Tipping

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We investigate the trading of institutions immediately before the release of analysts' initial buy recommendations. We document abnormally high institutional trading volume and buying beginning five days before recommendations are publicly released. Abnormal buying is related to initiation characteristics that would require knowledge of the content of the report—such as the identity of the analyst and brokerage firm, and whether the recommendation is a strong buy. We confirm that institutions buying before the recommendation release earn abnormal profits. Our results are consistent with institutional traders receiving tips regarding the contents of forthcoming analysts' reports. (*JEL* G14, G18, G24)

There is an ongoing vigorous debate as to whether financial intermediaries and corporate officers should be allowed to treat various investor groups differently.[1] Regulation Full Disclosure, for example, requires that corporate officers release material information equally to all market participants. Similarly, mutual funds have been criticized for allowing some investors to execute short-term market timing trades to the detriment of long-term fund investors. On the contrary, investment banks are allowed to allocate potentially lucrative stock offerings to preferred clients. We examine a similar practice that has received little attention: the provision of sell-side analysts' reports to some institutional clients before the public release of these reports.

We thank Ekkehart Boehmer, Amit Goyal, Bill Lastrapes, Jeff Netter, Annette Poulsen, Sorin Sorescu, Kent Womack, Joel Hasbrouck (the editor), an anonymous referee, and seminar participants at Dartmouth College, the University of Virginia (Darden), Michigan State University, Indiana University, Georgia State University, the Southern Finance Association meetings, the Financial Management Association meetings, the American Finance Association meetings, and the NBER for helpful comments. We especially thank the Plexus Group for providing institutional trading data. Address correspondence to Paul Irvine, Terry College of Business, University of Georgia, Athens, GA 30602, or e-mail: pirvine@terry.uga.edu

[1] The viewpoint of this introduction was inspired by a talk given by Larry Harris, SEC Chief Economist, at the 2003 NYSE–NBER conference.

doi:10.1093/rfs/hhl027 Advance Access publication July 6, 2006

Although selective prerelease 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 (AIMR) guidelines proscribe it. Furthermore, no analyst has ever been prosecuted for tipping, although at least one has been fired for it.[2] We believe the defining issue may be whether or not individual firms have made representations to their clients that all clients will be treated equally. In this regard, tipping is similar to market timing trades by mutual fund clients.

The economics of tipping are relatively clear. The cost of research is typically recovered, at least in part, from commissions on the trading activity of brokerage clients who benefit from the research. In exchange for these commission payments, brokerage firms may provide early access to research to those clients who generate significant commission revenues. In effect, tipping may allow a producer of information, who cannot otherwise trade on that information, to indirectly capture some benefits from information generation [Grossman and Stiglitz (1980)]. Any limits on tipping would reduce the value of research to institutions and may, therefore, reduce the commission revenues that support sell-side research. As a result, less sell-side research will be produced, resulting in less efficient prices.

Using a proprietary database of institutional trading activity around the release of analysts' initial stock-specific reports, we provide evidence on the existence, extent, and characteristics of tipping.[3] We find a significant increase in institutional trading and buying beginning about five days before the public release of analysts' initial reports (initiations) containing positive recommendations. We confirm that buying increases even after controlling for past returns, so the results are not driven by the momentum trading documented in Griffin, Harris, and Topaloglu (2003). Consistent with tipping-induced trading, we find that the increase in buying before the release is mostly driven by an increase in the average amount of buying per institution, with only a small change in the number of institutions and no change in selling per institution.

Our findings suggest that the increase in institutional buying before a release (abnormal buying) is related to characteristics of the analyst's report, implying specific knowledge of the report contents. For example, abnormal buying is more positive for strong buys than buys, more positive for initiations made by the top 20 brokerage firms as ranked by

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

[3] The data were provided by the Plexus Group, a widely recognized consulting firm that monitors the costs of institutional trading. Their clients manage over $4.5 trillion in equity assets.

Institutional Investor magazine, and more positive for All-star analysts. We verify that institutions buying in advance of the initiation earn abnormal profits. Finally, we examine the distribution of abnormal buying across brokerage firms. Assuming brokerage firms vary in the existence, nature, or enforcement of policies that might prohibit tipping, the distribution of abnormal buying across brokerage firms should not be random. We find this to be the case. In particular, we find that prerelease abnormal buying is especially pronounced for a small subset of brokerage firms.

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

The article proceeds with Section 1 exploring the literature on the dissemination and market reaction to analysts' reports. Section 2 examines the legal environment surrounding the practice of tipping. Section 3 outlines our hypotheses. Section 4 discusses the data, sample, and methodology. Section 5 provides a summary of our results, and Section 6 concludes.

1. Production and Dissemination of Analysts' Initial Recommendations

Previous studies consistently found 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) confirmed that stocks receiving analysts' initiations that contain buy or strong buy recommendations experience abnormal market returns as high as 3–4%.

Research examining trading strategies on the day of the public release of analysts' initiations or changes in recommendations [Kim, Lin, and Slovin (1997), Goldstein et al. (2006), Green (2006)] finds that prices respond extremely quickly.[4] Dimson and Marsh (1984) noted that share purchases before the public release are profitable, but purchases made a day or a week after the recommendation are not. Hence, knowledge of the

[4] The intraday trading data of Kim, Lin, and Slovin (1997) and Green (2006) suggest that profitable trading opportunities dissipate in minutes or hours. Goldstein et al. (2006) examine profits relative to the close.

recommendation before public release is valuable, and the ability to trade before the day of public release presents investors with profitable trading opportunities.

Analysts' firms may have strong incentives to tip because the firms place a high value on their relationships with institutional clients.[5] These relationships allow the analyst's firm to generate commission revenue and may also improve the analyst's compensation and career advancement opportunities.[6] Institutional investors who receive tips may enter orders to exploit their knowledge and capture the expected abnormal returns that accompany these reports. Specifically, institutions receiving information about upcoming buy or strong buy initiations may buy before these recommendations are released.

We investigate trading around analysts' initiations for many reasons. First, initiations are less likely than recommendation changes to be clustered around confounding events [Stickel (1989), Jeurgens (2000)]. This reduces the probability that any abnormal institutional trading we find is driven by events other than the initiation. Second, 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. In fact, Cheng (2000) concluded that the internal compliance review typically takes four days. Thus, the contents of the report will typically be known internally several days before public release. Because we investigate abnormal trading just before an initiation, it is likely the report has been completed before our observed trading—which provides additional assurance that the trading we observe is not driven by an event that also triggers an initiation.

Given the abnormal trading, we observe begins roughly when the report begins the internal review process, and our results suggest that the tips occur once the content of the report has been finalized. This would also explain how the extent of abnormal buying before the initiation is significantly related to characteristics of the report itself. In this respect, we also note that if exogenous events generated the abnormal buying, then there is no reason for the increase in buying to be disproportionately associated with a subset of brokerage firms. Thus, we believe the institutional buying just before analysts' initial reports is driven by prior knowledge of the report itself and not independently generated by confounding events.

[5] 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 economic incentives for sell-side analysts to provide tips and that we find evidence consistent with its occurrence.

[6] Irvine (2004) discussed how trading commission revenue affects analyst compensation.

2. Regulatory Environment

We investigated the legal and regulatory constraints on tipping. The legal counsel for the National Association of Securities Dealers (NASD) 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 is inappropriate for the firm to trade before its own recommendations (because 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 a member 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 1999–2001 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. This prohibition is intended to avoid the misuse of market-sensitive information and the appearance of impropriety.

The AIMR Code of Ethics and Standards of Professional Conduct (1999) 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."

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 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."[7]

However, there do not appear to be any current regulations that explicitly address tipping. Legal counsel for the SEC informed us 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.

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 brokerage firms 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 long-term investors in the fund, because all traders share the cost of executing the orders. Although some funds have clearly stated to their investors that no 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. Hypotheses

We believe that analysts have economic incentives to tip their preferred clients concerning the contents of upcoming initiations. Institutions who receive

[7] 1–1 is Merrill's highest recommendation; it recommends the stock as a strong buy for both short- and long-term investors.

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' buy and strong buy initiations.

Event studies of prices around analysts' initial recommendations consistently find that the largest price response occurs at the announcement. It is, therefore, unlikely that analysts tip their entire client base before the announcement or competition between informed investors would eliminate the price response at the time of announcement [Holden and Subrahmanyam (1992)]. 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 [Lloyd-Davies and Canes (1978), Barber and Loeffler (1993)]. Earlier empirical studies find no evidence of reversion in abnormal returns. In fact, Womack (1996) documented a drift in abnormal returns that continues in the direction of the recommendation. Thus, based on the event-study evidence, we expect that if tipping does occur, then 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 institutional buying to occur in the period before strong buy initiations than in the period before buy initiations because strong buy recommendations are expected to produce greater positive abnormal returns and thus greater profit opportunities for early informed investors. In addition, Stickel (1992) found that recommendations by *Institutional Investor* All-American analysts (All-stars) produce larger abnormal returns than those of other analysts. Because All-stars are chosen by a survey of 2000 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.

4. Data

To identify analysts' buy and strong buy initiations, we search for the first ever recommendation on a particular stock by a brokerage firm and analyst in the I/B/E/S database from March 31, 1996, to December 31, 1997 and from March 31, 2000, to December 31, 2000. These dates are determined by the availability of institutional trading data from the Plexus Group (described below) and allow us to study trading over a window from 60 trading days before to 60 trading days after an analysts' initiation. We look for first initiations by an analyst to avoid selecting analysts who transfer from one broker to another and repeat their outstanding recommendations at their new brokerage firm. We back check our results by examining all recommendations on each stock for at least two years before the initiation to ensure that the analyst has not recommended the stock previously. Finally, to ensure that our initiation is not just a result of I/B/E/S adding the brokerage firm to the database, we require that the brokerage appear in the I/B/E/S database at least six months before any initiation.

We began with a sample of 23,379 initial recommendations. We then filter our initiation sample following Irvine (2003). First, we delete all initial recommendations made within five trading days of a company's earnings release. Second, we delete stocks with a price less than \$5. Third, we delete all initial recommendations where the recommendation is for a company that has gone public in the previous six months.[8] Finally, we require all sample firms to have corresponding Center for Research in Security Prices (CRSP) data for price, aggregate trading volume, and shares outstanding. After filtering our sample and matching with CRSP, we are left with 13,204 initial recommendations made on 4677 different firms. We then delete all observations where another initial recommendation is released during the 11-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 11,492 initiations, 9065 contain either buy or strong buy recommendations.[9] We examine only strong buy and buy initiations because the

[8] Michaely and Womack (1999) and Irvine (2003) contended 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)].

[9] We validate our initiation dates as follows. We randomly select 265 (approximately 2% of the initiations sample) analysts' initiations from I/B/E/S database and cross-check them against the Dow Jones news wire to insure that 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

Table 1
Summary statistics for initiations

	Strong buy	Buy	Hold	Sell
Number of initiations	4467	4598	2291	136
Number of firms	2717	2858	1586	132
Number of analysts	4.55	4.76	5.39	5.40
Number of initiations by firm size				
Size deciles 9–10	1889	2215	1340	65
Size deciles 6–8	1824	1771	757	48
Size deciles 1–5	754	612	194	23

The 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 the brokerage firm in the I/B/E/S database for a particular stock. The number of analysts represents the average number of analysts issuing recommendations for a stock in the year before the initiation. The sample covers the periods from March 31, 1996, to December 31, 1997 and from March 31, 2000, to December 31, 2000.

significant positive abnormal returns associated with these recommendations suggest an unambiguous purchasing strategy for institutions that receive tips.[10]

Summary statistics for all initiations that satisfied our data screens are presented in Table 1. The number of firms for which coverage is initiated is lower than the number of initiations because, over time, multiple analysts initiate coverage in the same stock. On average, there are about five analysts who issue recommendations for a stock during the year before the initiation. Based on market capitalization quintiles, we see that most of the initiations are for larger firms.

To verify that price responses in our sample are consistent with the results reported in earlier studies, we examine abnormal returns (size-adjusted returns) for our sample of buy and strong 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. Strong buy and buy initiations are associated with significant event-day size-adjusted returns of 1.15 and 0.50%, respectively. Over the −5 to +5 event window, cumulative size-adjusted returns are 2.85 and 1.18%, respectively. We also observe a small price run-up before the initiation, which is consistent

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. Fifty-seven 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.

[10] Of course, sell recommendations also suggest an unambiguous trading strategy, but the number of sell initiations is negligible.

Table 2
Size-adjusted returns for buy and strong buy initiations

Relative day	All initiations	Strong buy initiations	Buy initiations
–20 to –16	0.485	0.482	0.487
–15 to –11	0.567	0.696	0.443
–10	0.052	0.065	0.040
–9	0.144***	0.136*	0.151**
–8	0.142***	0.121*	0.161**
–7	0.082	0.143**	0.023
–6	0.073	0.077	0.068
–5	0.161***	0.197***	0.127*
–4	0.057	0.107	0.009
–3	0.118**	0.165**	0.073
–2	0.181***	0.248***	0.116
–1	0.274***	0.427**	0.125*
0	0.817***	1.145**	0.500***
1	0.111***	0.176**	0.049
2	0.083*	0.139*	0.029
3	0.114**	0.093	0.134*
4	0.092*	0.064	0.119
5	–0.014	0.081	–0.108
6	0.026	0.098	–0.044
7	0.086*	0.037	0.134*
8	–0.041	0.021	–0.102
9	–0.003	0.018	–0.024
10	–0.016	–0.110*	0.073
11–15	0.304	0.545	0.071
16–20	–0.043	0.059	–0.143
–5 to +5	1.998***	2.848***	1.176***
0–2	1.012***	1.461***	0.578***

The table presents the size-adjusted returns for 4467 initial strong buy recommendations and 4598 initial buy recommendations in our sample period. We calculate size-adjusted returns for event firms by taking the daily firm return minus the mean return for all firms in the same Center for Research in Security Prices (CRSP) size decile on that day. Test of significance are calculated using the postevent trading window [20, 60]. We calculate mean size-adjusted returns for all event firms on each day during the postevent trading window. We then use the time-series mean and variance of size-adjusted returns in the postevent trading window to test for abnormal size-adjusted returns around analysts' buy and strong buy initiations. ***, **, and *reflect significance at the 1, 5, and 10% levels, respectively.

with prerelease informed trading. These results are comparable with earlier studies.[11]

We obtain institutional trading data from the Plexus Group. Our sample of Plexus client trades covers the periods from January 1, 1996, to March 31, 1998 and from January 1, 2000, to March 31, 2001.[12] We use all available data in our empirical tests. Summary statistics for Plexus client trading within 60 days of our sample of initiations are presented in

[11] Barber et al.'s (2001) 1985–1996 sample from Zack's investment research was a comparable large sample of analyst initiations. They found that strong buy initiations earn significant three-day cumulative abnormal returns of 1.09% and buy initiations earn significant abnormal returns of 0.48%.

[12] The disjointed dates for the Plexus data are a result of missing data. Data from the missing period are not available from the Plexus Group. Our results hold for each time period when they are examined separately.

Table 3
Summary statistics for institutional trading

	Shares traded	Dollars traded
Total Plexus sample (thousands)	47,588,262	2,382,137,100
Trading per initiation		
Mean	5,481,887	274,408,149
Median	1,041,926	25,228,631
75th percentile	3,610,199	115,788,000
25th percentile	255,064	4,712,140
Trading by client per initiation (given client trades around initiation)		
Mean	298,606	14,947,399
Median	38,238	1,221,268
75th percentile	178,600	6,532,620
25th percentile	7000	210,472

The table presents summary information on the institutional trading sample from the Plexus Group. Executions examined in this article originate from 120 different institutional Plexus clients during the time period from January 1, 1996, to March 31, 1998 and from January 1, 2000, to March 31, 2001. Results are given for the Plexus executed daily volume that occurred during the [–60, +60] day window around the initiations in our sample and reflect the number of shares and dollar value of executed trades.

Table 3.[13] Plexus clients traded a total of 47,588 million shares, averaging 5481 thousand per initiation. As expected, trading activity is highly skewed. The median shares traded per initiation is 1,042 thousand, with 25% of the sample initiations trading fewer than 255,064 shares. Similarly, the trading activity across the 120 Plexus clients varies substantially and is skewed. Plexus clients average 299 thousand shares per initiation, but about half the clients trade 38,238 shares or less. For the remainder of the article, any reference to institutions or trading by institutions refers to trading by Plexus clients only.

5. Results

5.1 Institutional trading before analysts' buy and strong buy initiations

To test for tipping activity, we examine the trading activity of institutions just before initiations. For each day associated with each initiation, we calculate (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 share turnover by dividing by shares outstanding. These numbers are expressed in percentages. This normalization prevents institutional trading in large firms from

[13] While the Plexus data include executed volume each day, the data do not distinguish between individual trades that were executed to fill an order within a given day. For this reason, we do not report trade size summary statistics. While our analysis uses daily totals of executed shares, the data do include information on the orders that generate this trading activity. The full sample consists of 5.3 million orders, of which 1.6 million occur within our initiation study windows. Finally, the data do not include the name of the broker who executed shares, so we cannot link executions to any particular brokerage firm. 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.

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 (2003).

Figure 1 contains graphs of institutional trading activity around analysts' initiations. The first two graphs present the mean of total trading and institutional trading for 120 and 40 trading days, respectively, around

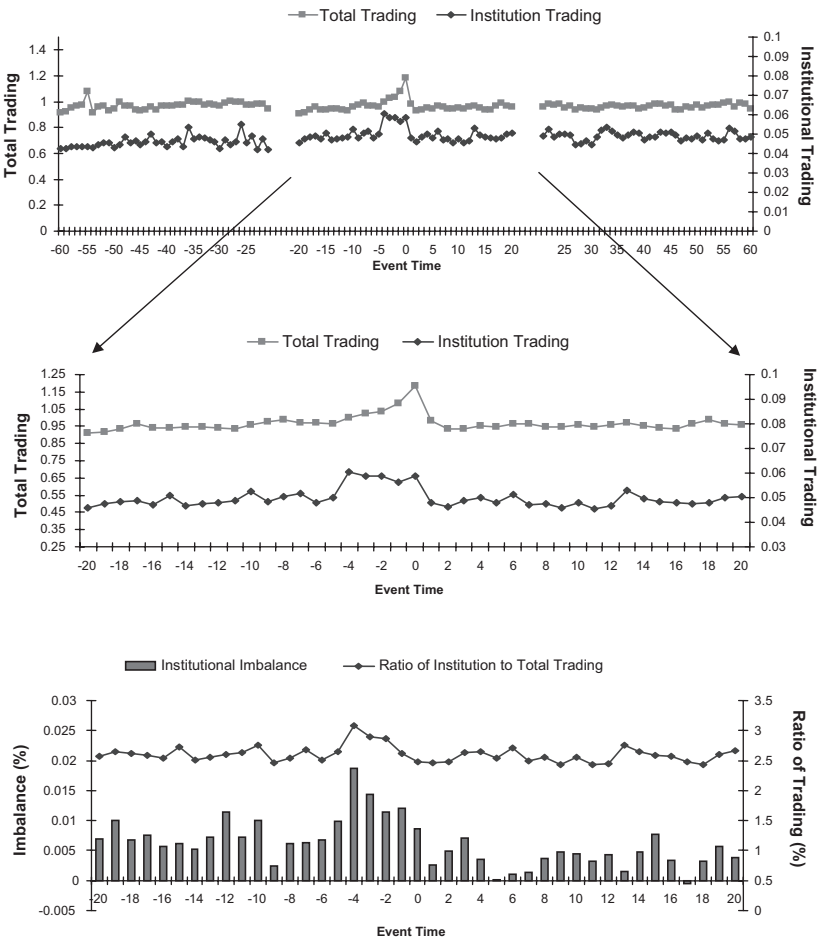

Figure 1
Institutional trading activity around analysts' initiations
The figure describes institutional trading activity around analysts' initiations. Activity is measured by trading volume relative to shares outstanding (turnover, in percent). The first graph shows total trading and trading by Plexus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

the public release of initiations (event day 0). Institutional trading is elevated beginning four days before 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 because tipping should not involve widespread early dissemination but rather selective dissemination to an analyst's preferred clients.

Comparing the pattern of institutional trading with 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 chose to examine initiations to eliminate problems related to confounding events. The fact that market-wide trading volume peaks on the date of public release suggest our sample is free of events that might induce institutional trading over the prerelease period. For example, if initiations cluster around an observable or predictable event such as an earnings announcement, then we should find a similar pattern in both market-wide volume and institutional volume. However, we find that 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, because we examine buy and strong buy initiations, we expect to see an increase in net buying in the prerelease period as opposed to simply an increase in trading. The third graph of Figure 1 presents institutional net 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 net imbalances (buying) beginning five days before analysts publicly initiate coverage. The net imbalance peaks four days before the public release of the reports, 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 analysts' recommendations but also trading in a manner consistent with foreknowledge of the contents of the analysts' forthcoming initial report.

Our formal analysis of trading is presented in Table 4, which reports daily event-period averages for institutional trading, net imbalance, total (CRSP) trading, the ratio of institutional share volume relative to CRSP total volume, the number of institutions trading, and the net imbalance per institution when institutions trade. As a basis for statistical tests, we calculate a benchmark level of trading activity by taking the mean across daily averages in the postevent period. The significance of any single day in our study window is then evaluated using a *t*-test comparing that day

Table 4
Institutional trading activity

Relative day	Institutional trading (turnover, %)	Institutional imbalance (turnover, %)	CRSP trading (turnover, %)	Plexus to CRSP trading	Number of institutions	Institutional imbalance per institution (turnover, %)		
						Net imbalance	Buys	Sells
−20 to −16	0.049	0.007	0.938	2.59	1.616	0.008	0.041	−0.041
−15 to −11	0.050	0.007	0.950	2.61	1.643	0.008	0.041	−0.040
−10	0.054	0.010***	0.969	2.76*	1.648	0.010**	0.045***	−0.043
−9	0.049	0.002	0.989	2.47	1.658**	0.004	0.036	−0.042
−8	0.051	0.006	1.001	2.54	1.666**	0.006	0.039	−0.043
−7	0.053	0.006	0.989	2.68	1.653**	0.006	0.043*	−0.045
−6	0.050	0.007	0.984	2.52	1.674***	0.008	0.040	−0.041
−5	0.052	0.010***	0.973	2.65	1.664**	0.008	0.044**	−0.042
−4	0.063***	0.019***	1.015**	3.08***	1.673***	0.015***	0.052***	−0.041
−3	0.060***	0.014***	1.041***	2.90***	1.649**	0.014***	0.051***	−0.045
−2	0.061***	0.011***	1.058***	2.87**	1.675***	0.011***	0.050***	−0.049
−1	0.058***	0.012***	1.108***	2.61	1.686***	0.014***	0.051***	−0.043
0	0.060***	0.009**	1.211***	2.48	1.696***	0.009**	0.047***	−0.047
1	0.049	0.003	0.998	2.45	1.666***	0.007	0.039	−0.041
2	0.047	0.005	0.943*	2.48	1.654	0.005	0.038	−0.040
3	0.050	0.007	0.949	2.64	1.633	0.007	0.041	−0.042
4	0.051	0.003	0.968	2.65	1.639	0.004	0.038	−0.046
5	0.049	0.001*	0.958	2.54	1.642	0.001	0.036	−0.047
6–10	0.049	0.003	0.964	2.55	1.641	0.004	0.037	−0.043
11–15	0.050	0.004	0.965	2.57	1.653	0.005	0.040	−0.044
16–20	0.050	0.003	0.976	2.55	1.643	0.005	0.040	−0.045
Benchmark (days 21–60)	0.050	0.004	0.972	2.57	1.619	0.004	0.038	−0.044

CRSP, Center for Research in Security Prices.

The table presents measures of institutional trading activity and net trading activity (normalized by shares outstanding) for Plexus clients around 9065 strong buy and buy initiations. Tests of significance are based on *t*-tests using the distribution of the postevent control window. ***, **, and *reflect significance at the 1, 5 and 10% levels, respectively.

with the benchmark level using the standard deviation of the daily averages during the benchmark period.[14] Because we are using the time-series standard deviation of daily means, we are only assuming independence across event time daily means—clustering in calendar time, which would lead to cross-sectional correlation, will not affect our inferences. Because we are testing for a difference between a specific daily mean and the benchmark (as opposed to testing whether the daily mean is different from zero), we are identifying days in which trading activity exceeds normal [see Bamber, Barron, and Stober (1997)]. We chose the postevent period to benchmark nonevent trading activity to minimize the effects of any institutional trading activity during the preevent period that may have precipitated the initiation.[15] However, results are similar (or stronger) when we use the preevent period to benchmark trading activity.

For all total trading measures in Table 4, we find abnormal activity before the initiation. For example, we see an increase in average institutional trading starting four days before the initiation and a persistent increase in net imbalance starting five days before the initiation. The magnitude of the increased buying is significant. During the benchmark period, institutions are net buyers of about 0.004% of shares outstanding each day, on average. This buying more than doubles before the initiation, reaching a peak of 0.019% of shares outstanding on day –4. Of course, as in most studies of initiations, there is some elevation in trading before the initiation, as seen in aggregate CRSP turnover. However, even after adjusting for aggregate volume by dividing institutional trading by CRSP trading (and expressing this as a percentage), institutional trading is unusually high on days –4 to –2. Thus, the relative increase in institutional purchases before a buy or strong buy recommendation cannot be explained by an overall increase in trading activity during the prerelease period.

If the institutional trading patterns we observe are a result of tipping, rather than precipitated by some other event, then we should see only a slight increase in the number of institutions active in the market (tipping would precipitate entry by, at most, the few institutions that were tipped). At the same time, given the nature of the reports, we should see an increase in the average buying activity of institutions (we cannot identify the specific institutions that were tipped, so we can only look at averages) and see little change in selling.

[14] The significance of multiple day periods is evaluated similarly: we use a difference in means test comparing the daily means across all days in the multiple day period and daily means of all days in the postevent period. Our methodology is identical to Corwin and Lipson (2004).

[15] O'Brien and Bhushan (1990) argued that the decision of a sell-side analyst to initiate research coverage and institutional investing is jointly determined. We use a postevent period to measure nonevent normal trading activity so that increasing institutional trading that could lead to analyst coverage does not bias our results.

Table 4 also presents the average number of institutions trading, the imbalance per institution, the imbalance per institution when institutions buy, and the imbalance per institutions when institutions sell.[16] The largest average number of institutions trading in the five days before the release date, 1.686 on day –1, exceeds the benchmark level of 1.619. Although the difference is statistically significant, the magnitude is small. In contrast, the imbalance per institution just before the release date far exceeds the imbalance over the benchmark period. The average over the five days before the release day is 0.012, which is three times the benchmark level of 0.004. In fact, the pattern in imbalance *per institution* closely mirrors the pattern in total imbalances, suggesting changes in aggregate trading activity result from an increase in the intensity of trading by a few institutions, rather than entry by many institutions. Furthermore, when looking at buys and sells separately, we observe a substantial increase in buying with virtually no change in selling. Thus, as would be expected if tipping initiated trading activity, the increase in buying before the release date is driven largely by an increase in the level of buying by institutions rather than a large change in the number of institutions or a drop in selling activity.[17]

To provide a sense of the economic magnitude of the change in trading, we note that the total imbalance over the five days before the release date is 145.3 million shares more than what would be expected given trading in the benchmark period. Because there are 9065 events in our sample, this means institutions purchase, on average, an additional 16,035 shares before the initiation. Of course, this is the average across all initiations and we do not expect tipping to happen frequently. Thus, as expected, the distribution of imbalances has a thick right (positive) tail. When we rank each initiation by magnitude of trading, the institutions in the top decile buy an additional 566,075 shares in the five trading days before the initiation. On average, almost half of this five-day imbalance occurs on a single day. Thus, instead of being spread out over five days, tipping-related trading appears to happen in short bursts.

5.2 Controlling for momentum buying by institutions

Stocks that receive analysts' strong buy and buy initiations may exhibit price run-ups before the initiation (Table 2). Because Griffin, Harris, and Topaloglu (2003) found that institutions are more likely than individuals to buy after a price rise, we test whether our results are driven by this

[16] These trading measures per institution are calculated for observed trading activity. Because we often have no institutions trading, the imbalance per institution will not equal the total net imbalance divided by the number of institutions. Similarly, the sum of average buying and selling imbalance per institution will not equal the net imbalance because there are not always the same number of buyers and sellers.

[17] One can also show that the rise in the number of institutions is driven by an increase in the number of buyers.

Table 5
Momentum quintiles—size-adjusted abnormal returns

	Quintile 1 (high returns)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (low returns)
Cumulative return	21.12%	7.08%	1.35%	–3.88%	–18.07%
Relative day					
–10	0.0136	0.0155**	0.0076	0.0171***	–0.0039
–9	0.0119	–0.0024	0.0024	0.0016	–0.0014
–8	0.0133	0.0018	0.0183***	0.0008	–0.0036
–7	0.0238**	0.0051	0.0080	0.0017	–0.0066*
–6	0.0159	0.0135**	0.0052	0.0026	–0.0034
–5	0.0149	0.0192***	0.0046	0.0097**	0.0008
–4	0.0363***	0.0104	0.0164***	0.0091**	0.0217***
–3	0.0392***	0.0073	0.0188	0.0018	0.0051
–2	0.0108	0.0185***	0.0077	0.0039	0.0157***
–1	0.0195*	0.0060	0.0131**	0.0120***	0.0093*
0	0.0090	0.0066	0.0154**	0.0018	0.0106**
1	0.0068	–0.0038	0.0069	0.0048	–0.0013
2	0.0068	–0.0019	0.0049	0.0035	0.0110**
3	0.0066	0.0024	0.0021	0.0000	0.0239***
4	0.0067	–0.0026	0.0051	0.0020	0.0063
5	0.0013	–0.0028	0.0034	–0.0050	0.0037
6	0.0002	0.0031	0.0025	–0.0019	0.0010
7	0.0023	0.0008	–0.0060***	0.0059	0.0040
8	0.0089	0.0053	0.0059	–0.0051	0.0037
9	0.0044	–0.0001	0.0147**	0.0012	0.0039
10	0.0013	0.0035	0.0154**	0.0016	0.0008
Benchmark (days 21–60)	0.007	0.003	0.005	0.001	0.001
$\chi^2(5)$ [–5 to –1]	44.61***	22.38***	29.12***	15.86**	15.14**

The table presents measures of institutional imbalance around 9065 strong buy and buy initiations. Initiations are partitioned into quintiles based on preevent cumulative size-adjusted abnormal returns during the [–20, –6] window. Tests of significance are based on *t*-tests using the distribution of the postevent control window. Chi-square tests test the null hypothesis of no abnormal trading in the [–5, –1] window for each quintile. ***,** and * reflect significance at the 1, 5 and 10% levels respectively.

effect. We do so by partitioning our sample into quintiles based on preevent cumulative size-adjusted abnormal returns. Based on the work of Cheng (2000) and the results in Table 4, our subsequent analyses will focus on trading during the five days before the release date, which we refer to as the prerelease period. Thus, we partition our initiations based on the cumulative abnormal return over days [–20, –6] and we examine each quintile as we did the whole sample in Table 4. Results for abnormal net imbalance are summarized in Table 5.[18] Cumulative abnormal returns vary substantially across the quintiles. Quintile 1 initiations experience mean cumulative abnormal returns of 21.12% compared with –18.07% for quintile 5.

We find that the change in buying activity is similar across quintiles. In every quintile, at least two of the five days in the prerelease period exhibit statistically significant abnormal buying. In fact, we observe three days of significant abnormal buying even in quintile 5, which has almost a 20%

[18] Results for institutional trading are omitted because the focus here is the effect of returns on buying versus selling. However, we note that statistically significant trading was observed in every quintile at some point in the –5 to –1 prerelease period.

decline in prices before day –5. Also notable in quintile 5 is the change from selling on days –10 to –6 (which would be expected given the price declines) to significant abnormal buying on days –4, –2, and –1. We also test whether the net imbalance in each quintile is elevated for the entire prerelease period relative to the control period. The results of that (chi-square) test are summarized in the table. In every quintile, we reject the hypothesis that buying over the five-day period is no different than the control period. Finally, we also test (again using a chi-square test) whether trading in the prerelease period is the same across every quintile. In this case, we fail to reject the hypothesis that trading is identical. These results suggest that differences in prerelease price movements have little effect on our analysis and, therefore, that the abnormal buying we observe in the whole sample cannot be explained by institutions buying in response to a price run-up before day –5.[19]

5.3 The determinants of prerelease buying

We next investigate whether the prerelease abnormal institutional buying imbalance is related to the contents of the forthcoming analyst's initiation. If the contents of initiations help to predict institutional buying before public release of the report, then this would suggest that tipping is responsible for some of the elevated buying in the prerelease period. We measure elevated buying as the sum of the daily imbalances over the prerelease period net of five times the average daily imbalance over the total control period (days –60 to –20 and 20–60). We refer to this elevated buying as abnormal buying. Our choice of regression specification must acknowledge the characteristics of the distribution of abnormal buying. In particular, abnormal buying tends to be either near zero or very large and positive. The large positive numbers also raise concerns about the influence of outliers. To address these issues, we transform abnormal buying into its corresponding rank across the sample of initiations and estimate the regression using ordinary least squares. This transformation preserves information in the relative ranking of the dependent variable but ignores the magnitude of the differences. As such, it is less sensitive to outliers in the tail of the distribution.[20]

[19] We also control for the effects of momentum stock returns using past returns as control variables in regression analyses. We analyzed abnormal trading (the regression residuals) in a manner identical to Table 4. Results are qualitatively similar. Results are also identical if we use raw returns rather than abnormal returns.

[20] Abnormal buying is kurtotic and right-skewed, thus basic OLS assumptions are violated. Alternate specifications using generalized method of moments (GMM) and maximum likelihood estimates using a *T*-distribution produce similar results but do not eliminate the concern that outliers could be affecting the results. The rank regressions represent a compromise between the OLS specification using net imbalance as the dependent variable and logit and ordered logit regressions which discretize the dependent variable into a limited number of categories. We note that results in all the alternate specifications suggest that a forward-looking element is present in institutional trading.

Along with many controls, our regression specification includes variables which prior research suggests would be related to the magnitude of the announcement price reaction. Specifically, we include dummy variables indicating: (i) that the recommendation is a strong buy (Strong Buy), (ii) that the recommendation is made by an *Institutional Investor* magazine All-American analyst (All-star), and (iii) that the recommending broker is among the top 20 most respected brokers according to *Institutional Investor* (Top 20). We also include the standard deviation of all analysts' earning forecasts in the month before the initiation (Uncertainty) and the difference between the initiation recommendation and the mean recommendation in the month before the initiation (Outstanding Recommendation).[21] As control variables, we include a dummy variable set to one if the firm trades on NASDAQ (NASDAQ), the log of the market capitalization of the initiated firm (Firm Size), and the cumulative return over days –20 to –6 (Cumulative Return). Control variables proxy for factors that affect trading activity but are unrelated to the variables of interest. For example, Cumulative Return addresses the concern that abnormal buying may be driven by momentum trading by institutions.

Table 6 presents the results of our regression analysis. None of the control variables is significant, including the cumulative return over days –20 to –6. However, all of the variables related to characteristics of the subsequent initiation are significant with the sole exception of Uncertainty. In particular, Strong Buy initiations (which generate larger average abnormal returns than unqualified buy initiations) are associated with greater abnormal buying than buy initiations. This result is consistent with the greater profit opportunities that accompany strong buy recommendations. The identity of the initiating analyst and brokerage firm also helps to predict abnormal buying. All-star analysts are associated with greater abnormal buying than non-All-star analysts. Similarly, identification as a Top 20 brokerage firm also has a significantly positive affect on abnormal buying.

The coefficient on Outstanding Recommendation is inconsistent with our ex ante expectations. If we assume that an initiation which is more positive than the consensus will generate more buying, then we expect a positive coefficient. We find the opposite to be the case. However, this result is consistent with Mikhail, Walther, and Willis (2005), who showed that the relation between an individual analyst's prior performance and trading activity is attenuated when the recommendation differs substantially from their prior recommendation (a large revision). Mikhail,

[21] Early research suggests these report characteristics are related to the price reaction at announcement. In our sample, all variables were significantly related to the announcement returns (both day 0 and the return over days 0 and +1) and of the predicted sign with the exception of Uncertainty, which was insignificant.

Table 6
Determinants of prerelease buying

Independent variable	1	2
Intercept	4125*** (15.26)	4170*** (16.60)
Strong Buy	253.0*** (3.35)	204.7*** (2.66)
All-star	438.8*** (2.77)	441.9*** (2.79)
Top 20 Broker	136.3** (2.37)	140.9** (2.45)
Uncertainty	31.9 (0.44)	3.14 (0.04)
Firm Size	15.74 (0.89)	15.71 (0.89)
NASDAQ	52.9 (0.90)	69.3 (1.19)
Outstanding Recommendation	−189.6*** (–3.28)	
Strong Buy × Outstanding Recommendation		−179.7** (–2.27)
Cumulative Return	198.7 (1.15)	196.4 (1.14)
R^2	0.35	0.29

The table presents regressions of the determinants of prerelease analyst tipping activity. The dependent variable is the rank of abnormal buying across initiations (abnormal buying is the sum of daily imbalance over [−5, −1] window after subtracting the average daily imbalance over the [−60, −20] and [20, 60] nonevent periods). Data are missing for some of the independent variables for 10 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-American analyst. *Top 20 Broker* is a dummy variable equal to one if the issuing analysts' brokerage firm is among the top 20 brokers as ranked by *Institutional Investor* magazine. *Uncertainty* is the standard deviation across all analysts' earnings forecasts in the month before the initiation. *Outstanding Recommendation* is the difference between the initiation recommendation and the level of the consensus recommendation in the month before the initiation. *NASDAQ* is a dummy variable equal to one if the company is a NASDAQ issue, and *Firm Size* is the natural log of the covered firm's market capitalization. *Cumulative Return* is the cumulative return during the [−20, −6] day window preceding an analyst's initiation. *** and **reflect significance at the 5 and 10% levels, respectively.

Walther, and Willis (2005) based their hypothesis on their earlier work [Mikhail, Walther, and Willis (2004)] and concluded that their finding is consistent with Trueman (1990), who theorized that large revisions cause a reassessment of the analyst's ability. In our case, a large discrepancy relative to the prior consensus leads to a similar reduction in the impact of the initiation.[22] To explore whether this effect explains the observed results, we create a Strong Buy × Outstanding Recommendation variable. This variable is included in the Column 2 regression. This regression shows that even though strong buy recommendations lead to increased trading (the coefficient on Strong Buy is still positive and significant), this effect is significantly attenuated when the initial recommendation is far from the prior consensus recommendation.

5.4 The distribution of abnormal buying across brokerage firms

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. Variation in policies and compliance across brokerage firms could lead to variation in tipping

[22] Mikhail, Walther, and Willis (2005) used the analyst's prior recommendation as a benchmark. Because an analyst's prior recommendation does not exist for an initial report, we use the prior consensus as a proxy.

activity across brokerage firms. Thus, abnormal buying should not be distributed randomly across brokerage firms.

To explore the possibility that brokerage firm policies affect the distribution of abnormal buying, we generate a distribution of abnormal buying in the absence of such an effect using the following bootstrap procedure. First, we assign initiations at random across brokerage firms in proportion to the number of actual initiations produced. Thus, if a given brokerage firm had 10 initiations, we assign 10 initiations at random, with replacement, from the pool of all initiations. Second, we sum the abnormal buying for each brokerage firm. Third, we sort the resulting brokerage firm totals and assign each brokerage a rank (largest to smallest) over the 278 brokerage firms in our sample. In effect, this process results in one randomly generated distribution of abnormal buying across brokerage firms—one that assumes no brokerage-firm effect. We repeat the process 500 times, providing 500 distributions, including 500 estimates of the abnormal buying for each rank. The medians across the 500 observations for each rank provide the desired expected distribution of net buying. The procedure also provides 90 and 10% quantiles for each rank. We then compare the observed trading associated with brokerage firm initiations to this distribution.

We present our analysis in the three graphs contained in Figure 2. To provide a context for evaluating changes in the distribution, the first graph presents the observed distribution across brokerage firms for both prerelease abnormal buying and the abnormal buying calculated over the 80 days in the control period (–60 to –21 and +21 to +60) appropriately scaled to match the five-day prerelease period by dividing by 16. In this graph, we see that most brokerage firms are associated with both prerelease and control period abnormal buying that is close to zero. However, the prerelease distribution differs notably from the control period for the brokerage firms whose initiations are associated with the largest amount of buying.[23] In this part of the distribution, we see substantially larger buying in the prerelease than control periods, in many cases twice the buying activity. The increase in buying is expected, given our earlier results. The point here is that the increase seems to be concentrated in one portion of the distribution, suggesting the additional buying is associated with a subset of firms, rather than distributed evenly across all brokerage firms.

The next two graphs address the specific question as to whether abnormal buying is clustered in some brokerage firms. In these graphs, we compare the observed distribution with the bootstrap distribution described above. The second graph in Figure 2 plots the observed distribution of buying along with the bootstrapped distribution (the median

[23] Note that we are comparing the *distribution* of trading in two periods. Thus, we compare the buying of the largest buyer in the prerelease period to the buying of the largest buyer in the control period.

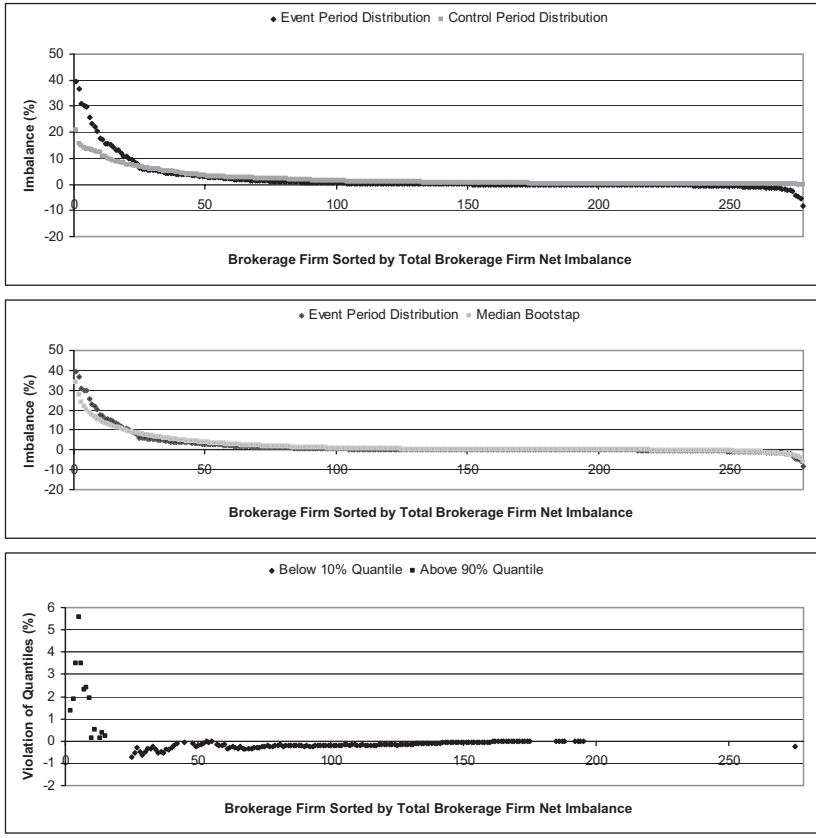

Figure 2
Distribution of brokerage firm trading activity
The figure describes the distribution of brokerage firm buying (net imbalance). Along the horizontal axis are the 278 brokerage firms sorted by the sum of their net imbalance over the designated periods. The horizontal axis plots this total brokerage firm activity. The first graph plots the prerelease (five-day) activity and the control period activity (appropriately scaled to an equivalent five-day total). Each plot is a separate sort across brokerage firms because the graph is an expression of the distribution of buying across brokerage firms, not an expression of the trading for particular brokerage firms. The second graph again plots the prerelease activity, but this time with the results of a bootstrapped prerelease distribution constructed by assigning initiations at random to brokerage firms. The third graph plots those points in the observed distribution that violate the 90 and 10% quantiles of the bootstrapped distribution.

across observations for each brokerage ranking). As expected, the distributions are close together because, by construction, the total buying in both cases is about equal.[24] However, the distribution is characterized by an increase in the buying activity of the largest buyers. Specifically, the

[24] They are not exactly equal because, as with all bootstraps, the initiations were chosen with replacement, and the total abnormal trading across all brokerage firms can vary.

observed distribution typically lies below the expected distribution but lies above for a small set of brokerage firms whose initiations are associated with a large amount of buying.

To provide some evidence as to the statistical significance of the deviation of the observed distribution from the bootstrap, we plot those points, which violate the 90 and 10% quantiles for each rank.[25] This is shown in the third graph in Figure 2. We see more clearly in this graph that the distribution deviates significantly from what would be expected if buying were randomly distributed across brokerage firms. More importantly, buying violates the 90% quantile for just 14 brokerage firms, and the increase in this range of the distribution is offset by reductions over much of the remainder of the distribution, with 156 firms violating the 10% quantile. To provide some sense of the economic magnitude of the deviation for these 14 firms, we calculated the mean difference between the realized and bootstrapped net imbalance on a per initiation basis.[26] This mean difference ranged from 107 to 362% of the mean imbalances in the benchmark periods from Table 4.

Taken together, these results suggest a substantial brokerage firm effect that is consistent with variation in brokerage firm policies and enforcement procedures related to tipping. Of course, because we cannot observe tipping, we can only comment on the distribution of abnormal buying and not on the distribution of actual tipping instances. Also, although the results are consistent with variation in tipping policies and enforcement, there may be other characteristics of the firms that might affect the distribution of trading activity in the prerelease period of which we are unaware.

5.5 Institutional trading profits

Tipping will only benefit institutions if trading on those tips leads to economic profits. Although 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), Conrad, Johnson, and Wahal (2001)]. We address this issue by looking at the actual profits that would be earned given the institutions' actual execution prices and executed volume.

Table 7 analyzes the trading profits of Plexus institutions that trade before analysts' buy and strong buy initiations. To calculate institutional

[25] A similar bootstrap could be used to provide statistical evidence on the difference between trading during the prerelease period and trading during the control period. That (unreported) analysis provides additional evidence of both an increase in trading and also that the increase is observed in the portion of the distribution associated with large buyers. We emphasize that the purpose of the bootstrap is not intended to demonstrate that there is more buying than expected but to demonstrate that buying is clustered more than expected within particular brokerage firms.

[26] Because each brokerage firm has multiple initiations, we have to divide the median aggregate trading by the number of initiations for that brokerage firm.

Table 7
Trading profits around buy and strong buy initiations

Trading period	Ending day: Day 0 (%)	Day 5 (%)	Day 10 (%)	Day 30 (%)
Panel A of Table 7 Profits for all institutional traders around analysts' buy and strong buy initiations				
[−5, −1]				
Mean	0.37	0.40	0.36	0.75
Standard error	0.16	0.18	0.20	0.27
Skewness	–0.54	–0.38	–0.67	–1.58
Median	0.04	0.11	0.11	0.26
[−5, 0]				
Mean	0.45	0.54	0.50	0.97
Standard error	0.16	0.17	0.19	0.25
Skewness	1.54	1.27	0.65	–0.13
Median	0.02	0.07	0.09	0.27
Panel B of Table 7 Profits for buying institutions around analysts' buy and strong buy initiations				
[−5, −1]				
Mean	3.5	3.9	4.0	5.4
Standard error	0.21	0.24	0.27	0.40
Skewness	4.74	3.31	2.33	4.30
Median	1.1	1.9	2.4	4.8
[−5, 0]				
Mean	3.3	3.7	3.9	5.3
Standard error	0.20	0.23	0.27	0.38
Skewness	5.63	3.83	2.76	4.31
Median	0.9	1.6	2.2	4.6

The 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 the Center for Research in Security Prices (CRSP).

trading profits, we assume that, six days before the initiation, the initial endowment (position) for all institutions is zero. We consider two different windows in which positions are established (the trading period is 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. 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. We express this profit as a fraction of the position established at the end of the

trading period. Thus, the profit is a return, and thus both acknowledges the magnitude of the required investment and reduces 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 −5 to −1 prerelease trading period, whereas panel B presents results only for those institutions that are net buyers. Given the known positive event-day returns to analysts' buy and strong buy recommendations, and because we document net buying by institutions in our sample, a slight profit is possible across all institutions. However, when evaluating the potential benefit from receiving tips, the results for buyers would be more relevant. Looking at all institutions, we find economically small, but positive, average returns. Profits range from 0.37% when positions are liquidated at day 0 to 0.75% when positions are liquidated on day 30. For buyers, profits can be substantial. For example, for positions accumulated from day −5 through day −1, institutional profits range from 3.5% when liquidated at day 0 to 5.4% when liquidated at day 30.[27] We note that the trading profits exhibit a large degree of positive skewness, suggesting the potential profits may be much higher for institutions that have better information about forthcoming initiations.

To provide a sense of the dollar magnitude of profits, we calculate the average buying activity of institutions over the control periods and then calculate the additional (abnormal) buying during the prerelease window. Applying the percentage returns to the abnormal buying provides the desired estimate of profits from additional trading. As expected, the average profit across all initiations is small ($35,774 per initiation) because the average daily turnover and shares traded are modest during the prerelease window even though they are larger than normal (see Table 4 and discussion on page 15). More relevant would be the profit to active buyers because those receiving tips would presumably trade more aggressively. If we look at the top 906 buyers (the top decile of buyers), then their abnormal buying during the prerelease period is $24,690,270, providing average profits of $469,818.

Neither do we expect that tipping occurs in every initiation nor do we expect that every institution is tipped. Nevertheless, our results suggest that the potential profits from obtaining tips can be substantial and may be a significant benefit that buy-side institutions expect from their sell-side analysts. Of course, these trading profits are 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 services [see

[27] All profit totals are statistically significant at the 1% level, but we omit indications to that effect in the tables.

Goldstein et al. (2006)]. The institutions may expect to be notified when the analyst decides to initiate coverage simply as part of that relationship.

6. Conclusion

This article investigates the trading behavior of institutional investors before the public release of analysts' buy and strong buy initial recommendations. Using a proprietary database of institutional trades from the Plexus Group, we find evidence of abnormal institutional trading before 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 before the public release. We confirm that abnormal buying is present even after controlling for institutional momentum buying. We also find that the extent of abnormal buying in the prerelease period is related to characteristics of the initiation that have been shown to predict the extent of a price increase at public announcement. We note that the five days before the public release of the initiation is when the analysts' report is substantially complete and undergoing the internal legal review process. Our results, therefore, are consistent with analysts (or someone in their firms) revealing the contents of the upcoming reports to preferred clients before the public release of the report.

We cannot, of course, observe tipping. We can only present evidence that is consistent with tipping. One concern is that if analysts can generate initiations on short notice, or possess a pool of potential initiations in various stages of completion that could be quickly completed, then analysts may react to institutional interest in a stock by initiating coverage. In effect, the trading we document may cause the initiation. However, the initiation activity of analysts during our sample period, as well as conversations with analysts and other practitioners, suggests that this is unlikely. A typical analyst in our sample issues only 3.24 initiations during our sample period or 1.30 initiations per year. This evidence suggests that individual analysts do not generate a large number of initiations and, therefore, are unlikely to have a large number of nearly completed initiations in their pipeline. It should also be noted that if analysts were responding to institutional trading, analysts would also have to adjust their opinion based on the level of trading by their client and All-star analysts would have to be more likely to accelerate an initiation.

We do not take a normative position on tipping. The purpose of this article is simply to draw attention to this activity and provide evidence consistent with 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, then 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 draw attention to the link between a very practical question—how should sell-side research be rewarded—and a possibly controversial policy question—how much discretion should analyst firms have over the release of that information.

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