WHO LISTENS TO ANALYSTS: TWO ESSAYS ON ANALYST RECOMMENDATIONS

by

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(Under the Direction of Marc L. Lipson)

ABSTRACT

This dissertation is comprised of two essays on analyst recommendations and investor trading behavior. The first essay investigates the trading behavior of institutional investors immediately prior to the release of analysts' initial buy and strong buy recommendations. Using a proprietary database of institutional orders from the Plexus Group, we document abnormally high trading volume and abnormally large buying imbalances beginning five days before initial recommendations are publicly released. We confirm that buying prior to the recommendation release generates positive abnormal trading profits. Furthermore, the magnitude of the trading imbalances are related to variables that are typically associated with positive price responses to initiations, including strong buy recommendations, the analyst being an all-star analyst, and lower prior dispersion in analysts forecasts. Taken together, our results suggest that some institutional traders receive tips regarding the contents of the soon to be released analysts' report. To the extent that brokerage firm clients who benefit from these tips are more likely to direct business to the initiating brokerage firm, tipping provides economic profits to the brokerage that can help defray the cost of analyst information gathering. Thus, while tipping benefits some traders at the expense of others, the welfare

consequences of tipping are unclear. The second essay investigates lead-underwriter (affiliated) analyst optimism immediately following IPOs with regard to buy/sell recommendations and long-term growth estimates. Consistent with previous studies we find systematic evidence of affiliated analyst optimism with respect to long-term growth estimates. However, we find no evidence of optimism in regards to recommendations. Furthermore, event study findings suggest that market participants respond similarly to affiliated and unaffiliated analysts buy and strong buy recommendations. In contrast to buy recommendations, we document significantly more negative abnormal returns around affiliated analysts hold/sell recommendations. In general, our results suggest that affiliated analysts provide recommendations that are unbiased compared to unaffiliated analysts, and, in fact, may be more informative in the case of hold/sell recommendations.

INDEX WORDS: Analysts, Institutions, Institutional trading, Brokerage research, Underwriting, Stock recommendations, Conflicts of interest

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DEDICATION

To my wife Meagan: without your love and support, none of this would be possible.

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CHAPTER 1

INTRODUCTION

This dissertation is comprised of two essays concerning analyst recommendations and investor trading behavior. The first essay examines the trading behavior of institutional investors prior to the public release of analysts' buy and strong buy initial recommendations. Analysts face strong economic incentives to disseminate market-sensitive recommendations to preferred institutional clients before those recommendations are publicly released. Using a proprietary database of institutional orders from the Plexus Group, we investigate institutional trading prior to the public release of analysts' initiations. We find statistically significant increases in the levels of institutional trading and net buying in the period beginning about five days prior to the public release. We note that the five days prior to the public release of the initiation is when the analysts' report is substantially complete and undergoing the internal legal review process. We conclude that some analysts (or someone in their firms) are revealing the contents of the upcoming reports (tipping) to preferred clients prior to the public release of the report. We also verify that these tips can provide profitable trading opportunities for the institutions that receive them.

We do not take a normative position on tipping. The purpose of this essay is simply to draw attention to this activity and provide some evidence as to its existence. Our results suggest that tipping occurs and, as a result, those investors who trade on the public release of analysts' reports do not receive the same benefits as those that obtain the reports before their release. However, the trading profits that tipping provides to large institutions are likely to be one of the

services large institutions expect from analysts' firms. If tipping were precluded, institutions would be less willing to pay for sell-side research and, consequently, the amount of price-relevant sell-side research would be reduced. For this reason, the social welfare implications of tipping are not clear. In general, our results raise an important question – how should sell side research be rewarded and how much control should analyst firms have over the release of that information.

In my second study we investigate underwriter (affiliated) analyst optimism following Initial Public Offerings (IPOs) from 1993 to 2000. Specifically, we investigate analyst optimism in relation to recommendations, long-term growth estimates, and for NYSE and Nasdaq listed IPOs. Previous literature suggests two competing theories for why affiliated analysts' reports may differ from the reports of other analysts. The conflict of interest hypothesis states that affiliated analysts issue positively biased reports in order to help procure fees for the analyst's firm. In contrast, the superior information hypothesis suggests that affiliated analysts' recommendations and estimates will be both unbiased and more accurate than other analysts since affiliated analysts have enhanced access to information during the due-diligence process. Our study tests these competing theories.

Our analysis makes a number of improvements over prior work. First, our sample covers a larger time period (1993-2000) and avoids selection bias related to analysts' selection.[1] Second, Ellis, Michaely, and O'Hara (2000) and Goldstein, Irvine, Kandel, and Wiener (2004) suggest that the magnitude of potential revenues for affiliated analyst firms is very different between Nasdaq and NYSE listed IPOs. We differentiate between these differing market

[1] Previous studies addressing lead analyst optimism for the most part use either the Dow Jones Newswire or Firstcall data to investigate the bias. Dow Jones Newswire self-censors their data by reporting recommendations from only the largest brokers. A preliminary analysis of Firstcall recommendations data during the period from 1994 to 1995 reveals that Firstcall contains only 52% of the analyst recommendations listed in I/B/E/S. This discrepancy diminishes significantly in 1996.

structures. Third, we investigate the market impact of analysts' hold and sell recommendations. Finally, we are the first to investigate the determinants of analysts' recommendations in a multivariate setting.

Consistent with previous studies we find systematic evidence of affiliated analyst optimism with respect to long-term growth estimates. However, we find no evidence of optimism in regards buy/sell recommendations. We find that three-day size-adjusted abnormal returns do not differ between affiliated and unaffiliated analysts around strong buy and buy recommendations. When separating the sample by recommendation year, we find that abnormal returns around unaffiliated analysts strong buy recommendations are twice as great as those around affiliated analysts' recommendations during the year 1994. Results support Michaely and Womack (1999) and suggest that analyst behavior has changed over time.

Extending the breadth of previous research, we investigate abnormal returns around analysts' hold and sell recommendations. Market reactions are approximately twice as large for affiliated analysts compared to unaffiliated analysts (-11.90% versus –6.90%). These results support the superior information hypothesis, and suggest that affiliated analysts have superior information about the firm when that information is negative.

CHAPTER 2

LITERATURE REVIEW

Sell-side analysts generally issue the following three reports: 1) buy/sell recommendations, 2) quarterly and annual earnings forecasts, and 3) long-term earnings growth forecasts (Dechow, Hutton, and Sloan, 1999). Each reflects future fundamentals, and future fundamentals determine a stock's value. Empirical literature consistently finds significant abnormal returns around the announcement of analyst initiations and changes to recommendations (Chung and Jo, 1996; Womack, 1996; Kim, Lin, and Slovin, 1997; Branson, Guffey, and Pagach, 1998; Michaely and Womack, 1999; Li, 2002; Bradley, Jordan, and Ritter, 2003). In particular, studies by Kim, Lin, and Slovin (1997), Branson, Guffey, and Pagach (1998), Michaely and Womack (1999), Irvine (2003) and Bradley, Jordan and Ritter (2003) confirm that stocks receiving analysts' initiations that contain buy or strong buy recommendations experience abnormal market returns as high as three to four percent.

Studies of changes in analysts' recommendations have lately been criticized because of the likelihood that confounding corporate events surrounding analysts' reports may lead to erroneous conclusions (Juergens, 2000). Stickel (1989) finds that analysts often change their current rating on a stock after material public information is released. For this reason, many researchers have chosen to study analysts' initiations to infer the impact that analysts' opinions on firm value. Findings by Boni and Womack (2002) suggest that a firm's internal legal department and research oversight committee scrutinize new recommendations before public release. It takes time to complete this internal review, which suggests that the contents of the

report are determined and known internally several days before public release. Cheng (2000) is more specific and concludes the internal review process normally takes four days.

Research examining trading strategies on the day of the public release of analysts' initiations or changes in recommendations (Kim, Lin and Slovin, 1997, Green, 2003; Goldstein, Irvine, Kandel, and Wiener, 2004) finds that prices respond extremely quickly.[2] Dimson and Marsh (1984) note that share purchases prior to the public release are profitable, but purchases made a day or a week after the recommendation are not. Hence, knowledge of the recommendation prior to their public release is valuable and the ability to trade prior to the day of public release presents investors with profitable trading opportunities.

Chapter 3 of this dissertation investigates the trading behavior of institutional investors prior to the public release of analysts' buy and strong buy initial recommendations. If preferred institutional clients receive analysts' initiations early, then our research design is an effective framework for testing the predictions of Hirshleifer, Subrahmanyam and Titman (1994). In their model, informed investors who discover information early will trade before the information is publicly released in order capture the value of their private information. When the information is publicly revealed, these early-informed investors will partially reverse their trading in order to secure some trading profits and reduce the overall risk of their positions. The differential timing in the receipt of information stimulates volume during the public release, by causing different groups to take both the buy and sell side of the market, even though they observe a common information signal.

A related body of analyst literature investigates biases that may arise among different groups of analysts. The majority of this literature concentrates on the group of analysts whose

[2] The intraday trading data of Kim, Lin and Slovin (1997) and Green (2003) suggests that profitable trading opportunities dissipate in minutes or hours. Goldstein et al. (2004) examine profits relative to the close.

firm also provides investment banking services (affiliated analysts). Michaely and Womack (1999) document that these affiliated analysts issue 50% more buy recommendations in the 60 days following an IPO during the period from 1990 to 1991. They also find that three-day size-adjusted returns centered around the announcement of analysts' buy and strong buy recommendations are significantly more positive for unaffiliated versus affiliated analysts (4.4% vs. 2.7%). This result is consistent with investors discounting the optimism of affiliated analysts. Lin and McNichols (1998A, 1998B) use an alternative approach when measuring lead optimism. By pairing lead analyst recommendations with the closest non-lead recommendations, they find that lead analysts are significantly more optimistic than non-lead analysts after both IPOs and SEOs. Similar results are found in research looking at long-term growth estimates. Dechow, Hutton, and Sloan (1999) and Lin and McNichols (1998B) find affiliated analysts are more optimistic with respect to long-term growth estimates than other analysts. These studies suggest that affiliated analyst optimism is likely the result of a conflict of interest.

Studies examining quarterly and annual earnings estimates of affiliated versus unaffiliated analysts do not, in general, find any difference between the two groups (Lin and McNichols, 1998A, 1998B).[3] The most probable explanation for these results is that short-term forecasts are the easiest way to measure an analysts' forecast accuracy, and as such, the accuracy of these short-term estimates is often a prominent factor in an analyst's election to the *Institutional Investor* All-American Research Team (Stickel, 1992; Hansen and Sarin, 1998; Lin and McNichols, 1998B). Thus, reputation forces are strongest in relation to short-term estimates. The accuracy of analysts' buy and sell recommendations and long-term growth

[3] Conflicting results by Dugar and Nathan (1995) find that affiliated analysts' annual earnings forecasts are, on average, 5.5% higher than those of unaffiliated analysts when a non-underwriting business relationship exists between a stock and the analysts' firm. Also, Irvine, Nathan and Simko (1998) find that analysts tend to be more optimistic in their two-year earnings estimates for firms that were recently added to the affiliated mutual fund family.

estimates are much harder to measure and less likely to affect reputation. Thus, these are the reports that are more likely to be biased since reputation provides less of a countervailing pressure.

In contrast to conflicts of interest, Allen and Faulhaber (1989) suggest that affiliated analysts will be both unbiased and more accurate than other analysts because of the informational advantage they possess. This informational advantage arises during the due diligence process of the underwriter, during which affiliated analysts are privy to information that is not disseminated to the entire market. Information asymmetry is highest in the period immediately following the offering date of the IPO. If this "superior information effect" exists, then one should observe a larger price response to the recommendations of affiliated analysts versus those of unaffiliated analysts. We are not aware of any empirical studies that document such an effect.

Recent work by Bradley, Jordan, and Ritter (2003) provides a different explanation for the cross-sectional variation of abnormal returns around analysts' recommendations. They find that abnormal returns around the quiet period do not differ between lead and non-lead analysts.[4] Furthermore, their findings suggest that the magnitude of abnormal returns is dependent on the number of analysts initiating coverage, and not the identity of the initiating analyst.

Chapter 4 investigates affiliated analyst optimism following Initial Public Offerings from 1993 to 2000. Specifically, we investigate analyst optimism in relation to recommendations, long-term growth estimates, and for NYSE and Nasdaq listed IPOs. We test the two competing

[4] U.S. Securities and Exchange Commission (SEC) regulations generally prohibit firms and their underwriters from publishing opinions for 25 calendar days after the completion of the IPO. This period is referred to as the "quiet period".

theories suggested by prior literature for why affiliated analyst reports may differ from the reports of other analysts.

CHAPTER 3

TIPPING

3.1 Introduction

There is an ongoing and vigorous debate as to whether financial intermediaries and corporate officers should be allowed to treat various investor groups differently.[5] Regulation Full Disclosure, for example, requires corporate officers to release material information equally to all market participants. Similarly, mutual funds have been criticized for allowing some investors to execute market timing trades that benefit those investors at the expense of other fund investors. On the other hand, investment banks are allowed to allocate potentially lucrative stock offerings to particular clients. We examine a similar practice that has received little attention: the provision of sell-side analysts' reports to some institutional clients prior to the public release of these reports.

Although selective pre-release of analyst reports – tipping – benefits only a subset of clients, whether these tips are inappropriate is unclear. We found no evidence of explicit regulatory prohibitions on tipping. However, some investment banks and the Association for Investment Management and Research proscribe it. Furthermore, no analyst has ever been prosecuted for tipping, although at least one has been fired for it.[6] We believe the defining issue may be whether or not individual firms have made representations to their clients that all clients

[5] The viewpoint of this introduction was inspired by a talk given by Larry Harris, SEC chief economist, at the 2003 NYSE-NBER conference.
[6] Smith (2003) documents the dismissal of a Morgan Stanley analyst for inappropriate dissemination of his research opinion.

will be treated equally. In this regard, tipping is similar to market timing trades by mutual fund clients.[7]

The economics of tipping are relatively clear. Sell-side research is a cost center and the production of research is an expensive activity paid for, at least in part, by revenue generating business directed to the full-service brokers who produce it. Buy-side institutions pay a considerable amount in commissions. In exchange for these payments, analysts' firms provide access to research and may provide early access to institutions that generate large commission revenues. Any limits on tipping would reduce the benefits institutions obtain from their commission payments and, in response, institutions would be less willing to pay the commissions that support sell-side research. As a result, less sell-side research will be produced. Since analysts' recommendation changes have been shown to result in significant permanent changes in stock prices, less research results in less efficient prices. Thus, tipping may be a mechanism by which a producer of valuable information captures a sufficient benefit to cover the cost of producing the information (Grossman and Stiglitz, 1980).

Using a proprietary database of institutional trading around the release of analysts' initial stock-specific reports, we provide evidence on the extent, existence and characteristics of tipping. We find a significant increase in institutional trading and abnormal buying beginning about five days prior to the public release of the analyst's initial report (initiation). We confirm that institutions buying in advance of the initiation earn abnormal profits. Furthermore, we find that the increase in institutional buying is related to variables that typically predict the size of the abnormal return at the time of an initiation. For example, abnormal buying is positively related

[7] In an article on Janus Capital Group's possible $200 million dollar settlement with investors, the *Wall Street Journal* (C6, April 27, 2004) noted that market timing trading "isn't necessarily illegal, but Janus had publicly stated policies under which it said it discouraged such trading".

to strong buy (relative to buy) initiations, positively related to analysts being classified as All-star analysts, and negatively related to dispersion in analysts' beliefs prior to the initiation.

We also characterize the trading behavior of institutions we believe are most likely to have been tipped – those that are significant buyers in the five days just before the initiation. We do so for a number of reasons. First, this analysis provides some insight as to which institutions are chosen to receive tips. Presumably, the chosen institutions are those that provide regular business to the analyst's firm and, therefore, are likely to be more active traders. Second, analysts may choose to initiate coverage in a stock in which its institutional clients have already taken an interest (O'Brien and Bhushan (1990) and Chung and Jo (1996)). Thus, we might expect the clients to have been buying a stock well before the initiation. Finally, Hirshleifer, Subrahmanyam, and Titman (1994) suggest that firms that trade on private information are likely to partially reverse their position after the information becomes public. We find that the largest buyers in the five days before the initiation are more actively trading and, on average, net buyers in the recommended stocks well before the initiation. However, we find no evidence that these buyers reverse their positions after the initiation, but they do appear to discontinue abnormal buying. These results suggest that tips are received by active institutions and, furthermore, that initiations may be motivated by institutional interest in a stock.

Taken together, our results suggest that some institutional traders receive tips regarding the contents of the soon to be released analysts' report. To the extent that brokerage firm clients who benefit from these tips are more likely to direct business to the brokerage, tipping provides economic profits to the brokerage that can help defray the cost of analyst information gathering. Thus, while tipping benefits some traders at the expense of others, the welfare consequences of tipping are unclear.

The paper proceeds as follows: Section II explores the literature on the dissemination and market reaction to analysts' reports. Section III examines the legal environment surrounding the practice of tipping. Section IV outlines our hypotheses. Section V discusses the data, our sample, and our methodology. Section VI provides a summary of our empirical results, and Section VII concludes.

3.2 Production and dissemination of analysts' initial recommendations

Previous studies consistently find significant abnormal returns around the announcement of sell-side analysts' initiations and recommendation changes (Chung and Jo, 1996; Womack, 1996; Kim, Lin, and Slovin, 1997; Branson, Guffey, and Pagach, 1998; Michaely and Womack, 1999; Li, 2002; Bradley, Jordan, and Ritter, 2003). In particular, studies by Kim, Lin, and Slovin (1997), Branson, Guffey, and Pagach (1998), Michaely and Womack (1999), Irvine (2003) and Bradley, Jordan and Ritter (2003) confirm that stocks receiving analysts' initiations that contain buy or strong buy recommendations experience abnormal market returns as high as three to four percent.

Research examining trading strategies on the day of the public release of analysts' initiations or changes in recommendations (Kim, Lin and Slovin, 1997, Green, 2003; Goldstein, Irvine, Kandel, and Wiener, 2004) finds that prices respond extremely quickly.[8] Dimson and Marsh (1984) note that share purchases prior to the public release are profitable, but purchases made a day or a week after the recommendation are not. Hence, knowledge of the recommendation prior to their public release is valuable and the ability to trade prior to the day of public release presents investors with profitable trading opportunities.

[8] The intraday trading data of Kim, Lin and Slovin (1997) and Green (2003) suggests that profitable trading opportunities dissipate in minutes or hours. Goldstein et al. (2004) examine profits relative to the close.

We assume that an analyst's firm has a strong incentive to tip since the firm places a high value on its relationships with institutional clients.[9] These relationships allow the analyst's firm to generate commission revenue and may also improve the analyst's compensation and career advancement opportunities.[10] Institutional investors who receive early information concerning analysts' initial recommendations may enter orders to exploit this timing advantage and capture the predictable abnormal returns that accompany these reports. In particular, institutions receiving information about upcoming buy or strong buy initiations will enter buy orders before these recommendations are released.

Our study investigates trading around sell-side analysts' initiations because initiations are not driven by specific corporate disclosures and therefore are more likely to be independent of confounding corporate events. In fact, studies of changes in analysts' recommendations have lately been criticized because of the likelihood that confounding corporate events surrounding analysts' reports may lead to erroneous conclusions (Juergens, 2000). Stickel (1989) finds that analysts often change their current rating on a stock after material public information is released. For this reason, many researchers have chosen to study analysts' initiations to infer the impact that analysts' opinions on firm value.

For the purposes of this study, initial recommendations have an additional advantage. Initial recommendations are usually in development stages for days or weeks before public announcement. The long development process of initiations reduces the probability that any abnormal institutional trading we find is driven by confounding corporate events. Conversations with sell-side analysts, research directors and findings by Boni and Womack (2002) suggest that

[9] We have no way to distinguish whether it is the analyst or someone else in the analyst's firm that may be tipping the institutions. Nor can we tell if an analyst's firm is aware that tipping occurs. We simply note that there are incentives to provide tips and the we find evidence consistent with its occurrence.
[10] Irvine (2004) discusses how trading commission revenue affects analyst compensation.

a firm's internal legal department and research oversight committee scrutinize new recommendations before public release. It takes time to complete this internal review, which suggests that the contents of the report are determined and known internally several days before public release. Cheng (2000) is more specific and concludes the internal review process normally takes four days. Based on this research, we expect any abnormal trading associated with tipping could begin as early as five days before the public release date.

3.3 Regulatory environment

We investigated the legal and regulatory constraints on tipping. The legal council for the National Association of Securities Dealers notes that the most relevant rule would be NASD rule 2110, a rule that details acceptable trading conduct for NASD member firms. In subsection IM-2110-4 the Associations Board of Governors makes the following interpretation of the rule:

> "Trading activity purposefully establishing, increasing, decreasing, or liquidating a position in a Nasdaq security, an exchange-listed security traded in the over-the-counter market, or a derivative security based primarily upon a specific Nasdaq or exchange listed security, in anticipation of the issuance of a research report in that security is inconsistent with the just and equitable principles of trade and is a violation of Rule 2110.
>
> Under this interpretation, the Board recommends, but does not require, that member firms develop and implement policies and procedures to establish effective internal control systems and procedures that would isolate specific information within research and other relevant departments of the firm so as to prevent the trading department from utilizing the advance knowledge of the issuance of a research report."

This rule explicitly prohibits the practice of trading by member firms based on the anticipated release of upcoming analysts' research reports. However, the rule does not address whether clients may trade in this manner. In other words, it may be inappropriate for the firm to trade before its own recommendations (something akin to front-running, but unrelated to specific orders) since it would be taking advantage of its own clients, but it may be acceptable for the

firm's clients to do so. Clearly, there is nothing in the rule that precludes the firm from informing some of its clients about the upcoming report.

The internal policies and procedures manual for several major brokerage firms address the dissemination of analysts' reports. For example, the Merrill Lynch Policies and Procedures Manual in effect during 1999 to 2001 imposed the following restrictions on pending research:

> "Pending initial opinions, estimate or opinion changes, and decisions to issue research reports or comments may not be disclosed by any means to anyone, either inside or outside the firm, until the information is disseminated in the appropriately prescribed manner. Exceptions are limited to [certain Merrill Lynch personnel] and, under limited circumstances, management of the subject company. This prohibition is intended to avoid the misuse of market-sensitive information and the appearance of impropriety."

The internal policies of several other brokers are consistent with Merrill Lynch and prohibit tipping activity.

The Association for Investment Management and Research (AIMR) has established strict guidelines to which all securities analysts must adhere. The AIMR code of Ethics and Standards of Professional Conduct contains rules on fair dealings with clients and prospects. Regarding the dissemination of opinions it states that analysts shall "deal fairly and objectively will all clients and prospects when disseminating investment recommendations, disseminating material changes in prior investment recommendations, and taking investment action."[11]

Most importantly, Securities and Exchange Commission (SEC) regulations do not address the practice of tipping by security analysts. Instead, these issues are addressed on a case-by-case basis. In one relevant case (litigation release 18115 on April 28, 2003), the SEC brought charges against Merrill Lynch that included the failure to supervise its security analysts and to ensure

[11] The Association for Investment Management and Research (AIMR) Code of Ethics and Standards of Professional Conduct (as amended and restated May 1999). According to a 1988 document concerning the code of ethics and standards, initiations of recommendations are explicitly defined as material information.

compliance with its own internal policies. Point 98 of the complaint contains the sole reference to tipping:

> "A Merrill Lynch analyst improperly gave advance notice of his stock ratings on Tyco and SPX corporation to three institutional clients prior to the publication of those ratings. In an e-mail dated September 7, 1999 to an institutional client, the analyst stated: "I will be launching coverage on Thursday morning. I will rate Tyco and SPX 1-1."[12]

However, there do not appear to be any current regulations that explicitly address tipping. Legal council for the SEC has issued statements suggesting that tipping may violate rule 10b-5, which states that it is illegal to use or pass on to others material, nonpublic information or enter into transactions while in possession of such information. However, this rule is typically applied to insider trading cases and any tipping complaints would still be evaluated on a case-by-case basis. One SEC attorney, who wished to remain anonymous, told us: "common sense tells you that such practices have to be illegal". However, there appear to be no rules or clear legal precedents at this point in time.

In general, our investigation suggests that the central legal issue is whether a firm has made any representations to its clients that it treats all clients equally. Internal guidelines may vary considerably across investment banks and over time. In this regard, the state of affairs parallels that of market timing trading by mutual fund clients. Market timing trades are trades that take advantage of the fact that some prices used to set net asset values may be known before the end of trading. Trading in and out of funds on this information (rapid trading) benefits those traders at the expense of traders who are buying and holding the fund, since all traders share the cost of executing the orders. While some funds have clearly stated to their investors that no

[12] 1-1 is Merrill's highest recommendation; it recommends the stock as a strong buy for both short-term and long-term investors.

investors will be permitted to rapidly trade the fund, other funds have not. As with rapid trading, we expect there will be a race to the top as firms seek to clarify their rules regarding this activity.

3.4 Hypotheses

Analysts' buy and strong buy initiations produce positive abnormal returns, on average, when released to the market. We believe that analysts have economic incentives to tip their preferred clients concerning the contents of upcoming initiations. Institutions who receive advance notice of these initiations are likely to earn trading profits by submitting orders before the public release. Thus we predict that institutional trading will exhibit positive abnormal trading volumes and buy imbalances before the public release of analysts' initiations.

We expect that analysts do not disseminate their tips to their entire client base, but rather to a few select clients. If analysts' tipped a large number of institutions prior to public release then competition between informed investors would eliminate the price response at the time of announcement (Holden and Subrahmanyam, 1992). However, event studies of prices around analysts' recommendations consistently find that the largest price response occurs at the announcement. Furthermore, if the practice of tipping is widespread, then the public announcement of analysts' initiations would merely be a secondary dissemination. As with other secondary disseminations, we would expect to see a partial reversal of the abnormal returns after the public release of the initiation (Barber and Loeffler, 1993; Lloyd, Davies and Canes, 1978).[13] Prior empirical studies find no evidence of reversion in abnormal returns. In fact, Womack (1996) documents a drift in abnormal returns that continues in the direction of the

[13] Barber and Loeffler (1993) analyze the *Wall Street Journal* dartboard column and find 4% abnormal returns followed by a price reversal of around 2% over the next 25 trading days. They contend this reversal is due to the fact that the dartboard column represents a secondary dissemination of information, and that reversals are the result of price pressure driving up prices rather than new material information.

recommendation. Thus, based on the event-study evidence, we expect that if tipping does occur, it is limited to only a select number of preferred institutional clients.

Institutional trading driven by tipping activity should be related to the contents of the analyst's initiation. The likelihood that early informed institutions submit orders before the release of analysts' initiations should be positively related to the institutions *ex-ante* expectation of abnormal returns when the initiation is publicly announced. Any identifiable characteristics of the analyst or the report that have been linked to abnormal returns should be able to predict the degree of tipping behavior. For example, we expect more buying to occur in the period before *strong* buy initiations than in the period before buy initiations because strong buy recommendations produce greater positive abnormal returns and thus greater profit opportunities for early-informed investors. In addition, Stickel (1992) finds that recommendations by *Institutional Investor* All-American analysts (All-stars) produce larger abnormal returns than those of other analysts. Since All-stars are chosen by a survey of two-thousand institutional investors, we expect that institutions have high regard for the All-stars and are likely to act on their recommendations: trading on tips will be more prevalent if the recommendation is made by an All-star analyst. We also test whether initiations by the most prestigious brokers (Womack, 1996) affect the level of tipping activity. We expect that reports issued by one of the twenty brokers ranked by *Institutional Investor* as having the most respected research make institutions more likely to trade if they receive tips from analysts at these firms. Other characteristics of the initial recommendation could affect investors' trading behavior. These include the level of information uncertainty in the stock and the surprise in the initial recommendation relative to the level of existing recommendations.

If preferred institutional clients receive analysts' initiations early, then our research design is an effective framework for testing the predictions of Hirshleifer, Subrahmanyam and Titman (1994). In their model, informed investors who discover information early will trade before the information is publicly released in order capture the value of their private information. When the information is publicly revealed, these early-informed investors will partially reverse their trading in order to secure some trading profits and reduce the overall risk of their positions. The differential timing in the receipt of information stimulates volume during the public release, by causing different groups to take both the buy and sell side of the market, even though they observe a common information signal.

We examine institutional trading activity for institutions we believe are most likely to have received a tip to test the predictions of the Hirshleifer et al. (1994) model. This analysis also provides additional insights into who might receive tips. In particular, we can see whether the clients likely to get tips are those that are active traders in the stock (which would be consistent with analyst tips going to valued clients) and whether they are recent buyers (which would be consistent with analysts initiating coverage for stocks in which their valued clients are already taking an interest). We identify institutions who are likely to have been tipped by selecting those institutions who are significant buyers in the five days before the initiation. We then look for significant selling after the initiation as well as significant trading activity and buy imbalances well before the initiation.

3.5 Data

We use the Institutional Brokers Estimate System (I/B/E/S) Detailed Recommendations Tape to identify analysts' buy and strong buy initiations. I/B/E/S covers over 5,000 analysts who are associated with over 400 research firms, and is the most extensive source available for

analysts' recommendations. I/B/E/S classifies recommendations with a standard formula, which rates the strength of the recommendation on a 1-5 scale. A strong buy it is given a recommendation value of 1, a buy rating gets a recommendation value of 2, hold recommendations receive a recommendation value of 3, sells a 4 and strong sells receive a 5.

We examine the I/B/E/S database from March 31, 1996 until December 31, 1997 and from March 31, 2000 until December 31, 2000. These dates are determined by the availability of Plexus data (described below) and allow us to get matching Plexus trade orders for the 60 days before and 60 days after the analysts' initiations in our sample. To identify analyst initiations we filter I/B/E/S data searching for the first ever recommendation on a particular stock by the brokerage firm and analyst. This filter avoids selecting analysts who transfer from one broker to another and repeat their outstanding recommendations at their new broker. We then back check our results by examining all recommendations on each stock for a year prior to the initiation in order to ensure that the analyst has not recommended the stock previously.

We began with a sample of 24,304 initial recommendations. We then filter our initiation sample following Irvine (2003). First, we delete all initial recommendations made within five days of a company's earnings release. Second, we restrict our sample to include only securities with a stock price over $5. Several conversations with buy-side investment professionals lead us to believe that institutional investment is restricted concerning stocks under this threshold. Third, we delete all initial recommendations where the recommendation is for an IPO that has gone public in the previous six months.[14] Finally, we require all sample firms to have corresponding CRSP data for price, aggregate trading volume, and shares outstanding. After filtering our

[14] Michaely and Womack (1999) and Irvine (2003) contend that IPO initiations may be anomalous because of strong corporate finance incentives faced by analysts at this time. We also exclude IPO initiations because of the predictability of initiations at the end of the quiet period (Bradley, Jordan and Ritter, 2003).

sample and matching with CRSP we are left with 14,129 initial recommendations made on 4,677 different firms. We then delete all observations where another initial recommendation is released during the eleven-day window surrounding the observation. This process reduces the chances that abnormal trading or volume measures reflect actions of previous analyst initiations. Of the remaining 12,417 initiations, 9,672 contain either buy or strong buy recommendations.[15]

Summary statistics for all initiations that satisfied our data screens are presented in Table 1. Of these, we examine only strong buy and buy initiations because the significant positive abnormal returns associated with these recommendations suggest an unambiguous purchasing strategy for institutions that receive tips about the contents of these reports. Of course, buy and strong buy initiations are far more common and there are a negligible number of initiations with a sell recommendation. The number of firms for which coverage is initiated is lower than the number of initiations since multiple analysts initiate coverage in some firms. On average, there are about 5 analysts who issue recommendations in a stock during the year prior to the initiation. Based on market capitalization quintiles, we see that most of the initiations are for larger firms.

To ensure that the returns in our sample are consistent with the results reported in earlier studies, we perform a traditional event study on our sample of 9,672 strong buy and buy initiations. Table 2 presents abnormal returns in an event window of –20 to +20 days around the public release of the analyst's initiation (event day). Standard cross-sectional t-statistics are calculated to determine the statistical significance of abnormal returns. Table 2 reports similar

[15] We validate our initiation dates as follows. We randomly select 265 (approximately 2 percent of the initiations sample) analysts' initiations from I/B/E/S database and cross check them against the Dow Jones news wire to ensure the dates are the same. Dow Jones news wire ceased carrying analysts' recommendations after July 1999. Our random sample of initiations consists of 194 observations before the July 1999 transition date. We find no evidence that I/B/E/S dating errors can explain our results. Specifically, 133 of our initiations were not reported by Dow Jones, consistent with the observation that Dow Jones self-censors their data by reporting recommendations from only the largest brokers. 57 initiation dates matched precisely, and four initiation dates on I/B/E/S were one day after the Dow Jones mention. Based on this survey, we cannot attribute significant abnormal volume as early as five days before the public release to errors in the I/B/E/S data set.

results as those reported in previous studies.[16] Strong buy initiations earn event-day size-adjusted returns of 1.13 percent (p-value < 0.001) and buy initiations earn event-day size-adjusted returns of 0.47 percent (p-value < 0.001).

We obtain institutional trading activity from a proprietary database of institutional equity orders provided by the Plexus Group. The Plexus Group is a widely recognized consulting firm that works with institutional investors to monitor their equity trading costs. Plexus clients manage over $1.5 trillion in equity assets, which represents a significant fraction of all institutional equity assets in the United States. Previous academic studies that have used Plexus data include Keim and Madhavan (1995), Jones and Lipson (1999), Conrad, Johnson, and Wahal (2001), and Barber and Odean (2002). Our sample of Plexus orders covers the periods from January 1, 1996 until March 31, 1998, and from January 1, 2000 until March 31, 2001.[17] We use all available data in our empirical tests.

Summary statistics for the full set of institutional orders and for the subset used in our analysis of initiations are presented in Table 3. The full set of data contains about 5 million orders while our study employs about 1.6 million orders.[18] In terms of order size, our sub sample is similar to the larger sample. We note that institutional orders are highly skewed – in our study sample the mean order size is about 20,000 shares, whereas the median is not quite 2,000 shares. This is, however, typical of institutional orders. We also note that when we partition the

[16] Barber, Lehavy, McNichols and Trueman's (2001) 1985-1996 sample from Zack's investment research is a comparable large sample of analyst initiations. They find strong buy initiations earn significant 3-day cumulative abnormal returns of 1.09 percent and buy initiations earn significant abnormal returns of 0.48 percent.

[17] The disjointed dates for the Plexus data are a result of missing data. Data from the missing period is not available from the Plexus Group.

[18] One feature of Plexus data is that it contains order level data. This includes the date of the order and the price and shares executed to fill the order. The data does not, however, distinguish between the individual trades that were executed to fill an order. Also, the shares bought or sold to fill an order may be less than the shares desired when an order was placed. We use executed volume in all our analysis. Note that when we refer to institutional volume or institutional trading activity, we mean that volume and activity associated with the institutions in the Plexus data set.

institutions in the sample by institution activity (measured by total trading activity in the sample period), the most active institutions also submit the largest orders.

3.6 Results

We begin by examining trading behavior to see if there is positive abnormal trading volume and buying imbalance prior to the public release of the initiation. According to Cheng (2000), analysts' initiation reports are completed an average of four days before they are publicly released in order to facilitate the internal review process. We expect that if the content of an initiation is revealed to preferred institutional investors, this occurs after the analyst has completed the report, but while the report is still being approved by the appropriate internal legal and regulatory committees of the analyst's brokerage firm.[19]

To test for tipping activity we examine the trading activity of institutional clients around the initiations. Following Goldstein, et al. (2004) we eliminate all institutional orders of less than 100 shares, and attribute these trades to exogenous inflows/outflows of capital. We first examine the mean daily institutional trading volume across all stocks with buy and strong buy initiations. We then aggregate executed volume by stock and trading day, and calculate total institutional trading volume. We calculate five measures of institutional and market volume: (i) shares traded by institutions, (ii) trading imbalance by institutions, (iii) the number of institutions trading, (iv) total (CRSP) market volume and (v) the ratio of institutional volume to total market volume. We then express (i), (ii) and (iv) in terms of turnover by dividing by shares outstanding. This normalization prevents institutional trading in large firms from dominating our results. It also

[19] It is possible that employees other than analysts are tipping institutions in the internal review period. However, to find the patterns we document in the data, such tipping by other employees would have to be systematic, which implies an unidentified economic reason. We focus on tipping by sell-side analysts as it seems to be the most likely explanation for the trading patterns we find.

reduces cross-sectional variation in trading activity that is solely related to firm size. Our measure of trading imbalance is similar to that of Griffin, Harris, and Topaloglu (2002).

Figure 1 contains graphs of institutional trading activity around analysts' initiations. The first two graphs present total turnover and institutional turnover for 120 and 40 trading days, respectively, around the public release of initiations (event day 0). Institutional trading is elevated beginning four days prior to the public release of the initiation. This increase is modest relative to the average level of trading in the data. However, it is consistent with tipping behavior since tipping should not involve widespread early dissemination, but rather selective dissemination to an analyst's preferred clients.

Comparing the pattern of institutional trading to market-wide trading is particularly revealing. This comparison is instructive because it shows that the date of public release is the most active trading day around our sample of initiations. Market-wide trading peaks on the event day, consistent with the large event-day volume reaction observed in prior event-studies. Thus, it appears that most investors are unaware of the information in the analysts' report until the report is publicly released. This result validates our research design. We have tried to eliminate confounding events, such as earnings announcements from the sample. The fact that market-wide trading volume peaks on the date of public release is confirmation that our sample is independent of confounding corporate events. If initiations cluster around earnings announcements, the way that other analysts' recommendations do, then we would expect to find similar patterns in market-wide volume and institutional volume. In contrast, institutional trading peaks on event day -4 and remains elevated through event day 0. This result suggests that institutional trading in our sample is responding to a different stimulus than the rest of the market. The evidence is consistent with trading stimulated by analysts' tipping activity.

More importantly, if certain institutions are being tipped about the contents of analysts' buy and strong buy initiations, then we expect to see an increase in net buying as opposed simply an increase in trading. We present evidence on net buying in the third graph of Figure 1, which presents institutional trading imbalance and the ratio of institutional volume to market-wide volume during the -20 to +20 period. The graph shows a clear pattern of high positive buying imbalances beginning five days before analysts publicly initiate coverage. The Institutional imbalance peaks four days prior to the public release of the analyst report, coincident with the peak in the ratio of institutional trading to market-wide trading. Thus, our results indicate that institutions are not only trading more actively in advance of analyst's recommendation, but are trading in a manner consistent with the content of the analysts' recommendations.[20]

Table 4 presents formal statistical tests of institutional trading activity. To calculate non-event mean trading measures we use the average from the post-event period extending from date +20 through +60. We choose a post-event period to measure non-event trading activity in order to minimize endogenous effects on our statistical tests, but the results are similar to those reported in Table 4 when we use a pre-event period to measure normal trading activity.[21] There is no theoretical basis for choosing a particular measure of normal volume. Significance testing of abnormal volume follows tests proposed by Bamber, Barron and Stober (1997). We calculate mean institutional trading volume in the estimation window +20 to +60 scaled by shares outstanding. We test for abnormal volume in the -20 through +20 estimation period by

[20] A net positive order imbalance in the non-event period is consistent with Chordia, Roll and Subrahmanyam (2002) who find an average positive order imbalance over 11 years of trading in S&P 500 stocks.

[21] O'Brien and Bhushan (1990) argue that the decision of a sell-side analyst to initiate research coverage and institutional investing are jointly determined. This point makes intuitive sense because institutional investors value the incremental governance and research that additional sell-side analysts provide, while sell-side analysts value the increased rents gained through trading commissions that their coverage is likely to instigate (Chung and Jo 1996). We use a post-event period to measure non-event normal trading activity so that increasing institutional trading that could cause subsequent coverage announcements does not bias our results.

subtracting mean trading volume in the estimation period from actual trading. Appropriate t-statistics are constructed to account for infrequent trading in the sample, and any potential time clustering of the observations.[22]

The statistical tests in Table 4 show that for all trading measures we find abnormal volume beginning as early as day -9, which shows a significant increase in the number of Plexus institutions trading in the recommended stock. However, the other volume measures do not show significant increases until days -5 or -4. Institutional share turnover is significant beginning on day -4. Institutional order imbalance is positive and significant beginning on day -5. Total turnover in the stock is also significantly elevated during the pre-release period and Plexus volume relative to total volume is elevated beginning on day -5. None of the measures of trading volume (with the exception of the number of institutions on day +1) show any significant institutional trading activity after the day of public release.

We next investigate whether the pre-release abnormal institutional buying imbalance can be explained by the contents of the forthcoming analyst's initiation. If the contents of initiations help to predict the institutional trading imbalances before public release of the report, this result strengthens our argument that analysts' tipping behavior is responsible for some of the abnormal trading activity. To implement this analysis we construct a Logit regression of the determinants of pre-release analyst tipping activity. In this regression a tipping event sets the dependent variable to a value of one. Since tipping prior to buy and strong buy initiations should lead to abnormal buying, tipping is defined as having occurred when the average daily abnormal positive order imbalance in the -5 through -1 period is greater than two standard deviations from

[22] This test involves forming a portfolio of institutional trading volume and estimating the standard deviation of the portfolio's trading volume in the non-event period. The time-series standard deviation is used in the statistical tests of event period abnormal volume. This technique is similar to that suggested by Brown and Warner (1985) to control for cross-sectional correlation in returns.

the non-event mean daily order imbalance. If a tipping event does not occur, the dependent variable is set to zero. The non-event period includes days -60 through -20 and the period +20 through +60. Under this definition of tipping there are 1,377 tipping pre-release periods and 8,287 no tipping pre-release periods.[23]

Our Logit regression includes independent variables that control for the trading environment and firm size and well as variables which we earlier hypothesized could be used to predict the effect of an initiation on returns and trading activity. Specifically, we include: Strong Buy – a dummy variable set to one if the recommendation is a strong buy, All-star – a dummy variable set to one if the recommendation is made by an *Institutional Investor* magazine all-star analyst, Top 20 broker - a dummy variable set to one if the recommending broker is among the top twenty most respected brokers according to *Institutional Investor*, Uncertainty – the standard deviation of all analysts' earnings forecasts in the month prior to the initiation, and Outstanding Recommendation – the difference between the initiation recommendation and the consensus recommendation in the month prior to the initiation. As control variables we include Nasdaq – a dummy variable set to one if the firm trades on Nasdaq, and Firm Size – measured as the log of the market capitalization of the initiated firm. The control variables are intended to proxy for factors that affect share turnover and order imbalance that are not related to the variables of interest. [24]

Table 5 presents the results of our Logit regressions. Most of the variables that are related to characteristics of the subsequent initiation are significant and consistent with our predictions.

[23] Data is missing for the independent variables in eight cases.

[24] The specification presented in Table 5 uses abnormal order imbalance to define tipping. As a robustness check, we explored alternative definitions of tipping using abnormal order imbalance normalized by average daily volume in the non-event period. We also changed the definition of tipping to include only those events where abnormal order imbalance was greater than three positive standard deviations from the mean. The results in those tests are similar to the results presented in Table 5.

Strong buy initiations (which generate larger average abnormal returns than unqualified buy initiations), generate significantly higher institutional buying in the period prior to public release of the initiations. This result is consistent with the greater profit opportunities that accompany strong buy recommendations. The identity of the initiating analyst also helps to predict abnormal order imbalances. All-star analysts generate significantly more pre-release buying than initiations by non all-star analysts. Uncertainty is significantly negatively related to trading imbalance, which suggests that the greater the divergence of analysts' opinions, the less institutions respond to a particular analysts' opinion.[25] An initial recommendation that is more positive than the outstanding consensus recommendation increases the positive abnormal order imbalance in the period prior to public release of the initiation. Identification as a Top 20 brokerage firm does not seem to have a significant affect on pre-release abnormal trading activity.

Thus, several variables that institutions could use to effectively gauge the likely price impact of an analyst's initiation help predict abnormal trading activity in the period prior to the public release of the initiation. This provides further evidence that the abnormal trading activity prior to the initiation is due to tipping. The fact that explanatory power of the regressions is low (the pseudo - R^2 in the regressions range from 10.8 percent to 10.9 percent) and that the variables that predict tipping provide only modest impact is consistent with the fact that tipping occurs for only a small subset of institutions and/or initiations.

Our review of the regulatory constraints on tipping suggests that the extent of tipping within a brokerage firm is likely to be a function of that firm's policies and compliance procedures. If there is any variation in policies and compliance across brokerage firms, then we

[25] This result is consistent with Irvine (2004) who reports that uncertainty is negatively related to trading through the recommending broker when an analysts' report is released.

would expect that tipping will, likewise, vary across brokerage firms. Our analysis for Table 5 included the identification of initiations that are most likely to have been preceded by tips – those with abnormally high buying before the initiation announcement. We use these same identifications to examine the possible distribution of tipping across brokerage firms.

Table 6 presents our analysis of the proportion of brokerage firm initiations accompanied by abnormal pre-announcement buying. We examine three nested subsets (test groups) of brokerage firms, those firms with at least 2, 10 or 100 initiations. Table 6 shows the number of brokerage firms in each test group, the total number of initiations by the brokerage firms included in each test group, and the proportion of initiations in the test group that have abnormal buying. Having then calculated the proportion of initiations with abnormal buying *for each brokerage firm*, we then test whether these proportions are the same across all brokerage firms. Equality is rejected at the 1% significance level for every test group using a chi-squared test statistic (Miller, 1999). This suggests that tipping varies systematically across brokerage firms. This also provides additional evidence that our identification of likely tipping events was not a random selection.

To provide some indication as to the distribution of tipping across brokerage firms and additional evidence that the distribution is reliably different from a randomly generated distribution, we proceed as follows. We assume the test group's proportion of initiations with abnormal buying represents an estimate of the unconditional likelihood of observing abnormal buying for any given initiation. We then calculate the probability of observing at least that brokerage firm's proportion assuming independence across the initiations. For example, if the test group proportion is 15%, the likelihood of observing at least 20 initiations with abnormal buying out of 100 initiations is 6.6%. We then count the number of brokerage firms where the

probability is less than a specified probability level (5%, 10% and 20%).[26] If abnormal buying were distributed randomly, the percentage of brokerage firms with abnormal buying in the test group should be about equal to the cutoff. If abnormal buying is clustered in some brokerage firms, then the percentage will be above the cutoff. For all three test groups and for all three cutoffs, the percentages are well above the cutoffs. For example, for the group of brokerage firms with at least 100 initiations, 14% of those institutions have levels of abnormal buying high enough that we should expect to see that level of abnormal buying only about 5% of the time. Thus, there appears to be an unusually large amount of abnormal buying prior to the initiation announcement for some of the brokerage firms in our sample. These results provide additional evidence that tipping occurs and, further, that tipping is related to policies and enforcement procedures in place at brokerage firms.

Tipping will only benefit institutions if trading on those tips leads to economic profits. While the results on abnormal returns are suggestive, they do not address issues related to the costs of establishing a position. In particular, trading activity will move prices and not all opportunities will turn out to be profitable (see Jones and Lipson (1999) and Conrad and Wahal (2001)). We address these concerns by looking at the actual profits that would be earned given the institutions' actual prices and executed volume.

Table 7 analyzes the trading profits of Plexus institutions that trade prior to analysts' buy and strong buy initiations. To calculate institutional trading profits, we assume that, six days prior to the initiation, the initial endowment (position) for all institutions is zero. We consider two different windows in which positions are established (the trading period in the first column)

[26] If each firm had the same number of initiations, we could simply present the number of initiations with abnormal buying that exceed a given level, where the level is associated with a given statistical likelihood. Since the number of initiations varies from firm to firm in our data, we cannot do so.

and four different points in time when the position is then liquidated (the ending day). Thus, the top left results are for net positions established from day -5 to day -1 (inclusive) and liquidated at the end of day 0 (the day the initiation is released).

We calculate profits as follows. First, we find the actual gains and losses associated with establishing a position as of the end of the trading period. To do this we acknowledge all realized gains and losses during the trading window at prices actually executed during the trading window. Thus, if an institution purchases 15,000 shares on day -4 at $30.00 and sells 5,000 shares on day -2 for $33, the realized profit is 5,000 × $3 = $15,000. We then acknowledge any unrealized gains as of the end of the trading period. Specifically, we mark the net position at the end of the trading period to the price at the end of the trading period. Finally, we acknowledge any gains over the subsequent holding period by applying CRSP returns to the net position at the end of the trading period. By using CRSP returns we acknowledge cash received in the form of dividends. Thus, to continue our example, if the price is $31 at the end of the trading period and the cumulative returns are 5% over the next 30 days, we calculate the total profits as follows: $15,000 realized profit during the –5 through –1 accumulation period, plus the unrealized profit on the remaining 10,000 shares during the accumulation period of: 10,000 × $1 = $10,000 plus 0.05 × 10,000 × $31 = $15,500, for a total of $40,500. We then express this profit as a fraction of the position established at the end of the trading period: $40,500/(10,000 × $31) = 13%. Thus, the profit is a return and we are acknowledging the magnitude of the required investment and reduce cross sectional variation in profits related to the size of a firm's trading position.

Panel A of Table 7 presents the results for *all* institutions trading during the trading period, while Panel B shows results only for *buyers* (the results that are most likely to apply to institutions that are tipped). While there is no reason to predict that institutional trading by all

institutions would be profitable in general, since we document a modest overall buying imbalance a slight profit is possible. Clearly, however, the buyers are more likely to be institutions receiving tips, therefore, the profit to buyers is the correct measure of the potential gains from receiving tips.

Economically small but statistically significant returns accrue to *all* institutions that trade in the period prior to the release of an analyst's initiation. Panel A finds positive and significant profits that range from 0.35 percent when positions are liquidated at day 0, to 0.75 percent when positions are liquidated on day 30. All institutions profit because institutions tend to be net buyers in all periods, and buy and strong buy initiations generate positive returns, on average.

More important, Panel B finds substantial profits to buying institutions. For example, for positions accumulated from days -5 through -1, institutional profits range from 3.5 percent when liquidated at day 0, to 5.4 percent when liquidated at day 30. All of the profits reported in Panel B are statistically significant, in addition to being economically meaningful. Buying institutions make profitable trades prior to analysts' initiations.

A characteristic of almost all of these profitable positions is that they exhibit a large degree of positive skewness. The right tails of these distributions exhibit extremely profitable trading activity. If tipping is more pronounced when price responses are likely to be higher (and our earlier results suggest this is the case), then the results in Panel B understate the profit to institutions that are actually tipped. Thus, the positive skewness of the returns indicates that the potential profits are extremely high – and this would certainly encourage institutions to solicit and trade on tipped information.

Table 8 repeats the analysis in Table 7, but only around strong buy initiations. Because strong buy initiations are associated with larger abnormal returns than buy initiations (Table 3),

we expect trading profits to be larger for strong buy initiations than they are for the full sample. The panels mirror those in Table 7: Panel A analyzes trading profits for all institutions and Panel B presents profits for only those firms that establish net buying positions. Results are qualitatively similar to Table 8 though, as expected, profitability is higher.

We do not expect that tipping occurs in every initiation, nor do we expect that every institution is tipped. In fact, we expect even larger profits would be observed if we could identify the institutions that actually receive tips. Nevertheless, the positive average profits and the large positive skewness in the profit distributions for institutions that trade in the same direction as the recommendation suggest that tipping can be a profitable activity for the tipped institutions and may be a significant benefit that buy-side institutions expect from their sell-side analysts.

To understand more about the potential trading profits around analysts' initiations, we again examine the 1,377 initiations where the overall buying imbalance during the [-5, -1] pre-release period is greater than two standard deviations from the non-event mean imbalance. We assume that the institutions trading in this subsample are more likely have received tips than institutions in the rest of the sample. Institutions that trade in the -5 to -1 period in this subsample have mean profits for each institution of $132,044, representing a mean return of 4.23 percent.[27] The largest buyer in this subsample earns $489,254, which represents a mean return of 4.20 percent. On average, 6.5 institutions in our sample trade before each initiation, earning total profits per initiation of $862,820, representing mean returns of 4.1 percent.[28]

[27] Assuming liquidation at the end of day 0.

[28] We should note that the potential profits to institutions from trading on tips is not the only motivation for giving the tips. The relation between the analyst's firm and the institution is a long-term relation where the level of revenue generated for the analysts' firm by the institution entitles the institution to an array of privileges (see Goldstein, et. al. (2004)). The institutions may expect to be notified when the analyst decides to initiate coverage simply as part of that relation, rather than strictly for the profits. They may also adjust their trading to take advantage of the information, but the magnitude of the profits could be a secondary consideration.

In this section we examine the trading behavior of a sample of clients that are likely to have been tipped. These are the clients that were significant buyers in the five days before the initiation release. As mentioned in the introduction, this analysis provides evidence on three issues. First, it allows us to characterize which institutions are chosen to receive tips. Second, it allows us to see if initiations occur for stocks in which clients have already expressed a buying interest. Finally, we are able to look for position reversals as predicted by Hirshleifer, Subrahmanyam, and Titman (1994).

To identify institutions likely to have been tipped, we proceed in a manner very similar to the way in which we identified tipping events for Table 5, but at the level of individual institutions. Specifically, we first calculate the standard deviation of daily trading volume by institution. We then identify those institutions who are the largest buyers over the -5 to -1 period, whose buying exceeds twice the standard deviation of their own trading activity, and who buy at least 1,000 shares. We compare the trading behavior of these institutions, the most active pre-release buyers, with two control samples. First we compare these institutions to those that were not active pre-release buyers. Second, we compare these institutions to the most active traders around randomly generated event windows (essentially "non-event" windows). Specifically, we choose two random five day periods (one at least 20 days before the initiation and one at least 20 days after the initiation) and repeat the exact methodology used to identify active traders – we identify institutions who are the largest buyers where their buying also exceeds twice the standard deviation of their own trading activity and is at least 1,000 shares. The second comparison allows us to evaluate whether the trading behavior of active buyers before and after the initiation differs from active buyers in general (those who, presumably, have not been tipped).

Our results are presented in Table 9. Panel A presents turnover and Panel B presents imbalances. Column 1 presents the daily turnover or imbalance for the most active buyers. Column 2 presents the average daily turnover or imbalance for the remaining institutions. Column 3 presents results of a t-test of the difference between the most active buyer and the other institutions. Column 4 presents turnover or imbalance for the most active buyers during the random event windows. Column 5 presents results of a t-test of difference between the most active buyers around the initiation and the most active buyers during the random event periods. Since the data in the -5 through -1 period is used to define abnormal buying prior to both the initiation and the random event day, statistics for this period are not reported.

The results in Panels A and B of Table 9 show that the most active buyer in the initiation sample has significantly higher turnover and buy imbalances around analyst initiations than other institutions. This result is not surprising since institutions are sorted on their buying activity. However, these results give us some indication of the trading characteristics of institutions that may have received tips. The most active buyers trade actively in the initiated stock and they have been aggressively accumulating a position for at least forty days prior to the public release of the initiation. Starting about 8 days after the initiation, the trading behavior of our most active traders does not differ from the remaining institutions. These results suggest that institutions that receive tips are already active traders in the stocks for which coverage is initiated. Furthermore, the institutions have been accumulating stock for some time, suggesting that the initiation itself may have occurred because the institutions have taken an interest in the stock.

A more demanding test as to whether the trading behavior of our most active traders is unusual is our comparison to active traders during random event periods. Column 5 reports a t-test for differences in turnover and buy imbalance between the most active buyers and the most

active buyers during a random event period. As before, the most active traders are more active traders and more significant buyers during days -15 to 0. To a lesser extent, they are more active traders for the 10 days after the initiation and more active buyers for 5 days after initiation. Note that prior to day -15 and after day 10 there are no significant differences between the two samples.[29] These results suggest that those institutions that are likely to have received a tip are more active traders and more active buyers than comparable firms that are not likely to have received a tip. It should be noted that institutions that have been active buyers in a security are likely to have a high level of interest in the contents of forthcoming initiations.

Tables 6 and 7 suggest that institutions that enter into net buying positions prior to analysts' buy and strong buy initiations may be able to lock in trading profits soon after the initiation becomes public. In fact, the evidence in those tables suggests there is little reason to wait and that the majority of the profits are realized by day zero. Furthermore, there is more overall trading activity immediately following the initiation, which means that positions can be more easily unwound. Hirshleifer et al. (1994) model the trading behavior of investors who receive private information before it is publicly released. Hirshleifer, et al. (1994) predict that in the period when information is publicly revealed, early informed investors will partially reverse their trading in order to lock in their trading gains and reduce the idiosyncratic risk that their trading may have engendered.

Our study of initiations provides a useful context for evaluating the Hirshleifer et. al. predictions. First, Plexus data allow us to follow the trading of specific institutions. Second, we have an event for which we also have evidence that private information is being conveyed. The

[29] The lack of difference extends to the full duration of our study windows, not just the portion shown in Table 9.

results in Table 9 provide little evidence to support the Hirshleifer et. al. (1994) prediction.[30] While firms that are likely to have been tipped do reduce the buying activity from earlier levels, they do not seem to reverse their positions nor do they appear to buy less than other institutions. Of course, we do not know for sure that our sample of most active buyers actually did receive a tip. We assume only that these firms are more likely than others to have received tips and, therefore, our sample will contain noise and reduce the power of our tests. Thus, positive results, such as the abnormal trading and buying documented above, are more convincing than negative results, such as the lack of a reversal.

3.7 Conclusion

This paper investigates the trading behavior of institutional investors prior to the public release of analysts' buy and strong buy initial recommendations. Using a proprietary database of institutional orders from the Plexus Group, we find strong evidence of institutional trading prior to the public release of analysts' initiations. Specifically, we find statistically significant increases in the levels of institutional trading and net buying in the period beginning about five days prior to the public release. We also find that the extent of abnormal buying in this period is predictable from variables that have been shown to predict the extent of a price increase at announcement of an initiation. We also note that the five days prior to the public release of the initiation is when the analysts' report is substantially complete and undergoing the internal legal review process. We conclude that some analysts (or someone in their firms) are revealing the contents of the upcoming reports to preferred clients prior to the public release of the report. We

[30] Table 9 examines all active buyers, but does not condition on whether there was a price increase at the time of initiation, which is one element of the Hirshleifer et. al. model. If we restrict our analysis to price increases of 1% or of 2%, the results are essentially the same as in Table 9.

also verify that these tips can provide profitable trading opportunities for the institutions that receive them.

We do not take a normative position on tipping. The purpose of this paper is simply to draw attention to this activity and provide some evidence as to its existence. Our results suggest that tipping occurs and, as a result, those investors who trade on the public release of analysts' reports do not receive the same benefits as those that obtain the reports before their release. However, the trading profits that tipping provides to large institutions are likely to be one of the services large institutions expect from analysts' firms. If tipping were precluded, institutions would be less willing to pay for sell-side research and, consequently, the amount of price-relevant sell-side research would be reduced. For this reason, the social welfare implications of tipping are not clear. In general, our results raise an important question – how should sell side research be rewarded and how much control should analyst firms have over the release of that information.

Table 3.1

Summary Statistics for Initiations

This table presents information on the sample of analysts' initial recommendations obtained from I/B/E/S. All recommendations are initial recommendations, and represent the first reported recommendation by both the analyst and brokerage firm in the IBES database for a particular stock. The sample covers the periods from March 31, 1996 until December 31, 1997 and from March 31, 2000 until December 31, 2000.

	Strong Buy	Buy	Hold	Sell
Number of Initiations	4,783	4,889	2,571	174
Number of Firms	2,846	2,991	1,718	162
Number of Analysts	4.55	4.76	5.39	5.40
Number of Initiations by Firm Size				
Size Deciles 9-10	2,090	2,432	1,508	91
Size Deciles 6-8	2,025	1,870	834	55
Size Deciles 1-5	668	587	229	28

Table 3.2

Size-Adjusted Returns for Buy and Strong Buy Initiations

Table 3 presents the size-adjusted returns for 4,783 initial strong buy recommendations and 4,889 initial buy sell-side analysts' recommendations in our sample period. Tests of significance are based on the standard deviation of returns during the post event window.

Relative Day	All Initiations	Strong Buy Initiations	Buy Initiations
-20 to -16	0.482	0.503	0.460
-15 to -11	0.544	0.689	0.402
-10	0.057	0.076	0.039
-9	0.156 ***	0.135 **	0.176 ***
-8	0.111 **	0.091	0.131 *
-7	0.078	0.129 **	0.028
-6	0.075	0.081	0.070
-5	0.153 ***	0.201 ***	0.105
-4	0.050	0.101	0.001
-3	0.109 **	0.151 ***	0.069
-2	0.181 ***	0.247 ***	0.117 *
-1	0.260 ***	0.412***	0.110 *
0	0.798***	1.131***	0.471***
1	0.101 **	0.191 ***	0.012
2	0.082 *	0.117 *	0.047
3	0.132 ***	0.110 *	0.154 **
4	0.066	0.048	0.083
5	-0.045	0.063	-0.151 **
6	0.030	0.132 *	-0.069
7	0.108 **	0.040	0.176 **
8	-0.043	0.029	-0.115
9	-0.001	0.022	-0.025
10	-0.025	-0.098	0.046
11 to 15	0.255	0.450	0.063
16 to 20	-0.017	0.044	-0.077
-5 to +5	1.891***	2.775***	1.022***
-1 to +1	1.159***	1.734***	0.593***

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

Table 3.3

Summary Statistics for Institutional Orders

This table presents summary information on the institutional trading sample from the Plexus Group. The orders in this sample were placed by 120 different institutional Plexus clients during the time period from January1, 1996 until March 31, 1998 and from January 1, 2000 until March 31, 2001. Results are given for both the full Plexus sample and for the sub-sample of orders used in our analysis of initiations.

		Order Size	
	Number of Orders	**Executed Shares**	**Executed Dollar Value**
Total Plexus Sample			
Mean	5,342,987	19,701	805,939
25th Percentile		8,950	305,620
Median		1,900	63,009
75th Percentile		500	17,139
Plexus Orders Around Initiation			
Mean	1,656,405	20,593	981,152
25th Percentile		9,500	378,025
Median		1,800	72,800
75th Percentile		400	19,300
Activity by Size of Institution (30 Clients per Quartile)			
1 – Largest	963,325	26,215	$1,296,144
2	425,810	14,331	$629,112
3	218,904	10,297	$410,217
4 - Smallest	48,366	10,336	$390,689

Table 3.4

Institutional Trading Activity

Table 4 presents measures of Plexus trading activity and net trading activity (normalized by shares outstanding to give values in turnover) around 9,672 strong buy and buy initiations. Tests of significance are based on t-tests using the distribution of the post-event control window.

Relative Day	Share Turnover	Imbalance Turnover	Number of Institutions	Total Turnover	Plexus to Total Volume
-20 to -16	0.048	0.007	1.599	0.933	0.051
-15 to -11	0.048	0.007	1.628	0.941	0.051*
-10	0.052	0.010***	1.630	0.958	0.055
-9	0.048	0.002	1.640**	0.976	0.049
-8	0.050	0.006	1.648**	0.986	0.051
-7	0.052	0.006	1.642**	0.971	0.053
-6	0.048	0.007	1.650***	0.970	0.050
-5	0.050	0.010***	1.647**	0.962	0.052***
-4	0.060***	0.018***	1.656***	0.999**	0.060***
-3	0.059***	0.013***	1.639**	1.024***	0.057***
-2	0.059***	0.011***	1.650***	1.037***	0.057***
-1	0.056***	0.011***	1.673***	1.084***	0.052**
0	0.059***	0.009**	1.674***	1.182***	0.050
1	0.048	0.002	1.652***	0.981	0.049
2	0.046	0.005	1.632	0.932*	0.050
3	0.049	0.007	1.623	0.937	0.052
4	0.050	0.003	1.625	0.954	0.052
5	0.048	0.000*	1.625	0.944	0.051
6	0.051	0.001	1.628	0.966	0.053
7	0.047	0.001	1.634*	0.963	0.049
8	0.047	0.004	1.622	0.945	0.050
9	0.046	0.004	1.628	0.947	0.048
10	0.048	0.004	1.610	0.956	0.050
11 to 15	0.049	0.004	1.633	0.953	0.051
16 to 20	0.049	0.003	1.627	0.963	0.051

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

Table 3.5

Determinants of Pre-Release Buying

Table 5 presents a Logit regression of the determinants of pre-release analyst tipping activity. Tipping is defined as having occurred when the abnormal positive order imbalance is greater than two standard deviations from the non-event mean order imbalance. The non-event period includes days -60 through -20 and the period +20 through +60. Under this definition of tipping there are 1377 tipping pre-release periods and 8,287 no tipping pre-release periods. Data is missing for some of the dependent variables for 8 of the initiations. *Strong Buy* is a dummy variable equal to one if the analysts' initial recommendation is a strong buy. *All-star* is a dummy variable equal to one if the initiating analyst is an *Institutional Investor* All-star analyst. *Top 20 broker* is a dummy variable equal to one if the issuing analysts' brokerage firm is among the top ten brokers as ranked by *Institutional Investor* magazine. *Uncertainty* is the standard deviation across all analysts' earnings forecasts in the month prior to the initiation. *Outstanding recommendation* is the difference between the initiation recommendation and the level of the consensus recommendation in the month prior to the initiation. *Nasdaq* is a dummy variable equal to one if the company is a Nasdaq issue and *Firm size* is the log of the covered firm's market capitalization. Numbers in parentheses below the coefficient estimates are standard errors.

	(1)	**(2)**	**(3)**	**(4)**
Intercept	-8.968***	-8.899***	-9.026***	-8.950***
	(0.285)	(0.285)	(0.286)	(0.287)
Strong Buy	0.105*	0.102*	0.263***	0.211**
	(0.062)	(0.062)	(0.089)	(0.090)
All-star	0.401**	0.409**	0.410**	0.413***
	(0.163)	(0.161)	(0.161)	(0.159)
Top 20 Broker	0.071	0.071	0.061	0.063
	(0.064)	(0.064)	(0.064)	(0.064)
Uncertainty		-0.246***		-0.202**
		(-0.082)		(0.086)
Outstanding Recommendation			0.174**	0.119*
			(0.070)	(0.072)
Nasdaq	0.217***	0.183***	0.180***	0.164**
	(0.064)	(0.065)	(0.066)	(0.066)
Firm size	0.501***	0.507***	0.505***	0.508***
	(0.019)	(0.019)	(0.019)	(0.019)
Pseudo - R^2 %	10.8	10.9	10.9	10.9
-2 × Log Likelihood	7,110.0	7,101.0	7,103.7	7,098.2

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

Table 3.6

Distribution of Abnormal Buying Across Brokerage Firms

This table analyzes the distribution of tipping (abnormal buying) across brokerage firms. For each brokerage firm associated with the initiations in our sample, we calculate the proportion of initiations from that brokerage firm that have a positive order imbalance during the five days prior to the initiation that is greater than two standard deviations from the non-event mean order imbalance. This table presents a chi-square test of the equality of proportions across brokerage firms. We also calculate the likelihood of observing at least the given brokerage firm's proportion assuming that abnormal buying is randomly distributed across brokerage firms. The table presents the number of firms, and proportion of firms, for which the probability is less than a given cutoff. The analysis is performed for subsets of firms based on the degree of initiation activity, measured by the number of initiations from the brokerage firm.

		Minimum Number of Initiations for Inclusion in Test Group		
		2	**10**	**100**
Number of Brokerage Firms in Test Group		258	165	28
Number of Initiations		9197	8736	4341
Proportion of Initiations with Abnormal Buying (%)		14.9%	15.2%	15.7%
Chi-Square Test of Equality of Proportions		361***	270***	65***
Distributions of Abnormal Buying				
5% Cutoff	*Number of Brokerages*	31	22	4
	Percentage of Test Group	12%	13%	14%
10% Cutoff	*Number of Brokerages*	48	32	6
	Percentage of Test Group	18%	19%	21%
20% Cutoff	*Number of Brokerages*	71	45	11
	Percentage of Test Group	26%	27%	40%

*** denotes significance at the 1% level

Table 3.7

Trading Profits Around Buy and Strong Buy Initiations

This table calculates the trading profits of early institutional traders around buy and strong buy analysts' initiations. The trading period specifies the dates during which institutional trading is analyzed. All institutional trades are recorded using actual execution prices as reported by Plexus. Ending day specifies the day on which we close out the position of the institution based on closing prices as reported by CRSP.

		Ending Day			
Trading Period		**Day 0**	**Day 5**	**Day 10**	**Day 30**
Panel A. Profits for all institutional traders around buy and strong buy initiations					
[-5,-1]	Mean	0.35%	0.40%	0.36%	0.75%
	Median	(0.02%)	(0.10%)	(0.11%)	(0.25%)
	Standard error	0.16%	0.17%	0.19%	0.25%
	Skewness	-0.48	-0.31	-0.61	-1.52
[-5, 0]	Mean	0.42%	0.51%	0.48%	0.92%
	Median	(0.01%)	(0.07%)	(0.09%)	(0.26%)
	Standard error	0.15%	0.17%	0.19%	0.24%
	Skewness	1.45	1.20	0.60	-0.14
Panel B. Profits for buying institutions around analysts' buy and strong buy initiations					
[-5,-1]	Mean	3.5%	3.8%	3.9%	5.4%
	Median	(1.1%)	(1.8%)	(2.4%)	(4.8%)
	Standard error	0.20%	0.23%	0.26%	0.38%
	Skewness	4.76	3.31	2.33	4.23
[-5, 0]	Mean	3.3%	3.7%	3.8%	5.3%
	Median	(0.9%)	(1.6%)	(2.2%)	(4.5%)
	Standard error	0.19%	0.23%	0.26%	0.37%
	Skewness	5.66	3.84	2.76	4.27

Table 3.8

Trading Profits Around Buy Strong Buy Initiations

Table 8 examines trading profits of early institutional traders around analysts' strong buy initiations only. The trading period specifies the dates during which institutional trading is analyzed. All institutional trades are recorded using actual execution prices as reported by Plexus. Ending day specifies the day on which we close out the position of the institution based on closing prices as reported by CRSP.

		Ending Day			
Trading Period		**Day 0**	**Day 5**	**Day 10**	**Day 30**
Panel A. Profits for all institutional traders around strong buy initiations					
[-5,-1]	Mean	0.45%	0.47%	0.45%	0.75%
	Median	(0.08%)	(0.14%)	(0.12%)	(0.31%)
	Standard error	0.23%	0.26%	0.29%	0.38%
	Skewness	-1.19	-0.77	-1.14	-0.74
[-5, 0]	Mean	0.34%	0.42%	0.43%	0.79%
	Median	(0.06%)	(0.08%)	(0.08%)	(0.26%)
	Standard error	0.23%	0.25%	0.28%	0.37%
	Skewness	-1.06	-0.54	-0.75	-0.78
Panel B. Profits for buying institutions around strong buy initiations					
[-5,-1]	Mean	4.3%	4.8%	5.0%	6.4%
	Median	(1.4%)	(2.4%)	(3.0%)	(5.6%)
	Standard error	0.27%	0.32%	0.36%	0.50%
	Skewness	7.29	15.69	4.27	2.61
[-5, 0]	Mean	3.6%	4.2%	4.5%	6.0%
	Median	(1.2%)	(2.2%)	(2.9%)	(5.4%)
	Standard error	0.25%	0.31%	0.36%	0.49%
	Skewness	4.47	2.82	2.06	1.51

Table 3.9

Trading Activity for Most Active pre-Release Buyers

Table 9 presents measures of turnover (Panel A) and buying imbalances (Panel B) for the most active pre-release buyers, the remaining buyers, and the most active buyers during a random event window. Column 1 presents the daily turnover or buy imbalance for the most active buyer (the institution who buys the most during the pre-release period, whose buying exceeds twice the standard deviation of that institutions daily trading volume, and who buys at least 1,000 shares). Column 2 presents the average daily turnover or buy imbalance for all the institutions not classified as most active buyers (the remaining institutions). Column 3 presents a t-test of the difference between the active buyers and the remaining institutions. Column 4 presents the average daily turnover of buy imbalance for all the institutions that are classified as most active buyers (same procedure) but around random event periods. Column 5 presents a t-test of difference in mean buy turnover or imbalances for the most active buyer in the initiation sample and the most active buyer in the random event periods. Since the data in the -5 through -1 period is used to define abnormal buying prior to both the initiation and the random event day, statistics for this period are not reported.

		Comparison to Remaining Institutions		**Comparison to Random Event Most Active Buyers**	
Relative Day	**Most Active Buyer**	**Remaining Institutions**	**Difference**	**Random-Event Most Active Buyer**	**Difference**
Panel A: Turnover					
-20 to -16	0.500	0.293	0.206**	0.430	0.070
-15 to -11	0.620	0.290	0.330***	0.414	0.206***
-10	0.724	0.313	0.411***	0.360	0.364***
-9	0.719	0.284	0.435***	0.352	0.367***
-8	0.808	0.295	0.512***	0.375	0.433***
-7	0.836	0.302	0.534***	0.448	0.388***
-6	1.246	0.267	0.979***	0.539	0.707***
0	0.837	0.337	0.500***	0.347	0.490***
1	0.605	0.281	0.324***	0.391	0.213**
2	0.737	0.271	0.465***	0.444	0.292***
3	0.574	0.292	0.282***	0.360	0.214**
4	0.670	0.299	0.371***	0.315	0.354***
5	0.577	0.289	0.288***	0.422	0.155
6	0.621	0.308	0.313***	0.423	0.198**
7	0.806	0.277	0.530***	0.461	0.346***
8	0.508	0.287	0.221**	0.273	0.235***
9	0.464	0.276	0.189**	0.332	0.133
10	0.686	0.287	0.399***	0.336	0.350***
11 to 15	0.514	0.293	0.222**	0.387	0.128
16 to 20	0.528	0.295	0.234**	0.410	0.118

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

Relative Day	Most Active Buyer	Comparison to Remaining Institutions: Remaining Institutions	Comparison to Remaining Institutions: Difference	Comparison to Random Event Most Active Buyers: Random-Event Most Active Buyer	Comparison to Random Event Most Active Buyers: Difference
Panel B: Buy Imbalance					
-20 to -16	0.275	0.040	0.236**	0.202	0.073
-15 to -11	0.459	0.035	0.423***	0.137	0.322***
-10	0.439	0.051	0.388***	0.198	0.242**
-9	0.484	0.001	0.483***	0.070	0.414***
-8	0.576	0.028	0.548***	0.133	0.443***
-7	0.738	0.019	0.719***	0.147	0.591***
-6	1.055	0.014	1.041***	0.138	0.917***
0	0.666	0.034	0.631***	0.174	0.491***
1	0.504	0.002	0.503***	0.187	0.317***
2	0.386	0.024	0.362***	-0.015	0.401***
3	0.235	0.038	0.197*	0.098	0.137
4	0.226	0.016	0.210**	0.078	0.148
5	0.319	-0.009	0.328***	0.052	0.266***
6	0.186	0.002	0.185*	0.167	0.019
7	0.058	0.008	0.051	0.025	0.034
8	0.187	0.019	0.167*	0.075	0.112
9	0.136	0.024	0.112	0.020	0.116
10	0.066	0.026	0.040	0.112	-0.046
11 to 15	0.177	0.022	0.155	0.046	0.131
16 to 20	0.075	0.017	0.057	0.028	0.047

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

Figure 3.1

Institutional Trading Activity around Analysts' Initiations

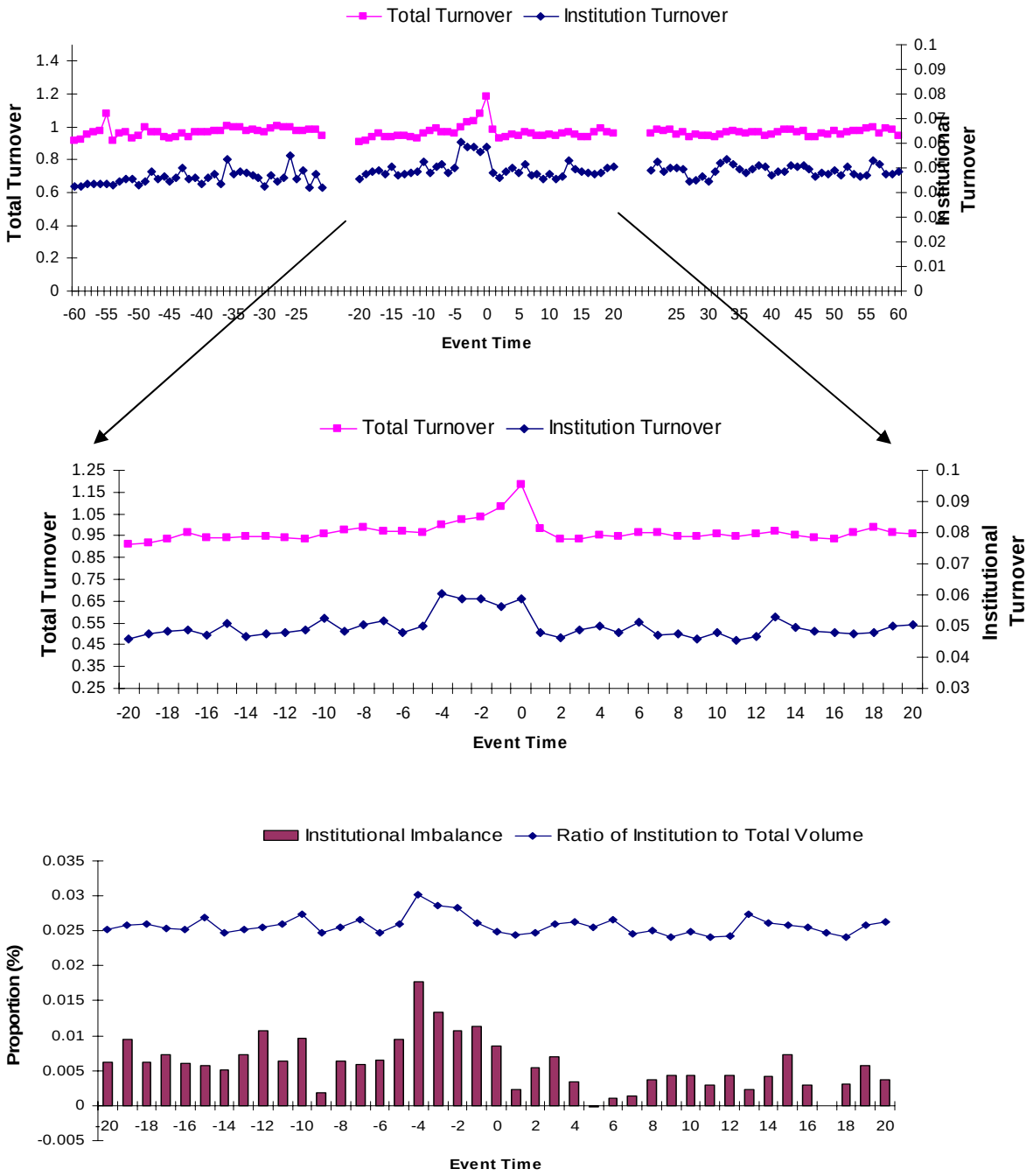

Figure 1 describes institutional trading activity around analysts' initiations. Activity is measured by trading volume relative to shares outstanding (turnover, in percent). The first figure shows total trading activity and institutional trading activity by Plexus clients. The second figure expands the event window from the first figure. The third figure presents the ratio of institutional to total volume (institutional volume is divided by two since it measures both buy and sell sides) and the imbalance in institutional order flow.

CHAPTER 4

ARE LEAD ANALYSTS REALLY OPTIMISTIC?

4.1 Introduction

Finance literature often refers to the empirical 'fact' that analysts employed by lead/co-lead underwriters (affiliated analysts) issue reports that are, on average, more favorable than reports by other (unaffiliated) analysts (Iskoz, 2003). In particular, Michaely and Womack (1999) and Lin and McNichols (1998B) find affiliated analysts are more optimistic than other analysts when issuing buy/sell recommendations in the period immediately following IPOs and SEOs, respectively. We revisit the empirical finding of affiliated analyst optimism during the more recent time period from October 1993 until December 2000. We also investigate affiliated analyst optimism in relation to both buy and sell recommendations, for long-term growth estimates, and for both New York Stock Exchange (NYSE) and Nasdaq listed stocks.

Michaely and Womack (1999) find that mean abnormal returns surrounding affiliated analysts' buy recommendations are 2.7% compared to 4.4% for unaffiliated analysts' buy recommendations. They suggest that affiliated analyst optimism results from a "conflict of interest" that exists with the affiliated analyst. According to the conflict of interest hypothesis, affiliated analysts issue positively biased recommendations in order to help procure fees for the analyst's firm. The finding of significantly different abnormal returns around buy recommendations of affiliated versus unaffiliated analysts supports the conflict of interest hypothesis, and suggests that market participants discount affiliated recommendations.

In contrast, Allen and Faulhaber (1989) suggest that affiliated analysts' recommendations and estimates will be both unbiased and more accurate than other analysts because affiliated analysts have superior information. During the due-diligence process, affiliated analysts have enhanced access to information, and therefore may be more knowledgeable than other analysts in the period immediately following the IPO. If this is the case, we should observe a larger market reaction around affiliated analysts' recommendations.

Our study examines both the level and market impact of affiliated and unaffiliated analysts' reports in order to test these two competing hypotheses. Our analysis makes a number of improvements over prior work. First, our sample covers a larger time period (1993-2000) and avoids selection bias related to analysts selection.[31] Second, Ellis, Michaely, and O'Hara (2000) and Goldstein, Irvine, Kandel, and Wiener (2004) suggest that the magnitude of potential revenues for affiliated analyst firms is very different between Nasdaq and NYSE listed IPOs. We differentiate between these differing market structures. Third, we investigate the market impact of analysts' hold and sell recommendations. Finally, we are the first to investigate the determinants of analysts' recommendations in a multivariate setting.

We test the level of affiliated analysts' optimism by looking at the distribution of analysts' recommendations and by matching affiliated analysts' reports with corresponding unaffiliated analysts' reports. When looking at the total recommendations issued the year following an IPO in our sample, affiliated analysts issue strong buy recommendations 41% of the time compared to unaffiliated analysts who issue strong buy recommendations 39% of the time. In contrast, Michaely and Womack (1999) report that affiliated analysts issue 50% more strong

[31] Previous studies addressing lead analyst optimism for the most part use either the Dow Jones Newswire or Firstcall data to investigate the bias. Dow Jones Newswire self-censors their data by reporting recommendations from only the largest brokers. A preliminary analysis of Firstcall recommendations data during the period from 1994 to 1995 reveals that Firstcall contains only 52% of the analyst recommendations listed in I/B/E/S. This discrepancy diminishes significantly in 1996.

buy recommendations than unaffiliated analysts during the 1990 to 1991 period. When affiliated analysts' recommendations are matched with corresponding unaffiliated analysts' recommendations (to ensure both recommendations are issued for the same firm and in similar information environments), we find no statistically reliable difference between the two groups. These results contrast Lin and McNichols (1998A) who use the same matching methodology to study affiliated analysts' optimism during the 1989 to 1994 time period. Interestingly, only when limiting our sample to NYSE listed firms do we find any evidence that affiliated analysts' recommendations are more optimistic than those of unaffiliated analysts.

Our investigation of the long-term growth estimates confirms the findings of affiliated analysts' optimism reported in previous studies. Specifically, when matching affiliated and unaffiliated long-term growth estimates, we find that affiliated analysts issue mean long-term growth estimates of 32.55% compared to mean estimates of 31.48% for other analysts. The difference between these two groups of analysts is 1.07%, and is statistically significant at the 5% level. Affiliated analyst optimism with respect to long-term growth estimates is present when looking at our entire sample, and when segregating the sample by market structure. These results are consistent with Dechow, Hutton, and Sloan (1999) and Lin and McNichols (1998B).

Analysis of abnormal returns around analysts' recommendations allows us to test the competing conflict of interest and superior information hypotheses. Once again, our results differ from Michaely and Womack (1999). We measure size-adjusted abnormal returns in the three-day window surrounding analysts' strong buy and buy recommendations and find no statistically reliable evidence that market participants differentiate between the recommendations of affiliated and unaffiliated analysts.

One possible reason our results differ from prior studies may be that analyst behavior has changed over time. In fact, we find that the market reaction around unaffiliated analysts' strong buy recommendations is more pronounced than the market reaction to affiliated analysts' strong buy recommendations during the 1994 sample year (2.05% versus 0.97%). Thus, analyst bias may have characterized the early 1990s, but has dissipated since then.

We also examine abnormal returns around analysts' hold and sell recommendations. Findings indicate that affiliated analysts' hold and sell recommendations produce market reactions nearly twice as large as the hold and sell recommendations of unaffiliated analysts (-11.66% versus –6.90%). The finding that the market impact is more negative around affiliated analysts' hold and sell recommendations suggests that market participants' view affiliated analysts as having superior information about the IPO when future prospects are negative. These results are consistent with the superior information hypothesis.

We implement two robustness tests to examine the validity of our findings. First, we examine the effect of analyst affiliation on abnormal returns in a pooled cross-sectional regression to control for other factors that may affect the magnitude of abnormal returns surrounding the issuance of an analyst report. Independent variables in the regression control for factors that previous literature shows to affect the magnitude of abnormal returns around analysts' recommendations. Consistent with univariate results, we find that an analysts' affiliation is not significantly related to abnormal returns for strong buy and buy and significantly related for hold and sell.

We also investigate the determinants of analysts' recommendations. We find that recommendations are significantly more positive for smaller firms, when the previous recommendations were positive, if the analyst is not an *Institutional Investor* All-Star, and for

larger cumulative returns from the IPO offer date. We fail to find any relationship between the analysts' affiliation and the quality of the recommendation.

The paper will proceed as follows. In the next section we review the relevant literature. In Section II we discuss the sample, data, and univariate findings. Section III investigates abnormal returns surrounding recommendations. We present robustness tests in Section IV, which look at abnormal returns in a multivariate setting and the determinants of analysts' recommendations. Section V concludes the paper.

4.2 Literature review

Sell-side analysts generally issue the following three reports: 1) buy/sell recommendations, 2) quarterly and annual earnings forecasts, and 3) long-term earnings growth forecasts (Dechow, Hutton, and Sloan, 1999). Each reflects future fundamentals, and future fundamentals determine a stock's value. Several recent studies examine the behavior of these analyst reports without distinguishing between the characteristics of individual analysts. Lim (2000) reports that analysts, as a whole, show a positive bias in their short-term earnings predictions. This may be done to keep open lines of communication with management. In fact, pessimistic analysts are likely to lose favor with a company's management (Dugar and Nathan, 1995; Francis and Philbrick, 1993). In contrast, Matsumoto (2002) finds that analysts are pessimistic in their short-term earnings estimates and attributes this to management guidance in order to avoid negative earnings surprises.

Other recent studies investigate biases that may arise among different groups of analysts. The majority of this literature concentrates on the group of analysts whose firm also provides investment banking services. Michaely and Womack (1999) document that these affiliated analysts issue 50% more buy recommendations in the 60 days following an IPO during the

period from 1990 to 1991. They also find that three-day size-adjusted returns centered around the announcement of analysts' buy and strong buy recommendations are significantly more positive for unaffiliated versus affiliated analysts (4.4% vs. 2.7%). This result is consistent with investors discounting the optimism of lead underwriter analysts. Lin and McNichols (1998A, 1998B) use an alternative approach when measuring lead optimism. By pairing lead analyst recommendations with the closest non-lead recommendations, they find that lead analysts are significantly more optimistic than non-lead analysts after both IPOs and SEOs. Similar results are found in research looking at long-term growth estimates. Dechow, Hutton, and Sloan (1999) and Lin and McNichols (1998B) find affiliated analysts are more optimistic with respect to long-term growth estimates than other analysts. These studies suggest that affiliated analyst optimism is likely the result of a conflict of interest.

Analyst compensation largely depends on 1) perceived reputation, and 2) his or her contributions to the revenues and profits of the firm. Perceived reputation is often associated with the success of recommendations, being elected to *Institutional Investor's* All-American Research Team, and evaluations from the firm's sales force. Contributions to the profits of the firm arise from sources including trading volume (brokerage commissions) that may be generated by recommendations, trading profits from market making activities, and the ability to attract and retain investment banking clients (i.e. underwriting profits).[32]

Investment banking revenues represent substantial profits for brokerage firms. Thus there may be pressure (direct or indirect) on affiliated analysts to portray these companies in a positive light. Studies examining quarterly and annual earnings estimates of affiliated versus unaffiliated analysts do not, in general, find any difference between the two groups (Lin and McNichols,

[32] Irvine (2004) discusses how trading commission revenue affects analyst compensation.

1998A, 1998B).[33] The most probable explanation for these results is that short-term forecasts are the easiest way to measure an analysts' forecast accuracy, and as such, the accuracy of these short-term estimates is often a prominent factor in an analyst's election to the *Institutional Investor* All-American Research Team (Stickel, 1992; Hansen and Sarin, 1998; Lin and McNichols, 1998B). Thus, reputation forces are strongest in relation to short-term estimates. The accuracy of analysts' buy and sell recommendations and long-term growth estimates are much harder to measure and less likely to affect reputation. Thus, these are the reports that are more likely to be biased since reputation provides less of a countervailing pressure.

Buy/sell recommendations may be positively biased because a buy recommendation will generate more commission revenues and market making profits than a sell recommendation. Buy recommendations allow brokers to sell a certain stock to any of their clients, whereas sell recommendations limit the number of transactions to those who already own the stock (assuming that short sale constraints exist). Buy recommendations also provide more market maker profits and trading commissions for the analysts' firm due to increased trading (Michaely and Womack, 1999).

Previous literature suggests that the magnitude of these fees is very different for underwriters who bring firms public on the Nasdaq as compared to underwriters who bring firms public on the NYSE. On the Nasdaq market, the lead underwriter always becomes the most active market maker in an issue (Ellis, Michaely, and O'Hara, 2000).[34] On average, the lead underwriter handles 60% of trading in the first few days, and 50% of total trading volume in the

[33] Conflicting results by Dugar and Nathan (1995) find that affiliated analysts' annual earnings forecasts are, on average, 5.5% higher than those of unaffiliated analysts when a non-underwriting business relationship exists between a stock and the analysts' firm. Also, Irvine, Nathan and Simko (1998) find that analysts tend to be more optimistic in their two-year earnings estimates for firms that were recently added to the affiliated mutual fund family.

[34] Ellis, Michaely, and O'Hara (2000) use a sample of 306 Nasdaq firms from September 1996 to July 1997 in their paper. The results are derived from that sample.

first few months. Alternatively, no explicit market making revenues are present for lead underwriters bringing companies public on the NYSE. This difference is due to differing market structures, where on the NYSE, specialists perform most market making duties. Regarding trading commissions, Goldstein et. al. (2003) finds a large differential in the commissions charged to institutional traders for NYSE versus Nasdaq stocks. Their findings suggest that only roughly 25% of institutional trades on the Nasdaq are charged explicit trading commissions, whereas over 90% of institutional trades on NYSE stocks are charged commissions. Therefore, trading commissions represent greater potential profits for underwriters bringing a company public on the NYSE.

The variation of underwriting revenues according to IPO listing suggests there may be differences in biases across listing venues. Previous studies could not differentiate between Nasdaq and NYSE listed IPOs since, prior to 1990, most IPO activity was restricted to the Nasdaq markets. Recently, however, we observe a substantial increase in the number of IPOs going public on the NYSE.

In contrast to conflicts of interest, Allen and Faulhaber (1989) suggest that affiliated analysts will be both unbiased and more accurate than other analysts because of the informational advantage they possess. This informational advantage arises during the due diligence process of the underwriter, during which affiliated analysts are privy to information that is not disseminated to the entire market. Information asymmetry is highest in the period immediately following the offering date of the IPO. If this "superior information effect" exists, then one should observe a larger price response to the recommendations of affiliated analysts versus those of unaffiliated analysts. We are not aware of any empirical studies that document such an effect.

Recent work by Bradley, Jordan, and Ritter (2003) provides a different explanation for the cross-sectional variation of abnormal returns around analysts' recommendations. Consistent with our results, they find that abnormal returns around the quiet period do not differ between lead and non-lead analysts.[35] Furthermore, their findings suggest that the magnitude of abnormal returns is dependent on the number of analysts initiating coverage, and not the identity of the initiating analyst.

4.3 Data

We obtain data for Initial Public offerings (IPO) from the Securities Data Company (SDC) database. From this database we retrieve all IPOs that occur from October 1, 1993 to December 31, 2000. According to SDC there are 3,902 initial common stock offerings during this time. Consistent with prior IPO research we exclude all REITs, ADRs, closed-end mutual funds, depository shares, spinnoffs, unit issues, and reverse leveraged buyouts. We also exclude all IPOs with a market capitalization below $5 million (see Michaely and Womack 1999) and those firms without corresponding data in the Center for Research and Securities Prices (CRSP) database. These filters leave us with 2,525 IPOs.

Table I provides descriptive statistics of our sample firms in terms of the offer year, market exchange, market capitalization, and lead underwriter. Consistent with prior studies, the majority of IPOs (83%) occur on the Nasdaq market. The number of IPOs varies significantly in any given calander year ranging from 222 in 1998 to 507 in 1996. We also find that underwriting activities are concentrated, with the largest twelve underwriters handling 48% of all IPO offerings in our sample period.

[35] U.S. Securities and Exchange Commission (SEC) regulations generally prohibit firms and their underwriters from publishing opinions for 25 calender days after the completion of the IPO. This period is referred to as the "quiet period".

Our investigation of analysts' recommendations and long-term growth estimates relies on the Institutional Brokers Estimate System (I/B/E/S), which provides investment professionals with a global database of analysts' earnings estimates and recommendations for publicly traded corporations worldwide. I/B/E/S collects earnings estimates from over 5,000 analysts who are associated with over 400 research firms worldwide beginning in October 1993.

I/B/E/S standardizes analysts' recommendations from all brokerage firms and assigns each a recommendation value. If a stock is rated a strong buy it is given a recommendation value of 1, a buy rating gets a recommendation value of 2, a hold rating gets a recommendation value of 3, a sell rating gets a recommendation value of 4, and a strong sell gets a recommendation value of 5.

We collect all recommendations and long-term growth estimates made for 365 days after each IPO.[36] The distribution of recommendations and long-term growth estimates is presented in Table 2. Panel A shows that affiliated analysts issue strong buy recommendations 41% of the time compared to unaffiliated analysts who issue strong buy recommendations 39% of the time. The results are similar when comparing hold/sell recommendations where our findings indicate that affiliated analysts issue hold/sell recommendations 11% of the time compared to 14% by unaffiliated analysts. We also look at the aggregate mean recommendations in the three-day period surrounding the quiet period in order to compare these to the results of Bradley, Jordan, and Ritter (2003). Consistent with Bradley, et. al. we find that affiliated analysts produce mean recommendations of 1.56 compared to unaffiliated analysts mean recommendations of 1.62.

The distribution of long-term growth estimates is presented in Table 2, Panel B. This distribution is also similar for affiliated and unaffiliated analysts. We find 669 (30%) of

[36] We repeat our analysis altering our time horizon to include only analyst recommendations made within six months, and within sixty days. Results do not change when altering time periods.

affiliated analysts' long-term growth estimates are between 20% and 30% compared to 2,002 (30%) of unaffiliated analysts' estimates. This parity also holds for more optimistic long-term growth estimates between 40% and 50%, where we find 282 (13%) affiliated analysts' estimates and 882 (13%) unaffiliated analysts' estimates. Although the distribution of total recommendations and long-term growth estimates are very similar between the two classes of analysts, we demand a more exact statistical test in order to compare the two groups.

4.4 Univariate results

We measure lead analyst optimism following Lin and McNichols (1998B). For all IPOs receiving affiliated analysts' recommendations, we require at least one unaffiliated analyst to make a matching recommendation within sixty days of the affiliated analyst.[37] When more than one affiliated analyst recommendation is made in the year after the IPO, the forecast or recommendation made closest to the offering date is included in the sample. Similarly, when more than one unaffiliated recommendation is made within sixty days of the affiliated recommendation, the unaffiliated recommendation issued most closely to the affiliated recommendation is chosen.

This research design allows us to compare affiliated analysts' recommendations with other analysts' recommendations under similar information environments, and allows us to control for the differences in characteristics of firms that affiliated versus unaffiliated analysts choose to cover. Results from the matching methodology are presented in Table 3, panel A. For the entire sample of IPOs, we find 1,818 (72%) that fit our matching criteria. In this sample affiliated analysts produced mean recommendations of 1.630 compared to mean unaffiliated recommendations of 1.637. The difference is not statistically significant. Similar results are

[37] We repeat this methodology requiring a matching non-lead analyst to make a recommendation within thirty days of the lead/co-lead analyst. All results are quantitatively similar.

found when restricting the sample to only Nasdaq IPOs, where affiliated analysts issue mean recommendations of 1.651 compared to 1.633 for unaffiliated analysts. Only on the NYSE do we find any evidence of lead analyst optimism in buy/sell recommendations. Mean affiliated analysts' recommendations on the NYSE are 1.503 compared to 1.662 for unaffiliated analysts. This difference is statistically significant at the 1% level.

We repeat the matching methodology for long-term growth estimates. We find 885 pairs of long-term growth estimates that meet our matching criteria. Results in Table 3, Panel B indicate that lead analysts produce mean long-term growth estimates of 32.55% compared to 31.48% by non-lead. We test whether the mean and median differences between pairs of affiliated and unaffiliated analysts' forecasts are significantly different from zero. Table 3, Panel B presents results of these tests. We find that affiliated analysts are more optimistic in their long-term growth estimates, and that this optimism is present on both the NYSE and Nasdaq markets. The magnitude of this optimism is 1.195% for Nasdaq IPOs and 1.08% for NYSE IPOs. These results are consistent both in significance and magnitude to those reported by Lin and McNichols (1998B). Thus, our univariate results suggest that lead analyst optimism is limited to long-term growth estimates, and is only present on the NYSE with respect to analysts' recommendations.

4.5 Abnormal Returns

According to the conflict of interest hypothesis, if investors perceive that affiliated analysts issue optimistic recommendations following IPOs, one should observe a larger market reaction around the release of unaffiliated analysts' recommendations than around affiliated analysts' recommendations. If the superior information hypothesis is correct, then market

participants believe affiliated analysts have superior information about the future prospects of the company, and we should observe the opposite effect.

In calculating size-adjusted returns, we use the entire sample of analyst recommendations made within 365 days of the initial public offering. The cumulative size-adjusted excess return is defined as the buy and hold return on the stock minus the relevant CRSP market capitalization decile portfolio:

$$CAR_{i,atob} = \left[\sum_{t=a}^{b} (r_{i,t} - r_{size,t}) \right]$$

where $r_{i,t}$ is the raw return on stock i on day t, and $r_{size,\,t}$ is the matching return on the appropriate CRSP market capitalization decile portfolio. We use t=-1, 0, +1, where 0 is the recommendation day.

T-statistics are computed to compare abnormal returns around affiliated analyst recommendations and unaffiliated analyst recommendations. We use Satterwaite t-statistics to account for differing sample sizes and unequal variance between the two groups.

Size adjusted abnormal return results are presented in table 4. For strong buy and buy recommendations we do not find any difference between the two groups of analysts. The mean three-day size-adjusted abnormal return around strong buy recommendations is 2.11% and 2.59% for affiliated and unaffiliated analysts respectively. Similarly, the mean abnormal return around buy recommendations is –0.01% for affiliated analysts and –0.01% for unaffiliated analysts. The difference between these two groups is not statistically significant. These results are quantitatively similar when limiting the sample to Nasdaq IPOs. The only evidence of differing market reactions occurs on the NYSE, where univariate tests show that the level of affiliated analysts' recommendations is more optimistic than the recommendations of other

analysts. Abnormal returns around buy recommendations for affiliated analysts are –1.18% compared to 0.23% for unaffiliated analysts. This difference is statistically significant at the 5% level.

We also look at abnormal returns around hold and sell recommendations. We find a large difference between the abnormal returns around affiliated and unaffiliated analysts. We find that size-adjusted abnormal returns are –11.66% around affiliated analysts' hold/sell recommendations compared to –6.90% around unaffiliated analysts recommendations. This difference is statistically significant at the 1% level. Results are consistent when limiting the sample to Nasdaq IPOs, where the difference between affiliated and unaffiliated abnormal returns is -4.07%. These results support the superior information hypothesis, where investors believe affiliated analysts have superior information concerning the future prospects of the firm when that information is negative.

Event study results comparing abnormal returns around strong buy and buy recommendations differ from Michaely and Womack (1999). One possible reason our results differ from prior studies may be that analyst behavior has changed over time. We divide the sample by recommendation year and report appropriate abnormal return statistics in Table 5. Our analysis begins in 1994 due to the small number of observations that exist in the 1993 sample. We find only one year where abnormal returns around strong buy recommendations differ significantly between affiliated and unaffiliated analysts. In 1994, size-adjusted abnormal returns around affiliated analysts' strong buy recommendations are 0.97% compared to 2.05% around unaffiliated recommendations. The difference is statistically significant at the 10% level. Results support Michaely and Womack (1999), and suggest that analyst behavior has changed over time.

4.6 Robustness Tests

In this section we perform robustness tests to ensure the validity of our event study analysis. We employ a pooled cross-sectional regression to investigate analyst affiliation. We control for factors that previous literature suggests affect the magnitude of abnormal returns. Event study results show that analyst affiliation is not significantly related to abnormal returns around strong buy and buy recommendations, but affiliation matters for hold and sell recommendations. Consistent with our previous findings, we run separate regressions as follows: 1) strong buy and buy recommendations, and 2) hold and sell recommendations. We describe independent regression variables below.

We rely on previous studies for our choice of recommendation specific variables. Ex-ante we expect that strong buy (sell) recommendations have greater abnormal returns than buy (hold) recommendations (Barber, Lehavy, McNichols and Trueman, 2001). "Sbdum" is a dummy variable set to 1 if the recommendation is a strong buy, and 0 otherwise. The variable "allstar" is a dummy variable set to 1 if the recommending analyst is an *Institutional Investor* All-American analyst, and 0 if he or she is not. Stickel (1992) finds that recommendations by *II* All-Americans produce larger abnormal returns than recommendations by other analysts.

Other independent variables reflect the information environment surrounding analyst recommendations. "Time" is the number of calendar days between the IPO offer date and the recommendation. Market participants place a higher value on recommendations made in environments of high information asymmetry, which is highest in the period immediately following the IPO. Ex-ante we expect the coefficient on this variable to be negative. "Firstrec" is a dummy variable set to 1 if the recommendation is the first ever to be issued for a particular IPO, and 0 otherwise. We expect that the first recommendation will convey a greater amount of

new information to market participants, and therefore will be positively related to the magnitude of abnormal returns.

Other independent variables include the natural log of the IPO's market value of equity, the recommendation relative to the existing level of recommendations, and the underpricing of the IPO (Michaely and Womack, 1999). We expect that the greater the difference between an analyst's recommendation and the existing level of recommendations, the larger the abnormal return. Underpricing is the percentage change between the IPO offer price and the CRSP reported closing price at the end of the first day of trading. We have no prior concerning expected sign or magnitude for coefficients on underpricing or the log of market value.

We also control for confounding events during the event window. "Earn" is a dummy variable set to 1 if there is an earnings announcement during the event window, and 0 otherwise. We include dummy variables to control for other analysts' recommendations issued during the same three-day event window (Bradley, Jordan and Ritter, 2003). "Other1" is a dummy variable set to 1 if one other analyst issues a recommendation during the event window, and 0 otherwise. "Other2" is a dummy set to 1 if two other analysts issue recommendations during the event widow, "other3" controls for three other analysts issuing recommendations during the event window, and "other4" controls for four or more other analysts issuing recommendations during the event window. Bradley, et. al. suggest that the magnitude of abnormal returns is dependent on the number of analysts issuing recommendations, and not the affiliation of the analyst. We expect the coefficient on "other1", "other2", "other3", and "other4" to be positively related to the magnitude of abnormal returns. Furthermore, we expect coefficients to be increasing in magnitude the greater the number of other analysts issuing recommendations in the event window.

The independent variable of interest is analyst affiliation. "Affil" is a dummy variable set to 1 if the analyst is employed by the lead or co-lead underwriter, and 0 otherwise. The conflict of interest hypothesis predicts that analyst affiliation will be negatively related to abnormal returns, indicating that market participants discount analyst optimism. Alternatively, the superior information hypothesis predicts a positive relationship. Our regression specification is as follows:

$$CAR = \alpha + \beta_1 time + \beta_2 \ln size + \beta_3 affil + \beta_4 sbdum + \beta_5 underprc + \beta_6 earn + \beta_7 firstrec + \beta_8 allstar + \beta_9 prev + \beta_{10} other1 + \beta_{11} other2 + \beta_{12} other3 + \beta_{13} other4 + \varepsilon$$

The variables in the regression are defined as follows:

CAR – the three-day size-adjusted cumulative abnormal return around the analyst's recommendation.

time – time in calendar days between the IPO offer date and the analyst's recommendation.

lnsize – natural log of the IPOs market value

affil – dummy variable set to 1 if the analyst is affiliated with the lead/co-lead underwriter

sbdum – dummy variable set to 1 if the recommendation is a strong buy

underprc- the IPO underpricing measured as the difference between the offer price and the price at the end of the first day of trading.

earn – dummy variable set to 1 if there is an earnings announcement in the three day window surrounding an analysts' recommendation.

allstar- dummy variable set to 1 if the analysts issuing the recommendation is an *II* all-star.

prev- the difference between the recommendation and the average of existing recommendations.

other1- dummy variable set to 1 if one other analyst issues a recommendation in the same three day event window.

other2- dummy variable set to 1 if two other analysts issue a recommendation in the same three day event window.

other3- dummy variable set to 1 if three other analysts issue a recommendation in the same three day event window.

other4- dummy variable set to 1 if four or more other analysts issue a recommendation in the same three day event window.

Regression results are presented in table 6. The first regression includes 11,932 buy and strong buy recommendations. Consistent with ex-ante predictions, coefficients on "time" and "prev" are negative and significant. Larger abnormal returns are associated with recommendations made closer to the IPO offer date, and recommendations that differ from the existing level of analyst recommendations. Table 5 also shows positive and significant coefficients on variables, "sbdum", "allstar", "other1", "other2", "other3", and "other4". Results for "sbdum" confirm our prior that strong buy recommendations produce larger abnormal returns than buy recommendations. Recommendations by all-star analysts are associated with larger abnormal returns than recommendations from other analysts. Consistent with Bradley, Jordan, and Ritter (2003), our regression shows that the magnitude of abnormal returns is significantly related to the number of other analysts issuing recommendations in the same event window. The magnitude of the coefficients increases, as expected, from "other1" to "other2", and from

"other2" to "other3". Contrary to expectations, the regression shows a slight decrease in the magnitude of coefficients from "other3" to "other4".

We do not find that the first recommendation or the existence of an earnings announcement during the same event window affects abnormal returns. Other variables that are unrelated to abnormal returns include the log of market equity and IPO underpricing. These results are consistent with those reported by Michaely and Womack (1999).

The key variable of interest, "affil", is not significant in this multivariate setting. Results are consistent with event study findings presented in Table 3. Thus, even after controlling for other factors, the market reaction around affiliated versus unaffiliated analysts buy and strong buy recommendations do not appear to differ.

The second regression presented in table 6 includes 1,829 hold and sell recommendations. The variable "selldum" replaces the strong buy dummy variable in the first regression, and is set to 1 if the recommendation is a sell or strong sell, and 0 otherwise. Ex-ante expectations for the predicted sign of coefficients are the exact opposite of the first regression. For example, we expect the sign on the coefficient for "allstar" to be negative and significant, since sell recommendations from All-American analysts should result in a larger negative abnormal returns than sell recommendations from other analysts.

Consistent with our predictions, the coefficients for variables "other1", "other2", "other3", and "other4" are negative and significant. The presence of other analysts issuing recommendations in the same event window is significantly related to abnormal returns. Similar to the first regression, the magnitude of coefficients increases from "other1" to "other2", and from "other2" to "other3". Again we find that the magnitude of coefficients decreases from "other3" to "other4".

We find no relationship between abnormal returns and variables “selldum”, “allstar”, or “prev”. These results differ from findings in the first regression. Also different from the first regression, we find the variables: “lnsize”, “underprc”, and “earn” are significantly related to the magnitude of abnormal returns. We have no ex=ante expectation for the sign or magnitude of these coefficients.

The most important change concerns the relationship between analyst affiliation and abnormal returns. The coefficient on “affil” is significant and negative. After controlling for other factors, abnormal returns are significantly more negative around affiliated analysts’ hold and sell recommendations versus those of other analysts. This finding supports our contention that market participants view affiliated analysts as having superior information with respect to negative future prospects for a company.

Finally, we investigate the determinants of analyst recommendations using a multinomial logit regression. The dependent variable is the analyst’s recommendation, where 1 represents a strong buy, 2 is a buy, 3 is a hold, 4 is a sell, and 5 is a strong sell. We choose independent variables to reflect firm and analyst specific factors and proxy for the market information environment. We include independent variables “time”, “lnsize”, “affil”, “underprc”, “allstar”, “earn”, and “firstrec” (see above). We also include the variable “avgrec”, which is the mean of all recommendations issued before the analyst issues his or her recommendation. Welch (2000) finds evidence that security analysts herd and follow the recommendations of analysts submitting earlier reports. We expect this variable is positively related to the level of analysts’ recommendations. We also include the cumulative return (cumret) for the IPO measured from the offer date until the day before the recommendation. We

expect that better performing firms receive higher recommendations, and therefore the coefficient on this variable will be positive and significant.

Results from the logit regression are presented in table 7. Coefficient estimates represent the average of four iterations of the logit regression, while separate intercept values are presented for each iteration. Coefficients on "time", "lnsize", and "allstar" are all negative and significant. Consistent with our priors, analysts are more optimistic when recommendations are issued closer to the end of the quiet period, and when issuing recommendations for smaller firms. All-star analysts issue less optimistic recommendations than other analysts. Table 7 also shows that "earn" is negatively related to the level of analyst recommendations. We have no ex-ante expectation for the sign or magnitude of this coefficient.

The coefficients for "firstrec" and "cumret" are both positive and significant. Results are consistent with ex-ante predictions, where the first recommendation issued is more positive than later recommendations, and the level of recommendations is significantly related to the cumulative return of the IPO. We find that "avgrec" is significantly related to the level of analyst recommendations, however, the sign is inconsistent with ex-ante expectations.

The second logit specification includes "nrecs", which is the total number of recommendations issued before an analyst issues his or her recommendation. We have no prior as to the expected sign and magnitude of the coefficient on this variable. Finally, the third logit specification includes an interaction term (time*underprc). We hypothesize that underpricing is related to recommendation levels the closer the recommendation is made to the offer date. "Underprc" is not significantly related to recommendations in the first two logit specifications. When including the interaction term, both underpricing and underprc*time become significant.

The key variable of interest continues to be the analyst affiliation. We find no relationship between analyst affiliation and the recommendation level. This result holds for all three regression specifications, and confirms previous findings.

4.7 Conclusion

In this paper we revisit affiliated analyst optimism during the more recent period from 1993 to 2000. Specifically, we investigate analyst optimism in relation to recommendations, long-term growth estimates, and for NYSE and Nasdaq listed IPOs. Consistent with previous studies we find systematic evidence of affiliated analyst optimism with respect to long-term growth estimates. This apparent optimism is present for both NYSE and Nasdaq listed IPOs. However, we find no evidence of optimism in regards buy/sell recommendations. We match affiliated analyst recommendations with corresponding unaffiliated analyst recommendations and find affiliated analysts produce mean recommendations of 1.63 compared to mean unaffiliated analysts recommendations of 1.637. When separating the sample by exchange, we find similar results for the Nasdaq sample. Only on the NYSE do we find any evidence of lead analyst optimism in relation to recommendations.

Analysis of abnormal returns surrounding recommendations allows us to test the competing conflict of interest and superior information hypotheses. We find that three-day size-adjusted abnormal returns do not differ between affiliated and unaffiliated analysts around strong buy and buy recommendations. Specifically, abnormal returns around strong buy recommendations are 2.11% and 2.59% for affiliated and unaffiliated analysts respectively. When separating the sample by recommendation year, we find that abnormal returns around unaffiliated analysts strong buy recommendations are twice as great as those around affiliated

analsyts' recommendations during the year 1994. Results support Michaely and Womack (1999) and suggest that analyst behavior has changed over time.

Extending the breadth of previous research, we investigate abnormal returns around analysts' hold and sell recommendations. Market reactions are approximately twice as large for affiliated analysts compared to unaffiliated analysts (-11.90% versus –6.90%). These results support the superior information hypothesis, and suggest that affiliated analysts have superior information about the firm when that information is negative.

We implement robustness tests to ensure the validity of univariate findings. Cross-sectional regressions for strong buy and buy recommendations show that variables including: the time since the IPO offer date, the recommendation being a strong buy, the analyst being an *Institutional Investor* All-star, the difference from previous recommendations, and the number of other analysts issuing recommendations during the event window are all significantly related to abnormal returns. The key variable of interest, analyst affiliation, is not related to the magnitude of abnormal returns in a multivariate setting. The second regression for hold and sell recommendations shows that the number of analysts submitting recommendations during the event window is significantly related to abnormal returns. We find that analysts' affiliation is significantly related to the magnitude of abnormal returns around hold and sell recommendations. All results are consistent with univariate event study findings. These results may help bridge the gap between previous empirical findings and the more recent results of Bradley, Jordan and Ritter (2003).

Our final robustness test analyzes the determinants of analysts' recommendations in a multinomial logit regression. Consistent with previous tests we find no relationship between analyst affiliation and the level of recommendations issued. We find that analyst

recommendation levels are significantly related to firm and analyst specific factors including the log of market equity, the cumulative return of the firm since going public, and the analyst being an *II* All-star. Other market environment factors found to be related to the level of analysts' recommendations include: time since the IPO offer date, the existence of an earnings announcement in the event window surrounding, the recommendation being the firms ever made for a particular stock, and the average of other recommendations issued for the same stock.

Table 4.1

Summary Statistics for IPOs

Table 1 presents the summary statistics for our sample of 2,525 NYSE and NASDAQ IPOs. Panel A gives the number of IPOs occurring in each sample year. Panel B shows the distribution of sample IPOs by market capitalization. Panel C lists the top 12 underwriters during our sample period , and the corresponding number of IPOs underwritten.

	All	Nasdaq	NYSE
Panel A: Yearly Statistics for IPO Sample			
1993	120	101	19
1994	305	247	58
1995	317	272	45
1996	507	425	82
1997	357	281	76
1998	222	165	57
1999	392	352	40
2000	305	284	21
Panel B: Size Statistics for IPO Sample			
Under $50 million	326	291	35
$50 mill. - $100 million	490	450	40
$100 mill. - $200 million	578	515	63
$200 mill. - $400 million	483	397	86
Greater than $400 mill.	648	474	174
Panel C: Largest Underwriters in Sample			
Goldman	181	132	49
CS-First Boston	134	106	28
DLJ	127	87	40
Merrill	120	58	62
Hambrecht	98	97	1
Alex-Brown	96	88	8
MSDW	89	62	27
Lehman	88	79	9
Morgan Stanley	76	54	22
Montgomery	69	67	2
Robertson	68	66	2
Bear	61	50	11

Table 4.2

Distribution of Recommendations and Long-Term Growth Estimates

Table 2 presents summary statistics for the distribution of affiliated and unaffiliated analysts' recommendations and long-term growth estimates around both Nasdaq and NYSE IPOs during the period from 1993 to 2000. Panel A presents the distribution of affiliated and unaffiliated analysts' recommendations for one year after the IPO offer date. Panel B presents the distribution of affiliated and unaffiliated analysts' long-term growth estimates for one year after the IPO offer date.

	TOTAL SAMPLE		NASDAQ		NYSE	
	Affiliated Analyst	Unaffiliated Analyst	Affiliated Analyst	Unaffiliated Analyst	Affiliated Analyst	Unaffiliated Analyst
Panel A: Distribution of Analysts' Recommendations						
Strong Buy	1,288	4,162	1,067	3,279	221	883
	(41%)	(39%)	(40%)	(39%)	(50%)	(37%)
Buy	1,465	5,017	1,283	3,932	182	1,085
	(48%)	(47%)	(49%)	(47%)	(41%)	(46%)
Hold/Sell	328	1,501	288	1,096	40	405
	(11%)	(14%)	(11%)	(13%)	(9%)	(17%)
Panel B: Distribution of Analysts' Long-Term Growth Estimates						
0% - 10%	66	236	40	96	26	140
	(3%)	(3%)	(2%)	(2%)	(6%)	(8%)
10% - 20%	702	1,926	443	887	259	1,039
	(32%)	(29%)	(25%)	(18%)	(55%)	(56%)
20% - 30%	669	2,002	526	1,465	143	537
	(30%)	(30%)	(30%)	(30%)	(30%)	(29%)
30% - 40%	343	1,067	319	962	24	105
	(15%)	(16%)	(18%)	(20%)	(5%)	(6%)
40% - 50%	282	882	269	857	13	25
	(13%)	(13%)	(15%)	(18%)	(3%)	(1%)
50% +	147	608	143	598	4	10
	(7%)	(9%)	(8%)	(12%)	(1%)	(1%)

Table 4.3

Univariate findings for Affiliated versus Unaffiliated Analysts

Table 3 presents tests of mean and median differences between pairs of affiliated and unaffiliated analysts reports. Pairs are obtained by selecting unaffiliated analysts' reports that are issued closest to affiliated analysts' reports, where time between reports does not exceed 60 calendar days. Panel A presents tests for mean and median differences between affiliated and unaffiliated analysts' recommendations. Panel B presents tests for mean and median differences between affiliated and unaffiliated analysts' long-term growth estimates.

		Affiliated Analysts		Unaffiliated Analysts			
	N	Mean	Std. Dev	Mean	Std Dev	Difference (t-test)[a]	z-test[b]
Panel A: Affiliated versus Unaffiliated Analysts' Recommendations							
Total	1,818	1.630	0.593	1.637	0.619	-0.007 (0.619)	(0.711)
Nasdaq	1,560	1.651	0.589	1.633	0.622	0.179 (0.337)	(0.312)
NYSE	258	1.503	0.599	1.662	0.603	-0.158 *** (0.001)	(0.0007) ***
Panel B: Affiliated versus Unaffiliated Analysts' Long-Term Growth Estimates							
Total	885	32.55	17.31	31.48	16.49	1.07 ** (0.029)	(0.050) **
Nasdaq	666	36.61	17.55	35.41	17.00	1.19 ** (0.043)	(0.041) **
NYSE	221	21.60	10.71	20.52	7.85	1.08 * (0.077)	(0.094) *

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

[a]The t-statistic tests the null hypothesis that the difference between the affiliated and unaffiliated analysts' recommendations is equal to zero.

[b]The Wilcoxon matched-pairs signed-rank z-statistic tests the alternative hypothesis that the median of the distribution of the differences between affiliated and unaffiliated analysts' recommendations is different from zero.

Table 4.4

Abnormal Returns

Table 4 presents size-adjusted abnormal returns during the three day event window [-1, +1] around analysts' recommendations. We present size-adjusted abnormal returns for affiliated analysts and other analysts for the total sample of recommendations, the Nasdaq sample, and the NYSE sample separately. The table also reports the difference between affiliated abnormal returns and other analysts' abnormal returns. P-values for this difference are presented in parentheses.

	Affiliated Analysts		Unaffiliated Analysts			
	N	Abn. Return	N	Abn. Return	Difference	(p-value)
Total Sample						
Strong Buy	1288	2.11% ***	4162	2.59% ***	0.37%	(0.191)
Buy	1465	-0.01%	5017	-0.01%	0.00%	(0.844)
Hold/Sell	328	-11.66% ***	1501	-6.90% ***	-4.76% ***	(0.0002)
Nasdaq						
Strong Buy	1,067	2.28% ***	3,279	2.85% ***	-0.57%	(0.197)
Buy	1,283	-0.03%	3,932	-0.20%	-0.02%	(0.6958)
Hold/Sell	288	-12.36% ***	1,096	-8.35% ***	-4.01% ***	(0.0053)
NYSE						
Strong Buy						
Buy	182	-1.18% ***	1,085	0.23%	-1.43% **	(0.042)
Hold/Sell	40	-6.58% ***	405	-2.98% ***	-3.59%	(0.2167)

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

Table 4.5

Abnormal Returns by Year

Table 5 presents size-adjusted abnormal returns during the three day event window [-1, +1] around analysts' strong buy recommendations. We present statistics separately for each year of our sample period. The table also reports the difference between abnormal returns around affiliated analysts' strong buy recommendations and abnormal returns around unaffiliated analysts' strong buy recommendations. P-values for this difference are presented in parentheses.

	Affiliated Analysts		Unaffiliated Analysts			
	N	Abn. Return	N	Abn. Return	Difference	(p-value)
1994	133	0.97% ***	261	2.05% ***	-1.08% *	(0.080)
1995	141	2.27% ***	372	1.88% ***	0.40%	(0.658)
1996	279	1.68% ***	637	1.72% ***	-0.05%	(0.940)
1997	198	1.03% ***	609	1.98% ***	-0.95%	(0.152)
1998	170	1.24% ***	497	1.43% ***	-0.19%	(0.819)
1999	169	3.42% ***	664	4.43% ***	-1.01%	(0.461)
2000	178	4.51% ***	950	3.96% ***	0.50%	(0.715)

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

Table 4.6

Cross-Sectional Regression

Table 6 presents the results from a pooled cross-sectional regression where size-adjusted abnormal returns around the recommendation are the dependent variable. For a description of independent variables see Section V. P-values are presented in parenthesis.

	CAR around buy and strong buy recommedations		CAR around hold and sell recommedations	
Intercept	0.01482		-0.17852	***
	(0.2682)		(0.0004)	
time	-0.00047	***	-0.00097	**
	(<.0001)		(0.0307)	
lnsize	-0.00028		0.01422	***
	(0.7899)		(<.0001)	
affil	-0.00453		-0.03939	***
	(0.1064)		(0.0006)	
underprc	0.00232		-0.02687	***
	(0.1705)		(<.0001)	
earn	-0.00105		-0.04003	***
	(0.8123)		(0.0028)	
firstrec	-0.00432		0.0748	***
	(0.1798)		(0.0006)	
allstar	0.00832	**	0.02379	
	(0.0413)		(0.1219)	
prev	-0.00913	***	-0.00973	
	(0.0012)		(0.3681)	
other1	0.00761	**	-0.0994	***
	(0.0117)		(<.0001)	
other2	0.00953	**	-0.19191	***
	(0.035)		(<.0001)	
other3	0.02883	***	-0.20111	***
	(0.0035)		(<.0001)	
other4	0.02579	**	-0.16848	***
	(0.0123)		(<.0001)	
sbdum	0.01756	***		
	(<.0001)			
selldum			0.0212	
			(0.389)	
Adjusted R^2 %	1.42		2.81	

* denotes significance at the 10% level
** denotes significance at the 5% level
*** denotes significance at the 1% level

Table 4.7

Determinants of Analyst Recommendations

Table 6 presents a multimonial logit regression of the determinants of analysts' recommendations in the year following the IPO offer date. The dependent variable is the analyst recommendation, coded 1 for strong buy, 2 for buy, 3 for hold, 4 for sell, and 5 for strong sell. We examine the determinants for 13,760 recommendations. Time is the time in calander days from the IPO offer date until the recommendation. Lnsize is the natural log of market equity. Affil is a dummy variable equal to one if the analyst is a lead/co-led analyst. Underprc is the difference between the IPO offer price and the closing price on the first day of trading. Other independent variables are described in section V. Coefficient estimates represent average of four iteration of the logit regression. P-values are presented in parenthesis.

	(1)	(2)	(3)
Intercept 1	1.611 ***	1.5297 ***	1.721 ***
	(<.0001)	(<.0001)	(<.0001)
Intercept 2	4.0178 ***	3.9399 ***	4.1355 ***
	(<.0001)	(<.0001)	(<.0001)
Intercept 3	7.3387 ***	7.2641 ***	7.4577 ***
	(<.0001)	(<.0001)	(<.0001)
Intercept 4	8.2128 ***	8.1383 ***	8.332 ***
	(<.0001)	(<.0001)	(<.0001)
time	-0.00264 ***	-0.00287 ***	-0.00334 ***
	(<.0001)	(<.0001)	(<.0001)
lnsize	-0.0717 ***	-0.053 ***	-0.0726 ***
	(<.0001)	(0.0005)	(<.0001)
affil	0.00793	0.0107	0.012
	(0.8509)	(0.7998)	(0.7766)
underprc	0.0246	0.0177	-0.2114 ***
	(0.3239)	(0.478)	(<.0001)
earn	-0.1431 **	-0.1442 **	-0.1491 **
	(0.0235)	(0.0224)	(0.0183)
firstrec	0.2044 ***	0.203 ***	0.1798 ***
	(<.0001)	(<.0001)	(0.0004)
allstar	-0.2702 ***	-0.2683 ***	-0.264 ***
	(<.0001)	(<.0001)	(<.0001)
avgrec	-0.5148 ***	-0.5117 ***	-0.5103 ***
	(<.0001)	(<.0001)	(<.0001)
cumret	0.4274 ***	0.4307 ***	0.4379 ***
	(<.0001)	(<.0001)	(<.0001)
nrecs		-0.089 ***	
		(<.0001)	
*underprc*time*			0.00144 ***
			(<.0001)
Psuedo R^2 %	13.3	13.3	14.0

* denotes significance at the 10% level, ** denotes significance at the 5% level, *** denotes significance at the 1% level

CHAPTER 5

CONCLUSION

In my first study we investigate trading behavior of institutional investors prior to the public release of analysts' buy and strong buy initial recommendations. Using a proprietary database of institutional orders from the Plexus Group, we find strong evidence of institutional trading prior to the public release of analysts' initiations. Specifically, we find statistically significant increases in the levels of institutional trading and net buying in the period beginning about five days prior to the public release. We also find that the extent of abnormal buying in this period is predictable from variables that have been shown to predict the extent of a price increase at announcement of an initiation. We also note that the five days prior to the public release of the initiation is when the analysts' report is substantially complete and undergoing the internal legal review process. We conclude that some analysts (or someone in their firms) are revealing the contents of the upcoming reports to preferred clients prior to the public release of the report. We also verify that these tips can provide profitable trading opportunities for the institutions that receive them.

We do not take a normative position on tipping. The purpose of this paper is simply to draw attention to this activity and provide some evidence as to its existence. Our results suggest that tipping occurs and, as a result, those investors who trade on the public release of analysts' reports do not receive the same benefits as those that obtain the reports before their release. However, the trading profits that tipping provides to large institutions are likely to be one of the services large institutions expect from analysts' firms. If tipping were precluded, institutions

would be less willing to pay for sell-side research and, consequently, the amount of price-relevant sell-side research would be reduced. For this reason, the social welfare implications of tipping are not clear. In general, our results raise an important question – how should sell side research be rewarded and how much control should analyst firms have over the release of that information.

In my second essay, we revisit affiliated analyst optimism during the more recent period from 1993 to 2000. Specifically, we investigate analyst optimism in relation to recommendations, long-term growth estimates, and for NYSE and Nasdaq listed IPOs. Consistent with previous studies we find systematic evidence of affiliated analyst optimism with respect to long-term growth estimates. This apparent optimism is present for both NYSE and Nasdaq listed IPOs. However, we find no evidence of optimism in regards buy/sell recommendations. We match affiliated analyst recommendations with corresponding unaffiliated analyst recommendations and find affiliated analysts produce mean recommendations of 1.63 compared to mean unaffiliated analysts recommendations of 1.637. When separating the sample by exchange, we find similar results for the Nasdaq sample. Only on the NYSE do we find any evidence of lead analyst optimism in relation to recommendations.

Analysis of abnormal returns surrounding recommendations allows us to test the competing conflict of interest and superior information hypotheses. We find that three-day size-adjusted abnormal returns do not differ between affiliated and unaffiliated analysts around strong buy and buy recommendations. Specifically, abnormal returns around strong buy recommendations are 2.11% and 2.59% for affiliated and unaffiliated analysts respectively. When separating the sample by recommendation year, we find that abnormal returns around unaffiliated analysts strong buy recommendations are twice as great as those around affiliated

analsyts' recommendations during the year 1994. Results support Michaely and Womack (1999) and suggest that analyst behavior has changed over time.

Extending the breadth of previous research, we investigate abnormal returns around analysts' hold and sell recommendations. Market reactions are approximately twice as large for affiliated analysts compared to unaffiliated analysts (-11.90% versus –6.90%). These results support the superior information hypothesis, and suggest that affiliated analysts have superior information about the firm when that information is negative.

We implement robustness tests to ensure the validity of univariate findings. Cross-sectional regressions for strong buy and buy recommendations show that variables including: the time since the IPO offer date, the recommendation being a strong buy, the analyst being an *Institutional Investor* All-star, the difference from previous recommendations, and the number of other analysts issuing recommendations during the event window are all significantly related to abnormal returns. The key variable of interest, analyst affiliation, is not related to the magnitude of abnormal returns in a multivariate setting. The second regression for hold and sell recommendations shows that the number of analysts submitting recommendations during the event window is significantly related to abnormal returns. We find that analysts' affiliation is significantly related to the magnitude of abnormal returns around hold and sell recommendations. All results are consistent with univariate event study findings. These results may help bridge the gap between previous empirical findings and the more recent results of Bradley, Jordan and Ritter (2003).

Our final robustness test analyzes the determinants of analysts' recommendations in a multinomial logit regression. Consistent with previous tests we find no relationship between analyst affiliation and the level of recommendations issued. We find that analyst

recommendation levels are significantly related to firm and analyst specific factors including the log of market equity, the cumulative return of the firm since going public, and the analyst being an *II* All-star. Other market environment factors found to be related to the level of analysts' recommendations include: time since the IPO offer date, the existence of an earnings announcement in the event window surrounding, the recommendation being the firms ever made for a particular stock, and the average of other recommendations issued for the same stock.

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