Tipping

Andy Puckett
Terry College of Business
University of Georgia
Athens, GA 30602
Phone: 706-583-0385
e-mail: puckett@uga.edu

Paul Irvine
Terry College of Business
University of Georgia
Athens, GA 30602
Phone: 706-542-3661
e-mail: pirvine@terry.uga.edu

Marc Lipson
Terry College of Business
University of Georgia
Athens, GA 30602
Phone: 706-542-3644
e-mail: mlipson@terry.uga.edu

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Abstract

This paper investigates the trading behavior of institutional investors immediately prior to the release of analysts' initial strong buy and 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. We also find evidence that some institutional investors partially reverse their trading patterns after analysts' initiations are made public, consistent with theoretical predictions about differentially informed investors' trading behavior. We conclude 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.

I. Introduction

There is an ongoing, vigorous debate over whether financial intermediaries and corporate officers should be allowed to treat various investor groups differently.[1] 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 only certain investors to engage in active trading that benefits those investors at a cost to long-term investors. On the other hand, certain practices are permitted, such as allowing investment banks to allocate potentially lucrative stock offerings to particular clients. We examine another practice that has not yet received much attention: the provision of sell-side analysts' reports to particular investors prior to the public release of these reports.

Although providing analyst reports to a subset of clients before the reports are made public – tipping – benefits some clients over others, whether these tips are appropriate is unclear. While we have uncovered nothing to indicate that tipping is illegal, 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.[2] The defining issue may be whether or not individual firms have made representations to their clients that all clients will be treated equally.

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 the commissions directed to full-service firms who produce it. The largest buy-side firms pay a considerable amount in commissions for research and early access to that research is presumably one of the benefits they expect in return for their commission dollars. Making tipping illegal reduces the benefits institutions receive from their commission dollars and, in response; institutions would be willing to pay less for 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

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[2] Smith (2003) documents the dismissal of a Morgan Stanley analyst for inappropriate dissemination of his research opinion.

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 can predict the size of the abnormal return at the time of an initiation. For example, abnormal buying is positively related 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 look for evidence that institutions that were tipped are more likely to liquidate their positions shortly after the initiation.[3] This analysis is complicated by the fact that institutions are net buyers, on average, reflecting the long-term trend of increasing assets under institutional management. We find that the largest buyers in the few days preceding the initiation (institutions that were most likely to have been tipped) reduce their buying significantly relative to their buying levels well before the initiation. These results provide weak evidence of position reversal following public revelation of information that had been tipped.

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.

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[3] Such behavior would be consistent with the theoretical predictions of Hirshleifer, Subrahmanyam, and Titman (1994).

II. Production and dissemination of analysts' initial recommendations

Previous studies consistently find significant abnormal returns surrounding 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 recommendations (Kim, Lin and Slovin, 1997, Green, 2003; Goldstein et al., 2004) finds that prices respond extremely quickly.[4] 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 an investor with a profitable trading opportunity.

We assume that analysts' have strong incentives to tip since they place a high value on their relationships with institutional clients. These relationships allow the analysts' firm to gain rents through trading commissions and thus indirectly benefit the analysts' compensation and career advancement opportunities.[5] 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. Studies concerning changes in analysts' recommendations have lately been criticized because of the likelihood that

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[4] 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.
[5] Irvine (2004) discusses how trading commission revenue affects analyst compensation.

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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. Because of the selection bias inherent in the study of changes in recommendations, many academics have chosen analysts' initiations to infer the impact that analysts' opinions have on firm value (see above).

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 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.

III. The legal environment surrounding tipping

We investigated the legal and regulatory constraints on tipping at brokerage firms, the NYSE, NASD, AIMR and the SEC. Conversations with legal council for the National Association of Securities Dealers reveal that tipping by security analysts may violate NASD rule 2110, a rule that details acceptable trading conduct of NASD member firms. In a subsection of rule 2110 (IM-2110-4) the Associations Board of Governors has approved 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 explicitly address solicited trading by institutional clients before research reports are released. 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), but it may be acceptable for the firm's clients.

The NASD recommends that member firms establish appropriate policies and procedures to address tipping. The internal policies and procedures manual for several major brokerage firms usually list similar restrictions regarding 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 ostensibly prohibit tipping activity.

Securities and Exchange Commission (SEC) regulations fail to directly address the practice of tipping by security analysts; rather current rulemaking is determined on a case-by-case basis. In an important recent case, litigation release 18115 on April 28, 2003 the SEC brought charges against Merrill Lynch, which included the failure to supervise its security analysts, and to ensure compliance with its internal policies. Buried deep in release 18115 the complaint's sole reference to tipping occurs in point 98 of the complaint:

"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."[6]

However, no general SEC rule makes tipping clearly illegal. Legal council for the SEC issued statements that trading by institutions based on advanced notice of analysts' recommendations may violate rule 10b-5, but would have to be evaluated on a case-by-case basis.[7] Private opinions suggest that explicit incidents of tipping, should they come to light may be actionable. One SEC attorney who wished to remain anonymous told us: "common sense tells you that such practices have to be illegal". However, there are no explicit judgments that ground this opinion in clear legal precedents.

In the absence of explicit regulation from the NYSE, NASD or the SEC, 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."[8]

All conversations with NASD and SEC legal council lead us to believe that tipping by security analysts violates the intent of regulations designed to promote fair and equitable trading. However, there do not appear to be any current regulations that explicitly address tipping, and therefore it is not clear whether tipping is in fact a legally actionable violation of securities law. Although, internal guidelines within investment banks and professional association ethical guidelines prohibit tipping, the strength of this

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[6] 1-1 is Merrill's highest recommendation; it recommends the stock as a strong buy for both short-term and long-term investors.
[7] SEC rule 10b-5 is often applied in insider trading cases. The rule 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.
[8] 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.

prohibition in practice depends on the strength of enforcement. The strength of a tipping prohibition could vary considerably across investment banks and over time. The recent actions by Morgan Stanley (Smith, 2003) and against Merrill Lynch, suggest that even in the current restrictive regulatory environment, incidents of tipping occur. The fact that incidents of tipping have been documented despite the potential for the analysts to lose their positions suggests that analysts have strong incentives to tip. Thus, it is reasonable to conclude that we could find incidents of tipping in our data, which covers the 1996-2001 period.

IV. Hypothesis development

Analysts' buy and strong buy initiations produce positive abnormal returns, on average, when released to the market. We believe that analysts have strong 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 volume and buying imbalance 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 rapidly drive prices upward prior to the date of public release (Holden and Subrahmanyam 1992). This result is not found in event studies of analysts' recommendations. 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 (Barber and Loeffler 1993, Lloyd, Davies and Canes 1978) after the public release.[9] Prior empirical studies find no evidence of mean-reversion in abnormal returns; in fact Womack (1996) documents a drift in abnormal returns that continues in the direction of the recommendation. Based on the

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[9] 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.

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 trading to occur on strong buy initiations than on buy initiations because strong buy recommendations produce greater positive abnormal returns and thus greater profit opportunities for early-informed investors.

There are several other characteristics that have been shown to affect the abnormal returns surrounding the release of an analyst report. Our choice of recommendation-specific variables relies on previous studies investigating the cross-sectional determinants of price or trading reaction to analysts' recommendation changes. One characteristic of analysts' initiations that can affect returns is the identity of the initiating analyst. 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 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 aggressively 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.

Empirically, we examine institutional trading activity around the release of analysts' initiations to test the predictions of the Hirshleifer et al. (1994) model. Using institutional trading data that identifies (by their code number) the institution involved in each trade we define early-informed institutions as those who submit buy orders in the period before analysts' strong buy and buy initiations are revealed to the market. We then track the trading behavior of these early-informed institutions after initiations are released. We expect that early-informed institutions will partially reverse their trading patterns after the analysts' initiation has been made public.

V. Data

To analyze the actions of institutional traders before analysts' initiations we rely on 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 trades covers the periods from January 1, 1996 until March 31, 1998, and from January 1, 2000 until March 31, 2001.[10] We use all available data in our empirical tests.

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[10] 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.

Summary statistics for our Plexus sample are presented in Table 1. Our data consists of approximately 7 million institutional orders from 120 different institutional investors, representing over $4.3 trillion in orders. Plexus identifies each institution using a unique numbered code and subsequently classifies these institutions into five types: (i) Value, (ii) Momentum, (iii) Diversified, (iv) International and (v) Other Institutions. The Diversified and Other Institutions types are the most active traders, Diversified institutions trade 2,400,700 orders and Other Institutions trade 2,275,671 orders. Momentum institutions have the largest mean order size of $764,616, though Value traders have the largest median order size at $67,210.

To identify analysts' buy and strong buy initiations we use the Institutional Brokers Estimate System (I/B/E/S) Detailed Recommendations Tape. 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 correspond to our available Plexus data and allow us to get matching Plexus trade orders for the three months before and three months after the analysts' initiations in our sample. To identify analyst initiations we filter I/B/E/S data searching for individual analysts who make their first ever recommendation on a particular stock. 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.

Our initial sample consists of 24,304 initial recommendations. We then filter our initiation sample following Irvine (2003) in order to remove the influence of confounding events that may corrupt our inferences. 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. We then delete all initial recommendations where the recommendation is for an IPO that has gone public in the previous six months.[11] We require all sample firms to have corresponding CRSP data for price, aggregate trading volume, and shares outstanding. After filtering our 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 ten-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.[12]

Summary statistics for the sample of buy and strong buy initiations is presented in Table 2. Empirically, 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. 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 3 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 3 reports similar results as those reported in previous studies.[13] Strong buy initiations earn event-day size-adjusted returns of 1.13 percent (p-value <

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[11] 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.

[12] We validate our initiation dates as follows. We randomly select 126 (approximately 1 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. We find no evidence that I/B/E/S dating errors can explain our results. Specifically, 81 of our initiations were not reported by Dow Jones, consistent with the observation that Dow Jones self-censors their data by reporting recommendations from the largest brokers. 39 initiation dates matched precisely, four initiation dates on I/B/E/S were one day after the Dow Jones mention, one observation was two days after and one observation was three days 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.

[13] 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.

0.001) and buy initiations earn event-day size-adjusted returns of 0.47 percent (p-value < 0.001).

VI. Results

Our first contention states that if institutions receive prior notice regarding the contents of analysts' initiations we should observe 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.[14]

VI.A. Institutional trading prior to analysts' strong buy and buy initiations.

To test for tipping activity we collect all institutional trades from Plexus for the initiated stocks. Following Goldstein, et al. (2004) we eliminate all institutional trades of less than 100 shares, and attribute these trades to exogenous inflows/outflows of capital. We first examine the mean institutional trading volume for all stocks with buy and strong buy initiations. We then aggregate all institutional trades by stock and trading day, and calculate total institutional trading volume. We calculate five measures of institutional and market volume: (i) shares traded by Plexus institutions, (ii) trading imbalance by Plexus institutions, (iii) the number of Plexus institutions trading, (iv) total market volume and (v) the ratio of Plexus 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 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).

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[14] 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.

For each initiated stock we calculate the difference between buying and selling volumes for a given day, also expressed in terms of turnover.

Figure 1 presents institutional trading activity around analysts' initiations. The first two graphs in Figure 1 present total turnover and Plexus institutional turnover for 120 and 40 trading days, respectively, around the public release of initiations on event day 0. Institutional trading is elevated beginning five days prior to the public release of the initiation. This increase is modest relative to the average level of trading in the data, but consistent with our view of tipping, which does 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 pattern is important 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 the event-studies. Thus, it appears that most investors are unaware of the information in the analysts' report until the report is publicly released. This is an important result given 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 Plexus institutional volume. In contrast, institutional trading peaks on event day -5 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.

Table 4 presents formal statistical tests on trading around our sample. 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.[15] There is no theoretical basis for choosing a particular measure of normal volume. Significance testing of abnormal Plexus 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 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.[16]

The statistical tests in Table 4 show that regardless of the trading measure 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.

More importantly, if certain institutions are being tipped about the contents of analysts' buy and strong buy initiations, which lead to positive abnormal returns, 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

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[15] 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.

[16] 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.

beginning four 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.[17]

We next investigate whether the pre-release abnormal institutional trading volume can be explained by the contents of the forthcoming analysts' 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 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 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.[18]

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 as independent variables: 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

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[17] 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.
[18] Data is missing for the independent variables in eight cases.

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. [19]

Table 5 presents the results of our Logit regressions. Consistent with our contention that tipping is not a widespread activity, the independent variables that can be used to predict trading activity associated with tipping, while often statistically significant, do not explain a large amount of the cross-sectional variation in institutional trading prior to the release of analysts' initiations: the pseudo - R^2 in the regressions range from 10.8 percent to 10.9 percent and much of the explanatory power of the regressions can be attributed to the significance of the control variables. These results suggest that much of the abnormal trading activity prior to initiations is not related to tipping activity.

Nevertheless, most of the variables that are related to characteristics of the subsequent initiation are significant and consistent with our predictions. Strong buy initiations (which generate larger average abnormal returns than unqualified buy initiations), generate significantly higher institutional trading 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 activity, which suggests that the greater the divergence of analysts' opinions, the less institutions respond to a particular analysts' opinion.[20] An initial recommendation that is more positive than the outstanding consensus

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[19] 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.

[20] 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.

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 to predict abnormal trading activity in the period prior to the public release of the initiation. The identity of the initiating analyst, that analysts' strong buy recommendation, the consensus recommendation and the standard deviation of outstanding earnings forecasts all help to predict abnormal positive order imbalance in the pre-release period. An institution that receives a tip would know all of these variables. Variables such as the identity of an analyst or the initiating recommendation have been shown to predict abnormal returns to analysts' reports. The fact that these variables help explain the positive abnormal order imbalance in the pre-release period strengthens our contention that some tipping activity is occurring in this period.

VI.B. Institutional trading profits from tipping.

Tipping will only benefit institutions if trading on those tips lead to economic profits. Ascertaining profitable trades require more than just documenting abnormal returns, since one must acknowledge the potential price impacts of establishing positions (see Jones and Lipson (1999) and Conrad and Wahal (2001)). Our approach is to look at profits using the actual prices at which positions are established.

Table 6 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) 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 apply CRSP returns to the net position at the end of the trading period. By using CRSP returns we acknowledge cash disbursements. 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%. In this manner, we acknowledge the magnitude of the required investment and reduce cross sectional variation in profits related to firm size.

Panel A of Table 6 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 profits to buyers are a better measure of the potential gains from receiving tips.

Economically small but statistically significant profits 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 purchases prior to buy and strong buy initiations are usually rewarded by positive returns.

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 7 repeats the analysis in Table 6, 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 6: 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 7 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 observe 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 examine 1,377 initiations where the overall buying imbalance is greater than two standard deviations from the non-event mean imbalance. We assume that this subsample is more likely to exhibit tipping than the other initiations. 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.[21] 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.

VI.C. Is there evidence of partial reversals of trading positions?

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.

To test this theory we look at only those institutions that enter into net buying positions during the [-5, -1] period before initial recommendations are publicly released. This methodology potentially captures the trading of some institutions that were not early-informed in the sense of the Hirshleifer et al. (1994) model; rather only by chance enter buy orders in the period before public release. Capturing trades by these uninformed institutions should not affect our inferences. Uninformed traders taking net buying positions in the early period will find themselves in the same situation as informed traders. Thus, according to Hirshleifer, et al. (1994) if the stock price increases after analysts' initiations are publicly released, it should be in the institution's best interest to partially reverse their trading positions in order to mitigate the risk of their holdings. Using Plexus data, we are able to identify each institution, and follow the trading patterns of those institutions trading in the period before public release. Thus, we do not analyze institutions that either do not trade, or enter into net selling positions during the early period. Figure 2 presents the results of our analysis for institutions that enter into net buy

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

positions prior to the release of analysts' buy and strong buy initiations. We restrict this sample to cases where the abnormal return on the day of the initiation announcement is greater than or equal to one percent. This restriction is motivated by the theory which assumes significant trading gains, without which it is unlikely that institutions will feel compelled to reverse their positions.

For these institutions we construct a normalized trading imbalance measure for the trading days surrounding the public release of an initiation. If early informed institutions do partially reverse their positions after analysts' initiations are released, we would expect to see a net selling trade imbalance for these institutions shortly after day 0. The results in Figure 2 suggest that institutions that enter into large net buying positions before the initiation announcement show evidence of a buy imbalance that is lower than usual after the announcement, but they are still not net sellers. A net buying imbalance averaging 0.10 percent of shares outstanding in the -60 through -20 estimation period, rises sharply in the -5 through 0 period and then drops below the estimation period mean after the initiation's public release.

Interpreting Figure 2 is complicated by the fact that institutions are regularly net buyers of stock. This reflects the inflows into funds over this time period. We do not observe an actual reversal of recent buying, but we do observe a reduction in buying (almost to zero) that appears to be lower than the typical buying imbalance. If we consider the buying imbalance to be the appropriate benchmark, then institutions are "selling" relative to that benchmark and this would be consistent with Hirschleifer et al. (1994). On the other hand, if one takes the prediction of Hirshleifer more literally, then we have no supporting evidence.

VI.D. Who gets tipped?

Table 8 uses the Plexus data from our sample of 1,377 high order imbalance initiations to make inferences about the trading activity of institutions that may have received tips. We first separate institutions in the high order imbalance sample into two groups, the largest turnover institution and all other institutions, and then compare turnover and trading imbalances for these two groups before and after the -5 to -1 period. Next we create a random sample non-event institutional trading. To do this, we choose

random non-event days and measure the order imbalance in the -5 through -1 period for this sample. All order imbalances from the non-event sample that are greater than two standard deviations from the non-event mean are considered to be pseudo-events. Data on turnover and buy imbalance for the largest institutional trader in the pseudo-event sample is compared to the trading by the largest institutional trader around the initiations sample.

Column 1 presents the daily turnover or buy imbalance for the largest institutional trader in the initiated stock. Column 2 presents the average daily turnover or buy imbalance for all other institutional traders in this sample. Column 3 presents a t-test of the difference between the largest traders and the other institutions. Column 4 presents identical statistics for the largest traders in pseudo-event sample, where the aggregate buy imbalance is greater than two standard deviations from the non-event mean. The pseudo-event dates are chosen randomly from the sample period, so they represent an analogous data-driven sample around random dates that do not contain initiations. Column 5 presents a t-test of difference in mean buy turnover or imbalances for the largest trader in the initiation sample and the largest trader in the pseudo-event sample. 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 8 show that the largest trader in the initiation sample has significantly higher turnover and buy imbalances around analyst initiations than other institutions do. This result is not surprising since institutions are sorted on their trading activity. However, these results give us some indication of the trading characteristics of institutions that may have received tips. The largest trader trades actively in the initiated stock; they have been aggressively accumulating a position for at least forty days prior to the public release of the initiation. If these aggressive traders receive tips, then we can conclude that the tipped institutions have been recent aggressive accumulators of the initiated company's stock.

A more stringent test of these aggressive institutions trading compares turnover and buy imbalance for the largest institutions trading prior to initiations with the largest institutions that trade prior to the randomly chosen pseudo-event date. Since both initiations traders and pseudo-event traders are defined by trading in the -5 through -1 period, if there is no anomalous trading around initiations, then their trading patterns

should be similar. Column 5 reports a t-test for differences in turnover and buy imbalance between the most aggressive (largest buy imbalance in the –5 through –1 period) traders around initiations and the most aggressive traders around the pseudo-event dates. Results of this test show that the institutions buying actively before initiations are significantly more active traders and more active purchasers than the most aggressive pseudo-event traders, particularly in the period prior to the initiation. These results show that institutions that are particularly active buyers in the –5 through –1 period and thus, more likely to have been tipped, are unusually active in the stock prior to the release of the initiation. In particular, these institutions have been aggressively accumulating positions in the stock and therefore, would have a high level of interest in the contents of forthcoming initiations.

VII. Conclusion

Our paper is 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 substantial evidence of institutional trading prior to the public release of analysts' initiations. To support our conclusion 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. During this period the analysts' report is likely to be substantially complete and undergoing the internal legal review process. We conclude that some analysts' engage in tipping, revealing the contents of their upcoming reports to preferred clients prior to the public release of their reports. We also establish that these tipping opportunities can be profitably entered into by the institutions that might receive tips.

We do not take a normative position on tipping; rather the purpose of this paper is to bring to light the practice of tipping, contributing to the public debate of this long overlooked practice. Given our evidence, it appears that the current regulatory environment lacks explicit rulemaking that effectively prohibits tipping. As a result, small investors, trading on the public release of analysts' reports are disadvantaged relative to the large institutional investors that are favored with early information. However, the trading profits that tipping provides to large institutions are likely to be one

of the services that large institutions expect and pay for from sell-side analysts. As the explicit prohibition of tipping would likely reduce the amount institutions are willing to pay for sell-side research and consequently, the amount of price-relevant sell-side research produced; the social welfare aspect of making tipping illegal are not clearcut.

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Table 1

This table presents summary information on the institutional trading sample from the Plexus Group. The trades 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. Median values are presented in parentheses below the means.

Type of Institution	Total number of trades	Total dollar value of trades	Mean dollar value of trades	Mean number of shares per order	Avg. Daily number of trades	Avg. Daily dollar volume
Value	684,919	$378.556 billion	$552,702.91 ($67,210)	15,243 (2,350)	767 (692)	$424.39 million ($389.35 million)
Momentum	1,284,875	$982.435 billion	$764,615.75 ($48,955)	17,570 (1,200)	1,453 (940)	$1.111 billion ($846.42 million)
Diversified	2,400,700	$1.4889 trillion	$620,194.11 ($58,750)	14,794 (1,700)	2,721 (2,668)	$1.688 billion ($1.461 billion)
International	347,930	$236.23 billion	$678,960.32 ($38,224)	15,094 (937)	1,108 (1,190)	$752.326 million ($735.78 million)
Other	2,275,671	$1.218 trillion	$535,226.78 ($52,085)	13,804 (1,300)	2,562 (2,416)	$1.371 billion ($620.55 million)
Total Sample	6,994,095	$4.304 trillion	$615,393.86 ($54,260)	15,041 (1,500)	7,814 (6,695)	$4.809 billion ($3.325 billion)

Table 2

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.

Sample category	Number of obs. in sample (in separate co.'s)	Number (%) of sample in Market Cap Deciles 9-10 (Large Cap)	Number (%) of sample in Market Cap Deciles 6-8 (Medium Cap)	Number (%) of sample in Market Cap Deciles 1-5 (Small Cap)	Mean number of analysts providing recs in previous 6 mos. (reported by I/B/E/S)
1 -Strong buy	4,783 (2,846)	2,090 (44%)	2,025 (42%)	668 (14%)	4.55
2 – Buy	4,889 (2,991)	2,432 (50%)	1,870 (38%)	587 (12%)	4.76
3 – Hold	2,571 (1,718)	1,508 (59%)	834 (32%)	229 (9%)	5.39
4 and 5 - Sell and Strong Sell	174 (162)	91 (52%)	55 (32%)	28 (16%)	5.40
Total Observations	12,417 (4,607)	6,121 (49%)	4,784 (39%)	1,512 (12%)	4.82

Table 3

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.

	Size-Adjusted Returns		
Day	All Initiations	Strong Buy Initiations	Buy Initiations
# of observations	9,672	4,889	4,783
-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 4

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 5

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.

Independent Variables	The probability of an order imbalance greater than two standard deviations from the mean imbalance in the non-event period is a function of:			
	(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)
Control variables				
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 6

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.

Panel A. Profits for all institutional traders around buy and strong buy initiations.

Trading Period	Variable	Ending Day			
		Day 0	**Day 5**	**Day 10**	**Day 30**
[-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.

Trading Period	Variable	Ending Day			
		Day 0	**Day 5**	**Day 10**	**Day 30**
[-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 7

Table 7 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.

Panel A. Profits for all institutional traders around strong buy initiations.

Trading Period	Variable	Ending Day			
		Day 0	**Day 5**	**Day 10**	**Day 30**
[-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.

Trading Period	Variable	Ending Day			
		Day 0	**Day 5**	**Day 10**	**Day 30**
[-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 8

Table 8 presents measures of turnover (Panel A) and buying imbalances (Panel B) for top traders and other institutions prior to 1,377 analysts' initiations where the aggregate buying imbalance is greater than two standard deviations from its non-event mean. Column 1 presents the daily turnover or buy imbalance for the largest institutional trader in the initiated stock. Column 2 presents the average daily turnover or buy imbalance for all other institutional traders in this sample. Column 3 presents a t-test of the difference between the largest traders and the other institutions. Since tipping is defined from the data in the -5 through -1 period, Column 4 creates a similar sample of largest traders in pseudo-events where the aggregate buy imbalance is greater than two standard deviations from the non-event mean. The pseudo-event dates are chosen randomly from the sample period, so they represent an analogous data driven sample around random dates that do not contain initiations. Column 5 presents a t-test of difference in mean buy turnover or imbalances for the largest trader in the initiation sample and the largest trader in the pseudo-event sample. 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.

Panel A: Turnover

Relative Day	(1) Largest Trader Turnover	(2) Other Trader Turnover	(3) Difference (Largest – Other)	(4) Pseudo-Event Large Trader Turnover	(5) Difference (Largest – Pseudo)
-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

Panel B: Buy Imbalance

Relative Day	(1) Largest Trader Buy Imbalance	(2) Other Trader Buy Imbalance	(3) Difference (Largest – Other)	(4) Pseudo-Event Large Trader Buy Imbalance	(5) Difference (Largest – Pseudo)
-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 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.
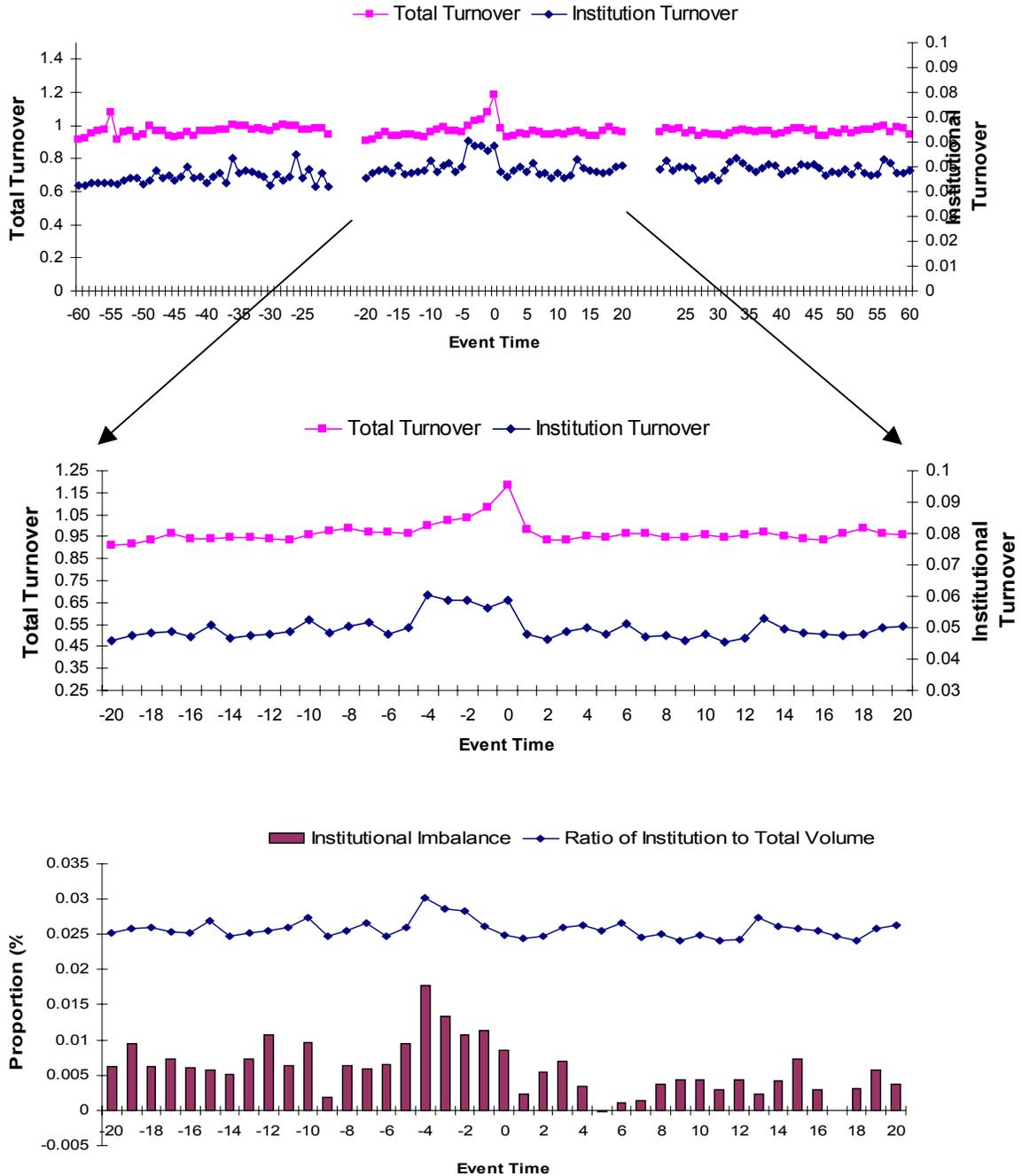
Figure 2. Trading Imbalance of Early-Informed Investors

Figure 2 graphs the normalized trading imbalance by trading day of early-informed traders, those who enter net buy trading orders in the period [-5, -1], prior to analysts' buy and strong buy initiations.