha + \beta_1 \times RMRF_t + \beta_2 \times SMB_t + \beta_3 \times HML_t + \beta_4 \times MOM_t + e_t,$$

where  $R_t$  is the excess return in month  $t$  on a firm,  $RMRF_t$  is the CRSP value-weighted market return minus the risk-free rate in month  $t$ , and  $SMB_t$ ,  $HML_t$ , and  $MOM_t$  are month  $t$  return of portfolios based on size, book-to-market, and momentum effects. The abnormal return is the difference between realized return and expected return based on the model. The event window ranges from 2 days to 6 months. The announcement date of the first revision is the event date.

Panel A of Table 8 provides cumulative abnormal returns around first recommendation revisions for all firms, upgraded firms, and downgraded firms. The total number of all firms is 660. Abnormal returns from all windows show negative and significant results. We separate the firms into two groups, upgraded firms and downgraded firms to see which firms drive the negative abnormal returns. Looking at the upgraded firms, consisting of 78 firms, a day before through a day after the upgrade, the investors react positively to the issued recommendation. However, the effect of upgrades ends shortly after 3 to 6 months, leading to negative abnormal returns. It is possible that even if these firms never receive downgrades, they may perform poorly.

Table 1.8 Abnormal Returns around First Recommendation Revisions

Panel A: Cumulative abnormal returns of sample firms surrounding first recommendation revisions

Sample firms	N	Pre-revision				Post-revision	
		2 day (0,1)	3 day (-1,1)	3 month	6 month	3 month	6 month
Upgraded	78	0.0325*** (5.12)	0.0411*** (5.28)	0.0019 (0.04)	0.0302 (0.56)	-0.1817*** (-4.79)	-0.2448*** (-4.56)
Downgraded	582	-0.0629*** (-27.72)	-0.0829*** (-27.72)	-0.0463*** (-3.30)	-0.0784*** (-3.95)	-0.1617*** (-11.54)	-0.3030*** (-15.30)

Panel B: Cumulative abnormal returns of all downgraded firms held by different types of analyst

Type of analyst	N	Pre-revision				Post-revision	
		2 day (0,1)	3 day (-1,1)	3 month	6 month	3 month	6 month
Underwriter	260	-0.0755*** (-18.85)	-0.0977*** (-19.90)	-0.0516** (-2.26)	-0.0838*** (-2.59)	-0.1508*** (-6.61)	-0.2542*** (-7.88)
Lender	91	-0.0299*** (-7.19)	-0.0364*** (-7.15)	-0.0108 (-0.45)	-0.0522* (-1.55)	-0.1382*** (-5.81)	-0.2416*** (-7.18)
Independent IB	455	-0.0606*** (-23.46)	-0.0726*** (-22.97)	-0.0395*** (-2.89)	-0.0718*** (-3.71)	-0.1384*** (-10.14)	-0.2426*** (-12.55)
Independent non-IB	322	-0.0611*** (-21.42)	-0.0666*** (-19.07)	-0.0133 (-0.98)	-0.0355** (-1.84)	-0.1258*** (-9.25)	-0.2476*** (-12.87)

Panel C: Cumulative abnormal returns of all downgraded firms based on trading by analyst

Trading type			Post-revision performance		
One quarter prior to revisions	Quarter of revisions	# of firms	3 month	6 month	9 month
Underwriter:					
Increase	Increase	48	-0.0089 (-0.17)	-0.0029 (-0.03)	-0.1609** (-1.78)
Increase	Decrease	54	-0.1210*** (-2.65)	-0.0201 (-0.31)	-0.1983*** (-2.51)
Decrease	Increase	96	-0.1245*** (-3.29)	-0.2022*** (-3.78)	-0.2780*** (-4.24)
Decrease	Decrease	34	-0.0844** (-1.84)	-0.5135*** (-7.94)	-0.5346*** (-6.75)
Lender:					
Increase	Increase	34	-0.1284*** (-3.91)	-0.2172*** (-4.65)	-0.2574*** (-4.51)
Increase	Decrease	16	-0.1533*** (-3.04)	-0.2859*** (-4.01)	-0.3643*** (4.17)



(Table 1.8 continued)

Decrease	Increase	20	-0.1468*** (-3.31)	-0.2165*** (-3.45)	-0.2023*** (-2.63)
Decrease	Decrease	8	-0.0823 (-1.08)	-0.1971** (-1.83)	-0.3078*** (-2.34)
Independent IB:					
Increase	Increase	118	-0.1021*** (-5.53)	-0.2399*** (-9.18)	-0.3215*** (-10.05)
Increase	Decrease	106	-0.1831*** (-5.67)	-0.2743*** (-6.00)	-0.3233*** (-5.78)
Decrease	Increase	77	-0.1638*** (-5.91)	-0.1726*** (-4.40)	-0.2748*** (-5.72)
Decrease	Decrease	53	-0.1283*** (-3.01)	-0.4121*** (-6.85)	-0.5778*** (-7.85)
Independent non-IB:					
Increase	Increase	75	-0.1694*** (-6.98)	-0.2859*** (-8.32)	-0.3401*** (-8.10)
Increase	Decrease	67	-0.1070*** (-3.36)	-0.2211*** (-4.91)	-0.3405*** (-6.18)
Decrease	Increase	65	-0.0781** (-2.08)	-0.1500*** (-2.82)	-0.2272*** (-3.49)
Decrease	Decrease	51	-0.0443 (-1.09)	-0.2511*** (-4.40)	-0.2218*** (-3.17)

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports abnormal returns around first recommendation revisions. Abnormal returns are calculated using the four-factor model (Carhart, 1997). Panel A presents cumulative abnormal returns on various event windows (2-day, 3-day, 3-month, and 6-month) for upgraded firms and downgraded firms. The number of firms in each category (N) is also reported. The event date is a first recommendation revision date since the class period starting date. Panel B shows cumulative abnormal returns of downgraded firms held by different types of analyst affiliated institutions over the various event windows. Panel C presents cumulative abnormal returns of firms that each type of affiliated institutions buys or sells a quarter prior to and of the first recommendation revisions. Buys (sells) are defined as those stocks for which affiliated institutions increase (decrease) holdings (measured with portfolio weight changes) in the quarter before and of the recommendation revisions. *T-statistics* are reported in parentheses.

Additionally, they may have a downgrade after the class period end date when their wrongdoing become public, ending up facing a financial lawsuit. For downgraded firms, as we expected, they have negative and highly significant abnormal returns during the 2 and 3 day-window. Those firms performed poorly even before their downgrades, which may prompt analysts

to issue the downgrades. During the post-revision period, the negative abnormal returns of downgraded firms are lower than those of upgraded firms.

In order to see institutional trading, first we calculate cumulative abnormal returns for downgraded firms only held by affiliated institutions in Panel B. Among 582 downgraded firms, underwriter analysts hold 260 firms on the revision date. The firms have negative abnormal returns at various windows. Firms held by other type of analysts follow a similar pattern. Therefore, we further classify those firms into groups based on trading by each type of analysts, reported in Panel C.

Trading type shows whether analysts buy or sell during the quarter prior to or of revisions. Since we may have more than one analyst holding a firm, the number of analysts is used to determine the trading type. For example, we count the number of analysts increasing *PWC* and compare it with those decreasing *PWC*. If the number of analysts increasing *PWC* is larger, then we call it “Increase”. Otherwise it is named “Decrease”. We drop firms having the same number of analysts increasing and decreasing.

Within each type of analyst, Sells in quarter prior to revisions and Sells in quarter of revisions show the largest negative abnormal returns for 9 month. If analysts buy stocks during the quarter of revision, then most of the stocks perform better than the rest, and vice versa, which indicates analysts’ trading is information-driven. Among sells, investors react strongly for longer terms (6 or 9 month window) to those stocks sold in both quarters by underwriter analysts (-0.5346 for 9 month) and independent IB analysts (-0.5778), while the stocks sold by independent non-IB analysts have the smallest negative abnormal returns, indicating there is less reaction relative to other analysts. The results support our third hypothesis that affiliated investment banks have

superior information about the covered firms, and investors react much more to those analysts' trading.

#### 1.4.5 Robustness Tests

The evidence presented in this paper supports the hypothesis that affiliated institutional investors change their holdings prior to their analysts releasing recommendation revisions. However, the portfolio rebalancing may be driven by potential confounding events that occur before revisions. In particular, prior downgrades issued during the holding period would lead to reduction of portfolio position. Therefore, we control for any downgrade that was preceded during the quarter prior to revisions. Table 9 reports robustness tests using all downgraded firms with three different dependent variables. The first regression (1) using *PWC* as the dependent variable is the same regression for all downgraded firms in Panel B of Table 5 except *Pre-downgrade dummy*. The coefficients on the variable are negative and significant, showing institutional trading in response to the pre-downgrades. The coefficients of lender analysts and independent IB analysts remain strongly negative.

To further ensure the robustness of the results, we use the abnormal portfolio weight changes (APWC) for regression analysis. The sued firms may be sold by not only the affiliated investment banks, but also overall institutional investors, providing a spurious relationship between analyst affiliation and banks' portfolio changes. Therefore, we calculate the abnormal portfolio weight change, which is the change in the portfolio weight of a stock in an institution's portfolio less the change in the portfolio weight of that stock in the overall institutional investors.<sup>10</sup>

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<sup>10</sup> We do not exclude affiliated institutions from the overall institutional investors.

Table 1.9 Robustness Tests

Variables	Dependent variables					
	(1) PWC		(2) APWC		(3) DPWC	
Analyst holding (AH)	-0.0075 (-0.45)		-0.0075 (-0.44)		-0.0176 (-0.99)	
Underwriter AH		-0.0148 (-0.96)		-0.0174 (-1.14)		-0.0213 (-1.20)
Lender AH		-0.0374** (-2.33)		-0.0304*** (-2.70)		-0.0499*** (-3.21)
Independent IB AH		-0.0391*** (-3.25)		-0.0416*** (-3.47)		-0.0506*** (-3.98)
Independent non-IB AH		0.1065** (2.05)		0.1158** (2.14)		0.0991* (1.84)
Reputation	-0.0134*** (-3.31)	-0.0085** (-2.33)	-0.0150*** (-3.93)	-0.0097*** (-3.03)	-0.0175*** (-3.73)	-0.0125*** (-2.99)
Allstar analyst	-0.0251 (-1.63)	-0.0175 (-1.30)	-0.0274* (-1.74)	-0.0190 (-1.40)	-0.0215 (-1.42)	-0.0138 (-1.07)
First revision issuer	-0.0304** (-2.05)	-0.0335** (-2.20)	-0.0297** (-2.08)	-0.0329** (-2.20)	-0.0329** (-2.08)	-0.0364** (-2.22)
First revision from allstar analyst	0.0137* (1.67)	0.0138* (1.67)	0.0054 (0.66)	0.0054 (0.66)	0.0098 (1.17)	0.0099 (1.18)
Pre-downgrade dummy	-0.0398*** (-5.66)	-0.0399*** (-5.68)	0.0184** (2.63)	0.0183*** (2.62)	-0.0468*** (-6.42)	-0.0469*** (-6.43)
Intercept	0.0903** (2.07)	0.0906** (2.07)	-0.1758*** (-4.01)	-0.1755*** (-4.00)	0.0845* (1.90)	0.0848* (1.91)
Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	126,644	139,654	126,644	126,644	126,644	126,644
R-squared	0.09	0.08	0.07	0.07	0.08	0.08

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports regression coefficients on portfolio weight change (*PWC*), abnormal portfolio weight change (*APWC*) and difference in portfolio weight change on sample firms and control firms held by institutional investors (*DPWC*) for affiliated analysts' recommendations revisions. *PWC* is the dependent variable calculated as the change in portfolio weight of a stock in an institutional investor's portfolio from at the beginning of quarter, which is quarter preceding recommendation quarter, to at the end of quarter. *APWC* is the dependent variable that equals to portfolio weight change of a stock (*PWC*) less the change in the weight of that stock in the overall 13f institutional investors' portfolios. *DPWC* is the other dependent variable calculated as the difference in portfolio weight changes between sued-firms and control firms that are non-sued, located in the same industry, and held by the same institution. Independent variables include dummy variables that represent whether a recommendation is issued by an analyst affiliated with a financial institution holding the covered firm (*AH*), an analyst issuing a recommendation on a firm is employed by an underwriter of the firm (*Underwriter AH*), an analyst issuing a recommendation on a firm is employed by a bank lending the firm (*Lender AH*), and an analyst issuing a recommendation on a firm is independent of the firm. The independent analyst-affiliated institutions are separated into institutions with (*Independent investment banking AH*) and without investment banking (*Independent AH*). Control variables include investment bank reputation (*Reputation*), recommendation issued by an *Institutional Investor* "All-American" analyst (*Allstar analyst*), dummy for first revision issuer, first recommendation issued by

an “All-American” analyst (*First revision from allstar analyst*), and a pre-downgrade dummy indicating that analysts issue downgrades during the holding period. More detailed information is in Appendix A. *T-statistics* are reported in parentheses.

Columns 4 and 5 support our hypothesis that affiliated investment banks decrease the abnormal portfolio weights in the sued firms, relative to non-affiliated institutions.

Lastly, we examine whether affiliated institutions decrease holdings of downgraded firms in excess of the decrease in holdings of the control stocks that are located in the same industry. Affiliated institutions might not only change their holdings in the stocks of downgraded firms but also do so in all the stocks located in the same industry. This would cause a spurious relationship between affiliation and trading. To avoid the potential problem, we employ difference in portfolio weight change (*DPWC*) as the other dependent variable calculated as the difference in portfolio weight changes between downgraded-firms and control firms that are non-sued, located in the same industry, and held by the same institution. The results (3) of Table 9 are similar to the other two.

## **1.5 Conclusion**

We examine whether institutions exploit pre-release information obtained through divisional activities by trading securities of the firms covered by their own analysts prior to issuing stock recommendation revisions. Using data on financial lawsuits that induce potential negative impacts of a downward revision on stock price, thereby providing analysts with a strong incentive to produce and pre-release information, we find that affiliated investment banks decrease their holdings in the recommended firms relative to non-affiliated institutions during the quarter prior to downgrades issued by their analysts. Combined with evidence of stock performance, empirical results suggest that underwriter analysts and independent IB analysts have superior information

and execute transactions to benefit themselves at the expense of retail clients. Evidence of pre-release information trading is robust to controls for firms' characteristics including size and book-to-market, past performance, institutional ownership, and analyst consensus and coverage.

## **CHAPTER 2: PRESSURE OF CONFLICTS OF INTEREST WITHIN FINANCIAL CONGLOMERATES: EVIDENCE FROM IN-HOUSE AND ASSET MANAGEMENT TRADING**

### **2.1 Introduction**

Conflicts of interest and sharing of information among divisions within a financial conglomerate have been a controversial issue because they might undermine the best interests of clients and common investors. Mehran and Stulz (2007) summarize findings on the issues in the literature. Asset management firms belonging to financial conglomerates were found to perform better in particular for those stocks that have business relationships with the banks, supporting the idea that affiliated funds exploit private information from their banks as their own. On the other hand, underwriters could use their managed funds as a dumping ground for newly issued securities, indicating that underwriters support their business at fund shareholders' expense (Hao and Yan, 2012).

Divisional activities may provide financial institutions with private information about their clients, which would give the institutions an information advantage. It, however, may create conflicts of interest between divisions as well if one division's action is detrimental to the others. In the previous chapter, I use aggregated holdings (13F) to investigate the issue and find that investment banks exploit private information obtained through analysts' research to trade stocks in advance. However, it is an empirical question whether the asset management arm and in-house traders trade in the same manner because the former is managing fund investors' money rather than the banks' own capital. If both investment banking and asset management firms of investment banks do not support their low quality sued firms, the problem of conflicts of interest between the asset management arm and its investing clients are not as severe, and otherwise, the interests of fund shareholders would be seriously compromised. This paper investigate whether investment

banks pressure asset management divisions to support clients of their underwriting business by examining trading of both the banks and affiliated funds on sued firms separately.

Hao and Yan (2012) find that investment bank-affiliated funds underperform unaffiliated funds because the affiliated funds hold disproportionately large amounts of stocks of their initial public offering and seasoned equity offering clients. These findings are consistent with the idea that investment banks use affiliated funds to support their underwriting business at the expense of fund shareholders. An alternative hypothesis is that affiliated funds take advantage of private information due to their banks' business relationships with clients and resources.

Massa and Rehman (2008) show that financial conglomerates use their mutual funds to exploit the information generated in-house by their lending activities. They provide evidence that the performance of the positions of affiliated funds in the stocks of borrowing firms exceeds that of their other positions in non-borrowing stocks located in the same industry. The former - information sharing hypothesis- and the latter - conflict of interest hypothesis - make opposed predictions regarding the institutional trading, thus it is an empirical question of which of these dominates. The purpose of this paper is to empirically examine the extent to which conflicts of interest affect the trading activities and the performance of affiliated funds.

Our findings support the conflicts of interest hypothesis. Using the firms sued for allegedly misreporting, affiliated asset management firms do not decrease their positions in sued firms underwritten by their banks, while banks decrease their portfolio weights in the clients before the firms' misbehavior is disclosed to the public. It seems that underwriters exploit private information to benefit themselves, meanwhile the information is not shared with their managed funds. In order to have more direct evidence, we compare affiliated funds' stockholdings of clients to those of non-clients, and evidence shows that affiliated asset management firms hold a disproportionately



large amount of investment banking clients' shares. Finally we find that the clients show huge negative abnormal returns after underwriters decrease their portfolio weights of the firms.

Our study is related to Hao and Yan (2012). They investigate the performance of affiliated funds and document their underperformance due to holdings of investment banking clients. However, they do not analyze trading of affiliated funds and also do not show the extent to which the investment banks benefit themselves, which is one of the main driving forces generating the conflicts of interest. The rest of the paper is organized as follows: In section 2 we discuss literature and develop hypotheses. Section 3 shows data and sample. Section 4 present empirical results. Section 5 concludes.

## **2.2 Literature Review and Hypothesis Development**

The conflicts of interest and information sharing among divisions within a financial institution have been extensively studied. Among other divisions, investment banking has been a central piece as they share privately collected information and pressure other divisions for their own business profits. According to the Securities Industry Association, the ten largest investment banks earn up to 65% of revenues from their underwriting business (Morrison and Wilhelm, 2007). Because of the huge portion of revenue from investment banking, it is possible that banks try to compete for underwriting business.

Hao and Yan (2012) find that investment bank-affiliated funds underperform unaffiliated funds. Affiliated funds hold worse-performing clients of underwriting business more than unaffiliated funds, consistent with the conflict of interest hypothesis. Investment banks use affiliated funds to support their underwriting business at the expense of fund shareholders. Ritter and Zhang (2007) examine the dumping ground hypothesis that a lead underwriter allocates cold

IPOs to its affiliated funds for future underwriting business. They find, however, little evidence of the dumping ground hypothesis.

Previous studies also show evidence supporting the information advantage hypothesis. Investment banks may acquire superior information about their clients through the process of due diligence. Jacob, Rock, and Weber (2008) find that analysts' forecasts of investment banks are on average more accurate than forecasts made by other analysts. And among investment bank analysts, analysts whose employer has an investment banking relationship with followed firms issue more accurate forecasts, conferring information advantage. It may indicate that the investment banks might share private information among other divisions, and it, thus, may bring additional profits to the banks.

Massa and Rehman (2008) study how information flows within financial conglomerates by analyzing the relations between mutual funds and banks that belong to the same financial group. Using a borrower-lender relationship, they find that affiliated funds increase their stakes in the borrowing firms, and the performance of the positions of affiliated funds in the stocks of borrowing firms exceeds that of their other positions in non-borrowing stocks located in the same industry as well as that of other stocks having similar characteristics. This paper examines both the conflict of interest hypothesis and the information advantage hypothesis by looking at in-house trading and asset management trading separately.

To understand the effect of business relationships, financial institutions are grouped into underwriters, lenders, and analysts. Underwriters are financial institutions which serve a firm as lead underwriter in the past 3 years. Lenders are banks which have a lending relationship with firms in the past 3 years. Analysts are institutions that employ analysts covering firms. Within each type of groups, we separate in-house trading divisions from asset management divisions.

Underwriters face conflicts of interest such that they may not dump stocks of their clients, and even purchase through proprietary trading accounts or affiliated mutual fund accounts for after-market support. Alternatively, the information advantage hypothesis is that institutions with underwriting relationships sell the sued firms, relative to non-underwriting institutions. For the prediction, we examine in-house trading and asset management trading separately. The conflicts of interest hypothesis predicts that investment banks with underwriting relationships pressure their funds to support underwritten firms.

**H1:** Affiliated asset management firms of underwriters buy or hold underwritten firms, relative to unaffiliated funds.

A negative relationship between trading activities and underwriting relationships provides the alternative hypothesis that the conflicts of interest between the affiliated funds and their shareholders are not severe.

We also compare the amount of holdings of client firms to those of non-client firms by the financial institutions with underwriting relationships. Hao and Yan (2012) find that affiliated funds hold a disproportionately large amount of their investment banking clients' shares. Thus, the second hypothesis is as follows;

**H2:** Underwriters and their affiliated asset management firms hold a disproportionately large amount of clients' shares, relative to non-clients' shares.

The information advantage hypothesis predicts that investment banks hold smaller amounts of clients' shares.

Lastly, underwritten firms held by underwriters and their affiliated funds may perform poorly. Hao and Yan (2012) find that investment bank-affiliated funds underperform unaffiliated funds due to the conflicts of interest. The affiliated funds hold disproportionately large amounts of stocks

of their initial public offering and seasoned equity offering clients that, on average, perform poorly in the long run. We propose the third hypothesis as follows:

**H3:** Firms in which asset management firms increase or hold their positions have negative abnormal returns.

## 2.3 Data

### 2.3.1 Data and Sample

We examine institutional trading on the firms sued in federal securities fraud class action lawsuits. The Stanford Clearing house offers detailed information on federal securities fraud class litigation. In order to identify the affiliated institutions and their holdings, we hand-collected the 11 largest investment banks' equity holdings from the first quarter of 2005 to the last quarter of 2009 from Securities and Exchange Commission EDGAR (SEC EDGAR). The investment banks are Bank of America, Bear Stearns, Citigroup, Goldman Sachs, HSBC Holdings, JP Morgan, Lehman Brothers, Merrill Lynch, Morgan Stanley, Wachovia, and Wells Fargo. We collected the banks' holdings as well as holdings of their asset management divisions which report equity positions consistently through the sample period.<sup>11</sup>

We use I/B/E/S for brokerage house information, including the announcement dates of recommendations, reporting analysts, number of analyst following, brokerage houses employing the analysts, the level of the consensus recommendation as well as each analyst's recommendation. To identify lending relationships between financial institutions and recommended firms, we use the Loan Pricing Corporation's DealScan database, which contains identification of a lead arranger

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<sup>11</sup> Under the SEC Act of 1934, all institutional investors with security assets of \$100 million or more under discretionary management are required to report their holdings each quarter on Form 13f.

of each borrower's package loan deal. For stock performance information, Center for Research in Security (CRSP) is used for the stock price, return, and shares outstanding. We obtain accounting figures in financial statements from COMPUSTAT to see firms' financial characteristics such as total assets, book value, and leverage.

### 2.3.2 Sample Selection

To look at whether investment banks and their asset management arms change stock holdings on sued firms, we first identify the sued firms with an event window, e.g. the class period. Filings for the lawsuit firms contain three important dates, the class period starting date (CPS), the class period ending date (CPE), and the filing date (FD). CPS shows when the wrongdoing starts, and CPE is the date at which that particular wrongdoing is uncovered. The period between CPS and CPE provides us with an important event window during which informed investors possibly make a profit by trading early based on private information, and it, thus, allows us to examine whether investment banks with underwriting relationships change their holdings during the event period. Figure 1 illustrates the time line of events associated with lawsuits and changes in stockholdings.

We investigate the sued firms held by top investment banks, including Bank of America, Bear Stearns, Goldman Sachs, HSBC holdings, JP Morgan, Lehman Brothers, Merrill Lynch, Morgan Stanley, Wachovia, and Wells Fargo. The SEC 13F filing form requires institutional investment companies to list their affiliated banks, funds, trusts, and any institutions under parent companies' investment discretion. We manually classified the affiliated institutions of each investment bank into 3 groups, such as in-house, asset management, and trust. The classification is based on the name of a listed institution. For example, Goldman Sachs reported 8 different companies' stock holdings to the SEC in the first quarter of 2005. Among those companies, Amalgatrust is classified as a trust, and Goldman Sachs Asset Management goes to the asset management category.

Goldman Sachs & Co., Goldman Sachs International, and Goldman Sachs & Co. Bank are in the in-house category.

Our samples are filtered through three criteria. First, we exclude lawsuit firms that CRSP, COMPUSTAT, I/B/E/S, and SEC EDGAR databases do not contain. Second, we delete stocks with a price less than \$1. Third, we focus on first financial lawsuits for each firm that could contain significant negative information and avoid firms that have already had lawsuits before. i.e., we keep firms with only one lawsuit. Accordingly, we finalize the sample of 318 firms with 359 filings.

Table 1 shows the sample firm distribution, reasons for filing securities class action lawsuits, and distribution of financial lawsuit filing-year during the sample period. Panel A reports the number of sample firms with the number of filings. Panel B presents why the sample firms got

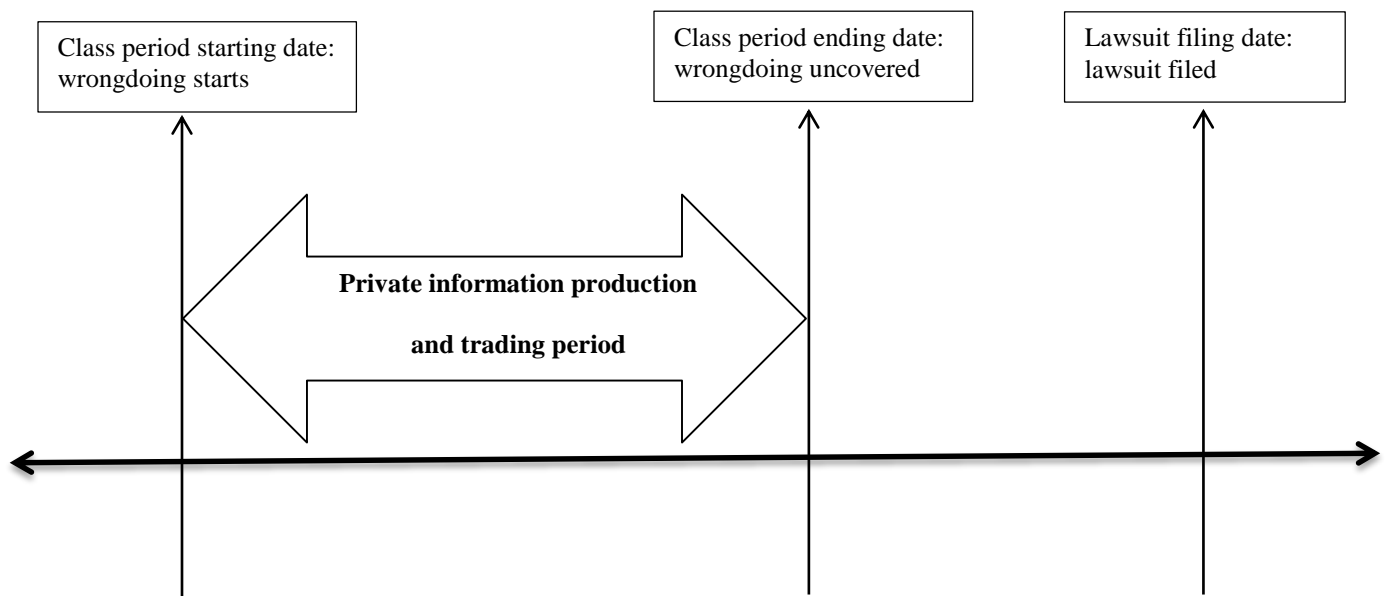


Figure 2.1 Time Line of Events associated with Lawsuits and Changes in Stockholdings

sued. For the total number of 359 lawsuit filings, general financial misreporting and artificially inflating securities prices, both violating SEC 1934 section 10(b) and rule, are the most popular

Table 2.1 Financial Lawsuit and Sample Firms

Panel A. Sample firms		
	Number of lawsuits	Number of firms
Initial sample firms	685	609
Filtered sued firms	359	318

Panel B. Reasons for filing lawsuits		
	Number of firms	%
General financial misreporting	337	93.87
Artificially inflate securities prices	280	77.99
Inadequate internal control	84	23.40
Bond issuance related	8	2.23
Equity issuance related	39	10.86
Mergers and acquisitions related	8	2.23
Insider trading and conflict of interest	63	17.55
SEC 1934 Sections 10(b) and rule 10b-5	298	83.01
SEC 1933 Section 11	82	22.84
GAAP violation/improper accounting	58	16.16
Investment banks also sued in the same filing	26	7.24
Total number of lawsuits	359	

Panel C. Distribution of financial lawsuits-year	
Year	Number of lawsuits
2005	25
2006	59
2007	79
2008	108
2009	71
2010	15
2011	2
Total number of lawsuits	359

Notes: This table reports the number of financial lawsuits and sample firms and the distribution of the reasons for filing securities class action lawsuits during 2005 to 2009.

reasons. Panel C shows the distribution of financial lawsuits-year. About one-third of the lawsuits are concentrated in 2008, indicating that during the 2008 financial crisis, investors actively sued firms.

Table 2 presents summary statistics of the sample firms. Panel A shows the summary of observations. 318 unique firms are analyzed. The total number of institutional holding changes or trading on the sample firms is 5,883. The average (median) class periods for all sample firms is about 500 (309) days during which sued firms allegedly conduct market manipulation unknown to public. Institutional investors with buy-side analysts, in particular, have an incentive to find out negative information early, and execute transactions based on the information of companies' wrongdoings not yet uncovered by common investors. After the public announcement of the market manipulation, it takes, on average (median), 133 (41) days for shareholders to file for a lawsuit against their firms.

Panel B reports financial characteristics of firms and control variables, including accounting variables such as total assets, book value of equity, and long-term debt to total asset ratio, which are measured at the fiscal year-end preceding the CPE for each firm during the class period. All others including market-adjusted return calculated as past 6 month (t-7 to t-1) cumulated returns minus CRSP value-weighted index return, and analyst coverage are measured at the end of the quarter prior to the CPE. All the reported numbers are median numbers. The total assets of a median firm are worth about \$ 1.6 billion. The size of the firm is about \$ 1.66 billion. And around 12 analysts follow the sample firms.



Table 2.2 Descriptive Statistics for Sample Firms

Panel A. Summary of observations	
Number of unique firms in the sample	318
Total number of institutional holding changes	5,883
Average (median) number of days during the class period	500 (309)
Average (median) number of days between the class period end and the lawsuit filing date	133 (41)
Panel B. Financial characteristics and control variables for lawsuit firms	
Total assets (million)	1,616
Market value (million)	1,663
Book-to-market	0.32
Leverage	0.12
Market-adjusted return	0.01
Average number of analyst following	11.99

Notes: This table provides summary statistics for the firms with class-action lawsuits in our sample from 2005 to 2009. Panel A presents the summary of observations, including the number of unique firms, the total number of institutional holding changes, and average (median) number of days during the class period. Panel B reports financial characteristics and control variables for the sample firms. All the variables are reported as mean values and computed using the relevant Compustat and CRSP data items. Total assets and market value are reported in millions. Market value is calculated as the price multiplied by shares outstanding. Book-to-Market equals the book value, which is common equity, divided by market capitalization. Leverage is a ratio of long term debts to total assets. Market-adjusted return (past 6 month (t-7 to t-1) cumulated returns minus CRSP value-weighted index return), where t is the month of the class period ending, and the average number of analyst following on a sample firm are also reported.

## 2.4 Empirical Results

### 2.4.1 Univariate Analysis

Our primary interest is to examine the extent to which institutions with channels for private information trade before others trading clients. We start by providing how to measure the institutional trading. Three different measures of changes in institutional holdings are constructed as follows:

- (1) Raw holding change (RHC), measured simply by changes in stockholdings

(2) Percentage holding change (PHC), measured by changes in the proportion of institutional ownership

(3) Portfolio weight change (PWC), calculated as changes in each institution's portfolio weight, where the portfolio weight is shares held by an institution on a stock divided by shares held by the institution on all firms

Size of investment banks may have an impact on the degree of RHC and PHC because a bigger institution tends to have more assets under management. Haushalter and Lowry (2011) and recently Jordan, Liu, and Wu (2012) use PWC as institutional trading.

Table 3 reports univariate test results showing holding changes of financial institutions with business relationships. In Panel A, while underwriters show unchanged holding positions in all the different measures of trading, non-underwriters significantly reduce their portfolio weights of sued firms. Non-underwriters may possess private information and trade sued firms prior to the release of unpleasant news to public. It may indicate as well that underwriters support their clients even with negative news. However, changes in stockholdings are not different between those with underwriting relationships and without underwriting relationships. For lenders, they reduce their ownership in borrowing firms by -0.0272 %, which is statistically significant at the 5% level. The difference in holding changes between lenders and non-lenders is also significant. As for PWC, while non-lender significantly decrease the portfolio weights of sample firms, no significant difference in trading between the groups is found. Analysts also show similar results to lenders. They do not report significant difference between the groups.

Investment banks may pressure their sponsored funds to support underwriting relationships. Hao and Yan (2012) find evidence that investment bank-affiliated funds underperform unaffiliated funds because they disproportionately hold large amounts of stocks of underwritten firms.

Therefore, we examine whether affiliated funds buy or hold those underwritten, sued firms. Panel B reports holding changes of the in-house trading divisions and asset management divisions of underwriters. The in-house divisions of underwriters reduce their portfolio weights of underwritten firms significantly, while the asset management divisions seem to hold those firms, and there is statistically significant difference in holding changes between in-house trading division and affiliated asset management firms. This indicates that underwriters with private information tend to sell their clients before those firms' wrongdoings are uncovered. However, their funds may not be able to sell them as their banks do. This may create more serious problems because the banks benefit themselves from pre-release trading while funds' shareholders bear the costs, which supports the conflicts of interest hypothesis.

It is possible that underwriters and their affiliated asset management firms sell their client firms earlier than the quarter prior to the class period end because they have superior information regarding the firms' business condition. I, thus, perform a series of univariate tests with respect to different periods of institutional trading.

Table 4 presents univariate tests for portfolio weight changes in four different periods. The second column reports average portfolio weight changes during the period from a quarter prior to the class period start to a quarter prior to the class period end. The third column is from a quarter after the class period start to a quarter prior to the class period end. For the fourth and fifth columns, the event period starts from a quarter prior to and after the class period, respectively, and both end a quarter after the class period end.

Table 2.3 Holding Changes of Affiliated and Non-Affiliated Institutional Investors

	No. of holding changes	RHC	PHC	PWC
Panel A: All institutional investors				
Underwriter	274	266,830 (1.17)	-0.0180 (-0.45)	0.0010 (0.02)
Non-underwriter	5,609	-6,892 (-0.44)	-0.0032 (-0.48)	-0.0086*** (-2.85)
Difference		-273,722 (-1.20)	0.0147 (0.36)	-0.0096 (-0.25)
Lender	541	-69,381 (-0.92)	-0.0272** (-1.88)	-0.0115 (-1.22)
Non-lender	5,342	13,475 (0.73)	-0.0015 (-0.22)	-0.0078** (-2.19)
Difference		82,857 (1.07)	0.0256* (1.59)	0.0037 (0.37)
Analyst	2,197	-9,161 (-0.22)	-0.0186* (-1.37)	-0.0077 (-1.25)
Non-analyst	3,686	14,807 (0.92)	0.0048 (0.70)	-0.0083** (-2.17)
Difference		23,968 (0.55)	0.0234* (1.54)	-0.0006 (-0.08)
Panel B: In-house VS. Asset management of underwriters				
In-house	111	624,288 (1.41)	0.0263 (0.32)	-0.0521* (-1.59)
Asset management	163	157,546 (0.34)	-0.0776 (-1.09)	-0.0261 (-0.95)
Difference		-600,880 (-1.20)	-0.0745 (-0.82)	0.0894* (1.33)

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a one-tailed test.

Notes: This table reports the trading activities of institutional investors during the quarter prior to the class period ending date. The sample consists of the firms with class-action lawsuits from 2005 to 2009. Analyst institutions report recommendations on covered firms. The trading activities are measured with holding changes, which are calculated as follows; (1) *RHC*, raw changes in shares held by an institutional investor, (2) *PHC*, percentage changes in shares held, and (3) *PWC*, portfolio weight change. Panel A presents trading activities of each type of institutions for the sample firms. Analyst shows all the analyst affiliated institutions' trading, and non-analyst reports holding changes of institutional investors without analyst affiliation. Underwriter and lender present their changes in holdings of the sample firms. Test of differences for each type is compared to all institutions without such type of business relationships. Panel B present in-house vs. asset management trading activities where the institutions have an underwriting relationship with the firm. *T-statistics* are reported in parentheses.

In Panel A, underwriters tend to hold or even increase their positions in the clients until the quarter before the class period end, while investment banks without underwriting relationships reduce their stockholdings in the same firms significantly. This is consistent with the conflicts of interest hypothesis that underwriters try to support their clients. However once the firms' misbehavior is recognized publicly, underwriters are more likely to sell the clients. In the last two columns of Panel A, both investment banks with and without underwriting relationships decrease the portfolio weights of the firms.

Trading of in-house and asset management is separately analyzed in Panel B. The average of portfolio weight changes for in-house trading is -0.0872 %, negative and statistically significant at the 10% level, for the period starting from a quarter prior to the class period start to a quarter prior to the class period end, indicating investment banks' selling. They tend to not trade after the class period start until a quarter prior to the class period end, while asset management firms of underwriters increase their portfolio weights during the same period. This supports the conflicts of interest hypothesis that investment banks use their affiliated funds for their underwriting business. The changes in their positions are negative and significant at 1% level when the event period is extended to the quarter after the class period end.

#### 2.4.2 Multivariate Regression Analysis

This section presents the empirical results of the multivariate regression analysis. We investigate whether business relationships, in particular, the underwriting relationship affect institutional investors' trading behavior. Table 5 presents regression results of institutional trading on different types of business relationships and various control variables. The results are reported with a year-fixed effect as well as a bank-fixed effect.

Table 2.4 Institutional Trading during Different Event Periods

		(1)	(2)	(3)	(4)
	No. of holding changes	From a quarter prior to class period start to a quarter prior to class period end	From a quarter after class period start to a quarter prior to class period end	From a quarter prior to class period start to a quarter after class period end	From a quarter after class period start to a quarter after class period end
Panel A: All institutional investors					
Underwriter	202	0.0134 (0.29)	0.0967* (1.46)	-0.2125*** (-2.17)	-0.1293** (-1.83)
Non-Underwriter	3,896	-0.0160*** (-3.28)	-0.0145*** (-2.89)	-0.0509*** (-9.87)	-0.0494*** (-8.65)
Difference	4,098	-0.0294 (-0.64)	-0.1112** (-1.68)	0.1616* (1.64)	0.0798 (1.12)
Panel B: In-house division and Asset management of underwriters					
In-house	80	-0.0872* (-1.48)	0.0323 (0.70)	-0.2501*** (-3.77)	-0.1305*** (-2.67)
Asset management	60	0.0108 (0.30)	0.0727** (2.03)	-0.1240*** (-3.40)	-0.0622** (-2.01)
Difference	140	0.0981* (1.43)	0.0404 (0.69)	0.1260** (1.66)	0.0683 (1.18)

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a one-tailed test.

Notes: This table reports the trading activities of investment banks for different event periods. The sample consists of firms with class-action lawsuits from 2005 to 2009. The trading activities are measured with portfolio weight change. Panel A presents trading activities of underwriters and non-underwriters for the sample firms. Panel B present in-house vs. asset management trading activities where the institutions have an underwriting relationship with the firm. *T-statistics* are reported in parentheses.

For the first two columns, we use percentage holding change as a dependent variable. Neither lending nor underwriting relationships reports a significant difference. Analyst affiliation is also not distinguished from zero. Initial portfolio weight is the portfolio weight of an institution at the beginning of the quarter prior to the quarter of the class period ending date, indicating that the higher initial portfolio weight, the greater the decrease in percentage holding change. The size of firms is negatively related to changes in ownership, reporting negatively significant coefficients at the 1% level.

The third and fourth columns provide empirical results with the portfolio weight changes as a dependent variable. Among others, initial portfolio weight has a negative and significant coefficient, -0.0150, at the 1% level. The results indicate that underwriters as well as lenders tend to hold or not sell their underwritten firms or borrowers at the aggregate institutional level. However, we do not conclude yet that underwriters and their asset management divisions trade in the same manner. It is possible that banks and their funds trade in the opposite direction, making the coefficient for each business type insignificant and irrelevant. In order to see whether banks and their affiliated asset management divisions trade differently, we separate their holdings from each other and have more precise regression analyses.

Table 6 presents the regression results for portfolio weight changes on in-house and asset management holdings. We control for investment bank and year fixed effects. The first column shows the results with only underwriters. The result in the second column controls for lending and analyst holdings. Looking at the coefficients on in-house underwriter holding in both columns, they are -0.0515 and -0.0527 and highly significant. After controlling for other factors, on average, investment banks with underwriting relationships with the sued firms decrease their portfolio

Table 2.5 Determinants of Change in Institutional Holdings prior to the Class Period Ending

Variables	PHC		PWC	
Analyst affiliation	0.0181 (1.52)	-0.0028 (-0.18)	0.0071 (0.82)	0.0018 (0.23)
Underwriting relationship	0.0153 (0.52)	0.0035 (0.12)	0.0147 (0.41)	0.0090 (0.26)
Lending relationship	-0.0006 (-0.03)	0.0018 (0.08)	-0.0041 (-0.23)	-0.0077 (-0.47)
Initial portfolio weight	-0.2620*** (-2.97)	-0.2698*** (-3.00)	-0.0150*** (-3.37)	-0.0168*** (-3.27)
Total institutional ownership	0.0000 (0.07)	0.0000 (0.12)	-0.0001 (-0.99)	-0.0001 (-1.33)
Analyst consensus	-0.0092 (-0.69)	-0.0088 (-0.65)	0.0044 (0.64)	0.0048 (0.70)
Analyst coverage	-0.0004 (-0.48)	0.0000 (0.01)	-0.0006 (-0.71)	-0.0007 (-0.82)
Size	-0.0178*** (-3.78)	-0.0153*** (-3.26)	-0.0024 (-0.34)	0.0000 (0.00)
Book-to-market	-0.0347* (-1.86)	-0.0281 (-1.48)	-0.0303* (-1.72)	-0.0201 (-1.24)
Market-adj return	0.0195 (0.94)	0.0217 (0.96)	-0.0027 (-0.29)	-0.0021 (-0.23)
Intercept	0.5217*** (4.00)	0.4763*** (3.93)	0.0670 (0.45)	0.0437 (0.28)
Fixed effect	No	Yes	No	Yes
Number of obs.	5,883	5,883	5,883	5,883
R-squared	0.17	0.18	0.00	0.01

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports regression results of percentage holding change (*PHC*) and portfolio weight change (*PWC*) for the class period ending. *PHC* and *PWC* are the dependent variables. *PHC* is a percentage change in shares held by institutions from quarter t-2 to quarter t-1, where quarter t is the quarter of the class period ending, and *PWC* is calculated as the change in portfolio weight of a stock in an institutional investor's portfolio from quarter t-2 to quarter t-1. Independent variables include dummy variables that represent whether a recommendation is issued by an analyst affiliated with a financial institution holding the covered firm (*Analyst affiliation*), underwriting relationship, and lending relationship. The other independent variables are portfolio weight at the beginning of the quarter (*Initial portfolio weight*), total institutional ownership, median level of recommendation consensus (*Analyst consensus*), analyst coverage, market capitalization (*SIZE*), book-to-market ratio, market adjusted past 6-month returns (*Market-adj return*) calculated as past 6 month (t-7 to t-1) cumulated returns minus market return (CRSP value-weighted index return). *T-statistics* are reported in parentheses.



weight 0.0515 and 0.0527 % more than investment banks without underwriting relationships. Asset management firms of the underwriters, however, seem not to sell or hold their positions in the underwritten firms. This indicates that underwriters may pressure their funds to support underwriting relationships or did not share negative information with them.

For other variables, lending and analyst relationships do not show any differences from institutional investors without those relationships. The initial portfolio weight is negative and highly significant, indicating more selling for larger initial positions. The other variables, including analyst consensus, coverage, size, book-to-market, and market adjusted returns, are insignificant. So far we have looked at institutional trading of the quarter prior to the class period ending dates. It is the period that banks have collected private information and also have an incentive to exploit it because the general public does not recognize the firms' market manipulation. Then it is natural to think what happened to the quarter of the public announcements of the wrongdoings.

Table 7 provides regression results for portfolio weight changes in the quarter of CPE. In-house divisions of underwriters tend to decrease their portfolio weights further. The coefficients on in-house underwriter holding are negative and significant at the 5 % level. Interestingly, asset management firms of the underwriters also tend to decrease portfolio weights in those firms. The coefficients indicate that on average, asset management firms of underwriters decrease their portfolio weight of 0.0346 (0.0410) more than the other institutional investors. Initial portfolio weight and size are the variables significantly different from zero. Both variables have a negative and significant coefficient at the 5% level, indicating that more selling for larger initial positions and less selling for smaller firms.

Table 2.6 Determinants of Change in In-House and Asset Management Holdings prior to the Class Period Ending

Variables	PWC	
In-house holding	-0.0025 (-0.21)	-0.0041 (-0.33)
In-house underwriter holding	-0.0515** (-2.03)	-0.0527** (-2.00)
Asset management holding	-0.0027 (-0.24)	-0.0017 (-0.17)
Asset management underwriter holding	-0.0145 (-0.85)	-0.0136 (-0.83)
In-house analyst holding		0.0042 (0.42)
Asset management analyst holding		-0.0019 (-0.30)
In-house lender holding		0.0013 (0.18)
Asset management lender holding		-0.0019 (-0.15)
Initial portfolio weight	-0.0165*** (-3.18)	-0.0165*** (-3.15)
Total institutional ownership	-0.0001 (-1.32)	-0.0001 (-1.38)
Analyst consensus	0.0048 (0.70)	0.0049 (0.71)
Analyst coverage	-0.0007 (-0.81)	-0.0008 (-0.87)
Size	0.0004 (0.06)	0.0003 (0.04)
Book-to-Market	-0.0187 (-1.09)	-0.0186 (-1.10)
Market-adj return	-0.0011 (-0.11)	-0.0010 (-0.10)
Intercept	0.0367 (0.23)	0.0386 (0.24)
Fixed effect	Yes	Yes
Number of obs.	5,883	5,883
R-squared	0.01	0.01

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports regression results of portfolio weight change (*PWC*) for the class period ending. *PWC* is calculated as the change in portfolio weight of a stock in an institutional investor's portfolio from quarter t-2 to quarter t-1. Independent variables include dummy variables that represent analyst affiliation, underwriting relationship, and lending relationship for each in-house holding and asset management holding. The other independent variables are portfolio weight at the beginning of the quarter (*Initial portfolio weight*), total institutional ownership, median level of recommendation consensus (*Analyst consensus*), analyst coverage, market capitalization (*SIZE*), book-to-market ratio, market adjusted past 6-month returns (*Market-adj return*) calculated as past 6 month (t-7 to t-1) cumulated returns minus market return (CRSP value-weighted index return). *T-statistics* are reported in parentheses.

Table 8 presents regression results for different event periods. The first two columns only include up until a quarter before the class period end. Only asset management underwriting holding shows statistical significance at 10% among primary interest variables, supporting their underwriting clients of investment banks by increasing their portfolio weights. As with the univariate results, the coefficient on in-house underwriting holding is negative and significant at the 1% level in column 3. Overall, investment banks tend to hold their clients until firms' wrongdoing is uncovered.

#### 2.4.3 Client Holdings and Non-Client Holdings of Underwriters and Asset Management Firms

To provide more evidence on the conflicts of interest hypothesis, we compare the proportion of investment banks' positions on their clients and non-clients. Investment banks have an incentive to hold their clients' stocks to win future underwriting deals. Underwriters thus may pressure their funds to hold disproportionately large amounts of client firms even though those firms are anticipated to perform poorly. Hao and Yan (2012) find that affiliated mutual funds hold a disproportionately large amount of their investment banking clients' shares.

Table 9 presents holdings of investment banks and their funds with underwriting relationships. Column 1 and Column 2 report portfolio weights of the institutions on clients and non-clients,

Table 2.7 Determinants of Change in In-House and Asset Management Holdings during the Quarter of the Class Period Ending Date

Variables	PWC	
In-house holding	0.0120 (1.02)	0.0060 (0.54)
In-house underwriter holding	-0.0814** (-2.19)	-0.0821** (2.09)
Asset management holding	0.0248 (1.48)	0.0141 (1.06)
Asset management underwriter holding	-0.0346* (-1.72)	-0.0410** (-2.02)
In-house analyst holding		0.0198 (1.16)
Asset management analyst holding		0.0209** (2.12)
In-house lender holding		-0.0208 (-0.08)
Asset management lender holding		0.0220* (1.84)
Initial portfolio weight	-0.0377** (-2.26)	-0.0382** (-2.29)
Total institutional ownership	0.0001 (0.56)	0.0000 (0.47)
Analyst consensus	0.0100 (0.77)	0.0103 (0.81)
Analyst coverage	0.0028 (1.26)	0.0026 (1.22)
Size	-0.0320** (-2.20)	-0.0325** (-2.21)
Book-to-Market	0.0033 (0.11)	0.0033 (0.11)
Market-adj return	-0.0029 (-0.25)	-0.0015 (-0.13)
Intercept	0.5946** (2.00)	0.6082** (2.01)
Fixed effect	Yes	Yes
Number of obs.	5,883	5,883
R-squared	0.02	0.03

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports regression results of portfolio weight change (*PWC*) for the class period ending. *PWC* is calculated as the change in portfolio weight of a stock in an institutional investor's portfolio from quarter t-2 to

quarter t-1. Independent variables include dummy variables that represent analyst affiliation, underwriting relationship, and lending relationship for each in-house holding and asset management holding. The other independent variables are portfolio weight at the beginning of the quarter (*Initial portfolio weight*), total institutional ownership, median level of recommendation consensus (*Analyst consensus*), analyst coverage, market capitalization (*SIZE*), book-to-market ratio, market adjusted past 6-month returns (*Market-adj return*) calculated as past 6 month (t-7 to t-1) cumulated returns minus market return (CRSP value-weighted index return). *T-statistics* are reported in parentheses.

respectively. Underwriters and affiliated asset management firms hold significantly larger amount of stocks of client firms than non-client firms among sued firms. Investment banks hold a portfolio weight of 0.0058% in the underwritten, sued firms, relative to a portfolio weight of 0.0003% in the non-underwritten, sued firms. Similar to the aggregate positions, in-house and asset management holdings on clients are significantly larger than their positions on non-client holdings.

#### 2.4.4 Stock Performance

In this section, we explore stock price performance around the public announcement of the firms' wrongdoings. We evaluate stock price performance using a four-factor model (Carhart, 1997).

$$R_t = \alpha + \beta_1 \times RMRF_t + \beta_2 \times SMB_t + \beta_3 \times HML_t + \beta_4 \times MOM_t + e_t,$$

where  $R_t$  is the excess return in month t on a firm,  $RMRF_t$  is the CRSP value-weighted market return minus the risk-free rate in month t, and  $SMB_t$ ,  $HML_t$ , and  $MOM_t$  are month t return of portfolios based on size, book-to-market, and momentum effects. The abnormal return is the difference between realized return and expected return based on the model. The class period ending date when general public realize firms' manipulation is the event date.

Table 10 present cumulative abnormal returns of sample firms around the class ending dates. In Panel A, all firms and underwritten firms have negative and significant cumulative abnormal returns over the past 6 months. They have larger negative abnormal returns around the event month.

Table 2.8 Multivariate Regression Results for Portfolio Weight Change during Different Event Periods

Variables	(1)	(2)	(3)	(4)
	From a quarter prior to class period start to a quarter prior to class period end	From a quarter after class period start to a quarter prior to class period end	From a quarter prior to class period start to a quarter after class period end	From a quarter after class period start to a quarter after class period end
In-house holding	-0.0007 (-0.06)	-0.0150 (-0.78)	0.0224 (1.48)	0.0075 (0.38)
In-house underwriter holding	-0.0832 (-1.52)	0.0293 (0.60)	-0.1623*** (-2.71)	-0.0523 (-1.23)
Asset management holding	-0.0049 (-0.34)	-0.0079 (-0.52)	0.0389* (1.85)	0.0297 (1.43)
Asset management underwriter holding	0.0326 (0.71)	0.0693* (1.87)	-0.0081 (-0.24)	0.0310 (1.13)
Initial portfolio weight	-0.0462*** (-3.23)	-0.0475*** (-3.21)	-0.0869*** (-3.03)	-0.0736*** (-3.66)
Total institutional ownership	-0.0007** (-2.03)	-0.0003* (-1.90)	-0.0004 (-1.10)	-0.0001 (-0.43)
Analyst consensus	0.0274* (1.91)	0.0030 (0.24)	0.0290* (1.96)	0.0037 (0.21)
Analyst coverage	-0.0003 (-0.18)	-0.0007 (-0.40)	0.0044** (2.11)	0.0042** (2.41)
Size	-0.0026 (-0.20)	0.0029 (0.27)	-0.0499*** (-3.71)	-0.0441*** (-3.43)
Book-to-market	-0.0498 (-1.41)	-0.0740** (-2.48)	-0.0731 (-1.49)	-0.0964*** (-2.77)
Market-adj return	0.0333 (1.34)	0.0278 (1.17)	0.0189 (0.63)	0.0142 (0.62)

(Table 2.8 continued)

Fixed effect	Yes	Yes	Yes	Yes
Number of obs.	4,098	4,098	4,098	4,098
R-squared	0.03	0.02	0.06	0.04

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports regression results of portfolio weight change (*PWC*) for the class period ending. *PWC* is calculated as the change in portfolio weight of a stock in an institutional investor's portfolio from quarter t-2 to quarter t-1. Independent variables include dummy variables that represent underwriting relationship for each in-house holding and asset management holding. The other independent variables are portfolio weight at the beginning of the quarter (*Initial portfolio weight*), total institutional ownership, median level of recommendation consensus (*Analyst consensus*), analyst coverage, market capitalization (*SIZE*), book-to-market ratio, market adjusted past 6-month returns (*Market-adj return*) calculated as past 6 month (t-7 to t-1) cumulated returns minus market return (CRSP value-weighted index return). *T-statistics* are reported in parentheses.

Table 2.9 Comparison of Client Holdings and Non-Client Holdings

	Client holding	Non-client holding	Difference
	(1)	(2)	(1) - (2)
Aggregate holding	0.0058	0.0003	0.0054*** (7.01)
In-house holding	0.0066	0.0003	0.0063*** (5.07)
Asset management holding	0.0047	0.0004	0.0042*** (6.30)

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports holdings of investment banks and their firms with underwriting relationships. Holdings are measured as the total number of shares held by each institution on a firm during a quarter prior to the quarter of the class period ending date divided by the total number of shares held by the institution on all firms during the same quarter. *T-statistics* are reported in parentheses.

It seems that sued firms perform poorly before their wrongdoings are uncovered, which may lead institutional investors to sell those firms. Interestingly, while overall sample firms continue to perform poorly after the class period ending date, the underwritten firms perform well. Their cumulative abnormal return is 0.0710 or 7.10%, which is significant at the 10% level. It is possible that underwriters support their clients by purchasing stocks. As a recent case of an IPO, Facebook, on May 18, 2012, went public at its debut price of \$38 per share, which fell to \$27.72 on June 1. As the price fell, the lead underwriter of Facebook, Morgan Stanley, reportedly stepped in to keep the stock from breaking through its offer price. Schultz and Zaman (1994) and Aggarwal (2000) document that underwriters repurchase large quantities of stock in the aftermarket.

Table 2.10 Stock Performance around the Class Period Ending Date

Panel A: Cumulative abnormal returns of sample firms around the class ending dates				
Sample firms	N	(-6, -2)	(-1, +1)	(+1, +6)
All firms	318	-0.1296*** (-8.34)	-0.3514*** (-29.21)	-0.0916*** (-5.38)
Underwritten firms	55	-0.1405*** (-4.05)	-0.3026*** (-11.27)	0.0710* (1.87)

Panel B: Cumulative abnormal returns of underwritten firms around the class ending dates				
Positions on underwritten firms	N	(-6, -2)	(-1, +1)	(+1, +6)
Increase	28	-0.0477 (-1.07)	-0.2259*** (-6.58)	0.1432*** (2.95)
Decrease	27	-0.1960*** (-4.08)	-0.2770*** (-7.46)	0.0069 (0.13)

\*, \*\*, \*\*\* indicate significance at the 10%, 5% or 1% level, respectively, for a two-tailed test.

Notes: This table reports abnormal returns around the class period ending dates. Abnormal returns are calculated using the four-factor model (Carhart, 1997). Panel A presents cumulative abnormal returns on various event windows for all sample firms and underwritten firms. The number of firms in each category (N) is also reported. The event date is the class period ending date when general public realize firms' wrongdoings. Panel B presents cumulative abnormal returns of underwritten firms that underwriters and affiliated asset management firms increase or decrease their portfolio weights of the firms during a quarter prior to the quarter of the class period ending dates. *T-statistics* are reported in parentheses.



Panel B shows whether the positive abnormal returns come from the support of underwriters. Among the underwritten firms, we separate the firms in which underwriters and their affiliated asset management firms increase their positions from the firms without such an increase in positions. We find that firms with support from underwriters have positive and significant abnormal returns, 0.1432 or 14.32%, after the class period ending date, which is statistically significant at the 1% level. Firms without support have insignificant positive abnormal returns.

## **2.5 Conclusion**

This paper investigates whether the pressure of conflicts of interest plays role in institutional trading behavior. Investment banks may use their affiliated funds to support clients of the underwriting business, which creates costs borne by the funds' shareholders. Empirical evidence does support the conflict of interest hypothesis, showing that affiliated asset management firms do not decrease or even increase their stockholdings of the underwritten, sued firms significantly in the class period. Both in-house investment banks and their affiliated asset management firms hold disproportionately large amounts of stocks of their underwritten clients, which generates negative abnormal returns. Overall underwriters' support for the clients comes at the fund shareholders' expense.

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## APPENDIX A

Dependent variables	
RHC	The changes in the number of shares held by institutions from quarter t-2 to quarter t-1, where quarter t is the quarter of analysts issuing the first downgrade (upgrade)
PHC	The percentage change in shares held by institutions from quarter t-2 to quarter t-1, where quarter t is the quarter of analysts issuing the first downgrade (upgrade)
PWC	The portfolio weight change for a stock held by institutions from quarter t-2 to quarter t-1, where quarter t is the quarter of analysts issuing the first downgrade (upgrade)
APWC	The portfolio weight change (PWC) less the change in the weight of the stock in the overall 13f institutional investors
Independent variables	
Analyst holding (AH)	Dummy variable, equal to 1 if a recommendation is issued by an analyst affiliated with a financial institution holding the covered firm; 0 otherwise
Underwriter AH	Dummy variable, equal to 1 if an analyst is employed by an investment bank underwriting a firm in the past 3 years; 0 otherwise
Lender AH	Dummy variable, equal to 1 if an analyst issuing a recommendation on a firm is employed by a bank lending the firm in the past 2 years; 0 otherwise
Independent IB AH	Dummy variable, equal to 1 if an analyst with investment banking issuing a recommendation on a firm is independent of the firm; 0 otherwise
Independent non-IB AH	Dummy variable, equal to 1 if an analyst without investment banking issuing a recommendation on a firm is independent of the firm; 0 otherwise
Reputation	Investment bank's reputation based on the bank's market share in equity (debt) underwriting (%), calculated as a bank's aggregated total dollar amount in lead underwriting divided by all deal amount in equity (bond) markets in a given year
First revision issuer (FRI)	Dummy variable, equal to 1 if an analyst issues the first downgrade (upgrade); 0 otherwise
Allstar analyst	Dummy variable, equal to 1 if a recommendation is issued by an <i>Institutional Investor</i> "All-American" analyst; 0 otherwise
Initial portfolio weight	Portfolio weight of a bank for a stock at the beginning of a quarter
Total institutional ownership	Total percentage of institutional ownership of a firm at the beginning of a quarter
SIZE	Market capitalization at the beginning of a quarter
Book-to-market	Book-to-market ratio of a stock at the end of a quarter
Market adj. return	past 6 month ( $t-7$ to $t-1$ ) cumulated returns minus CRSP value-weighted index return
Analyst coverage	Analyst coverage (number of analyst following a stock)
Analyst consensus	The median level of consensus: 1 (Sell), 2 (Underperform), 3 (Hold), 4 (Buy), and 5 (Strong Buy)
Post-Rec	Dummy variable, equal to 1 if institutional trading take place during the post-recommendation period

## APPENDIX B

Dependent variables	
RHC	The changes in the number of shares held by institutions from quarter t-2 to quarter t-1, where quarter t is the quarter of analysts issuing the first downgrade (upgrade)
PHC	The percentage change in shares held by institutions from quarter t-2 to quarter t-1, where quarter t is the quarter of analysts issuing the first downgrade (upgrade)
PWC	The portfolio weight change for a stock held by institutions from quarter t-2 to quarter t-1, where quarter t is the quarter of analysts issuing the first downgrade (upgrade)
Independent variables	
Analyst	Dummy variable, equal to 1 if a recommendation is issued by an analyst affiliated with a financial institution holding the covered firm; 0 otherwise
Underwriter	Dummy variable, equal to 1 if an analyst is employed by an investment bank underwriting a firm in the past 3 years; 0 otherwise
Lender	Dummy variable, equal to 1 if an analyst issuing a recommendation on a firm is employed by a bank lending the firm in the past 2 years; 0 otherwise
In-house	Dummy variable, equal to 1 if investment banks hold a stock; 0 otherwise
Asset management	Dummy variable, equal to 1 if asset management firms hold a stock; 0 otherwise
Initial portfolio weight	Portfolio weight of a bank for a stock at the beginning of a quarter
Total institutional ownership	Total percentage of institutional ownership of a firm at the beginning of a quarter
SIZE	Market capitalization at the beginning of a quarter
Book-to-market	Book-to-market ratio of a stock at the end of a quarter
Market adj. return	past 6 month ( $t-7$ to $t-1$ ) cumulated returns minus CRSP value-weighted index return
Analyst coverage	Analyst coverage (number of analyst following a stock)
Analyst consensus	The median level of consensus: 1 (Sell), 2 (Underperform), 3 (Hold), 4 (Buy), and 5 (Strong Buy)

## **VITA**

Hyoseok Hwang was born in Korea. He obtained his Bachelor of Science in Economics in 2006 from the University of Seoul. He served in the Republic of Korea Army before graduating. After graduating from college, he came to the United States and earned his Master of Science in 2008 from the University of Nebraska at Omaha. He continued his academic pursuits and started the doctoral program in finance at Louisiana State University in August 2008, and expects to obtain his Doctor of Philosophy degree in August 2013.